# Command Lines:

## Aesthetics and Technique in Interactive Fiction and New Media

a dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in English

by

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dedicated to my grandparents Charles and Norma Keller Enid and Malcolm Douglass your love made everything possible

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ABSTRACT

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The Interactive Fiction (IF) genre describes text-based narrative experiences in which a person interacts with a computer simulation by typing text phrases (usually commands in the imperative mood) and reading software-generated text responses (usually statements in the second person present tense). Re-examining historical and contemporary IF illuminates the larger fields of electronic literature and game studies. Intertwined aesthetic and technical developments in IF from 1977 to the present are analyzed in terms of language (person, tense, and mood), narrative theory (Iser's gaps, the fabula / sjuzet distinction), game studies / ludology (player apprehension of rules, evaluation of strategic advancement), and filmic representation (subjective POV, time-loops). Two general methodological concepts for digital humanities analyses are developed in relation to IF: implied code, which facilitates studying the interactor's mental model of an interactive work; and frustration aesthetics, which facilitates analysis of the constraints that structure interactive experiences. IF works interpreted in extended "close interactions" include Plotkin's Shade (1999), Barlow's Aisle (2000), Pontious's Rematch (2000), Foster and Ravipinto's Slouching Towards Bedlam (2003), and others. Experiences of these works are mediated by implications, frustrations, and the limiting figures of their protagonists.

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Plain-Text Edition

This plain text-edition of Command Lines omits footnotes, figures, and bold/italics. It simplifies tables, and moves traditional front-matter to the end of the main document in order to aid content accessibility. A full-content edition is freely available from jeremydouglass.com and ProQuest/UMI Dissertation Publishing.

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Table of Contents

* Glossary

* Acknowledgement

* Vita

* Full Table of Contents

* Figures

* Works Cited

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Foreword: Foreclosure and Interactive Fiction

This study aspires to increase the awareness and appreciation of interactive fiction in the new media arts and the humanities. To that end it forwards a few general theories of that command line genre, as well as a number of exemplary contemporary works worthy of close study. The theories generally focus on how interactive fiction is experienced as a phenomenon of discovery and understanding; the examples highlight how contemporary works have explored and refined this mode of play with the player's knowledge. One consequence of these arguments is that much is made of analyzing experiences as they are discovered. Yet if you have not already explored a variety of interactive fiction (and most people have not), this puts the examples in the awkward position of murdering to dissect the process of exploration and discovery. This foreword's meditation on spoilers and foreclosure serves both as a gentle warning to potential readers of this study and as a brief discussion of what in this situation is unique to the given subject of interactive fiction works.

'Spoilers' are statements that reveal the crucial details of fictional media to potential audiences. These details may be of any kind, and indeed the effect may be undesired (as with a review that reveals some climactic secret) or desirable (as with a players guide to a quest video game). Regardless, the effects are most acutely felt whenever they preempt the progressive revelation of the work, often by resolving some central mystery before it can be engaged, whether in drama, literature, cinema or new media. How might Birnam wood move against Macbeth? Who committed the murder on the Orient Express? What happened to Luke Skywalker's father? How can the Prince of Persia defeat his shadow-self? For the uninitiated, the true danger is not that answers might reduce the pleasures of revelation, but that answers might excise revelation entirely. Wherever questions are fundamental to the experience of the work, answers prevent a questing motion of the mind that the work might otherwise encourage, and thus answers prevent the work itself.

It is normal for mysteries in art to end in discoveries, as energy accumulates around the gaps in the mind between knowns, remaining potential until, in a sudden synaptic arc, a connection is made: closure. A spoiler is merely a special type of closure, which I will term foreclosure. External and prior rather than internal and concurrent, foreclosures perform in themselves the act of resolving the gap, and in doing so preempt the reader's performance. The site of potential energy is short-circuited before engagement with the work even begins. While the potential for foreclosure is implicit any time the uninitiated consider a work from a distance, the concept of the "spoiler" as a threat to experience is most relevant addressing potential audiences, as do book and film reviews or introductions to unfamiliar genres. Even then, foreclosures are taken most seriously in domains where the process of exploration and discovery is held to be central to the experience of the work itself, as for example in mystery, suspense, riddles, or jokes. This is true across media forms such as theatre, literature, and film. This is also true in the case of interactive media such as video games. Foreclosure is more consequential for the experience of Zork (whose progresses and pleasures depend largely on puzzles and mysteries) than it is for Space Invaders (whose progresses and pleasures depend largely on reflexes and technique).

Figure 1. The hero Wander charges to climb the leg of Valus in the video game Shadow of the Colossus.

Two distinct types of foreclosure affect interactive media. The type described thus far is conceptual foreclosure. For example, Fumito Ueda's 3D video game Shadow of the Colossus (2005) presents a young hero, Wander, who begs an ancient spirit to revive a dead girl. To ransom her life, the hero (and, by extension, the player) is told to hunt and destroy a pantheon of magical stone creatures called colossi, yet not told why the colossi exist, or to what end they must be destroyed. While this mystery is resolved at the conclusion of the game, uncertainty, ambivalence, and doubt about the hero's goals are what give the work part of its peculiar and powerful emotional force. Much as in a film, foreclosing this uncertainty for the player in advance of play would change the work, particularly the desire for and fear of outcomes that might color the player's labors.

The second type of foreclosure that can affect Shadow of the Colossus is procedural foreclosure. The colossi are antagonists, but they are also mysteries, in that each one must be first located in a vast landscape and then undone by discovering and exploiting a series of physical and behavioral weaknesses. Acting as the hero, the player must locate, observe, and engage with the colossi, often culminating in physically traversing the terrain-like expanses of their vast bodies. Colossi can only be destroyed once interaction with them has been explored to the point that they are truly understood for what they are    more majestic than terrible, and more bestial than monstrous. This intimacy may lead the player into identification with the colossi, and is part of what transforms each expected triumph into a loss. While mastery is the goal, the outcome of a collapsing colossus is a sobering spectacle of exterminating the sublime, evoking an atmosphere of wistful melancholy.

Procedural foreclosure displaces this active process of coming into understanding, as for example when the player learns in advance of initial play the optimal method for locating and destroying each colossus (as with a guide, tutorial, or review). Procedural foreclosure changes both the play technique and the resulting procedures of the interactive experience, and thus changes those aesthetic affects that arise procedurally. In the case of Shadow of the Colossus, optimally guided play shortens the length of the work dramatically by omitting exploration in every sense. Forewarned and forearmed, an epic half-hour struggle to subdue a creature fighting for its life becomes 30 seconds of precise and perfunctory execution    an encounter with Moby-Dick revisited by contemporary commercial whale-harvesters. As with a viewing of The Empire Strikes Back prefaced by the identity of Luke's father, the aesthetic experience of the work may be changed. Unlike the film watcher, however, the player of Shadow of the Colossus additionally creates and witnesses a different work    a shorter work largely cleansed of both mystery and the learning process.

Spoilers are not a normal anxiety for those writing literary and art criticism, which is generally intended for readers who are already familiar with the objects of study. To the extent that criticism is concerned with engaging crucial detail, avoiding spoilers may in fact be beyond its power to achieve. As the forgoing rumination on foreclosure suggests, however, the preemptive understanding of interactive works imparted by criticism is almost unavoidably destructive, both in the aesthetic sense and in the way it excises the experiences of ambiguity, exploration, and frustration. Where works are constituted by what the player does not yet know, as with mystery and suspense, this prevents the work. That is the dual warning and insight of this foreword, which will now place its conclusion (and the entire rest of this study) under the following banner:

* SPOILERS WARNING *

Once we already know that Darth Vader is Luke's father, we cannot experience the lead up to their confrontation in The Empire Strikes Back in the same state of mind. Nor can we guide the hero of Shadow of the Colossus against the colossi of the forbidden land in the same state of mind once we know that his true task is to release the fragments of a dark soul from captivity, and that each victory over a colossus leads the hero one step closer to a terrible demonic possession. Further, while we can appreciate the hero's single-minded bravery, we cannot fully appreciate the tragic quality of his heroism unless we have struggled

with him, becoming complicit in somehow overcoming the overwhelming odds that separate him from his doom. This is an ergodics of guilt, and the heights of effort that the player achieves on behalf of the doomed hero are what lend weight to the corresponding depths of their eventual betrayal, and together these procedural and conceptual closures make up the meaning of the work. When the hero is finally consumed by darkness and rises again as the incarnation of the shadowy Dormin, the game camera takes up position over the shoulder of the massive creature, and the player is given control for the first time of a massive figure (majestic, terrible, and doomed) with a sense of recognition. The hero has become the uncanny double of his victims, and we know that this fate, however little it is to be desired, has been earned. At the last the player must control a monstrosity whose defeat is the victory condition of the game.

Figure 2. Possessed by Dormin, the doomed hero Wander attacks four soldiers (upper right) as a dark colossus.

What do Shadow of the Colossus and interactive fiction have to do with each other? Quite a lot. While the cinematic sensibilities and dramatic pacing of the game all conspire to make it affecting, the game is exceptional where it uses interaction to make the player complicit in a progression of mysteries, reversals, and revelations. This design pattern is the essential difference in the design of Shadow of the Colossus that caused a sensation in 2005, and it is also the very essence of what contemporary literary IF has been exploring for the previous two decades. When we return to the groundbreaking work about the self-defeating transformation of a protagonist into a specter, it won't be Shadow. It will be the 2000 interactive fiction called Shade.

## Chapter 1

: The Command Line and the Second Person

You are standing in an open field west of an English Department.

There is a small mailbox here.

> OPEN THE MAILBOX

Opening the mailbox reveals a dissertation.

> READ THE DISSERTATION

(taken)

You open the dissertation to the first page, and begin to read....

This dissertation undertakes a study of the genre called "interactive fiction" (or 'IF'), a text-based narrative experience in which a person interacts with a computer software simulation by alternately typing text phrases (generally a command in the imperative mood) and reading software-generated text responses (generally a statement in the second person present tense). The primary focus in this study is the intertwined aesthetic and technical developments of the genre of IF from its emergence in the 1970s to the present. In particular, this study addresses the large body of almost unexamined works of IF written in the past decade and their turn away from the simulation of challenging environments and towards the exploration of computational narration. These thousands of recent independent works, some challenging, sophisticated and beautiful, have remained largely invisible in recent new media and games scholarship, which instead repeatedly cites a very few commercial works from the early 1980s. Given the vast scope of this lacuna in new media criticism, a complete survey of IF or even a complete survey of contemporary IF is outside the scope of this project. Nevertheless, a study of the genre as exemplified by selected contemporary authors is certainly in order, and this study takes up close analyses of the works of Sam Barlow, Adam Cadre, Jon Ingold, Nick Montfort, Andrew Plotkin, Andrew Pontious, and Emily Short, among others.

What we have to gain from a critical study of IF goes far beyond canonical supplement, and straight to the heart of how many fields have attempted to define and create taxonomies of digital new media arts. IF is something of a problem child for studies of games, hypertext fiction, and electronic literature, and part of the interest in studying IF arises precisely out of the difficulty one encounters when attempting to assimilate it under most current categories, typologies, and theories of new media. The lack of critical engagement with real works of IF, in other words, may not be entirely oversight, but may in part arise out of exactly these difficulties in addressing the question "What is IF?"

What is IF? The question requires quite a bit of unpacking, and this can begin with the formal and procedural questions, "What are the mechanisms of IF?" and "What is the process of IF?" In general, the process of exploring an IF work occurs through a recurrent cycle of text generation, alternating in turn between the software program and the software user, or 'interactor,' both referencing the same simulated world. At the computer screen prompt, also known as the "command line" ('>'), the interactor types a phrase, generally in the command tense ("> READ THE DISSERTATION") and the program attempts to parse the command with regards to the simulated world (perform the read action on the dissertation object), acts out any results in the simulated world (move the dissertation object into the possession of the protagonist object) and then narrates what has happened to the interactor, generally in the second person ("You open the dissertation to the first page, and begin to read....") before the process begins again.

Figure 3. Above: The opening screen of Blank and Lebling's Zork I (1981). Below: The interface to Cadre's Lock & Key (2002).

Those readers unfamiliar with objects as detailed above must remember that, as in any critical engagement with media art, caveat lector: reading criticism cannot substitute for direct engagement with these works. The description may be helpful, but in the end may only be marginally more helpful then describing a film to someone who has never experienced one as "the rapid superimposition of photographs" or a comic as "the spatial juxtaposition of images." What is elided from such descriptions is the experience of the medium: the way that rapid superimposition simulates motion, or the manner of reading spatial juxtaposition that creates a simulation of time and space. So too in IF, technical and procedural descriptions tend to elide the crucial fact of how the command line prompt enables exploration and acts as a locus of experience: that it marks a gap between what the interactor knows and does not know, that it is a site of closure and coming into understanding, and that the result synthesizes the thesis of the program's narration with the antithesis of the interactor's interrogation. The heart of this study's approach to IF is this model of the command line, a site of negotiation between the actual code of the simulation and the "implied code" of the interactor's conception. This model of exploration through interrogation builds on earlier critical models of IF as a role-play, a participation, a drama, a conversation, a cybernetic feedback loop, or a series of riddles.

These terms 'interactor,' 'exploration,' and 'interrogation' may seem metaphorical but have been proposed here with some care. The interactor is, as many have remarked, neither a reader nor a writer, neither a speaker nor a listener (Montfort, Murray). While engaging IF she does read, and also types (and so, in a loose sense, writes), and might even be said to 'wread.' This total process in IF is best described as exploration. In the general sense, 'explore' captures the spirit of reader response theory that Louise Rosenblatt termed "literature as exploration" in 1938. In the more literal sense, 'explore' reflects the new media theory that J. David Bolter and Michael Joyce used in 1987 when they described navigating hypertext fiction links as exploring a "garden of forking paths" (6), and perhaps a mode of engagement appropriate to almost any text we might term 'ergodic.' Unlike most hypertext fictions, most IF employ a spatial rather than topical metaphor (in that many individual exchanges produce substitutions of text that correspond to movement through simulated space, not associated topics), and thus are explored in the more pragmatic sense of explore: "travel through an unfamiliar area in order to familiarize oneself with it." But most importantly, to engage with IF is to 'explore' in the most literal sense of its Latin derivation, ex-plorare: "to cry out." IF proceeds, if it proceeds at all, as a result of outcry utterances, typed by the interactor, that produce in response a growing familiarity with the simulated landscape.

If the results of these utterances in IF are typically a kind of reading I term 'exploration,' the utterances themselves are typically a kind of writing I term 'interrogation,' in that they are both forceful imperatives in the command tense and, at the same time, questions. The first time an interactor types "OPEN THE MAILBOX" she is also implicitly asking "(CAN I) OPEN THE MAILBOX (?)". The process of an interrogation is a special kind of imperative asking, focused only on eliciting information. It is asking precisely in that it can easily be and routinely is denied ("The mailbox is rusted shut. Perhaps if you had oil...."), and, like the cross-examining lawyer who says "I put it to you," the command tense of IF is both strident and essentially impotent. Restated loosely in terms of speech acts from J. L. Austin's 1955 lectures How to Do Things with Words, the IF interactor constantly attempts to make declarative performative utterances (to say things, thereby making them so), but often without the ability to judge whether they will be 'happy' or rather flawed infelicities. In question is whether interactions will be an accepted procedure ("I do not know how to 'open'"), whether in that case they will be executed properly and completely ("You can only 'open' something with something else"), whether once accepted they will be disallowed or vitiated ("As you grasp the mailbox lid, the hot metal causes you to jerk your hand back") and so forth. Austin's study of infelicities in speech acts maps in a fascinating way onto the common methods of rule execution and error handling used in IF systems, perhaps in part due to their shared concern with how one adjudicates the tenuous connections between unruly language and some model of the real. These judgments, which for Austin were resolved by the negotiations of cultural context and public opinion as much as by the parties themselves, are

in the case of IF adjudicated by the software system. As useful as it is, speech act theory can lead us into an error in imagining the encounter at the command line as conversational, when it is precisely the asymmetry just outlined that makes it least like a conversation and most like an interrogation. The sworn witness in a cross-examination answers at the direction of the prosecutor, but (in theory) cannot be led, and is (unlike the prosecutor) the sole producer of admissible testimony. Such is the case with the IF system at the direction of the interactor.

It is difficult to choose a critical terminology and situate the study of IF in digital media without privileging either an Electronic Literature or a Games Studies framework of assumptions, as it is difficult to avoid taking an implicit position in the "Narratology vs. Ludology" debates that have marked the recent establishment of Games Studies as a discipline. Ludology is a theoretical approach to the study of games with a primary emphasis on the operation of video game rules, and setting it in opposition to the approach of its narratologist forebears was a largely unproductive exploration of applying the false dilemma "rules, or stories?" to a host of complex problem. This is particularly vexing when dealing with rule-based objects that narrate, as with IF. What to call such objects? Nick Montfort raises a number of options just in the title of his 2004 article "Interactive Fiction as 'Story,' 'Game,' 'Storygame,' 'Novel,' 'World,' 'Literature,' 'Puzzle,' 'Problem,' 'Riddle,' and 'Machine'", and captures some of the frustration in his opening line:

Asking whether a new media artifact is a story or a game is like asking of a poem: "Which is it? Narrative or metrical?"

IF provides an excellent example of a specific genre poorly served by the assumption that eliterature and games are exclusive areas of inquiry demanding strictly partitioned approaches and terminologies. IF objects are sometimes games that are played, and sometimes stories that are read, and often both or neither. Further, their narrative and rule aspects interact continuously at a deep level. For this reason, the IF 'work' and its 'interactor' will be described throughout this study, not to deny the importance either of the game player or of the electronic literature reader, but to establish a more fundamental baseline for critical discussion of IF operations in terms of both rule structures and narrative operations.

By describing interacting with IF works in terms of exploration and interrogation (wandering outcry and forceful asking), I've tried to mark a new path across well-trod territory, beginning in form and process before passing through on the way towards an understanding of affective experience. The description of IF as form and process is something of a fixture in popular introductions to the genre (e.g. Firth & Kesserich, Shiovitz, Short, Nelson), dissertations, theses, and monographs on the genre (e.g. Buckles, Maher, Montfort, Sloan) and critical surveys of electronic literature, games, and new media more broadly (e.g. Aarseth, Murray). All of these have in common the need to reach out to a reader unfamiliar with the medium    an obligation and an opportunity that critical studies of novels or films do not often share. The best scholarly answers to the question "What is IF?" have tended towards the provisional and composite, covering aspects such as form (hardware, software architecture, and interface), process (methods of engaged conversation / exploration / interaction / participation / play), genre (often narrowly understood as themes present in typical or archetypical works), and history (invention, commercial boom / bust, and independent era). If such composites have been diverse in their approaches, however, they have also been fairly uniform in their limitations: too many have placed emphasis on incomplete historical sketches of IF circa 1980-1985, and several of the most influential have incorrectly proclaimed IF to be a 'dead' genre (e.g. Aarseth, Yellowlees Douglas), usually with the mystifying justification that contemporary IF does not sell. This suggests comparison to chapbooks of poetry, for if sales are to be the new standard for 'living' genres, then language arts and new media arts are both in serious trouble. Yet while these critical accounts of the history of IF are often factually incorrect, even the recent renaissance in (corrective) IF historical scholarship has shared some of their deepest assumptions, and as such partially obscures IF from view.

IF is history!

In recent years, the understanding of IF has experienced a quiet revolution in the meticulous research of Jerz, Montfort, and Maher. Their works have revised and expanded the history of the genre into a generally uncontested sequence. Taken together with public histories such as Graham Nelson's "A short history of interactive fiction" (2001) and community records such as Stephan and Misty Granade's "A Brief History of Interactive Fiction" (2002) all recent histories suggest a generally shared periodization. This introduction cannot recapitulate the entirety of their findings on the history of IF, but it can synthesize this periodization for the purpose of critique:

* 1975 Origin: IF began when Will Crowther, working in his spare time, wrote a spelunking simulation of a real Kentucky cave for his two daughters. The file, named "ADVENT" (a.k.a. Adventure) was written in FORTRAN on his work's timesharing PDP-10 computer. Publicly available on ARPANET, the game became a sensation.

* 1976 Coauthorship: Don Woods discovered Adventure and, with permission and source from Crowther, revised / expanded the work substantially. His major influence is generally agreed to have been shifting the emphasis from spelunking to a fantasy treasure hunt.

* 1977 Folk Art: So dubbed by Buckles in 1985, the Crowther / Woods Adventure is widely ported and imitated, including by a group at the MIT Laboratory for Computer Science who later found Infocom.

* 1978-1980 Commercial Games: Scott Adams programs the loose adaptation Adventureland, which becomes the first commercial software game when he takes out a small mail order ad in a computer magazine.

* 1980-1985 Corporate Games: On-Line Systems (later Sierra On-Line) and Infocom both release games, with other companies (Level 9, Synapse, etc.) following. Infocom rises to prominence as a mass-market phenomenon and dominates the computer game software and publications industries for five years.

* 1985-1991 Defunding (The Crash): Bankruptcy and closure for IF companies Adventure International (1985), Infocom (1986-89), Level 9 (1989-91) and finally Magnetic Scrolls (1992). In 1993 "Gateway II: Homeworld" is the last commercial game widely released by a studio which is entirely parser-driven (Grenade).

* 1991-2005 Independent / Community Era: Mature IF development languages like TADS and Inform circulate widely on Usenet and non-commercial authorship rises in conjunction with a culture of public archives, craft discussions, critical reviews and ratings, and awards ceremonies.

What is radical in the accounts synthesized here is not only their accuracy compared to earlier writings but also their inclusion and account of the final Independent / Community Era. Individual histories vary in their divisions. The Granades choose 1991 as the transitional year to independence, whereas Montfort writes more expansively that "the still-growing community of interactive fiction authors first really began to demonstrate the vitality of the form in the 1990s, innovating in ways that early hackers and later game companies did not" (193). Montfort's book chapter divisions "Adventure and Its Ancestors," "Infocom and Commercial Beginnings," and "The Independents" follow this general formulation of hackers, companies, and independents, although he also provides meticulous pre-histories that suggest complications to each category. Did the independent era begin when published noncommercial output outstripped the flagging corporations? Was it in 1987, when the independent "InfoTaskForce" group reverse engineered Infocom's Z-machine , guaranteeing a continuity of texts and techniques that would nurture the generation after the commercial crash? Or was it in 1983, with the release of Graeme Yeandle's IF authorware The Quill / Adventure Writer?

These questions suggest a new way of telling of the history of IF that is quite distinct from the approach of Montfort or the Granades, holding that the Folk Art and Independent eras are, in fact, one continuous and inseparable period, running from 1975 to the present, and characterized by a broadly shared set of production

and consumption practices that made similar uses of mainframes / ARPANET / Usenet / the Internet for the open and free distribution of IF programs and their source codes. Should IF be understood in terms of a failed relationship to the model of publishing? Perhaps it could instead be represented as an ongoing successful relationship to the model of network distribution, or to the set of logics Alexander Galloway terms "protocol." The commercialization of IF, while foundational for the later commercial computer games industry, can be recast in this telling as an important anomaly, a brief big-business deviation from the otherwise constant association of the IF genre with individual authors each networked into a kind of literary salon culture. Indeed, as we focus on this version it quickly becomes unclear whether business production methods were ever strongly deviated from the methods of the earlier folk era or the later independent era: a single author laboring for some months, with perhaps the help of a few volunteer beta-testers. In fact, at the absolute apex of the corporate era, Infocom appeared to adopt a model much more like the working method of Crowther in 1976 or Plotkin in 1996 than it was like the massive team-based approach of a film studio or video game production house. In an interview, founder Dave Lebling recalls "Infocom had putting out games down to a science: a team consisted of one author, one interpreter, and some QA [...] and we could bring a game to market in nine months" (Briceno et al. 2000).

Figure 4. De-periodizing our thinking: from marketplace to production

Old Timeline: IF as failed product culture

1975-1980 Folk IF Era

1980-1991 Corporate IF Era

1991-2007+ Independent Era

New Timeline: IF as successful independent culture

1975-2007+ Folk / Independent IF Era

1980-1991 Corporate IF

To those not steeped in the history of IF it may not be immediately apparent how radical it is to argue against the (de facto) centrality of a corporate era. A look beyond the scholarly histories may clarify the situation. As I have written in "IF is History! Interactive Fiction in the News" (2006), there have been hundreds of feature articles on IF run in periodicals over last decade, most reporting the generally received wisdom that IF "was killed by the graphics card." This techno-Darwinian factoid has been repeated in technology-beat circles to the point where Infocom's downfall has become wrapped up in a kind of urban legend, the tragedy of a once-proud digital genre laid low. As tragedy, the tale can only be recounted in a tone of appropriate nostalgia and mourning, as in this typical opener for Andy Klien's article "War of the Words" (Los Angeles CityBeat, 2005-08-11):

Only once in my life have I seen a wonderful medium effectively wiped out by new technology. Let us then pay homage to the text adventure game, a fascinating form that flourished so briefly that it only lingers on in the minds of fans.

Such eulogies are all too often interrupted with the information that reports of IF's death were greatly exaggerated; indeed, the good news of the existence of an Independent era often inspires these nostalgic features in the first place. The cognitive dissonance in mourning the dead genre reborn is very much in evidence in these articles. That dissonance is in part an artifact of Infocom's status in our capitalist culture as both icon and uncanny ghost of an early games era. Infocom is famed for a spectacular rise and fall that is now fundamentally associated with the popularity of their signature genre of IF, and the unquestionable fact

of that corporate fall literally prevents us from seeing what comes after. Hence the whimsy with which journalists often unveil IF's current 'lingering,' framing IF practitioners not as a growing community of avant-garde experimenters but as a dwindling enclave of techno-Luddite reactionaries who have stubbornly refused to hear that The Market Has Spoken.

The truth may in fact lie somewhere in-between, but in order to find it we must first understand how the market has been speaking, and what significance this has. In their investigative report "Down From the Top of Its Game: The Story of Infocom, Inc." (2000), Hector Briceno et al. argue convincingly that Infocom was destroyed, not by a sharp downturn in their games sales, but by gambling everything and losing on marketing a failed commercial database application, "Cornerstone." Crucially, Infocom not only used their vast IF revenue to fund the development of Cornerstone, but also cut their R&D budget for IF during the crucial transition period of the emergence of graphics. The observation that Infocom was bankrupted by business software opens up a space for us to imagine alternate histories of IF commerce, although questioning the myth of Infocom's end only begins to address the larger history of de-commodified IF. As the Granades note, corporate IF did experience a kind of mass extinction event from 1987-1993. Still, it is worth noting that these dates are not absolute. The Granade's account is focused on English-language products in the U. S. market, as are most available histories. The European market appears to have lagged behind, with continuing commercial distributions of IF for the Spectrum and Commodore 64; eventually it followed suit when Zenobi stopped publishing around 1997. Similar accounts may hold in the IF markets other than English, although the extent to which they were truly established in the first place also varies. Oral histories of IF in French, Italian, Spanish, and Russian have only begun to be assembled by SPAG magazine in the past year, but they remain tentative.

The more recent commercial history of IF has not yet been written. IF corporate commerce has been largely quiet for a decade, a lull which is an eye-blink in the history of media but an eternity in the history of digital technology. Yet the actual impact of this lull is complex. Activision acquired and soon closed Infocom, but has periodically re-released various editions of the Infocom catalog every few years since, creating a kind of liminal space for IF commercial availability that resembles the cycles book edition reprinting. In this, IF has arguably been more fortunate than the vast majority of console and platform games (or the majority of books, for that matter) whose continued circulation soon depends on aftermarket auctions, bargain bins, and grey market redistribution by 'abandonware' networks. Another complication is that there are forms of commerce other than studio-based corporate mass marketing. What we have seen instead is a series of tentative moves towards smaller publishing ventures. In 1998, Infocom author and software developer Mike Berlyn attempted to start an IF publishing house called Cascade Mountain Publishing. The brief and disorganized venture published two works in little more than a year before shutting down. In 2002, Howard Sherman founded Malinche Entertainment, an IF business which today successfully distributes a growing catalog of Sherman's own work. As a single-author distributor, Malinche does not function as an IF publisher except in the narrowest of senses. Yet its press activities have been a form of cultural advocacy for IF. Malinche periodically generates headlines on IF as commercial available boxed products, as well as headlines on IF use with the latest computational devices du jour    PDAs, the Nintendo DS personal game device, the Apple iPhone cellphone, and so forth. Also in 2002, Peter Nestad's Illuminated Lantern Publishing began to distribute his own 1893: a World's Fair Mystery, a singularly comprehensive and historically well-researched multimedia IF that has done a brisk business since as both an entertainment and an educational product. In contrast to Malinche, which casts itself as carrying on the torch of the Infocom corporate games era, Illuminated Press has instead targeted bookshops, museums, gift shops, and so forth, promoting the work first for its subject matter and only secondarily for its form. In 2006, David Cornelson announced Westfield Chandler Publishing, Inc., a new IF publisher whose imprint ("TextFyre") intends to market original IF works to children. The venture is currently underway with three titles under development by different authors, but its results remain to be seen.

IF commercial entities may also engage in non-commercial activities. On the occasion of a 2007 exhibition of H. P. Lovecraft's work in Switzerland's Maison d'Ailleurs (the Museum of Science Fiction, Utopias, and

Extraordinary Journeys), Illuminated Lantern has organized a collection of English, French, and Spanish works of IF all inspired by Lovecraft's unpublished notes. The IF works that make up the H. P. Lovecraft Commonplace Book Project are not yet available commercially, however they on exhibition in Switzerland and distributed freely over the web by the publisher. Like Malinche, Illuminated Lantern is acting here as a kind of cultural advocate for the genre, and the exhibition recalls some of the many ways in which the public practice of IF culture can be organized around terms other than direct commerce. The legitimacy of non-commercial exhibition also raises a larger and more important question that has remained unasked by the extant histories to date: Why are all our histories of IF invariably organized around commerce rather than aesthetics? Commerce tells us much about how IF works have been bought and sold, while telling us little or nothing about what IF works have been and meant. While I share Montfort's objections to Aarseth's evaluation of IF as "a remarkable, short-lived genre" (Aarseth 101), I must simultaneously note that Montfort shares with Aarseth the presumption that the difference between "The Commercial" and "The Independents" (that is, the difference between IF produced with the intent to sell and IF produced with the intent to distribute freely) is a fundamental organizing difference for describing IF. This might be argued to be the case for many possible reasons. For example, aesthetic shifts might have been tightly tied to the changes in technologies and shifts in active authors that occurred as a result of the commercial-to-non-commercial transition. However, no critic has in fact argued that works of IF are different in important aesthetic or formal ways that logically organize them into groups by these periods. Instead, critics have simply presumed these differences in association with the given commercial timeline, while speaking in general terms of contemporary 'innovations'    a set of explorations into 'shorter' 'puzzle-less' and 'literary' IF which rise in prominence during recent years but which have strong precursors in earlier productions. From a critical and aesthetic standpoint, exploring formal and thematic continuities may be more helpful to us than a tale of rupture and disjunction.

Existing histories of IF are important, but insufficient to aid us in coming to grips with the aesthetic objects. Before building on them, we need to begin again, and more broadly, addressing IF not just as an assumed form or as an ex-commodity, but as a contested term and an ambiguous genre. In the next two sections of this introduction I'd like to return to our original question, "What is IF?", dividing it this time by a new distinction into two questions about which there is substantial confusion: "What has 'interactive fiction' meant?" and "What has IF been?"

Figure 5. Some things that have been termed "interactive fiction" (clockwise from left): Choose Your Own Adventure #1, Zork I, Myst, Dragon's Lair, Patchwork Girl

"What has 'interactive fiction' meant?" is a question of cultural etymology, concerned primarily with how the signifier 'interactive fiction' has been attached to a multitude of surprisingly different signified objects over the past three decades of development and two decades of scholarship. The question is also concerned with the advent of hypothetical future objects which might one day be labeled "interactive fiction" but do not as yet exist. Many of these object groups have been forms of digital avant-garde art, research prototypes, or simply imaginings, while only a very few have been categories of commercial goods. Uses of the phrase in criticism have reflected a wide range of a priori positions (that is to say, ideologies) on what true interactivity is and is not, as well as what it can and cannot become with regards to fiction, narration, literature, and text (not to mention conversation, drama, game, etc.). The phrase "interactive fiction" opens out onto a whole universe of media forms, including IF (e.g. Zork), hypertext fiction (e.g. Afternoon), immersive puzzle games (e.g. Myst), cinematic action games (e.g. Dragon's Lair), gamebooks (e.g. Choose Your Own Adventure), and much more. Tracing out the scholarly questions and assertions surrounding this phrase illuminates a fascinating history of confusion and disjuncture in which new media scholars have talked past each other by using similar words to mean different things. In particular, the use of "interactive fiction" as a synonym for either "electronic literature" or "hypertext fiction" emerged during an enthusiastic era of hypertext studies from the mid-1980s to the mid-1990s and declined thereafter. Thus in 1984 Niesz and Holland turn from sustained consideration of command line interaction to contemplating the immanent internet that a possible future of massively multi-author texts (126), while Moulthrop and Kaplan follow in 1991 by citing this "first critical appraisal of interactive fiction" (45-46) in their own discussion of the advent of hypertextual node-and-link authoring    a

transition Jerz notes in his bibliography appears to be "comparing apples to oranges." Perhaps due in part to this recent history of contestation and ambiguity, disparate new media scholars are largely in agreement today in dismissing the term 'interactive' is far too vague to be critically useful. The logics of these dismissals come with some caveats and will be scrutinized in a section that follows.

"What has IF been?" on the other hand is a question of genre, concerned primarily with signifieds and attempting to delineate a group of similar cultural objects a posteriori. These objects are called by the familiar acronym "IF" not as an articulation of theory, but rather as a matter of record, deferring to the predominant use of the label by the creators and audiences of these objects, and the historical fact of subsequent circulation of the label in awards ceremonies, newsletters, manuals, archives, newsletters, and so forth. We can describe such objects formally (as was done above) but this must primarily be a report on existing practices. While commercial histories may ground objects of study in exchange value, cultural studies require only cultural circulation, in which a name need not be purchasable, only knowable. This is not to say that the naming of genres is a monolithic practice. Indeed, the objects here called "IF" have gone by many names, commonly referred to as "text adventures" and "adventure games," and less commonly referred to as "compunovels" "storygames" "perspecta-stories" and "fantasy simulation games," each reflecting a unique perspective (that is to say, ideology) on the total work. Importantly, these can be associated with historical periods. Tracing the popular uses of these labels reveals an interesting periodization, with the explicit "adventure games" (referring to the original Adventure) later bifurcating into two terms, on the one hand the retronym "text adventure games," signaling the growing primacy of graphical software termed "adventure games," and on the other hand the neologism "interactive fiction," later applied to many other media forms and genres. In addition to the popular history of labeling IF, there is also a critical history, and like tracing the widespread dismissal of the phrase "interactive fiction," tracing out the scholarly formulations of these objects (whatever they are called) reveals a different form of broad consensus. IF works are often invoked in new media criticism during flare-ups in scholarly debates (Hypertextual Studies, Games Studies, "Ludology vs. Narratology" etc.) as an example of commonality and a common reference point across categorical distinctions of story / game, text / drama, conversation / simulation and so forth. IF's given role is as the irreducible and inassimilable remainder of several competing theoretical frameworks for new media objects.

Genre and cultural etymology are not separable areas of inquiry, of course. From one point of view, the study of IF as genre could be taken as one subset of a much larger debate over many a priori concepts of "interactive fiction" with the eventual goal of fitting IF into a framework or typology (e.g. Aarseth's 'textonomy'). From the complimentary point of view, such questions are more properly approached as the subset, subordinate to the studies of actual art objects. Beginning in genre, we instead ask, "What ideology is reflected in this community adoption of this term to describe these works?" While both the discussion of the conceptual term "interactive fiction" and the living genre "IF" will now be pursued in more detail, and both approaches to the intersection of cultural etymology and genre can lead into interesting discussions of systems and practices, this study overall leans towards the generic rather than ideal formulation as it progresses in chapters from generalities into close readings of actual objects of art. Indeed, one of the underlying concerns of this study is how the process of "close reading" can meaningfully be conducted in relation to simulation and to source code. This is a very interesting problematic for new media humanists, and one whose practices can only be worked out through specific undertakings.

What has IF been? IF as genre

First, a framing analogy: Given paper as a 'medium,' the codex as a 'media form,' and the novel as a 'genre,' this project is a study of the genre historically called "interactive fiction," as it occurs in the media form of the command line text parser, in the medium of the stored program digital computer. Already in this simple analogy the terms 'media' and 'media form' are straining to accommodate many layers of hardware, data, virtual machine, software processes, and interface into an implied clean bifurcation. The term 'genre' similarly strains towards its own endless bifurcations, for what is the Bildungsroman but a sub-genre of the genre called the novel, and / or of fiction, etc.? Hopefully this analogy has still conveyed aesthetic specificity     specificity,

but not formality. Rather than a naturally occurring partition of the arts, 'genre' here signifies Wittgenstein's concept of "family resemblances," and as such a genre study of IF is a negotiation of compound observations and partial definitions    contingent in its distinctions, always deferential to historical traditions of naming, production, and reception, and yet insistent in questioning how relationships of materiality, form, aesthetics, and practice are at the heart of the genre's cultural work and human meaning. It is central to this approach to question precisely those qualities of IF as a genre that are not evident necessities of media form, but rather might (or might not) grow out of or in relation to that form. Two examples of such questions engaged at length in this study:

1. "Why are the overwhelming majority of IF works written in the second person, given the near absence of sustained second-person in almost all other genres of textual art, and the absence of technical restrictions necessitating it?" In brief, I argue that a) the second-person mode, while unstable, is highly effective at eliciting immersion in a textual simulation, similar to the first-person camera, and yet b) this aspect of IF is not truly technology-dependent, but instead best understood as one of a group of the only three genres in which use of the second-person predominates: gamebooks, role playing games, and IF. All of are tightly related in origin and emerged almost simultaneously in the ~1966-1976 period I term "the rise of semiotic simulation." While connections between each pair in this triumvirate have been remarked, taken together each third represents a missing link in understanding the other two.

2. "Why have the aesthetics of critically acclaimed IF works shifted over the past two decades away from extroverted adventures (e.g. fantasy quest, murder mystery, pirate voyage, space flight) and towards introverted tales of alienation (e.g. amnesia, interrogation, hallucination, kidnapping)?" In brief, I argue that a) this shift is a continuing trend rather than a rupture, as emphasis on introversion and alienation was present from the earliest works, although they were not generally advertised as such and the slide from talk of "adventure" to "fantasy" further obscured it, and that b) current trends in IF authorship represent serious artistic exploration of a problematic, 'frustration,' that, like the specular gaze of the camera in cinema, presents both a set of extreme constraints on IF artists and the opportunity to develop a set of unique idioms, although c) current IF themes and styles cannot be explained purely as an engagement with form, as they reflect a deep relationship between the writers of contemporary independent IF and the 20th century novel, in particular popular generic tropes such as detective fiction and the high literary generic trope Linda Hutcheon terms "historiographic metafiction."

These questions demonstrate how this approach to IF as a genre differs from how it has normally been first defined and then engaged as a media form: a technology of command line, text parser, and object model often seen as synonymous with or trivially distinct from the aesthetic uses of that technology, much as if the genre of "novel" were to be conflated with the media concept of "codex." This widespread emphasis on function following form is in part due to the trends in the field, and in part due to the real absence until just a few years ago of robust historical research such as that done by Jerz, Montfort, and Maher. Despite my earlier critique, these histories provide this study with tall shoulders on which to stand (albeit carefully) when moving from a retelling of what to towards an engagement with why and how. If other criticism has largely neglected the genre as a whole, and instead turned again and again to the exceptionally well-understood and well-documented history of the 1970s text parser, this is understandable. Understandable, but lamentable and still worth belaboring: it is as if we had a body of criticism on the novel with most articles retelling the story of Cervantes writing Don Quixote before moving to discuss aspects of page numbering, chaptering, and tables of contents in "Quixote-like works," with scant attention to themes, modes of characterization, exposition, narration, plot, etc. Just as the novel is neither simply a codex nor a set of variations on Don Quixote, but instead grows out of and in intimate relation to the codex form, so too the IF genre is neither simply the command line text parser nor a set of variations on Adventure. Making this distinction allows us to question how IF has developed out of and in relation to the command line form it is so often conflated with, as well as interrogate the generic features that at first seem superfluous to that form, asking "Why the imperative tense?" "Why spatial rather than temporal or topical agency?" and so forth. These questions may lead us (as they often have in the criticism of print fiction) to consider not only ur-texts, but also precisely those exceptional

experimental works that are celebrated for their violations of conventions. So, for example, in the IF works of Andrew Plotkin, Hunter in Darkness (1999) removes visual representation, Spider and Web (1998) removes continuous chronology, The Space Under the Window (1997) removes spatial navigation, and So Far (1996) removes material realism, each implicitly asking "is this still IF?" By exploring these border cases    from Sam Barlow's non-sequential Aisle (1999) to Emily Short's conversational Galatea (2000)    we simultaneously highlight the limits of IF and discover the deeper continuities between IF and related novels, films, video game, hypertexts and so forth. Importantly, the vast majority of these 'border case' works have all been written during the critical lacuna of the past decade, with scholarly attention limited to discussions scattered amidst the historical summaries of that period mentioned earlier    "The Independents" in Nick Montfort's Twisty Little Passages (2003) and both "The Growth of Hobbyist IF" and "The Evolution of a Community" in Jimmy Maher's thesis "Let's Tell a Story Together" (2006). These histories reveal how scholars have been trapped in an origin myth of IF    a myth that reassures us we already know what IF is, and need only demonstrate it. Meanwhile, the growing prevalence of "experimental" work hints at an ongoing shift in the conception of what writing IF entails.

A genre approach is not counter to, but rather builds upon fundamental engagement with the media forms that are the strata of aesthetic experiences, just as asking, "What is a codex? What is paper? What does it do?" might provoke a deeper engagement with James Joyce's Finnegans Wake or Mark Danielewski's House of Leaves. Working in the fraught and shifting terrain of new media arts criticism today in fact presumes such provocations, and one of the great opportunities of our present critical moment is the constant defamiliarization that computational media enact on our perceptions, encouraging us always to see everything anew. In "Print Is Flat, Code Is Deep" (2004), N. Katherine Hayles frames this situation as a great awakening: "Lulled into somnolence by five hundred years of print, literary studies have been slow to wake up to the importance of media-specific analysis" (20).

Yet the welcome revivals of materialism and structuralism in contemporary new media criticism and games studies have brought, along with their rigors and rewards, a danger of losing the object of study, whether that object be a chatbot or a hypertext, a video installation or a video game. Browsing through stacks of critical monographs, piles of papers, and a hard drive of files, I am struck by the infrequency with which I encounter close readings    or rather, close interactions    in relation to these objects: a rarity of extended critical engagements with not only the form but also the texture of IF works as they unfold for us in all their aesthetic particularity. Perhaps this lack is a mere byproduct of our shifting focus away from what things mean and towards a renewed attention to what they do. At times, however, I fear that a deeper prejudice may be at work in our critical community, leading scholars to focus too often on the how of new media at the expense of the what, and in so doing dismiss with perfunctory summary the passions of artists and the experiences of their audiences, precisely as if the work warranted (and indeed, could bear) no deeper scrutiny. I fear the mistake, in other words, of assuming that the enduring importance of new media objects resides always in the ways that they are new, but never in their particular artistic renewals of our continual engagements with lived experience. The great disappointment of new media criticism in the humanities is that much of it is surprisingly inhumane.

Such a critique, invoking genre, close reading, and the human uses of human art, might easily be labeled contrarian, if not reactionary, and it is not an overstatement to describe this approach as a calculated risk. Risk, because this study's modest focus on so specific a subject as the IF genre may seem considerably less grand (and less widely useful) than the broad structural and formal theories of hypertext, games, and computation that have in large part been the lifeblood of recent new media arts criticism. Calculated, however, because the works in this study do reward sustained engagement, and here they are thus engaged: an uncanny late night preceding a desert rave, the rich rendering of a single moment in a grocery store, the relentless replay of a single-car accident at a crowded pool hall, and more. One reward of this approach is rich comparative study. Rematch for example suggests comparative study of the event of the car crash as it plays out across disparate works, say as compared to the car crash at the heart of Michael Joyce's preeminent hypertext fiction Afternoon, and in the context of the car crashes that often appear in variable-timeline themed

films such as Run Lola Run, Donnie Darko, The Butterfly Effect, It's a Wonderful Life, and Groundhog Day (to name just a few). If we subsequently find that car crashes signify not just mortality but specific attitudes towards moments of crucial choice, then reading Rematch and Afternoon together is not only mutually illuminating, but reflects some light back on how such choices tend to be represented or may be represented differently in works of IF and hypertext.

Out of such engagements arise compelling new theories of digital text, theories aspiring to broad appropriation and reuse. Thus this work forwards a theory for computational reading and interaction practices as "implied code," a new approach to cybernetic understandings of narrative communication through "error aesthetics," and a model of how code impacts the formation of art genres through "inclusion effects." Such frameworks and methodologies, however, are only substantive when they grow out of a close relationship to the art that inspired them.

What has 'interactive fiction' meant? Interactivity and narrative

The term interactivity is overused and underunderstood.

   Chris Crawford, The Art of Interactive Design

Having introduced the need for and potential of a genre approach to IF, up to the closest reading, we now turn outward, to the question of the cultural etymology of the phrase "interactive fiction" as it extends to almost infinite space. By now it is hopefully apparent that "interactive fiction," as used in this study in the familiar 'IF,' cannot be an abstract category of fiction that somehow lays theoretical claim to an authentic or privileged 'interactivity.' Rather, it is a historic designator of a set of art objects with deep family resemblances, and as a designator it is as arbitrary in its way as the association of the signifier 'pipe' with its signified, and as anachronistic and specious in its way as the claim of new media to be new, of modernism to be modern, or even of the 16th century Italian 'novella' to be, as we might translate it into English, a 'little novelty,' or 'novel.' All such terms can seem irritatingly vapid in the cold light of a decade or two, but the irritation fades, until after a mere century the terms may appear to be wholly natural. While the terms 'interactive' and 'fiction' when combined to make up IF are arguably more misleading (if not more contentious) than other anachronisms like 'novel,' similar considerations apply: while critics might easily choose another term to substitute for 'novel' (and, indeed, some have done so) most are dissuaded from this clean break with tradition by the inconvenient activities of authors, who continue to write works that they call 'novels' and furthermore stubbornly insist on circulating those works in culture named as such. This same situation applies to the thousands of extra-canonical new media works cataloged and available for public download at Baf's Guide to the Interactive Fiction Archive, fêted at awards ceremonies, and discussed on IF newsletters, IF discussion boards, and so on and so forth.

The danger of this kind of theoretical realpolitik that embraces common usage is that it may run the risk of uncritically assimilating the assumptions present in the genre's self-representation. Such assimilation could perhaps be avoided by a substitution that replaces "IF" with either an existing alternative such as "storygames" or perhaps yet another neologism: I might propose "simulator-parsers." Of course, these labels come with their own ideological freighting, not least the ones that sound the most technologically dispassionate. Instead, perhaps we should confront head-on the ideology inherent in the current terms we see in predominant circulation. New media critics have tended to deal with "interactive fiction" either as a category (interchangeable with "interactive narrative" and other evocative statements) or as a symptom of critical frustrations within the realm of new media criticism, rather than from a vantage of cultural critique that asks what the phrase meant to its users and promulgators and what cultural work that use did. We can begin by tracing the existing critiques of 'interactive,' considering how they have addressed or bypassed the genre of IF before considering how we can build on them and move beyond them.

In theories of computer-based narratives the term 'interactive' has been so richly evocative and so widely

circulated in the past two decades that it is in perpetual peril of becoming evacuated of all meaning. Researchers in new media and electronic literature are continually tempted to set the term aside once and for all, and this temptation has arrived with such constant consistency for the last decade at least that a statement repudiating 'interactivity' for its vagueness has become a great commonality and even a vogue in the otherwise disparate work of critics confronting the issues of computational narratives. Before embarking on a new exploration of the problematic relationship between computational interactivity and narrative, let us begin first by attempting to understand the recent vexed history of the 'underunderstood' term interactivity.

Consider two opposing but complimentary examples drawn from the titles and bodies of recent, prominent new media monographs: In the introduction to The Art of Interactive Design (2003), Chris Crawford dismisses 'interactivity' as "one of the buzzterms of the times" (2) applied to everything from computers to shampoo, before defining it concisely as "a conversation" and detailing a dialogic theory of interactivity. Similarly, in Pause and Effect: the Art of Interactive Narrative (2002), Mark Meadows opens his discussion of 'interaction' by deploring how "catchwords abound" in its definition (37) before moving to craft a quite different theory from Crawford    a 'perspective' theory grounded in the history of western visual arts. When Meadows describes interactive narrative as "a time-based representation of character and action in which a reader can affect, choose, or change the plot" (62), the parting of ways from Crawford's "conversation" is profound. For Crawford, there are degrees of interactivity, but true interactive storytelling is nascent, and will remain unrealized until character and plot have been abstracted into the conversational physics that will one day become generative drama. For Meadows, interactive narrative is here and now, with rich examples of plot branches negotiated by readers seeking new perspectives, abounding in a myriad of digital genres. Yet if Meadows's perspectival computer narratives and Crawford's conversational computer storytelling seem only occasionally and orthogonally to describe the same subjects, both theoretical approaches to computer narration share a point of departure in the need to escape the tyranny of their primary term 'interactive' through some substitution.

Such acts of substitution have a precedent in Janet Murray's influential Hamlet on the Holodeck: the Future of Narrative in Cyberspace (1997). In it, Murray defines the digital environments in which the narratives she terms 'cyberdrama' will occur as "procedural, participatory, spatial, and encyclopedic," before volunteering her own terms as a substitution: "the first two properties make up most of what we mean by the vaguely used word interactive" (71). For Murray, the vagueness of 'interactivity' is pernicious, as it spreads deeper critical confusions in its wake:

Because of the vague and pervasive use of the term interactivity, the pleasure of agency in electronic environments is often confused with the mere ability to move a joystick or click on a mouse. But activity alone is not agency. [...] Some games, like chess, can have relatively few or infrequent actions but a high degree of agency. (128)

The problem identified by Murray is not merely how interactivity is hyped, nor indeed how it has been misapplied to trivial objects such as shampoo, but instead how the term has become generic, appropriate to any electronic environment and thus a synonym for all the amorphous virtues of computation, making rigorous definition of real human-computer relationships more difficult for responsible scholars.

In The Language of New Media (2001), Lev Manovich appears to concur, although his approach is first to codify the problem as a stereotypical objectionable claim regarding the special difference of new media, a claim he terms "the myth of interactivity." He summarizes that myth as follows:

New media is interactive. In contrast to old media where the order of presentation is fixed, the user can now interact with a media object. In the process of interaction the user can choose which elements to display or which paths to follow, this generating a unique work. In this way the user becomes the coauthor of the work. (55)

Manovich's primary objection to use of the term interactivity is now familiar: "I find the concept too broad to be truly useful." His subsequent critique, however, is substantive. First, computer-based definitions of interactivity are a tautology, as all modern HCI (human-computer interaction) is interactive by definition. Second, due to the inherent complexity of perceptual processes and cognition, experience-based definitions of interactivity do not provide useful distinctions between new media artworks and the history of other artworks that "orchestrate the viewer's attention" including examples in theatre, painting, film, and so forth. Third, applying the label "interactive media" solely to computer-based media lures both media studies scholars and psychologists into substituting a material metaphor for the actual mental processes that should be studied, and encourages the fallacy that the structure of any new medium is isomorphic to the mind    a fallacy repeated since the 19th century by Galton, Münsterberg, Eisenstein, Lanier, and others. Yet if Manovich faults interactivity for seducing scholars into a repeatedly discredited history of criticism, it is worth noting that he also respects the unique critical challenge interactivity represents, declaring that "to deal theoretically with users' experiences of (interactive) structures... remains one of the most difficult theoretical questions raised by new media" (56).

The final word on rejecting interactivity is reserved here for Espen Aarseth's Cybertext: Perspectives on Ergodic Literature (1997), from a strident passage in which he damns interactivity utterly as "commercial rhetoric... accepted uncritically by academics with little concern for precise definitions or implicit ideologies" (48). As in Murray's contemporaneous book, and as Manovich does later, Aarseth identifies the term 'interactivity' as an artifact of early computing culture, signifying nothing more specific than any user-input enabled computer, and, with user-input being the de facto standard ever since the decline of the earliest batch processing machines, that means any computer. Aarseth sees this empty signification of 'interactive' as enabling broader excesses of marketing language "such as interactive newspapers... and even interactive houses" (48), an objection later echoed by both Meadows and Crawford in their complaints about catchwords and shampoo. Aarseth, however, goes further than either in his complaints, naming-and-shaming a rogue's gallery of vague critics, with special attention paid to the hypertext scholars whose appropriation of the term he views as transparently ideological. He also goes deeper in providing a partial but useful cultural etymology of the phrase "interactive fiction," from its commercial coining by Scott Adams's software company Adventure International, through its appearance in Bob Liddil's 1981 Byte magazine article "Interactive Fiction: Six Micro Stories," and up to the first literary critical use in the title of Anthony Niesz and Norman Holland's 1984 article "Interactive Fiction." While Aarseth holds these forbears responsible for the term's incorporation into 1990s theories of hypertext, how this came to pass is left as an exercise to his readers.

This survey has thus far retraced a broad consensus on the recent critique of interactivity by new media and electronic literature scholars, and it ends here, in Aarseth's origin tale, a particular series of important firsts (first commercial slogan, first industry publication, first critical essay) that together attempt to locate a crucial moment of transfer when the marketing of software became conflated with its theorization. Yet this does not prove that the market has either cheapened or obscured the art, but rather suggests that criticism has itself been overwhelmed by the specter of commerce. Indeed, we should be cautious of an overly simplistic tale of low 'industry' terminology and its inappropriate appropriation into high 'critical' discourse, as it elides the cultural zeitgeist through which the phrase "interactive fiction" crossed over from marketing language into critical theory    if in fact it ever truly did so. Not only has a terminological approach failed to reflect the historical conditions under which objects called "interactive fiction" circulated in culture, the tale of linguistic misappropriation as detailed by Aarseth (and as at least suggested by every other critic cited in this section thus far) may lead us into a number of errors in our understanding of what it meant and means for fiction to be interactive. First, the tale fails to convey what kind of cultural discourse "Interactive Fiction" was in 1984 not obscure industry jargon, but rather a bestselling mass-market phenomenon, a phrase not merely handed down to but also in part owned by the popular culture that popularized it over many alternatives. Second, the tale obscures the relationship between the production of cultural objects termed "interactive fiction" and the operations of the academy, implying a separation between academia and industry when in fact the major distributors and marketers were academics, working first from within academia and then later in close concert with it. Third, the tale moves too quickly to dismiss the significance of marketing rhetoric categorically as

useless in the quest for formal rigor, and in this dismissal it glosses over the importance of the nature of the marketing rhetoric that was widely circulating during this crucial time    in particular, the fact of the rhetoric's unexpected coherence and verbose specificity. Finally, the tale invites us to discard as incidental the real and historically identifiable practice of doing interactive fiction    for if 'interacting' is an empty term, the widespread practices of creating and engaging with these objects remain quite real, whatever we call them.

This, then, is a point of intervention: taking IF, this one genre of "interactive fiction" at the crossroads of interactive narrative's contestation, and trace its practices and theories forward to the present, not because it is clear, rigorous, and separate, but precisely because it is unclear, contingent, and entangled with other registers and modes of textual and narrative art. But first, a final word on the quest for a formal definition (or renunciation) of 'interactivity.' Searching the "curiously few" formal definitions of interactivity, Aarseth finds two: Peter Bøgh Anderson's semiotic definition in which "the reader can physically change the discourse in a way that is interpretable and produces meaning within the discourse itself" (49) and Andrew Lippman's interpersonal definition in which "mutual and simultaneous activity on the part of both participants" implies an artificially intelligent interlocutor. Aarseth objects that Anderson's definition might be better termed "participation" and that Lippman's A.I. interlocutor does not yet exist, disqualifying any current computational narrative from being truly 'interactive.' This returns us to Meadows and Crawford, where we began. In their similar parting of ways over a decade after Anderson and Lippman's work, I would suggest that we can perceive in Meadows and Crawford the figure of a recurring formation that divides approaches to interaction. On the one hand Meadows's work on interactive narrative reflects a permissive focus on many current forms of reader choice and agency. On the other hand Crawford's work on interactive storytelling reflects a rigorous demand for some future sophisticated system (although Crawford differs from Lippman in focusing not on character simulation but storyworld simulation). Just as both works struggle with, but ultimately succumb to their titular term interactive, both conceptions struggle, not in outlining interesting approaches to narration, but in forging a necessary connection between those approaches and the field of computational media. Perspective, fine, conversation, fine, but what makes this particular to the stored program digital computer? On the knife's edge of media-specificity, the Anderson and Meadows paradigms of choices and perspectives topples the way of pre-computational media, where they can be easily deconstructed back to a generalized hermeneutics of participation and perception that describes most art. Lippman and Crawford's paradigms of conversation topples the other way, into a post-computational realm of behaviors that our computers might one day exhibit, but which for now are most clearly recognizable in the improvisational actor or role-playing game-master    that is to say, in the figure of the human being.

What isn't IF? Chatbots, MUDs, and more

I could, if I wished, create a program that took whatever the player cared to type in and perform numerical calculations on the ASCII values of the characters and through some mechanisms of its own return a value. This, I think most people would agree, would also not be IF in the form that we understand it.    Emily Short, What's IF?

Thus far we have developed the silhouette of what IF is in a number of ways, and this last exploration has brought a number of problems into sharper focus. IF claims at least superficially to be "interactive fiction," which is to say some form of computational narration. Yet formulations of computational narration are heavily contested due to difficulties in outlining a form of narration that is both exclusive to computation and sufficient in its narrative result. Hypertextualists and gamebookers tend to find opposing formulations either insufficiently narrative or too rigorous to be fulfilled; while A.I. researchers, conversationalists and dramaturges tend to find opposing formulations non-exclusive to computational media or too general to be convincing. Where IF falls, I will argue, is in the middle    which is to say that it fails at both in quite interesting ways. But to prepare for larger arguments that IF itself is defined by what it is not (that is, that it cannot fulfill claims made in its name by strong-AI or strong-plot theories), I'd like to discuss what IF manifestly is not    all those exceptions so important to exclude from this study that they must be included.

Representations of the Command Line

IF is not a painting or photograph containing a command line prompt, nor is it a book describing a command line prompt, whether by William Gibson in Neuromancer or Neil Stephenson in Cryptonomicon, nor is it a movie scene replaying a command line interaction, whether it be Neo first encountering Trinity via his terminal in the film The Matrix (1999) or the man / child Josh Baskin playing a hybrid text adventure game in the film Big (1988)    although such scenes may tell us much about our cultural preconceptions. While it may seem obvious that IF is not a scene of actor Tom Hanks playing at Josh Baskin playing, this also suggests that IF is not a videotape of the hour-long session of IF that you yourself may have explored, nor the map you drew to aid your explorations. Neither is IF the complete printed transcript of your session. Artifacts such as walkthrough recordings (of the command stream) and transcripts (of the entire text stream) circulate widely in IF culture, and are important to it, but the transcripts are not themselves works of IF, which always imply procedural and experiential elements that cannot be flattened. Hypertext studies critics and games studies critics are at this point nodding their heads at this familiar purist position on interactive artifacts. A thornier question, however, is "specifically which parts of the total work of IF are missing when we read a transcript?" As I hope my model of 'implied code' will demonstrate, simply answering "the software" is specious, as the structure of the software manifests itself in tangible ways through a transcript, enabling readers (who are not, at that moment, interactors) to form complex hypotheses about the software's form and function    although not, crucially, to test hypotheses beyond the limits of the transcript. This is an interesting continuity and distinction, and has implications for theories of how we read text generator artworks and software in general. Historically, we have seen the experience of IF continuously extend beyond the interface in two ways. First, early interactors who logged in to IF works such as Adventure using line printers (rather than screens) would study their printed transcripts after their session in order to plan future interactions. Second, communal interaction was common (and perhaps even typical) in the early era, with two or more participants gathered together around the interface to discuss the session and suggest possibilities as it unfolded.

In her article "Player Created Tiers in Alternate Reality Games," Christy Dena formulates a 'tiering' approach to explicate how Alternate Reality Games (ARGs) may come to be experienced partially or entirely through player-created content rather than content originating from the primary producers. Such a theoretical approach challenges any attempted essentialism about IF. In particular, ARG tiering suggests how IF might also be a tiered experience, with the maps and transcripts generated by what Dena calls "hard-core player tiering" (e.g. my own activities as a critic) creating an extension of IF experience that is then transmitted to a larger audience (e.g. readers of this study). In ARGs, this larger readership encounters the effects of interactive experience second-hand, and it may be so with IF as well. Still, for the purposes of this study, we will primarily investigate IF as direct experience, even if the mode of investigation is itself paradoxically indirect.

Chat clients

Perhaps it should also go without saying that a chat client, or software designed to pass instant messages, is not a work of IF. Still, many of the components are present, including the command line prompt, the give and take of language exchange, and a transcript. Many components are absent, however, the most important these being software that parses the interactor's text and responds. As outlined earlier with regards to speech act theory, IF resembles an asymmetrical engagement with a formal system more than a conversation. A chat client is not in itself a work of IF, yet it can become part of such a work if its command line is pointed towards an interlocutor that behaves in a certain way    and some chatbots actually enable exactly this kind of activity. The relationship of the chat client to IF is not a superficial resemblance. Instead this resemblance goes right to the heart of what we might call the more existential questions about the IF genre and its relationship to both artificial intelligence and roleplaying, that is, the machine and the human. Consider: an interactor engages two interlocutors using a chat client. One is a talented roleplayer and storyteller, who has been instructed to use the conventions of IF in a story in as rigorous a way as possible. The other is a chatbot running a sophisticated piece of IF software, which in addition to its brilliant ability to accommodate unexpected actions is versed in imitating human chat behaviors such as slowness, typos, etc. If the interactor can't tell the difference, should

we then define IF as an experience rather than a digital artifact? More importantly, who in this scenario is trying to pass as what?

Figure 6. A.L.I.C.E. chatbot with Oddcast avatar. Bots emphasize breadth of varied short-term reactions over IF's depth of logical chained interactions.

Chatbots

IF is not a chatbot, whether Joseph Weizenbaum's ELIZA (1966) or Richard Wallace's A.L.I.C.E. Artificial Linguistic Internet Computer Entity (1995-present). Most chatbots, while they are both command line based and software systems, are formally different from IF in crucial ways. Chatbot software generally lacks an object tree or world model, and thus has difficulty in making responses based on the past information (e.g. "What number did I ask you to remember?"). Rather than enabling the user to act on the stored states in world (or conversation) model, with subsequent dynamics of spatial exploration or interrogation, chatbots instead attempt to simulate a topical conversation, and in this endeavor chatbots are generally programmed with strategies of permissive pattern matching rather than IF's prescriptive parsing. Due to these differences, chatbots are computational personalities who may in the course of conversation relate narratives, whereas works of IF are in themselves computational narratives, in that they internally compute events (Mailbox Open) which are then represented ("You open the mailbox") with the software acting in the role of narrator. The difficulty of this distinction about the (simulated) real is especially fascinating where it breaks down, when IF authors implement chatbot-like characters, and in so doing sometimes making their thoughts, moods, and topics of conversation objects in the model of the simulated world (e.g. Short's Galatea).

MUDs and MOOs

Command line based and simulated, Multi-User Dimensions and MUDs-Object-Oriented are more than the precursors to modern graphical MMOGs, they are the communal analog to IF, and have in common with IF not just the command line, the object tree, and the parser, but a vast array of shared conventions growing out of a long mutually entangled history. Yet, for the purposes of this study, MUDs are part of what IF is not for two reasons: first, the experience of reading IF as outlined in this study arises in part out of sustained engagement with the parser-interlocutor, and MUDs (with the constant opportunity for interjection by other users) presume no such sustained engagement. Second, MUDs and MOOs introduce the aspect of time in ways that crucially change the nature of textual exchange. An IF at a crucial juncture can be left running for a second, or an hour, or a week before entering further text at the command line, and furthermore entries can often be rescinded and changes reverted. This quality enables a crucial dynamic that encourages introspection in a way not present in a MUD, where pausing to contemplate the apple of discord enables another user to snatch it up.

Figure 7. Façade: looking with graphics, holding a glass with the mouse, speaking in text.

Façade

Perhaps one of the most intriguing (and disconcerting) command line based computational dramas of the last decade is the Michael Mateas and Andrew Stern research project Façade (2005), an apartment drama in which the interactor may be audience, provocateur, or facilitator to the marriage meltdown of old friends Trip and Grace. While Façade provides the command line as one key part of its user interface, it is the culmination of a radical departure from IF in many ways. Façade is graphical (it simulates a visual world, rather than reporting on it, with the exception of printing spoken dialog), kinetic (the user largely speaks through the command line, but acts physically through a 'hand' icon), and real-time rather than turn-based (time in the simulated world goes on regardless of input or lack thereof). There are many, many implications of these decisions, but the most important is that Façade is not narrated, explored, or interrogated in the sense these concepts apply to IF. Instead Façade creates a largely unambiguous visual environment within which it situates unambiguous

physical interactions and potentially ambiguous verbal engagement with the simulated personalities of Grace and Trip. Typing is exclusively a form of speaking rather than acting, navigating, or thinking. This combination of dramatically scripted virtual reality with chat is likewise reflected in the works of other Oz Project alumni such as Zoesis, Inc.'s The Pearl Demon. I will be fascinated to see where Façade leads, and particularly delighted if the development tools are open sourced and something akin to the IF authoring community emerges around them. Nevertheless, my prediction is that Façade-like computational dramas will seldom have similar aesthetics or encourage similar artistic explorations to those of IF computational narratives, for the simple reason that Façade attempts to cleanly disambiguate exactly the points of ambiguity and interesting failure that have been so central to the recent developments in IF aesthetics treated in this study.

Figure 8. An IF "abuse": Plotkin's adaptation of Tetris written and run using IF development tools.

Abuses

A work may be command line based, non-temporal, single-user, manage an object-tree, have a parser, and still not be IF. One of the most common ways is to be an "abuse," an IF community nickname for whimsical projects that repurpose the object-tree and parser model of IF development languages for some other form of HCI. Abuses might play textual animations, create pseudo-graphical video games, or (as Short suggests above) return arbitrary input as directly transcoded output. IF abuses, like obfuscated code and quines, are cultural artifacts that emerge out of a playful engagement with what IF is, and they can serve to remind critics in our more serious moments of what shaky ground our formalities stand upon. First, they recall the properties of the Turing Universal Machine, and how easy (or, at least, possible) it is to reduce the complex systems we concretize as 'software' to the manipulations of their more fundamental properties. Second, and perhaps more importantly, abuses remind us that IF, if one scratches the surface, lies only lightly over the figure of the HCI computer itself, with keyboard, command line, and screen, input, data, process, and output. How much of IF aesthetics are also the aesthetics of the PDP-10, or of the archetypal souls of our newer machines? Of the differences that remain, are any procedural or systematic, or are all the key distinctions of IF ultimately questions of voice, style, and subject matter?

Figure 9. Emily Short's City of Secrets interface, featuring traditional command line, ambient illustrations, and clickable links.

Hypertext Fiction

IF is not hypertext fiction, except of course when it is hypertext fiction. Hybrids in fact abound, including languages like HTMLTADS and multimedia Glulx with specific augmentations for the purpose of mixing link-clicks in with typing at the command line. These moments of choice (rather than projective statement) can be smoothly embedded into a work of IF, as in City of Secrets in which the compass rose provides navigational commands and conversations suggest hypertext-linked default topics (while still allowing creative replies). Some hypertext-IF hybrids do not augment the command line interface with links, but instead come at the issue perpendicularly, adding an IF world-model to the hypertext interface of linked-prose navigation, e.g. Mike Tolar's Clink: A Clickable Text Adventure. I'm strongly tempted to discount world-modeled hypertext as not-IF, for the simple reason that they do not solicit freeform projective statements, and thus do not share in the effects of works that do. However, this suggests a corollary: in a command line IF with only two locations (HERE, THERE), two objects (APPLE, BANANA), and two available commands (GO, EAT), should the work be considered essentially a spatial hypertext, as it is read through navigation-selection (not exploration?). My provisional reply is: a) only if the available commands are already known, otherwise guessing fundamentally changes the experience from hypertextual, even if the commands don't exist, and b) even if the commands are known, only if the combinatorial possibilities of the space are low enough that spatializing the possibilities is a plausible reading strategy, otherwise the exploration process is still not hypertextual reading.

Nonfiction

There is one final thing that IF isn't, and that is poetry, scholarly essays, or indeed anything that isn't 'fiction'... at least, in theory. In practice, there are several prominent works of IF that push the borders of fiction, being lyric (Simone Di Conza's translation of Francesco Cordella's The Land of the Cyclops, 2002), conceptual (Plotkin's The Space Under the Window, 1997), or philosophical (Kevin F. Doughty's Threading the Labyrinth, 2000). Still, we don't yet have prominent examples of interactive non-fiction, to compare say to examples of scholarly hypertext such as George Landow and Jon Lanestedt's The Dickens Web (1992). One work that approaches a scholarly hypertext is Neil deMause's Lost New York (1996), a work that lavishly documents New York City circa 1780, 1880, 1905, 1954, and 2040 via a time travel narrative that often seems a pretext for historical documentary. Adam Cadre remarks in his review "Puzzles vs. History," "The fact that the game begins with a slideshow and ends with a bibliography is another indication of where the author's interests lie." Yet, despite the volume and weight of paratextual reference material, Cadre notes that Lost New York remains strongly shaped by the formulae of fictional puzzle-driven text adventure games. Peter Nepstad's 1893: a World's Fair Mystery (2002) is likewise a meticulously researched interactive tribute to a historical city (here Chicago rather than New York), yet remains historical fiction as a vehicle for history.

Figure 10. Peter Nepstad's 1893: a World's Fair Mystery (2002) featuring historically descriptive text and period photography.

The dearth of non-fiction IF might be due to the prominence of focalization in IF, even in such unusual works as The Space Under the Window. If narration is inherent in parser response (regardless of tense), character is implicit in focalization (agency implies agent), and interaction varies the nature of reported events, then the formula of narration plus character plus variable representation strongly implies fiction. Arguably then the only command line interactive non-fiction would be focalized on a 'you' that was believably continuous with the identity of the interactor. Still, there might be other potential modes; it is hard not to suspect that the formulation of IF as fiction (rather than IL, interactive literature) doesn't presumptively limit exploration of certain possibilities. We can summarize our own specific critique of the term IF as both over-general and over-specific. The term IF is over-general because it is constituted by the command line, a specific form of interactivity. The term IF is also over-specific because it is a form of literature, not necessarily constrained to prose fiction. From this, we can posit a neologism that draws a better approximation around the actual body of extant works, both excluding and including correctly where the term IF does not: Command Line Literature (CLL). Command Line Literature specifies both the manner of interaction (the command line parser) and the form of the result (literature: things made of letters). To the extent that these works are challenges or contests that are played for victory, some CLL works may also be games, while others may not; this determination involves a subset of design considerations and interactor approaches. An open question for this approach is whether or not CLL should then include the total body of chatbots, MUDs, abuses    that is, anything which combines a command line with textual response, regardless of software architecture or other disparate features and conventions. While CLL might be a provocative categorical lens for the approaches of future interactive textualists, for the multitude of reasons already given, the established term 'IF' will be used in the remainder of this study.

Overview

How does IF work, and what does it teach us about similar new media forms (chatbots, MUDs, or MMOGs), or about interactive narrative, electronic literature (eliterature), and literature in general? I address these questions in chapter two through a cognitive approach to IF interaction    "implied code"    and a method of close interacting which engages both the sense and the source code in Andrew Plotkin's Shade. In chapter three, I consider the emergent aesthetics of error, frustration, and alienation as they relate to the IF protagonist. In chapter four I examine of fundamental interaction design patterns present in even the briefest exchanges ("minimal interactivity") such as mood, tense, and precedence, then engage in close interactions of exceptional short works (Aisle, Shrapnel, Rematch) that demonstrate both the limits of IF and the implications

of IF aesthetics for literature, hypertext fiction, and film, and video games.

My second chapter, "The Implied Code," moves from a structural and historical understanding of the command line to a theory of how it operates during a reader's response, which is to say at the time of interaction. The interactor confronts the command line with neither obvious affordances nor a strict set of conventions for interaction, and must therefore guess how the hidden code might work in order to proceed. The framework for these guesses is what I term the "implied code," defined as an interactor's mental model of the operational logic of the interactive work. 'Implied' emphasizes both difference from the actual code and the emergence of the model as a co-construction, half expectations of the interactor, half implications of the text. When considered as a process in time, the formation of the implied code can generally be described as a coming-into-understanding. In contemporary literary IF, the interactor's progress in learning to interact is often paralleled by the progress of the protagonist within the work, who also struggles to understand something within the world of the story. Implied code sets the pace of a dual epiphany that is both the climax and the conclusion: the character understands the world in the moment that the reader understands the code, and at that moment the work ends.

Interactor expectations are oriented to the interactive work in many ways, with a range exemplified by a brief survey of tutorial stages from console video games (e.g. Indigo Prophecy, Prince of Persia, Psychonauts), noting in particular how the tutorial is variously incorporated or not in the diegesis. Distinguishing between transcript and experience, I consider comparisons between the ethics of implied code and Lawrence Lessig's ideas about "code as law," as well as the IF "cruelty" system for describing interactive difficulty as a property of code. Numerous IF critics have attempted to articulate aesthetic ideologies of difficulty. The immediate implication of implied code is a 'gap' theory of IF which attends to codes that are unreliable, deconstructive, imitative etc. Implied code can be partially described in terms of several common vocabularies from critical theory, including fabula / sjuzet and the implied author / implied reader. Iser in particular has been repurposed many times by IF critics dealing with various aspects of the IF work; I categorize these applications to clarify their differences. In particular, attempting to formalize the study of gaps in code based on victory or strategic advancement tends to obfuscate the fact of experience, as we see in actual analyses of works such as Marc Blank's Deadline.

Reflecting again on the implications of this experiential IF code aesthetics for an IF code ethics, Jacques Derrida's work in Archive Fever suggests a general vocabulary for thinking about the code configuration of parser and database as archon and archive. Following Derrida's thoughts on the archive as historiography, Linda Hutcheon's similar definition of historiographic metafiction in terms of detectives presents us with a potential figure for the interactor. Triangulating the archive and the detective, I propose the figure and configuration of the executor, will, and estate as an analytic metaphor for the command line situation with broad significance to a range of related works new media and metafictional works all characterized by what I term the information fetish.

I conclude by conducting an extended close interaction of Andrew Plotkin's Shade that situates the work in the context of the history of generic tropes in IF, whose ur-text was a spelunking simulation that evolved into the fantastical dungeon crawl of an underground empire. I argue that this "cavern fiction" tradition, while it has elicited a long history of homage from many interactive fiction authors, has also had a more important and unique impact on the IF genre: the code and libraries of interactive fiction languages have been optimized to handle light in a manner similar to spelunking, in particular the simulation (and absence) of light and the idea of the dark. This analysis demonstrates the importance of reading source code in the digital humanities, because without knowledge of how the tools of simulation have been passed down through the genre, we cannot perceive the inheritance aesthetics whereby generic tropes and conventions become codified transmitted. In my reading of both prose and code, I argue that "Shade" does not simply reenact the tradition of light in IF, but alludes to it, plays with it, and ultimately dispenses with it    as it dispenses with the dimensions of space and time. Enlightenment, rather than light, is what the work attempts to model, and in doing so it stands in conversation with the simulation, game, and fantasy traditions in IF, while being

unmistakably literary in conception. In elucidating how the normative second person mode of Shade is established (and later destabilized), first draw out the historical confluence of origins among IF, gamebooks, and RPGs    which I term semiotic simulations    and then consider the idea of the "second person camera" and comparisons between simulated immediacy in IF and film (Terminator, Predator) or video games (Doom, 2ndPS, Battletoads), in particular critiquing the idea that formal parallels hold across media, and instead highlighting comparisons between sets of work-audience relationships.

My third chapter, "The Aesthetics of Error," considers how the idea of implied code and the mandate of the executor can illuminate the emergence of aesthetics of frustration and error in the IF genre. Like hypertext fiction after it, the commercial text adventures that inaugurated the personal computer game industry were heralded as liberatory, with command line interaction billed as an open-ended alternative to the confines of the novel that supposedly freed the reader from the confines of linear authorial intention. Yet the genre of IF is often highly frustrating to newcomers and to seasoned interactors alike, who experience IF as a tightly defined system of rigid constraints, within which the reader struggles (often unsuccessfully) to read. The frustrations of IF have been attributed on the one hand to the genre's tradition of puzzles, which strive to create difficult challenges, and on the other hand to the inherent limitations of the command line interface, in particular the strategy of freeform language parsing that leaves open the continual possibility of misunderstanding and error. Less noted has been the confluence of two trends in IF: one towards the incorporation of fewer formally challenging puzzles, and another towards the rise of a particular kind of protagonist, one radically alienated from agency. I argue that these trends are reflective of a general move in literary IF towards incorporating the limits of the medium as its strengths.

While many interactive media provide choices in a way that paradoxically emphasizes constraint, literary IF incorporates the incapacities of the command line parser as elements of the story-world situation, often through the figure of a protagonist who lacks the normal capacity to act: disoriented (Adam Cadre's 9:05), hallucinating (Stephen Granade's Losing Your Grip), malfunctioning (Dan Shiovitz's Bad Machine), un-evolved (Lucian P. Smith's The Edifice), blind or even dying (Andrew Plotkin's Hunter in Darkness and Shade), and so on. It is the hallmark of the contemporary IF protagonist to be crazy, dreaming, lost, marooned, trapped, displaced, or otherwise alienated in such a way as to make successful interaction with the world an immediate challenge. In this context, error messages are not a failure of the interface to provide pure agency, but rather a crucial part of the aesthetic project of a work, as they relate how and why agency is radically limited. This is crucial because this situation must be understood by interactor and protagonist in order to be overcome. Error messages are neglected under many theories of interactivity due to the mistaken assumption that nothing noteworthy has 'happened' if the state of the simulated world has not changed. This is a failure of analyzing new media as systems rather than cybernetic feedback loops that include the interactor. Analyzing "implied code" emphasizes that something crucial has changed after the production of an error message    the mental model in the interactor's mind.

I consider how the aesthetics of frustration in IF differ from hypertextual navigation, and in particular consider how the cybertextual textonomy is unable to account for frustration and error in its model. Surveying the critical theory characterizing IF as frustrating (and as artful), I consider in particular metaphor of IF as riddle-art    its rhetorical strengths and potential critical drawbacks. Riddles are one of many aesthetics of productive frustration. I argue that aesthetics against frustration are founded on a crucial misunderstanding: first of the interactor as wielding a pure 'puppet' or avatar (an untenable configuration in ambiguous semiotic simulation) and, by extension, of an interactor liberated from code constraint, a myth of anarchic freedom that I suggest replacing with discussion of productive engagement in terms of enfranchisement. As an alternative productive vocabulary, I propose directing protagonists (rather than playing player characters).

Returning to the theme of IF successfully or unsuccessfully scripting expectations, I question the recurring idea that expectation scripting led IF authors into the necessary use of generic fictional tropes . Tracing a critique of failed and dysfunctional parsers and IF works that has repeatedly characterized IF characters, systems, and interactors in terms of autism, I argue that this is a misunderstanding of objectivism in the

system, but that the representations of incapacity and disability (and, more generally, the questioning of normative agency) is a core aesthetic strategy of IF that, along with amnesia, solves several core design problems.

My fourth chapter, "Minimal Interactivity," examines that work of IF at the level of a single interaction, in metaphoric comparison to Prince's "minimal story." Considered in contrast to closure in comics, closure in IF is prospective rather than retrospective in time. I consider strong normative stance of second person present tense work in the canon, and look at the aesthetic effects of shifting to first and third person or to the past tense. Finally, I consider basic distinctions between the concepts of minimal activity, reactivity, and interactivity, as well as the framing idea of minimalism in relation to games. Exploring the tension in short works between traversals that end and sessions that constantly restart, I consider "time loop" fictions, including looped structures such as Joyce's novel Finnegans Wake and the representation of repetition in films like Groundhog Day and Lola Rennt. I turn to extended close interactions with a series of short IF works that trouble the idea of minimal sessions and play with circular time, including Aisle by Sam Barlow, Shrapnel by Adam Cadre, and Rematch by Andrew Pontious. All of these works locate frustration and alienation less in the figure of the protagonist than in the special state of the world, which is either a dream exhibiting heavy Freudian condensation or else a trap of space-time crafted by some divine force. Where Aisle popularized the sub-genre of "one-move" IF, Rematch elaborates on this idea of the single interaction by embedding it within an infinite loop that refuses to end. In my reading of both prose and code, I explore how the process of discovering an escape from a dangerous situation simultaneously explores the protagonist's emotional frustrations with his life. The true resolution is simultaneously instrumental and philosophical.

# Chapter 2

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The Implied Code:

IF as mental model, mystery, and tradition

Having considered interactive fiction and the command line historically and conceptually, we can now move to a theory of how it functions as a process at the time of interaction. The IF interactor confronts the command line with neither obvious affordances nor a strict set of conventions for interaction, and must therefore guess at how the hidden code might work in order to proceed. The framework for these guesses is what I term the "implied code," defined as an interactor's mental model of the operational logic of the interactive work. As the interactor engages the IF work, she accumulates a set of hypotheses about its structure: what commands are understood, what actions are possible, what desirable states might lead to what resolutions, how far the scope of the simulation extends, and so forth.

When I say that implied code models "operational logic" I mean a set of behaviors on the part of software, whether perceived by the user as tendencies, rules, or laws. For this reason the formation of an implied code is a normal (and largely unconscious) process for any interactor, regardless of her level of technical experience or sophistication. To possess an "implied code" does not require that the interactor be a skilled programmer with an aptitude for imagining precompiled syntax; in fact, the presence or absence of such imaginings is beside the point. The interactor may be somewhat inexperienced or totally computer illiterate, but regardless of her circumstances she will posses an implied code to the extent that she recognizes the code as a phenomenon in the normal manner outlined by behavioral, environmental, and situational psychology. As a set of expectations implied code is not strictly limited to interactive systems, but rather general to what we might call the phenomenology of software. In the case of IF, however, the predictive power of the implied code model is in particular focused on interaction, exemplified by the question "How might my input be understood, and what type of response might I expect?"

Expectation and diegesis in video game tutorials

Many factors may influence the expectations with which an interactor engages an interactive work. While our focus will be the play of expectation during the process of interaction, many influences on expectation are fully formed before interaction begins. Some involve how inherently knowable the interface is (as opposed to random, pseudo-random, or shifting), while others involve the stance, abilities, and limitations of the interactor. Others involve the familiarity of the interactor with other works in general (media literacy or game literacy) or in specific. Examples include familiarity with genre conventions (e.g. expecting the ability to leap by a certain method in Jordan Mechner's Prince of Persia: The Sands of Time (2003) because it is a member of the 'platformer' genre), or with precedents (e.g. expecting the ability to rebound from walls by a certain method in Kevin Guillemette's Prince of Persia: Warrior Within (2004) because it was previously available in The Sands of Time), or with various paratexts, whether those be epitexts (Prince of Persia manuals, guides, reviews etc.) or peritexts (in-software hints, control diagrams, configuration screens etc.).

Figure 11. Peritext controller diagrams from Prince of Persia: The Sands of Time.

In discussing implied code, my emphasis is on the interactor's mental model as formed at the time of interaction and in the diegesis of an interactive fiction. This distinction is not a simple one. In-software materials designed to set interactor expectations run the gamut from the non-interactive and extradiegetic to the interactive and diegetic, with many intermediate and partial positions. What (for example) counts as part of a video game proper, and which interactions lie within its magic circle? The clearest examples come from the conventions of video game tutorials     explanations designed to orient players (as opposed to their avatars

or protagonists) to the controls. As a context for later discussion of text-based IF design, we'll start by considering tutorials as they are handled in several recent 3D graphical console video games, in particular ones chosen for strong narrative elements.

Figure 12. An avatar of the game director explains interaction on a virtual film set in Indigo Prophecy.

David Cage's Indigo Prophecy (2005) (a.k.a. Fahrenheit) is a third-person adventure / interactive film that offers 'Tutorial' as a menu alternative when starting a new game, and sets the tutorial in an extra-diegetic fictional space. An environment resembling a film set and captioned "Shooting Set: First day of shooting" appears, and a character representing the game writer and director David Cage steps, out, faces the fourth wall, and addresses the player directly. In order to master the controls, the player is encouraged to manipulate an abstract avatar resembling an animatronic crash-test dummy, while printed directions and diagrams corresponding to the controls appear on-screen. In the Keita Takahashi third-person scale-free puzzler Katamari Damacy (2004) there is a similarly optional introduction. In it, the Prince of the Cosmos is placed on a similarly arbitrary orientation space, although this abstract plain is nominally diegetic, as it has been created by the King of All Cosmos to instruct the Prince in the use of his magical ball to collect summoned objects. The Bungie Studios third-person shooter-fighter Oni (2001) likewise offers a training sequence with set-pieces and dummies. This training is included as a diegetic first chapter (rather than as an optional paratext) titled "Trial Run." In it the player leads paramilitary agent Konoko through a workout at an expensively equipped combat training facility. Tim Schafer's third-person platformer Psychonauts (2005) goes further in incorporating training into the diegesis, with the player exposed to a few selective controls and given a chance to wander the environment    a summer training camp for psychic children    before leading camper Raz through Basic Braining, a ropes course / boot camp conducted psychically by one of the camp staff, Coach Oleander. Within a scarred mental landscape resembling a war zone, system messages to the player on controls (e.g. "Press X while airborne to double jump") are complimented by Oleander's running commentary to Raz on interacting with mental landscapes.

Figure 13. A projection of Oleander (left) lectures Raz, while system text (bottom) instructs the player of Psychonauts.

Tutorials are a place of basic interaction learning, as opposed to skill mastery through repetition. In game design parlance, tutorials primarily exist to expose 'verbs' or types of agency. Yet tutorials are by no means the only place where verbs are learned. Of the examples thus far, Oni and Psychonauts in particular have extremely complex controls and large interaction models. Each game features a series of abilities unlocked over the course of the game; instruction on each new ability is presented at each moment of acquisition. Still, all of the works discussed thus far address the problem of familiarizing the player with complex controls by creating a space for interactive practice, and to the extent that they are diegetic all struggle to incorporate an interactively complex and variably demanding (yet low risk) environment into the story world, with a cosmic deity, a rich government organization, or a psychic secret agent providing the excuse for such an environment to exist.

By contrast the Fumito Ueda third-person action adventure Shadow of the Colossus (2005) integrates its tutorial into the first interactive sequence of the game: the quest of the hero Wander to locate and destroy the minotaur colossus, Valus. Like the King of Katamari Damacy, Shadow of the Colossus begins with a powerful motivating figure, the spirit Dormin. Rather than having Dormin conjure up a magical educational scenario to train the hero, however, the hero is sent out into the vast landscape in search of Valus. During the search the player encounters a carefully constructed sequence of obstacles that require riding, jumping, climbing, and so forth on his way, accompanied by non-diegetic system messages describing each control the first time it must be used. Here, the player is being silently oriented. Unlike the Prince of the Cosmos or Raz, the hero is presumably already familiar with the climbing athletics he demonstrates, and needs no orientation.

Figure 14. Tutorial captions accompany an in-game progression of challenges in Shadow of the Colossus and

The Sands of Time.

Jordan Mechner's Prince of Persia: the Sands of Time (2003) uses a similar method of carefully integrating a sequence of verb-exposing tasks and obstacles into the opening diegesis. In the first level, "In Search of Treasure," interaction begins with the Prince of Persia attempting to loot the Maharajah's palace while the city is under siege and bombardment. The shifting, rubble-obstructed landscape provides a series of challenges that allow the non-diegetic orientation of the player (via direct system messages) as the Prince uses already-mastered urban climbing and parkour techniques to reach the treasure vaults.

Although the player is oriented through non-diegetic captions (e.g. "Left analog stick controls Prince"), The Sands of Time uses direct address from the Prince to an unnamed narratee in an unconventional place: system messages. Whenever the protagonist dies or the player saves, quits, or performs other actions that require the system to suture time, the interruption is accompanied by the Prince's voiceover, e.g. after death: "No no no... that didn't happen either. Let me begin again." System menu selections likewise elicit statements that appear to emanate from some frametale, e.g. Restart: "Now, where was I?" and Quit: "Do you wish me to leave before finishing my story?" While the narrative cannot accommodate the player's knowledge of physical interfaces (such as right analog sticks), it can accommodate menus and memory cards. In the penultimate scene, we learn the Prince has been addressing the Princess Farah in a grand recounting that occurs just prior to the climactic battle. This suggests that all our mistakes as players have a diegetic explanation in Farrah's difficulties accepting the plot as presented. When a player mistakenly dies, this does not represent the Prince bizarrely misremembering his own death, but rather Farah's unheard objections that the Prince should have died, which is in turn brushed aside by the Prince as non-authorized ("No, that didn't happen.") By reaching the end of the game and resolving it, we justify the Prince's authority, proving what did happen and finally incorporating extra-diegetic interactivity into the diegesis.

Figure 15. The character Issun mixing diegetic and extra-diegetic explanations of saving in Ōkami.

There is a final mode of framing expectations about interaction to consider, in which the controls are directly explained within the diegesis. An excellent example of this is the Hideki Kamiya third-person action-adventure Ōkami (2006), in which the player controls a white wolf    the reincarnation of the Shinto goddess Ameratsu    as it struggles to discover the artistic techniques that can restore a Japanese village and free the land from evil spirits. Like Shadow of the Colossus or Sands of Time, Ōkami integrates the orientation of the player to the controls during an introductory quest, River of the Heavens. Unlike those works, however, Ameratsu is accompanied by a diegetic character who serves simultaneously as both comic commentary and the voice of the system. This voice is Issun, a one-inch tall artist who accompanies both Ameratsu and the player, and freely addresses both. His utterances may prompt Ameratsu's attention or model action (e.g. "Hey look! Are those stars forming a pattern, or is it just me?" "Guess I'll just have to draw the missing star!") or may instead speak directly to the player holding the controller ("Press the R1 button to hold the brush, then the    button to draw"). As the voice of the system, Issun is playful about this inconsistency, as for example when introducing the mystic structures that signify points where the player can save the game, Issun describes how if gazed into "your memories will be stored in the mirror for all eternity!" provided the presence of certain equipment: "I'm talking about a memory card (8MB)(for PlayStation®2), silly!"

Figure 16. First person view of a vision test in Halo, which calibrates the Master Chief's (that is, the player's) "vertical looking" controls.

An interesting contrast to this rupture is the Halo series of games by Bungie Studios for the Xbox console. In the beginning of the first Halo: Combat Evolved, configuration of the "vertical looking" control is integrated into the diegesis: the recently defrosted cyborg Master Chief is being reoriented and needs a vision test. This orientation is a cyborg moment, as the Master Chief, like a robot (or the player), can have his neck impulses 'inverted' by the technicians during an eye exam. By Halo 3 even this conceit reduced to its barest essence. A medic holds up a light and asks the Master Chief to "look up," with either corresponding thumb motion

interpreted as an implicit configurative act.

All of these examples are responses to the problem of specifying interaction and teaching the interface, and while the approaches to form of address and diegesis are quite varied, they reflect a broad consensus that it is the responsibility of games to orient and educate their players and that they may reflect a general progression away from representing the interaction model purely in epitexts (manuals) that has moved through peritexts (help menus) into tutorial sequences, and now focuses on the integration of tutorial design into the diegesis. This may in part represent a valuation of learning in games, and a desire to participate in shaping the proximal development of the player's abilities. Conversely, it may also represent a deep impatience with learning, and a forceful method of evoking the perfect implied player of a game as quickly as possible so as to get interface ambiguity out of the way. This is not to say that many games do not spread out learning, particularly those with complex interfaces. Ōkami, for example, teaches the player how to draw 13 magic brush strokes over the course of the game, while Psychonauts teaches a sequence of new psychic abilities spread across dozens of hours of play. By and large, however, the function of the tutorial is to resolve the interface, dispensing with the mystery of agency so that the game can focus on skill (e.g. not how to attack, but when is the optimal moment) or content (e.g. not how to unearth an item, but where it is located or which one to pick up).

The function of the tutorial, in other words, is to resolve the potential danger of the player not knowing interaction mechanics; tutorials address the fundamental problem of how. In comparison to the contemporary narrative videogame, one might say that contemporary narrative IF is almost a tutorial genre, in that works tend to end at the moment that mastering the interface concludes. In contrast, we might rather say that IF does not seek an efficient resolution to the problem of how, but rather seeks an evocative exploration of the problematic of how; this is its primary design space.

Availability of transcript and ethics of code

So we return at last to implied code, which is so central to understanding IF because it is at its heart a network of hows. Like the operational logic it is based on, implied code generally predicts structures and syntax of interaction rather than any specific content. For example, an IF interactor typing "> TALK TO CLAUDIUS" might have a strong expectation that the system will understand the action as speech (as opposed for example for assuming that the interactor is referring to an object named TALK that should be given to Claudius). In addition, the interactor might have a weak expectation that the system will respond with a speech act from the character addressed. Little can be expected, however, about what precisely will be said    at least, little that relates to one's conception of the code. Expectations about how it would be appropriate for the protagonist's uncle to react at this point in the discourse are part of an entirely different order of knowledge from the implied code, which is concerned primarily with how the Claudius object may be affected in the simulation and what type of changes might result from a given action. Rather than "If I do A, the next story event will be B," predictions take a form more similar to "If I input interaction A, then the parser will understand the input as of type X, and a change of type Y will occur." Here we might describe implied codes cognitively in terms of schema theory; implied codes are in this sense particular kinds of schemata that map software behaviors.

Because it is a mode of knowledge acquisition, implied code is usually in the process of forming, but may not develop during interactions that fail to map input to output due to inattention or confusion. For example, when playing a fighting arcade games such as one from the Samurai Showdown or Street Fighter series, combinations of joystick motions and button presses render different fighting maneuvers; a private language of maneuvers is available for each character out of a set of potential avatars. While the question "what does this button do?" does not necessarily originate out of the implied code (as there is no hypothesis), the observed result may be added to the implied code, refining the interaction model. On the other hand, rapidly pushing buttons without attention to which or how ("button-mashing") may expand but not refine the implied code, no matter how impressive the maneuver produced; something new may have been discovered about the vocabulary of available maneuvers, but not how it is evoked. If one can 'read' the process of interaction, then button-mashing is the limit on that form of reading. Other types of confusions are also possible    forgetting,

for example. IF is particularly susceptible to the problem of interactors remember how something was done and why but become confused over the precise symbolic representation. For example, remembering that conversation with a guard on the topic of a door is different from remembering the syntax ASK GUARD ABOUT DOOR vs. TELL GUARD ABOUT DOOR vs. TALK TO GUARD vs. GUARD, TELL ME ABOUT DOOR and so forth.

IF works might be vulnerable to misremembered interaction in unique ways, but most are also uniquely adapted to address the problems remembering interaction. An IF work typically features a scrolling-transcript style interface that records past commands interleaved their corresponding responses. The IF transcript history (which scrolls up from the command line like a ticker-tape as the IF session proceeds) is almost unique in its accessibility compared to common user interfaces for hypertext, video games, interactive drama and so forth. This aspect of command-line display is not universal. Some command line works either record the input transcript in a separate pane or accept input into a single bar with no record. Indeed, IF once routinely omitted the transcript as part of the display, leading Niesz and Holland to observe in 1984 that "one cannot look back at what went before [...]. Thus, in a literal sense, there is no text, nothing that could be put on a shelf and pointed to as the source of roughly similar experiences by readers." (120). Regardless, the transcript history today is a widespread default convention of compilers and parsers. This constant presence of the recent past in IF interactions is unusual for an interactive new media genre. Breadcrumb trails that lead backward are of course possible in all interactive digital media, and have been experimented with (although seldom made conventions) in many, from hypertexts (e.g. the Eastgate history menu) to video games (e.g. Prince of Persia: Sands of Time) to interactive video installations. Even in these cases it is rare to find an exportable transcript, or some a record of experience that can "be put on a shelf and pointed to." Auto-transcribing and auto-recording works enable a uniquely robust construction of the implied code; the traces they leave behind create the potential for them to be reflected more clearly in the mind.

Implied code is itself neither a set of instructions nor a transcript of past interactions. The code that takes shape in the mind of the interactor is in some sense a reflection of the source code, byte code, or machine code it stands in relation to, but the normal result is a translation into a set of an abstractly conceived network of opportunities, allowances and prohibitions. At the command line, whose blind input mode encourages (and punishes) experimentation, these prohibitions such as error messages may take on disproportional weight in the implied code    disproportional to the form of the source, that is, although not perhaps to the transcript of the experience. Just as a rigorously enforced legal code becomes remarkable not for its disparate features but for those few passages that most impact the life of a citizen, the real code (which, by its nature, is rigorously and automatically enforced) is noted and understood by the user where it enables and constrains in perceptible ways. This comparison between software code and legal code recalls the work of Lawrence Lessig, who in Code and Other Laws of Cyberspace (1999) writes concisely "code is law" (6). Coming from a background in legal studies, Lessig became concerned about the increasing uses of technology to control the individual. In Lessig's model, an individual's ability to act is constrained by four interdependent modalities or regulators: laws, markets, social norms, and architecture. Most importantly for our purposes, architecture is Lessig's term for any medium or technology, including code (89). Lessig is not anti-regulation; what disturbs him about contemporary trends in cyberspace and software is not code's use to regulate per se, but rather the way code is used as a form of indirect regulation (e.g. embedded Digital Rights Management), subsuming and hiding constraints in code that should more properly be negotiated in social contracts or the open market.

Figure 17. Lessig's four-regulator model as depicted in Code 2.0. Here law is shown exerting indirect regulation via the others.

Constraining and disciplinary functions are only one part of code's importance, of course. Architecture (whether structure, medium, technology, or source) can be both limiting and enabling. In fact, these aspects are often inseparable, as the bridge often constrains access to the water with the same structure it uses to enable passage from shore to shore. Lessig's focus, however, is on the ways code conceals regulation, either obscuring its effects or naturalizing those effects and thus rendering them invisible. In this light, gaps between

what code actually does and what we perceive it to do register as sinister. By declaring "code is law," Lessig hopes to take a multitude of contemporary software processes and render them socially visible, like a farmer of the enclosure era crying "Fences are law!" to mobilize the commons and avert disaster.

While Lessig considers the individual's knowledge of code at length and from many angles, he deals with no concept analogous to "implied code" because he is engaged with different concerns. He begins from the assumption that all code tends to be under-understood and that this situation has no appreciable utilitarian benefits. Within his prevue, this could arguably be the case. While many cryptography systems, Digital Rights Management systems, and "security-through-obscurity" systems depend on hidden or obfuscated code in order to function, and while many utilizing such systems will advocate them, critiquing both the social efficacy and effectiveness of such systems is one of the major projects of the free software and copyright reform movements with which Lessig is associated. I personally subscribe to many of the same ideals and concerns regarding the relationship of code to desired transparency in law and society, but it is perhaps unsurprising that the mirror-world of aesthetic study has led me towards a diametrically opposed opinion about obscurity in code, which I tend to view as admirable rather than pernicious. Whether or not utilitarian code can be beneficially obscure, the obscurity of artful code does have a clear benefit. Artful code can be obscure in order that its obscurity may be overcome. It is possible that the sole purpose of IF code is being overcome, such that enduring in obscurity (which might represent a triumph in cryptography) would represent the failure of the work.

We have been considering the broadest possible implications of code by sketching code's general stance with regard to ethics and morality. This latest concept of IF's benevolent and even loyal opposition to the interactor expands the possible valences of our code anthropomorphism. We can expand the possibilities further by considering practical discussions of IF ethics, as the concept of anthropomorphic IF code is not unique to academic philosophy. IF authors and interactors have discussed the openness of code and the relative ease or difficulty with which it is overcome in both theoretical and practical terms. One of the best examples of this is a popular rating system in IF, a set of labels used to identify the difficulty of an IF game in anthropomorphic terms. The "Zarfian Cruelty Scale" rates games as Merciful, Polite, Tough, Nasty, or Cruel. The scale describes how works of IF become unwinnable, especially how and when the interactor (here a player, and one trying to win) learns this. The highest cruelty levels indicates that the game can easily be put into an irrevocably unwinnable state without warning and perhaps even without notice even after the fact. One of the fascinating things about the Cruelty Scale is that it is not a difficulty rating in any traditional sense. It has no correspondence to evaluating the reading level (e.g. accessibility of the prose to varying education levels), and it has little if anything to do with evaluating the critical thinking level (e.g. the difficulty of any conceptual leaps required to progress). Instead, the Cruelty Scale focuses solely on evaluating the way that code moderates action and enables or hinders progress towards its own revelation    particularly when and to what extent the system reveals information about its own state. An IF work might require reorienting a globe by hidden compass degrees, decrypting a word from a 2D array of letters, or discerning the significance of five book names selected from the Bible, and it can still be rated "Merciful."

Figure 18. Evaluating cruelty in works of IF

This is precisely the case of Sam Gordon's terribly difficult (yet categorically merciful) IF Final Selection (2006), whose HELP notes read in part:

Nothing in the game can inflict a fatal injury on the player and it should not be possible to manipulate the objects so as to make the game unwinnable, until the very end.

The most hostile rating ("cruel") is distinguished neither for "fatal injury," nor for how often or how unfairly the IF simulation enters an unwinnable state, but instead for concealing that fact from the interactor both before and after it has occurred. Concealing the fact after the work becomes unwinnable in some ways represents the outer limit on the concept of the code as benevolent opponent. Once the work becomes silently

unwinnable, an interactor could spend minutes or days trying to master it, never knowing she had entered a wasteland beyond reason. Still, perhaps it is still a matter of degree; there is always RESTART, which makes most IF works winnable. Nothing but taste truly determines whether an interactor will avoid or actively seek out Cruel works, and the question is left open: at what point during the progress of interaction should all be revealed? Should all be revealed?

We might refine the earlier proposal that being overcome may be the sole purpose of code in IF by saying that the simulation state cannot be merely resolved, but the solution must be mirrored in the interactor's mind and understood. Cruelty is one description of the betrayal whereby significant code is not implied, rendering further interactions with the system futile. Conversely, true understanding might also obviate the need for further actions against the simulation, as the purpose of the work is fulfilled. As in the operations of mystery, suspense, and drama, the truth is obscured in art in order that it may be revealed. As a medium, the simulator-parser may be indifferent with respect to the transparency of its inner workings. As a genre, however, revelation is the purpose of IF. The code conjures up its double in the reflective surface of the interactor's mind, and this image is the implied code.

This emphasis on revelation is an aesthetic ideology specific to my experience as a researcher immersed in the study of fictional simulations intertwined with the history of puzzles. Rhapsodizing about the beauties of adversity and its resolution follows a long tradition in literary studies of celebrating 'difficult' texts, while also echoing past IF scholars legitimating their studies within the context of literature and the arts. In her seminal 1985 doctoral thesis on Adventure, Buckles compares IF to folktales based on two factors: community authoring and circulation practices on the one hand, and isomorphism between the interactor's difficult progress and the hero's journey so central to folk traditions (and their structural analyses) on the other. In an article published the following year Buckles terms Adventure "oral literature," a phrase with even more power to legitimate extra-canonically orphaned works. By comparison, the more ambitious gambit of Nick Montfort's 2003 monograph on IF, Twisty Little Passages, is to legitimate the study of IF by first staking out a territory for the riddle as an ancient (and hence respectable) tradition of literary art (37-63), then framing IF as the legitimate inheritor of that tradition by virtue of its puzzle-nature. In longing for the relative safety of literature's canonicity, I might here make a related appeal on the part of the difficult codes that make up IF, this time to yet another 'tradition' of artistic difficulty    the high art avant-garde (that abusive foster-mother of all canonically orphaned works).

Moving from utilitarianism to aesthetics and from the sinister to the benevolent, however, risks decreasing the perceived stake in analyzing IF code by de-emphasizing its relationship to power and subsequently political and moral consequences. Lessig's engagement with code as a vector of oppressive policy is deeply consequential, as is Galloway's engagement with protocol as a logic of imperialist global capital. While my theories of implied code in IF are largely neutral (rather than libratory or oppressive), our exploration of implied code still runs parallel to these considerations of regulatory architecture in two important ways: first in its focus on the gap between understanding (implied code) and reality (code), and second, in its use of the metaphor of law to explore the impact of implied code on the individual.

Despite being the result of abstraction, the implied code always exists in relation to the real (if invisible) code itself; it is an approximation or mirror-construction of what proceeds operationally in software and hardware. In IF, the interactor's process of approximation constructs the implied code inductively, with each new move a guess and each new response reaffirming or contradicting the mental model. 'Implied' here emphasizes both the difference of the mental model from the actual code and the emergence of the mental model as a co-construction, half expectations of the interactor, half implications of the work.

Implied code and critical theory

IF is neither the incarnation of a set of critical theories, nor the perfection of a line of critical thought. Instead, it is a genre whose works will be more or less elucidated by appropriate theory. How does implied code serve

in this regard? We can do more than describe implied code; we can also analyze it or evaluate it as we might a reader's interpretation. For example, we might ask if an interactor's implied code is more or less accurate, or if it is more or less successfully predictive. How good is the interactor at inferring how her input will be understood or processed, or how good is she at predicting the responses?

The returns on such critical processes might be poor if their only goal was to verify, rate, or grade interactors based on the relative fidelity of their efforts. But "inaccuracy" in the realm of artistic impression is not a metric so much as it is a dimension of aesthetic effect. When we focus on the aesthetics of the gap between the code and its implied double, a whole world of complexities unfolds before us:

* Unreliable code that, like an unreliable narrator in fiction, attests to its own status, but is caught lying

* De(con)structive code that, in the tradition of disruptive net.art, orients the interactor to a set of interfaces or affordances, which are then disrupted and removed

* Imitative code that, in the tradition of Turing's "imitation game" as carried on by Loebner Prize chatbots, uses simple behaviors to create the illusion of highly complex ones

There are many more potential gaps. Purely structural or media-specific approaches to code-based artworks are best at describing the fact of the code as a method of elucidating its mysteries. But implication can free the discussion of code aesthetics from the tyranny of its fact. If code can imply, then code can also lie. Thus code can be woven into the very fabric of fictional experience, rather than merely undergirding it. In addition to exploring the evocative power of code, we can also embrace the idea that, as with the receptive experiences of many art forms, artists working in interactive code aim to shape the implied code, and that this aim influences their designs.

If the authorial hand reaches out in an attempt to shape implied code, it must do so through the code itself. Here we can revisit the idea of implication once more from the artist's perspective, considering how the implied code stands as a second-order phenomenon in relation to the primary artistic medium of code. A useful analogy is the Russian Formalist distinction (following Victor Shklovsky) between sju et (plot) and fabula (story). The sjuzet is the direct production of the author, concretely mediated (in sound, on paper, via screen etc.), and consisting of a representation of events. These events are represented in an arbitrary order (for example, an explicitly non-chronological one), yet the experience of the sjuzet representation on the part of the reader is itself chronological (like all experiences).

The fabula, by contrast, is the indirect construction of the reader, conceived (but seldom communicated) in relation to the original medium, and consisting of a logical reordering of what in the sjuzet appeared disordered. Traditionally the fabula represents the imposition of chronological time on a story concept or schema that has arisen from the atemporal sjuzet. Here the implicit analogy with implied code finally fails, most acutely in the case of interactive simulations. Most (although not all) works of IF, for example, present the experience of the simulation as a procession of strictly linear time. Like the fabula, the implied code performs a kind of reordering in order to recuperate the key logic of source, yet what the implied code attempts to reconstruct are not chronologies of events, but instead networks of causality. In IF these strands of cause and effect lead to resolution of the work. Yet the play transcript often attests to how these causal relationships can be badly fragmented and garbled by the process of exploration and the relentless plodding of simulated chronology. In this one manner implied code is not the analog of the fabula, but rather its opposite and annihilation. In a reversal of the classic fabula-sjuzet distinction, the implied code is the interactor's goal-directed process with the aim of reconstructing the story of the work out of the ashes of the mere plot.

Figure 19. Parallels between fabula and implied code.

Sjuzet (plot)

Fabula (story)

Code

Implied code

author-constructed user-constructed

concrete mediation conceptual remediation

arbitrary order of representation logical rendering of recollection

When considered as a process in time, the formation of the implied code can be described as a coming-into-understanding    a process with significant implications for aesthetics in contemporary IF. Before focusing, however, it is worth elaborating how the concept of implied code is not inherently specific to interactive fiction, but arises out of narrative theory and environmental psychology, and has a potentially broader application for discussing issues in interactive new media art, games studies, Human Computer Interaction (HCI), and software studies.

What does it mean for the code or indeed anything to be implied? A fascinating process in its own right, implication is a subtle shift whereby the mind is prompted to some new and unstated conclusion. Lacking overt mechanism by definition, implication still emphasizes the external prompt that sparks revelation. It is the sense of external, involuntary origin that qualitatively differentiates this experience from inference, which characterizes the same closure as an internal process of volitional deduction. Where inferences are taken, implications are given, and indicate either parsimony with direct statement or generosity with secrets.

An implication model inverts the commonly emphasized sites and roles in interactive new media art and digital storytelling. In interactive simulations such as IF, "interaction" normally describes a process during which the interactor acts to intervene (via the parser) in the simulation. While outcomes are the result of a negotiated and cyclical communication process, the simulation or storyworld serves as the object of negotiation, the locus of all outcomes, and the ground against which the figure of the interactor performs. The converse of the interaction-simulation model is one of implication-cognition, which shifts the primary ground of discussion from the simulated space to the human mind while emphasizing the experience or reception of the work over its performance or construction. Through this lens the work rather than the user is now the primary actor.

Such a model of interactive reading proceeding by implication (subtle prompting) is incomplete on its own, yet it compliments the previously described interrogation and exploration (forceful asking and wandering outcry). Narrative theory has long explored the relationship between reading as exploration and what we might call reading as implication. Indeed, the question of how and to what extent textual meaning is unilaterally constructed or co-constructed has been central to the development of reader response theories. In Literature as Exploration (1938), one of the founding texts of reader response, Louise Rosenblatt describes the literary work as existing "in a live-circuit set up between reader and text" (24)    a provocative metaphor for contemporary textual theorists with a more cybernetic bent. For Rosenblatt, reading must be understood experientially, which is to say psychologically. Her focus on cognition bypasses a generation of formalist, text-centric reader response.

In literary criticism, the complementary theories to Rosenblatt's reader response exploration have been the major theories of implication, in particular theories of the implied author and the implied reader from which implied code most clearly inherits its name. For Wolfgang Iser, the implied reader is a hypothetical reader (rather than a real person) that arises out of the structure of the text and defines a reading role that "embodies all those predispositions necessary for a literary work to exercise its effect    predispositions laid down, not by

an empirical outside reality, but by the text itself." Unlike Rosenblatt's real reader, who explores, it is Iser's text that structures, implies, and conditions, and out of which the implied reader emerges. "[T]he role offered by the text is in no way an abstraction derived from a real reader, but is rather the conditioning force behind a particular kind of tension produced by the real reader when he accepts the role." Crucially, this offer is circumspect. The narrator may address the narratee as 'you' (as in Huckleberry Finn, which opens by addressing a contemporary reader that probably read The Adventures of Tom Sawyer) yet this is distinct from the implied reader, who is only indirectly addressed by the implied author.

Wayne Booth similarly conceives of the implied author as a "second self" separate from the actual historical figure of the author, in this case conditioning the morals, norms, and values of the text that cannot be attributed to either the narrator or the real author (73). As with the implied reader, the implied author emerges out of the text, and for this reason Wimsatt and Beardsley's objections regarding what they term "the intentionally fallacy" do not arise. Like the implied reader it is a role, and although that role is not offered to the reader it likewise serves a disciplinary function, delimiting expectations for the real reader regarding what consciousness outside the narrator regulates the world of the story. Like the implied reader, this disciplinary function is circumspect. In Coming to Terms, Chatman writes, "the implied author 'says' nothing. Insofar as the implied author (the text itself) communicates something different from what the narrator says, that meaning must occur between the lines" (85).

In practical application these two concepts can sometimes be hard to distinguish from the narrator and narratee (respectively), and they are most useful in different kinds of texts. Gerald Prince for example suggests the implied author is clearest in the case of homodiegetic narratives such as Charles Dickens's Great Expectations, while implied readers are most useful in cases where the narratee is also a character, as in Vipers' Tangle (A Dictionary of Narratology, 43). There is also a practical asymmetry in the two concepts due to their application to scenes of reading rather than writing, for if both are roles grounded in and implied by the silent structure of the text, the implied reader is a more practical onus directed towards the real reader, while the implied author is necessarily in absence of the real author, and can hold no such force    after all, both come into being in the reader's mind. Like the implied author and the implied reader, the implied code is structurally rooted in the work but actively constructed in the mind as part of an ongoing process. In non-interactive code works, the implied code is analogous to (though not identical with) the implied author or programmer. In interactive works, however, it is more closely analogous to a fusion of both the implied author and implied reader    that is, the proffered role of interactor and the delimiting scope of the system are part of a single HCI structure of interaction design.

Like the implied reader of a novel, an IF work can have an implied interactor whose experience, interests, and interpretive impulses compliment the work. In the novel, this reader is "implied" through the arrangement and comportment of the text (for example, the frequent use of French phrases might indicate that the implied reader is expected to know French). Implications generally delimit knowledge and experience, including special forms of knowledge like background or opinions    perhaps the implied reader is an immigrant, is a woman, dislikes guns, etc. Implied code concretizes part of the implied reader as a set of practical experiences    media literacy in IF, a set of known verbs, familiarity with certain kinds of problems, etc. This is active knowledge, and the work's assumptions about them are crucial because traversal is in jeopardy if the assumptions fail. Unlike assumed literacy and experience, in other words, the implied interactor is characterized by certain verbs or actions.

Figure 20. Implied code as a fusion of implied reader / author

Implied reader Implied author

(verbs) Implied code (nouns)

Implied interactor

(reader) Implied programmer

(author)

Like the implied author of a story, an IF work can have an implied programmer whose interests shape the direction and focus of what unfolds. Just as the implied reader becomes concretized as the implied interactor in aspects of the code that afford strategies of forward motion (verbs) so too the implied author becomes concretized as the implied programmer in aspects of the code that establish priorities of attention (nouns). The actual code anticipates (or presumes) the programmer and interactor in the possibility space of code, while the actual interactor likewise presumes, and her assumptions unravel and reform. As they become code, the implied reader and implied author collapse into a single entity. This unified set of potential interventions and outcomes forms the possibility space of the simulation and are negotiated at the interface. In many ways, active engagement with the reality of the code (its disciplinary function, for example, in error messages) constantly threatens to eclipse the traditional role of prose in shaping reader and author expectations    the code confirms or denies. This eclipse is not the activity of the work supplanting the vitality of the author, however. It is rather the operation of the implied code itself, which joins the implied verb space of reading and noun space of authorship into a schemata of connected verbs and nouns.

Theories of the implied reader are an ongoing conversation in IF criticism. In 1984, Niesz and Holland first invoke Iser's reader response and implied reader theories in service of correcting a libratory, writerly conception of IF (among other related digital text genres) as inviting the reader to participate as co-author: that the IF does not emancipate, and that its implied reader is not open, but rather plural: "the text configures itself, so to speak, according to the characteristics of the reader [...] as far as literary theory is concerned, however, this contouring by the computer does not introduce an extra stage" (123-125). In 1985, Buckles is more interested in how interaction in fact proceeds than in refuting a writerly myth, and agrees, with a difference: "Iser's model does not apply to interactive fiction, but for other reasons than those Niesz and Holland suggest." Buckles is the first to make a detailed application of Iser's gaps (leerstellen) to IF, noting that compared to gaps in the novel there two obvious differences in gaps in IF, which are 1) required: the gap at the command line must be closed by typed input to proceed, and 2) explicit: the gap "in meaning" can only be closed when the correct input is confirmed (165-166). Where Niesz and Holland point out that interactors are free to volunteer whatever bizarre input they choose before being disciplined by the system, Buckles gently misunderstands this as Niesz and Holland not perceiving that some inputs are felicitous, while others are not (a distinction they in fact discuss). In reality, because mere typing closes the gap of the interface (the command line), Buckles finds that the command line interface gap has insufficient explanatory power for the process and experience of IF. Consequently she refocuses on a new and distinct gap, a "gap in meaning" (code), which is only closed by felicitous exploration. In her example, an interactor attempts to approach the iron grate which guards the cavern system of Adventure via the commands "South" "Go in" and "Go grate" before finally succeeding with "Go down." This last command closes the gap in meaning. Although Buckles never explicitly labels them, in her review and elsewhere she presents three distinct kinds of gaps: 1) Iser's reading-gaps, which are implicitly present in all text and closed by contemplation, 2) Niesz and Holland's command-gaps, which are explicit interruptions of the command line in the surface of the text and closed by typing, and 3) her own code-gaps, which are potential responses in the system that are only closed through felicitous input.

In his short 1988 article "Determining Literariness in Interactive Fiction" Neil Randall likewise turns to Iser, although he unfortunately talks past Buckles in doing so, citing only Niesz and Holland and describing only command line gaps. In her 1991 doctoral thesis, Sarah Sloane mentions Niesz and Holland, Buckles, and Randall, but does not engage any of their ideas on Iser, although (again like all her predecessors) she takes Iser up at great length. Sloane crafts "a synthesized Phelan-Iser model," a general perspective on both paper and digital second-person works that combines an attention to instabilities in meaning with an emphasis on the real as opposed to ideal reader (27-28), and a subsequent emphasis on reader experience:

[G]aps operate on two opposing levels in interactive fiction: implicit and explicit, or semantic and textual. The dissonance between these two kinds of gaps occur when, during the process of reading, the reader's questions about the progress of the text do not coincide with the gap inviting the reader to respond. When the implicit gaps in the reader's understanding are in dissonance with these explicit gaps on the screen, the illusion of participation is ruptured, and the reader is left unable to participate satisfactorily in making sense of the text. I see this failure as a symptom of the Objectivist epistemology underlying all interactive fiction. (115-116)

Sloane identifies two types of gaps, "implicit / semantic" (reading-gaps) and "explicit / textual" (command-gaps), and her sense of code-gaps is only indistinctly seen in the second. For Sloane, the potential for rejection or failure in IF and its manifestation in error messages is an occasion for cultural critique, as frustrating code gaps are symptomatic of "an outdated realist epistemology that posits a univocal, objectified reality and that ignores the force of social context in meaning-making activities" (12). This epistemology is ultimately not an inherent quality of the medium, but a design flaw that is a product of ideology (111-112). Sloane's critique of objectivism initiates a vital conversation (see Ch. 3), but unfortunately her continual confusion of realism (the claim that a representation is approximately isomorphic to reality) with focalization (experiencing the work through a sharply limited and constrained set of observations) leads her to argue against herself, as when the "realist epistemology" of Blank's Deadline prevents her from successfully dialing 9-1-1 on the telephone (141). As an alternative to realism, her suggestion is "social constructivism," a design strategy that would incorporates greater and greater code complexity to the point where IF elements transcend their frustrating limitations in an ecstasy of mimesis    that is, realism. For Sloane, the code should ultimately anticipate and welcome interactor standing points rather than unfolding a specific and limited one; code should not have to be implied at all.

In Cybertext, Aarseth notes that Iser's gaps have been a productively recurrent issue in Niesz and Holland, Buckles, Sloane, and others writing on IF, but sees a recurring problem of application: "They all argue that the adventure game has a second type of gap, a narrative vacancy, which must be filled by the reader for the 'text' to continue" (110-111). Aarseth's slight mischaracterization of all these second gaps as 'narrative' (not the term used by most of his sources) signals that he intends to distance himself from and dismiss them, emancipating works of IF "that have been obscured by the shadow of narrative and its powerful theories for too long." Aarseth does this not by rejecting Buckles's work, but by building on top of it one further distinction within what we have called her code-gaps:

The openings, or keyholes, of the adventure game are therefore of two different functional kinds: those that advance the strategic position of the player and those that don't. Only the first are gaps in the quest for the solution of the game, but on a 'narrative' level there is no discernable difference" (111).

Aarseth's unnamed fourth type of gap    what we will call "code-resolution-gaps"    is really a subtype of the code-gap in which interaction is required to terminate the simulation. This suits his methods of functional analyses, emphasizing that some grates must be opened in order to win, while some can be opened for no good reason. Aarseth does not further explain how critics who apply his method will identify gaps that "advance the strategic position." This is not surprising, as his rigorous-sounding formula invites a myriad of difficult distinctions. Consider for example a few potential definitions using a hypothetical Adventure-esque IF work: a chamber with four identical doors, from which the interactor is instructed to escape in order to achieve victory. To the north is an empty room. To the south is an open shaft, ending the game in defeat. To the east, a (functionally useless) mouse is caught in a trap, and may be released. To the west, a sign identifies the area as "Attic Storage." Attempting to go down from the chamber discovers a previously unnoticed trapdoor and ends the game in victory.

Figure 21. Distinguishing strategically significant gaps in code, considered as a hypothetical toy IF work.

Which interactions should we say close the "gaps" of Aarseth's fourth type? The interactor begins a single move from victory. Anything except going down actually worsens (through elaboration) her strategic position,

like a runner sprinting away from her finish line. Perhaps going DOWN is the only code-resolution-gap in the work. One might practically retort, however, that going west does advance the strategic position of interactor, in that the description of the sign text gives her an implication or allusion (not even a modeled object or a command string) that, while not formally required by the signals processed by the software, is practically helpful to the interactor: if this level is an attic, egress from attics is often down. We can call this informative advancement. Aarseth's Textual Machine in fact invites us to hold a mere thought on par with a system state change, as it posits a cybernetic feedback loop in which the operator participates as an equal partner (21); yet in the application of his theories he generally retreats from the cybernetic position, opting to avoid models and terms that give theoretical parity to cognition.

How the unseen trapdoor comes to be used is a cognitive-functional process rather than a purely functional one, so this example is perhaps an argument for the efficacy of an implied code approach to describing IF interaction. Yet are many additional arguments that we could make for the inclusion of code-resolution-gaps. Falling down the open shaft is a valid (if presumptively undesirable) resolution of the work. In many works, a so-called "defeat" condition may in fact be more rewarding and / or more difficult to achieve than the so-called "victory" condition (e.g. 9:05), and many works have a plurality of such conditions, including conditions which are strongly charged but not conveniently labeled as victory or defeat by the system. Should entering the shaft be included, as it is, structurally, a resolution? Or must we, before identifying code-resolution-gaps, first evaluate the worth or desirability of each potential resolution of the simulation? We might evaluate according to the author who so-labels endings ("You have won!"), or according to the interactor, or according to the critic, and so forth. The question of alternative resolution advancement, in other words, is whether to consider resolution as a formal description of a terminated simulation, or alternately to find the distinction in each work by first articulating various ideologies of resolution. Identifying the resolution ideology of a work seems deceptively simply in the case of Adventure or Deadline, as the victory condition appears to be itself structurally modeled in code. Yet even these works complicate under analysis, and the general approach and is complicated still further by contemporary experimentalism, which often declines to classify ends in terms of agon.

Whether or not we include the shaft, what of the trapped mouse that has no structural bearing on the resolution? Yet while the work may end identically and without comment, the mouse is the primary interesting feature of the work. Three outcomes are possible. 1. The interactor never encounters the mouse. 2. The trapped interactor frees the trapped animal in the course of her escape. 3. The interactor abandons the animal. Arguably these are different works. If the code prints the addendum "10 points for freeing the mouse," would this now count as advancing the strategic position of the interactor where it did not count before, even though it is not formally required to resolve the work in either case? In other words, should we include it because it is unambiguously marked as part of a particular interaction ideology? Enormous amounts of classic cavern crawl code fall under this category of labeled-but-structurally-optional interaction, which we might call optional advancements. Excluding them from consideration would mean that our distinction, code-resolution-gaps, is a formula for excluding the majority of a great number of works, both in how they were experienced and in how they were desired. After all, the exhaustive drive for what was called "the last lousy point" is perhaps one of the definitive characteristics of early IF players.

Finally, and perhaps most contentiously, entering the empty room is neither necessary nor apparently informative. Yet it remains an action that brings the interactor closer to resolution. It changes the state of her mental map, refining her imagined options for egress through the process of elimination. To extend this argument, an error message in response to going UP ("You can't go that way") could similarly be part of this process of elimination    even though the state of the simulation does not change in any way. Informative advancements might likewise arise out of interactions that fail to change the state of the simulation, as in attempting to go UP ("Nope, no trapdoors in the ceiling"). This argument for the importance of exclusionary advancements, if accepted, is the rabbit-hole down which the classification of strategic advancement disappears, for relatively few actions in our hypothetical example neither advance the simulated state nor refine the figure or ground of the interactor's implied code. Everything is strategic for some definition of

strategic. The only form of Buckle's code-gaps presumptively excluded from this interpretation of code-resolution-gaps would be insignificant repetitions    e.g. repeatedly walking back and forth between the chamber and the empty room, such that no new information is acquired (and in a work where the advancement of time has no effect).

Ultimately, analysis of the process and experience of code-resolution could involve any configuration of these outlooks on events that prompt the interactor (informative advancement), alternative resolutions such as failures (alternative advancement), optional but significant interactions (optional advancement), and exploration of the possibility space via the process of elimination (exclusionary advancement). How we position strategic advancement in relation to these terms will them have significant consequences for interpreting the gaps in a given IF work; many productive positions are possible, although their productivity will be in relation to the characteristics of specific works. My purpose is not to articulate one superior position, nor simply to point out that Aarseth does not articulate one. More interesting I think is that Aarseth's implicit, default position appears to be that strategic advancement is a property of simulation state rather than the combined text-operator loop, that it is defined only in relation to victory as labeled within the work, that it excludes extraneous interactions, and that it especially excludes negative explorations such as error messages. This would be consistent with his statement that resolution gaps are not necessarily visible. It would also be a reasonable stance to take towards his chosen text, Marc Blank's Deadline. Yet this stance and its distinctions bear almost no relationship to his actual critical analysis of that work (115-128). Like most close interactions with IF, Aarseth's discussion of Deadline spends the majority of its time on precisely those important features of the work that most definitions of strategic advancement would exclude: error messages and odd misrecognitions, anecdotes of fascinating failures (an unexpected suicide, an unintended murder), and subversive outcomes (re-killing the corpse). All of these interactions are either extraneous to or counter-indicate victory, and few clearly occur amidst the direct pursuit of victory. Yet most of Aarseth's close interaction resembles actual IF play    a sequence of limit-testing behaviors and explorations that together make up an entertaining and erudite analysis. Importantly, his focus on limits is not merely a performance in service of enacting genre definition for a lay, IF-illiterate audience. Rather, these are also precisely the type of features remembered, remarked, and reported in IF histories, interviews, and reviews within the IF-literate community.

Of all the critics who have contemplated implication in relation to actual works of IF, Buckles and Aarseth have produced the most productive close interactions with IF scenes and sequences, whether due to or in spite of their respective theoretical frameworks. Rather than refining Buckles's model and building a theory of IF focused around only those grates that open to a purpose, I'd instead suggest broadening the model, if only slightly. We can attend to grates that open as well as to those that do not, and in particular to the tension between the parallel (but perhaps disjunctive) representation of those grates as action potentials in the code and in the mind. My position is that this is both practical (in that the types of interactions of most interest will generally be those implied within the work of IF, whatever their relation to resolution) and productive. For example, Aarseth describes the following 'rebuttal' on the part of Deadline as "pure nonsense" (116):

PLAYER: Fingerprint me.

VOICE: Upon looking over and dusting the me you notice that there are no good fingerprints to be found.

Montfort demurs, remarking that the clearly unintended message has an accidental sense that makes it 'felicity' (183). More importantly, however, this exchange is a potential progression in the development of the interactor's implied code. The interactor has discerned the potential to FINGERPRINT in the work, and hazarded that it is an act of collecting biometric information (ink images of the tips of fingers) that can be applied to people. As the protagonist is a person, the interactor directs a self-fingerprinting. The result, however, makes clear as a byproduct of its failure that his utterance was (following Austin) accepted procedure and executed completely, but not executed properly: fingerprinting in Deadline is in fact possible and can be so directed, but it is an act of collecting residual biometric traces (oil images left by fingers) that

can be applied to objects, and while the protagonist is (apparently) an object of the type person, he does not bear any residual fingerprints on the surface of his person. The interactor was not unreasonable in confusing the act of collecting ink impressions from fingertips with the act of collecting oil traces from objects, as they are two slightly different definitions of the same verb, but the improperly executed outcome has clarified this issue by demonstrating an unproductive dusting rather than stating "None found." The verbal artifact "the me" further seems to indicate that impersonal objects (the cup, the table) are invariably expected by the implied code, at least in failure cases. From this experience the interactor might further hypothesize that dusting other persons should be possible, yet will probably never be strategically productive. Of course, this is only an implication of how persons, objects, and fingerprinting are conceived in code, and it hinges on language (e.g. 'the' generally does not preceded names of persons). Perhaps we should try fingerprinting the corpse, just to be sure....

Figuring the interactor: archon, detective, executor

Do critical theory models elucidate the ways in which IF code disciplines and shapes interaction? Recalling Lessig's earlier description of "code as law," the question remains as to code's stance: liberating collaborator or oppressing antagonist? While the power of code to evoke or restrict interaction is contextual with no predetermined moral valence, we can go beyond pure formalism in considering how structural and legal theories of code play out as tropes in raising the issues for contemporary IF genre that currently frame its affective possibilities. Implied code is only a critical lens    a formal description of a standing point in relation to IF and other semiotic simulations. What are the ethics, politics, and poetics of contemporary IF? Considering Jacques Derrida on the archive, Linda Hutcheon on historiographic metafiction, and Gaston Bachelard on the poetics of space, we can begin to craft a preliminary answer    one based in the information fetish, the executor, and the estate.

In the introduction to Archive Fever: a Freudian impression (1995), Jacques Derrida elaborates on the etymology of the archive descending from the Greek arkheion, the home of the law-giver or archon. In this home both the storage of legal documents and the authority to interpret them coincide (2). For Derrida, the complement and supplement of the archive is the death drive. Any time that archiving is taking place, it is against the death (or "destruction" or "aggression") drive that this is carried out (11). The death drive in fact excuses and justifies the drive to archive (13). Derrida locates the move against the death drive in inscription and the externalization of memory into some form of technology, whether it be stone, wax tablet, paper, and so forth, with a focus beginning in typographic printing and moving on to email (13-14, 16, 25). Digital technology's continual advancement of the ability to externalize memory brings with it attendant anxieties about the need to put into order (or bring into law) some kind of completion which mirrors the "dying-after-one's-own-fashion" that Freud described when he first explored the death drive through the example and metaphor of salmon swimming upstream.

Archive Fever is full of provocative metaphors and play that might enrich our discussion of IF. For example, Derrida's describes impression as an unformed concept (recalling our previous discussion of implication) but also as the undivided moment when printer and printed are joined in the act of inscription (18), as a pen tip makes an impression on a surface. While we may stretch to connect this image to the undivided cybernetic moment of an interactor typing a letter (and is thus part of the symbol system of the machine), Derrida's metaphor of impression reminds us that Archive Fever is ultimately focused on the uncanny connections between Freud as author and his work as collected and dedicated in an archive housed in his former home. It is in other words focused on the axis that runs between the author and the work, and in this sense diverges from our primary focus on reader response and the connection between the interactor and the code.

The configuration of archon, archive, and their attendant fever is paralleled by IF's textual code-work, consisting as it does of database (archive), parser (archon), and the exploring, interrogating figure of the interactor. If as Lessig suggests "code is law," and the work of IF is a consignment of both code (database) and the authority to interpret that code (parser), what does Derrida's psychoanalytic model of 'fever' suggest

about the malady and obsession that drives the interactor?

I am seeking an image of an interactor and her strategies that I can explore in relation to IF structures, something to serve as an analytical, aesthetic, and ethical metaphor. In trying to suggest a general figure of implied interactor for the whole of contemporary literary IF, I hope to deduce something about the implied authors and programmers of the genre. Derrida's metaphors initially evokes an anxious and compulsive interactor, one struggling against the anarchivic forces of amnesia, forgetfulness, effacement, and loss that are the enemy and occasion for the work. This reading of Derrida is deeply appropriate to IF, in which the gaps of knowledge and missing answers are the faithful and terrible antagonists of the interactor's puzzled drive towards resolution. Most IF works require recapitulation and recovery of answers in the code via implied code. To the extent that they do, such works stage the process of recovering that code / law as a kind of morality play whose central figure must always be the death drive. What is staged, in other words, is archival exegesis, and so the work in which the interactor must take part could be termed an archive drama. This sketch only goes partway, however. Derrida suggests that the unifying trait of his theses on the archive is historiography (5). While imaging a theory of IF code in his terms, this concept of history is at first hard to appropriate to IF, for IF works are generally presented in the present tense and resolutely situated in a kind of projective relation to description. Yet historiography, especially in its postmodern formulation, has much to offer an aesthetic theory of IF interaction    in particular suggesting a role name and a motivation for this emerging, archivist-like figure as a kind of historian or detective.

In "Beginning to Theorize Postmodernism," Linda Hutcheon grapples with competing terminologies and theories of postmodernism by considering a generic trope in the contemporary novel that she terms "historiographic metafiction": a generic tope that subverts generic tropes from within, whose hallmark is the difficulty readers and critics have in classifying it, and whose preoccupation is the continually emphasized presence of the past. This past is always engaged through a critical reworking, never a nostalgic return. In this sense of history-writing, we can begin to see an analogy to the explorations of the interactor excavating the logic of the code. Interaction could be described as a kind of re-construction, re-creation, or re-performance of the actions originally imagined in the code.

For Hutcheon, however, the reader is not a historian, whether archaeologist, archivist, or archon. Rather, the guiding metaphor for the reader is a detective. The role of the detective serves as both the archetypal protagonist of postmodern fiction and as a figure for the reader; we might say that the motivations of detective work are what the protagonist and the implied reader have in common, it is an imperative to detect meaning that joins them. The detective is a provocative figure who engages moral and ethical issues of loss and injustice, if ambivalently, by the very fact of engaging with mysteries. This serves Hutcheon's later models of both poetics and politics well, the more so because the metaphor of the implied reader as detective brings with it a lot of cultural baggage. Detective fiction is a "low" generic trope whose centrality to experimental metafiction serves to illustrate Hutcheon's more general concepts of trope mixing and high-low culture subversion.

Derrida's archive suggests a model for IF, while Hutcheon's detective suggests a protagonist/interactor figure to encounter it. The combined metaphor describes a seeking figure whose task is to convert mystery into revelation; not a bad description of IF as far as it goes. Derrida and Hutcheon's theories harmonize particularly well where they share a concern with mortality. While the detective's case does not strictly require a murder any more than the archivist's research requires the death of the author, death is the presumed and prototypical situation of both    the ultimate and irrevocable loss that must be confronted yet can never be undone.

How might we describe the archive-detective of IF, an interactor who works at the command line to discover and execute the commands implied in code? I propose here that the prototypical implied interactor of new media metafiction is the executor. The executor is a very particular form of archivist, detective, historian, and law-giver whose charge is to execute the will of the deceased, making manifest the unrealized law or code through the process of execution. Terming this process 'execution' is its own homage to the deconstructive

psychoanalytic theory we are building on. To execute or "carry out" implies both the revocation of agency through capital punishment (execution of the body) and the legal simulation and extension of agency after death (execution of the will). Crucially, both executions must take place within a legal framework, without which they become unauthorized    mere murders or dedications. There is also a third sense of the term execution particular to new media, as execution describes the manner in which a sequence of computational processes such as a program (or "executable") is carried out. This too is a form that must take place within a framework of constraining rules and regulations, where here law is code. At the command line the IF interactor takes part in execution through a constant process of interruption-continuation.

How is the distinction between detective and executor important to understanding interactive new media and code? Both are charged with understanding. Yet, unlike the detective, whose occasion for investigation may or may not be related to the desires of the missing or deceased, the executor always stands in relation to a corpus in which loss and law are superimposed. Like the interactor at the command line, the executor is directly addressed by the will and directly addresses the estate in return (at least, in theory). While the detective's concerns are the acquisition and interpretation of evidence, the executor is primarily concerned with the apportionment and disposition of things. It is this objectification of will and legacy into the act of consigning the archive of the estate that fits best with the structural manipulations of hypertexts, MUDs, and works of interactive fictions. The vital taking of inventory signifies on the part of author and interactor a shared information fetish.

The executor as described here is a particular kind of detective refocused to depict more clearly the issues confronting implied readers of interactive fiction, but still largely overlaps with the detective role, and thus it is no surprise that executors are already to be found amongst the detectives of canonical historiographic metafiction. The exemplary fictional executor is Oedipa Maas of Thomas Pynchon's The Crying of Lot 49. The newly named executrix struggles to discern and execute the will of her wealthy eccentric ex-boyfriend Pierce Inverarity, a project that seems to lead her into an impossibly expansive, all-encompassing conspiracy. For Oedipa, the legal, financial, and social codes that make up Pierce's estate seem to have no exteriority she is always trapped within its logic and sees that logic everywhere, in a Remedios Varo triptych (11) or in the circuit-board-like layout of a city (13). Her response to growing alienation and paranoia is to fetishize information    a long winnowing down to a single object, an auction lot of "forged" stamps (143) whose manipulation offers the tantalizing possibility of a final answer. Without it, both her status as a self-suspected paranoiac and her alienation from a previously held idea of America threaten to remain permanently unresolved. The auction lot of stamps is the key, not only to her self, but also to the system of her world. By comparison, in Vladimir Nabokov's Pale Fire the mad editor Charles Kinbote is an executor as well, although the estate he executes (with dubiously acquired authority) consists solely of poet John Shade's final manuscript. Just as auction lot 49 becomes a fetish that symbolizes Oedipa's lost sense of America and signifies her experience of a larger cultural crisis of history, Shade's manuscript becomes an information fetish for Kinbote, valued for its potential (under interpretation) to make manifest and thus justify his lost nation of Zembla, the total world-system of Kinbote's alternate lives, memories, and fantasies, as well as the coping mechanism that assuages his alienation as a U.S. immigrant. Whereas The Crying of Lot 49 concludes with Oedipa suspended in a moment of irresolution, however, Kinbote ultimately concludes his reading of the Pale Fire manuscript    and thus falters and dissolves. For Oedipa the promise and threat of her information fetish is the promise of a potential resolution to her world-system that simultaneously threatens to remain unresolved. For Kinbote these valuations are in the end reversed, and the rich promise of the liminal, suspended, and always-potential world-system of Zembla is threatened by resolution. Regardless of valence, the information fetish is this dual promise and threat of the transformative power of resolution.

Oedipa and Kinbote's crises of meaning could be described as crises of self, yet they are always framed in terms of an external, purportedly objective (if ethereal) world view or historiography. The executor figures of science fiction form similar information fetishes, although many explore the sense of lost meaning through the body, especially the physical fact of the mind as irreducible remainder of Cartesian mind-body duality. In William Gibson's Neuromancer, for example, the protagonist Case becomes ensnared in a series of

international intrigues and paramilitary exercises fulfilling the will of the dead Marie-France Tessier-Ashpool. A fulfillment that requires he navigate both the consensual hallucination of global capital that is the matrix and a memory fragment of Marie-France, an unassuming beach scene where her will for the future of humanity was first conceived as a sort of manifesto. That will, whose culmination is the birth of a new artificial sentience into the matrix, can only be fulfilled through a particular fetish object: a mechanical bust (173) that must be accessed with a key (180) and then activated with a secret word (261). While this secret word is perhaps the purest form of the information fetish (the answer), the bust is an ornate jeweled, ostentatious, grotesque supplement for the lack of the missing visionary Marie-France. The hallmark of executor-fictions is this potential estate of information instantiated in an object whose manipulation takes on technical, magical, or symbolic significance    stamps, index cards, bust, and so forth. As the missing answer, the information fetish must always be separate from the subjective self, yet this separation can be represented as an uncanny fusion when the fetish becomes the protagonist's objectified self. In both Gibson's short story Johnny Mnemonic and Haruki Murakami's The Hard Boiled Wonderland and the End of the World, each executor-protagonist is a specialized technical worker who deals in data-trafficking, using the unique properties of their respective minds to ensure securely encrypted secrets. Each discovers that a bequest of information is stored technologically in his skull, and must be disposed of before he is killed. Living on borrowed time and alienated from the contents of their own minds, these protagonists become their own executors, struggling with the distinction between data, information, and knowledge that renders their heads into severable commodities.

The executor is a thematic figure that describes a kind of implied interactor. As such the executor is a generic trope rather than a figure who appears in every IF work. Like the detective, the executor is recognizable by her situation, but also by her desires and actions. In fiction these desires and actions are shown, but in IF they are nascent, and must be performed by the interactor before coming to pass. The avatar may be characterized with executor-like goals and desires, and the implied interactor may be encouraged and enabled to behave in an executor-like fashion, but ultimately the interactor chooses whether to participate in the exegetical desires of the work.

Figure 22. Comparing Detective, Archivist, and Executor figures: six Venn diagrams.

Thus far we have discussed the idea of an estate of information at some length, both in relation to the will of the absent (the departed, the implied author) and as a collection of objects. The idea of the estate in the sense of land and architecture also resonates with IF more generally. Much of IF is constituted around conventions of the physical manipulation of objects and the navigation of simulated space; this is an undeniable part of the tradition of its poetics. While archive fever may have much to tell us about what the situation the IF protagonist and interactor are confronted with, and the detective / executor may help us imagine the implied motivations and standing point from which the interactor is compelled to engage, the estate is the what of that engagement. IF simulations consist of a wide array of objects and environments. They are often fantastic, but no matter how outlandish the setting they usually begin in and are built out of elements of the everyday and the familiar. This baseline in the everyday is exemplified by the mailbox and small white house that provide the opening locale of Zork. The boarded front door is Zork's first puzzle, and the solution (enter using a window) gives way to a slightly more esoteric architectural barrier (a trapdoor under a rug), which in turn grades slowly into a fantastic underground empire. Throughout Zork and many other works (from works set in outer space to those set on the Spanish Main) the pervasive language is of quotidian objects    doors and windows, steps and ladders, tables and chairs, shelves and drawers, handles and buttons.

Here, Gaston Bachelard is the pre-eminent theorist of IF aesthetics, and his work in The Poetics of Space (especially "The House" 3 and "Drawers Chests and Wardrobes" 74) is perhaps the pre-eminent statement of IF aesthetics, for he is concerned with the way that the quotidian language of functional objects and architecture takes on significance. For Bachelard, structures exist in relation to and are approved by their functionality. Rain is what makes the roof good, as all adversities elevate the necessities that they inspire (although, like the bridge over the river, the same roof may keep us from the sunlight    as we shall see). In the

functionalist world of IF, where objects exist to participate in action and create effects, this concept of emotion and aesthetics attaching to neo-platonic functionalism is very generative. It also invites us to examine small things, from one-room apartments down to their doors and lamps, asking ourselves how these things structure the experience of story.

One problem with the metaphors explored thus far is that they describe the executor's exploration of the estate and manifestation of the will as if these things were representations to be apprehended. Yet the primary power of these metaphors is that they describe modes of interaction. The joint origin of the will in the interactor and in the code shapes the protagonist's resolution of a mystery that is more than the sum of its quotidian parts. To demonstrate how this process arises and takes on its aesthetic character, I now turn to an extended close analysis of a particularly uncanny executor contemplating the smallest and humblest of estates: Andrew Plotkin's Shade.

Enlightening IF: Andrew Plotkin's Shade

In Andrew Plotkin's interactive fiction Shade (2000), the interactor finds the protagonist sitting up late on the night before a trip to a desert rave. At first this nondescript traveler is preoccupied by the tedium of travel preparations and the stress of misplaced plane tickets. However, a growing unease sets in as the familiar landscape of the apartment begins to change    objects morph, break, and dissolve, while sand appears everywhere in patches, then piles, then avalanches. The arriving headlights of the airport taxi wash away the walls of the apartment and reveal the truth: 'you' have already gone to the rave, and subsequently wandered into the desert. Dying of exposure there in the harsh noon sun, 'you' hallucinate this dimly remembered apartment, reliving the small choices leading up to the end.

It is easy to demonstrate the differences between a work like Shade (2000) and works like Adventure (1977), Zork II (1983), Bureaucracy (1987) or Jigsaw (1995). These prominent past texts and most like them are clearly of a set    adventurous in outlook and with bursts of frenetic action, expansive in design with a wide range of locations to explore, a humorous tone that generally avoids taking itself too seriously, filled with puzzles substantial enough to take many hours to complete, and filled with "Easter eggs" to reward those playing not only for victory, but also for eking every last lousy point out of the system. By contrast Shade is muted yet uncanny, cramped in space and time, minimal and spare, largely lacking puzzles in any overt sense, with a short traversal length and no point scoring system whatsoever. It is almost as if someone had set out to write the anti-Zork: trading the trapdoor to a fantastic kingdom beneath a rug in for a stubborn patch of sand on worn tract carpeting, the trophy case of wonders for some empty cabinetry and so on.

Figure 23. Infocom ad parodies cult deprogramming, contrasting the mindlessness of joystick video games with IF's imagination-evoking text.

There is much to say about how Shade differs from its forbears, but the place to begin is perhaps in its most noticeable continuity, maintained in the face of all exceptions: the continued use of the second person to address the interactor. While the second person mode was present in IF from its first days as a spelunking simulation environment through its period as Tolkien-esque folk-art on the mainframes of U.S. college campuses, it is Infocom whose marketing made the second person mode synonymous with embodiment and immersion: "Interactive fiction is a story in which YOU are the main character." While it sounds as if the interactor has been invited to step into the world of the story, it is just as often an invitation to step into a role on a stage. Rather than YOU being the main character, the interactor has an opportunity to role-play the main character, exploring 'your' personality as a detective, a spy, an A.I., and so forth, even while exploring the environment. There are many 'you' roles to explore. Infocom's catalog eventually encompassed a wide variety of generic tropes (including detective fiction, espionage, fantasy, romance, science fiction, and space opera), often with corresponding characters to become. This trope explosion in IF coincided with the rise of the graphics card and a massive shift in the computer games marketplace. In advertisements, Infocom responded to the market threat of graphics by lauding the rich complexity of prose ("We draw our graphics from the

limitless imagery of your imagination") and deploring the mindlessness of arcade shooters ("I was a Teenage Zombie!"). The company also experimented with multiple hybrid text-graphic forms, yet, like all text game corporations of that era, Infocom eventually went out of business (although this process was complex, see Ch. 1).

Yet the downfall of commercial IF in the late 1980s crystallized a grassroots art and design community around the emerging Usenet. In the 1990s, as graphical desktop computing entered the landmark era of Windows 3.0, Mosaic, and Myst, IF experienced a quiet renaissance, with languages, libraries, toolkits, and game files circulating freely among individual artist-practitioners on a growing number of groups, websites, and forums, including rec.arts.int-fiction, the if-archive, and ifMUD. The strong retro aesthetic of the community was tempered by an interest in further developing the form and shaped by the practical necessities of doing independent and often single-person development on no budget. This led many new artists to turn away from sprawling mazes filled with puzzles, and re-conceptualize IF design in contrast to the computer game industry as a craft of interactive dramatic short fiction.

In design and content, Shade is indebted to the original era, yet quintessentially a product of the later independent scene.

Light and dark

"Odd, how the light just makes your apartment gloomier. Pre-dawn darkness pools in the corners and around the tops of walls. Your desk lamp glares yellow, but the shadows only draw your eyes and deepen."    Shade

Throughout Shade, the traveler protagonist inhabits two worlds. In the first world, a vision of the apartment invites reflection on choices in the traveler's former life. This reflection leads to the second world, the reality of the desert and of the traveler's death. Although a bulb brightly lights the apartment, it is also a shadow world    the hallucination of a dead or dying shade. The question is not whether death will happen, as it has already happened, but instead how the bad news will arrive.

One window, whose shade is down, and the front door firmly shut.

Your luggage is piled untidily by the door. A potted hyacinth sits beneath the window.

You are sprawled on the futon, staring up into that gloom. Your eyes feel gritty. But it's too late    early    no time left for sleep, anyway. In a few hours your ride will arrive.

On the desk are your to-do list and a travel book.

The drawn shade and the front door of the apartment are always there, and beyond them stretches the desert of the real and the realization of death that end the story. Yet this realization must come slowly. The process cannot be short-circuited by opening the door early, as Plotkin's protagonist is constitutionally unwilling to even look outside until the taxi arrives. The "firmly shut" door, the lamp bulb which "glares," and even the drawn shade hint at a fierce immutability.

>OPEN DOOR

The sun hasn't risen; what light you have would just leak out into the night. Anyway, the taxi hasn't arrived, so there's nowhere to go.

>OPEN SHADE

Darkness is already crawling around the edges of the windowshade. You have no desire to look night in the

face.

>TURN OFF LAMP

You do not want the dark.

These responses are essentially error messages. No matter how many times the interactor directs the protagonist to turn off the lamp, the requested interaction is politely refused, and the underlying world model is not changed. Yet understanding of the work is advanced by reading these messages, indeed, trying to interact and failing is necessary, as their poetic menace puts much of the coming experience in context.

The style of these messages is particular to whoever 'you' are supposed to be ("You have no desire" "You do not want"). They represent the normal constraints of the simulation on the interactor ("You can't do that") in terms of psychological characterization ("You won't do that"). Interactor input serves as id, parser response as superego, and the emerging character is a negotiation between play and design. For the interactor, the psychological error messages naturalize the limits of the simulation as merely the limits of a personality. Rather than being disciplined for attempting to explore the unimplemented reaches of the world, the interactor is invited to discover the inhibitions (and thus definitions) of a persona. Play is exploration, but it is also autobiographical archaeology    holding bits of 'yourself' up to the light.

Shade is a work of light, as a narrative and as a game. As a narrative, it tells a story of enlightenment    in this case, realizing the traveler's own death and understanding the traveler's complicity in causing it. As a game, it is a simulation defined by vision and perception. In IF, scope of interaction is largely determined by what the interactor and protagonist can and cannot 'see.' We can understand how Plotkin innovates and responds to the traditional use of light in IF by understanding how originally Crowther translated his concept of spelunking from a practical experience into a simulation suitable for his daughters. In Adventure the presence of a light source was necessary for navigation, manipulation of objects, and indeed almost any activity. Given the original context, this makes sense, as it is highly dangerous to wander around cave systems in the dark. The introduction of fantasy elements only increased the importance of using light to model magically glowing objects, fire, and so forth. Widespread reimplementation and later commoditization as the Zork series left the primacy of light firmly embedded in both the games and the development languages and tools. ("It is dark. You are likely to be eaten by a Grue.") Today, explicit illumination remains integral even to contemporary IF authoring systems like TADS ('lightsource') and Inform 6 ('has light'), with light as a core attribute of every object. Indeed, an examination of the source code of many contemporary IF can reveal odd vestigial light code. According to the Inform Beginner's Guide, "There must be at least one light source in every room (unless you want the player to be told that 'It's pitch dark and you can't see a thing'); most commonly, that light source is the room itself" (Firth 2002, 32). For example:

Object hallway "Hallway"

with

description "A twisty little passage runs north

to the bedroom and east to the bathroom.",

n_to bedroom,

e_to bathroom,

has light;

This source code defines a hallway location with a brief description, exits to the north and east that connect to other locations, and light. Note that this does not mean that the hallway contains a light (like a lamp, or a bulb). Rather, the hallway object itself emanates light. If it didn't, by default most IF protagonists could not find their way from bedroom to bathroom with the lights out.

This illustrates one of the terrible things about darkness in a game. You can't see anything; you can do very little indeed. All objects except those in your inventory are out of scope, unreachable, as if non-existent. Worse, if you DROP one of the objects your are carrying, it will be swallowed by the dark, never to be found until there is light to see by. (Firth 2002, 142)

Without vision, there is no agency. This may not seem so strange unless we consider interacting with such work from a radically different perspective. For example, because serially displayed text is highly accessible, the blind gaming community has long turned to interactive fiction as a mainstay of computer entertainment. The irony of designing such a medium around the indispensability of lamps is hard to miss.

In Adventure, Zork, and many more classic IF works, darkness kills (or at least incapacitates). In Shade this situation is ironically reversed. The traveler fears the darkness "crawling around the edges of the windowshade," and fears that precious light will "leak out into the night." Yet here, light is not life. Death has already arrived in the form of a light that cannot be escaped. Other contemporary IF works have played with reversing expectations about light as well. Enlightenment: an interactive one-room absurdity by Taro Ogawa uses the standard light model and turns the goal on its head. An adventurer of the classic Zork style is encumbered with an armload of glowing objects, yet desperately trying to hide, lose, and break his plundered riches to gain a much-needed moment of darkness. Hunter in Darkness: a cave crawl also by Andrew Plotkin, pitches a hunter headlong into a cave only moments after the story begins. Lost and injured, the interactor must feel and smell the way to freedom.

In its code, Shade simply opts out of light simulation entirely, overriding it in a single expression:

! Simple light function which says everything is lit.

[ OffersLight i;

if (i == 0)

rfalse;

rtrue;

];

At the level of code, like the level of the story, everything is illuminated     although at neither level is this immediately apparent to the interactor.

The source

Arguments for selecting Shade either as a case study or as a classroom example of IF might highlight its relatively short length, the high quality of the writing, and the availability of the code. The commented source code of Shade is in fact freely downloadable for non-commercial use, and is extremely edifying for anyone curious about (or confused by) the experience. The code is written in Inform 6, an object-oriented, C-like language. Inform commands and syntax structures were carefully chosen so that non-programmers can often read the code in a manner similar to colloquial English. In the case of Shade, the code is more intricately designed (and thus significantly less readable) than most IF. Yet even the complexities of Shade are often in

pursuit of a simplified interface.

One example is the treatment of navigation. IF works are traditionally navigable by compass rose (N, S, E, W), with objects and events distributed in space as an exploration. Shade, by contrast, eschews navigation for a single location. Subtitled "a one-room game set in your apartment," Shade playfully refers to the phenomenon of "my apartment" pieces in IF. These are generally learner works in which authors new to the medium begin by scrupulously implementing a detailed model of everything within sight of their desks. Such pieces usually lack setting, conflict, and / or plot, tending instead to concentrate on the detailed execution of conventionally modeled IF objects    an interactive lamp, cabinet, closet, and so on.

Just as Shade opts out of conventional light modeling, it dispenses with conventional spatial navigation. Instead, the kitchen, bathroom, and bedroom of the apartment form one unified location    a contiguous "room" with several "nooks" whose objects are always in scope. The interactor location is indicated through nuance and shifting emphasis. Interacting with something in the one area automatically shifts the interactor to that area, while the view is reorganized to describe nearer objects before those further away. The net effect is a feeling of differentiated space without rigid underlying zones:

You survey your one small room. The kitchen alcove has a refrigerator, a sink, a stove, and barely enough space to stand between them. One wall projects out to form a counter, with a cupboard beneath it. The rest of the place is mostly filled by your futon, and the computer desk in the corner. The bathroom alcove is across from you, and the closet next to it.

> TURN OFF COMPUTER SCREEN

You step out of the kitchen nook, and sit down at the desk.

You hit the power key; the computer gives a tiny sigh and shuts down.

> LOOK

You survey your one small room. One desk, paper-piled, with a dusty computer shoved to the side. Your futon, upon which you sit. Second-hand stereo sitting on a cardboard crate. A kitchen nook one way and a bathroom nook the other, with a closet to the side.

Another way in which Shade simplifies through complicating is by providing stable references for series of objects that are in fact the same Platonic "object" in the code. Such objects change names and representations gradually over time, as with the hyacinth that morphs into a cactus:

```
Object -> plant "plant"

with

name 'pot' 'potted' 'plant' 'soil',

short_name [;

switch (self.number) {

0: print "hyacinth";

1: print "spider plant";
```

```
2: print "palm plant";

3: print "cactus";

default: print "[BUG]";

}

rtrue;

],
```

While the hyacinth changes sequentially, another piece of code controlling the task list involves a group of selectively visible items that only "jump out at you" as they become pertinent or available in the loose progression of events. While this subtle effect naturalizes the progression through the IF, individual tasks disrupt and forestall progress- in particular the bit of code behind the missing plane tickets:

```
Global ticket_counter = 0;

[ CheckTicket obj;

if (obj.ticket_search >= 2) {

if (obj.ticket_search == 3)

"No matter how often you look, the plane

tickets aren't there.";

obj.ticket_search = 3;

"The plane tickets still aren't there.";

}

obj.ticket_search = 2;

ticket_counter++;

if (ticket_counter < 3) {

"Nope. The tickets aren't there.";

}

Goaled(tickets);

move tickets to Apartment;

print_ret "Nope. The tickets aren't     ", (emph) "Aha.",

"They are, after all. The tickets slide to the floor and
```

lie there, smirking at you.";

];

The tickets are not merely hidden, nor hidden randomly. The code declares them to be hidden in "the third hiding spot searched." Once the tickets turn up missing, Plotkin's code keeps a global counter on the number of hiding places checked, with a further counter for each individual place so that response messages vary. Only once two of the appropriate places have been checked will the tickets turn up in the third.

One of the consequences of this hiding method is that the hunt for the tickets tends to familiarize the interactor with the environment by producing a thorough ransacking of the house. It also produces a moderate amount of frustration. Finding the tickets on the third try is unlikely, as not all locations in the house are hiding spots, but finding them on the first or second try is in fact impossible. Lost items, as Shade describes them, simply take longer to find. This shaping of experience is not evident to the first-time interactor, however. Only upon replaying Shade and going immediately to the previously discovered hiding place (e.g. the jacket in the closet) will the interactor find no tickets, and realize that the world model is not logical and deterministic in some straightforward way. This discovery on replay is virtually guaranteed, for unlike randomization, the tickets are defined such that they will not appear wherever the interactor knows them to be. Using outside knowledge from the last traversal, the re-player will go directly to the jacket or stack of papers where the tickets were last found, and in doing so change (but not shorten) the story of the search. The description approximates the real-world experience of a frustrating search, not through more detailed models of the hunting ground, but through a simulation that requires a similar process. When the sequence ends, picking up the tickets triggers another detail niggling towards revelation: "Taken. Something scrapes underfoot as you bend to pick the tickets up." This moment introduces the small patch of sand that indicates the gradual breakdown of illusion, and the underlying presence of the desert of the real.

Not coincidentally, the inability to trust one's own eyes is the common thread in all the examples above. With the hyacinth / cactus, the interactor learns that the connections between objects and their appearances are complex and mutable. With the illegible task list, the interactor learns that attention is fickle, and that the protagonist will only perceive what "interests you." With the tickets, the interactor learns (if she replays) that unseen processes manipulate her experience. All is not as it seems.

In Shade, the textual aesthetics of light, with "crawling shadows" and "burning glare," are communicated directly to the interactor. The code aesthetics of light, however, occur at the disjunction between the interactor's mental model of the code as it is expected to be ("If I LOOK in a place, an object is either there or not, and if it is there, a description of the object will be printed") and the reality of the code as it actually functions. The implied code is wrong, and the virtual light entering the interactor's imaginary eye is to be mistrusted, if for no other reason than that the actual code is unconventional: what is seen is not always what is modeled, and what is modeled is not always seen.

For this among other reasons, Shade can be a frustrating experience. Concealing or misrepresenting the simulated world state seems to break the fundamental contract between the parser and the interactor: the parser providing a description of the world, and the interactor providing descriptions of actions in that world. After evidence of such a breach of faith, some interactors may no longer be interested in interacting.

Yet these frustrations are to a certain extent naturalized if we choose to either side with the protagonist against the illusions of a deceptive world or side with the 'real' world against the illusions of a self-deceptive protagonist. In either case, there is a gap between vision and the world, between the code as we assumed it was and the code as we discover it must be. That gap is defined by what innovative or unexpected qualities we encounter in the code itself, and one reads / plays the work by closing the gap    by solving, by revealing, by coming to understand.

Second person in context

While Shade is technically innovative in a number of ways, it is utterly conventional in one very important way    the use of the second person mode of address. Over 90% of the IF works currently listed in Baf's Guide are second person works (see Ch. 4), with the remainder split between first person, third person, and various text-art experiments or "abuses". By contrast to IF, a vanishingly small number of novels are written using second person as the dominant mode, and most that do feature intercepted communication (e.g. the epistolary novel) rather than continuous direct address. In order to understand IF's deep entanglement in and historical co-development with this highly unusual mode, we need to consider it in the context of two other forms of entertainment in which use of second person predominates: gamebooks (a.k.a. "Choose Your Own Adventure" or CYOA books) and role playing games (RPGs). Just as the IF work directly addresses the interactor, the gamebook text directly address the reader and the RPG game master directly addresses the players. These three forms are deeply interconnected, and developed together out of the same historical moment and set of cultural phenomena.

The precursors to contemporary gamebooks may have been the nonfiction instructional series TutorText, whose first volume The Arithmetic of Computers was printed in 1958. Fictional gamebooks did not appear until 1967, when Raymond Queneau of the OuLiPo group published his short story "Un conte à votre façon." That same year saw the publication of E. W. Hildick and Peter Barrett's Lucky Les, the first illustrated children's gamebook, and the subsequent steady increase in gamebook publication until over a decade later when the Choose Your Own Adventure series appeared in 1979 and "almost single-handedly started the American gamebook boom of the eighties" (Katz, 1998).

Just as TutorText predated gamebooks, mass-market wargaming of the kind popularized by Charles S. Roberts in his 1952 Tactics predated the ur-role playing game Dungeons and Dragons (D&D). In 1968, the year after the publication of "Un conte à votre façon," wargamers began a series of experiments with fiction and fantasy to alleviate growing boredom with historical reenactments and straight scenarios. The official TSR publication did not arrive, however, until 1974.

Figure 24. Significant dates in the rise of second person simulation genres.

1952 RPG Charles S. Roberts Tactics

1958 CYOA TutorText The Arithmetic of Computers

1966 J. R. R. Tolkien's "Lord of the Rings" (US release)

1967 CYOA Raymond Queneau Un contre à votre façon

1967 CYOA Hildick and Barrett Lucky Les

1972 IF Terry Winograd SHRDLU

1974 RPG TSR Dungeons and Dragons

1975 IF Will Crowther Adventure

1979 CYOA R. A. Montgomery and Edward Packard Choose Your Own Adventure (series)

1981 IF Infocom Zork (PC)

Like gamebooks and RPGs, IF was arguably predated by simulation methods that emphasized fact over

fantasy and system over story, one example being Terry Winograd's 1972 object-modeling program SHRDLU. In 1975, the year after D&D was released, IF first circulated in what rapidly became a fantastical form. IF was sold commercially as early as 1978, yet it did not reach a mass audience until 1981, when Infocom expanded on their initial PDP-11 release with new versions targeting the personal computer market.

Why did the 1970s see a dramatic increase in the desire for second person simulations, exhibited in the form of a flurry of experimentalism coupled with the rise of mass audiences for new game and fiction genres? RPG sociologist Gary Alan Fine lays credit for the flashpoint at the feet of Tolkien's 1966 US release of The Lord of the Rings, which shifted the interest of tabletop wargaming communities to fantasy role playing (Fine 1983). Tolkien, "Adventure" and early RPGs have a common ancestor, and out of common communities came a history of cross-influences. Many of these influences weave through MUDs, MOOs, and present-day MMORPGs. Yet the proximity of second person simulations to contemporary computer games creates the possibility of slippage or misunderstanding in using the term 'person,' especially when shifting between discussion of language-based and image-based simulations.

Strangely, the use of the term 'person' in language studies does not correspond to its use in visual studies. Most games studies discussions use 'person' in the visual style, corresponding to the viewpoint of the player. The first person camera is the most immediate, providing a view from the eyes of the avatar with little more than a hand of the avatar-self encroaching on the image. The third person camera is more mediated and distancing, as when the separate self of Lara Croft or Master Chief is displayed on screen and followed through the game world by a cinematic crane shot. The function of this mediacy is complex, but one effect is that greater immediacy imparts greater immersion.

In language simulations such as IF, gamebooks, or RPGs, this process works differently. Rather than the process of simulation occurring as if from the player's viewpoint, the simulation is addressed to the player from the simulator ("You are in a maze of twisty little passages") creating complimentary thoughts in the mind of the player ("I'm in a maze!"). Second person narration ("You are") evokes first person participation ("I am!"). Like the visual form of a first person shooter, second person text is the most immediate, with most of the "you" ("I!") being automatically cropped out of the mental image. Conversely, a 3D game with a first person camera image of a field and a white house could be described as an assertion on the part of the simulator in the second person mode of address: "You are standing in an open field west of a white house...."

In both the textual and visual case, the game system describes an inhabitable experience through assertion (second person) for the purpose of the player's participation, identification, or immersion (first person). We can conclude that the "first person camera" as it is discussed in games studies and the "second person narration" of RPGs and IF are not in fact two categories, but rather two perspectives on the same category of simulated immediacy.

This immediacy is distinct from the more mediated "first person narration," which creates much the same distancing effect as a "third person camera." It does this in much the same way, by introducing a separate self into the frame. Upon reading "I am sitting at my desk," many IF interactors immediately think (and sometimes type):

> WHO ARE YOU?"

Figure 25. In Oliver's 2ndPS: second person shooter, we are looking out of the eyes of our opponent "You" and see the successful targeting of our avatar, "Me," which is incorrectly looking left. To succeed, we must turn "Me" right and fire at the camera position. In the two-player version under development, our act of targeting will give our (currently oblivious) opponent like information to return fire with "You."

The odd category out in this typology of point-of-view is the "second person camera," a phrase that only makes sense in interactive media and the only in the rare cases when the player can intentionally switch the

camera to the first-person perspective of a non-controllable character, as in Julian Oliver's experimental game 2ndPS: a second person shooter (Oliver, 2005). As Oliver describes:

In this take on the 2nd Person Perspective, you control yourself through the eyes of the bot, but you do not control the bot; your eyes have effectively been switched. Naturally this makes action difficult when you aren't within the bot's field of view. So, both you and the bot (or other player) will need to work together, to combat each other.

I know of no equivalent in MUDs, RPGS, or gamebooks in which the descriptive text simulates one actor's point of view while interactor input controls a different actor. In IF, this separation is an inescapable problematic that has been engaged directly in a few experimental IF works (e.g. see Ch. 4 on The Beetmonger's Journal). The separation of focalization from agency is also one major topic in current IF research, as for example in the "nn" prototype IF architecture currently under development as a continuation Nick Montfort's doctoral thesis Generating Narrative Variation in Interactive Fiction (2006). At present, most IF such experiments involve a pair of figures in a tightly established and ostensibly cooperative arrangement: an archaeologist and assistant (Scott Starkey's The Beetmonger's Journal), a deity and supplicant (Tommy Herbert's Bellclap). Hypothetically, such an IF might look like Plotkin's Hunter, In Darkness    still controlling the hunter, yet narrated from the point of view of the hunted Wumpus.

Figure 26. In Battletoads (1991), the side-scrolling camera (1) switches to a second person boss camera view (2) and attacks (3). Player avatar Rash counterattacks by hurling rocks directly at the player's own perspective (4), disrupting the camera function (5) and leaving "crack" artifacts on the view (6).

There have been some comparable experiments in video games and film that focus on the alienating disassociation of perspective from agency. A much less radical precursor to Oliver's 2ndPS is the confrontation with a giant robot that culminates the first level of the Rare Ltd. NES console video game Battletoads (1991). Before any more than a giant leg can be seen, the view shifts to depict the conflict entirely from the perspective of the unseen opponent, a panning camera frame view whose lens / screen is temporarily disrupted and cracked as the avatar Rash hurls rocks directly at the player's point of view. Rather than destabilizing a first person game, this move largely maintains the familiar third person control scheme of Battletoads as a conventional platformer, always keeping the avatar in view and instead formalizing the constraining role of the screen frame, which already functions in side-scroller and platformer games as an unspoken opponent. The red-shifted screen of Battletoads with its informatic heads-up display (HUD) recalls prior characterizations of the camera as antagonist in film, e.g. the targeting HUD of the Terminator and the thermal-vision HUD of the Predator in their respectively titled films (James Cameron, 1984; John McTiernan, 1987).

Figure 27. In The Terminator (1984) a first person shot of the T-101 antagonist HUD as it considers conversational responses to a man yelling from behind a closed door, while in Predator (1987) the Yautija alien antagonist HUD analyzes the voice pattern of a laughing soldier seen in thermal image. Both modes of apprehending the world depict human language as a visible artifice.

In Gaming: essays on algorithmic culture (2006), Alexander Galloway considers the history the characterized first person shot in cinema and its significance to interactive media and video games in "Origins of the First Person Shooter" (39-69). Galloway begins in Edward Branigan's distinction between the point of view (POV) shot and the "perception" shot, a special kind of POV shot which adds some signifier of mental condition. Renaming this the "subjective shot," Galloway considers such shots from the 1947 Robert Montgomery film Lady in the Lake to the present, with special attention to the works of Hitchcock. He notes that subjective shots are both extremely rare and usually signify "some type of negative vision:"

It is sometimes an evil vision, or an in-human one, or simply a moment of alienation or detachment within a character. Few other shot styles are as closely associated with such a specifically defined mood. (46)

Galloway's survey of subjective shots signification covers mental states such as intoxication, detachments such as disembodiment, antagonisms such as predatory vision, and cyborg moments including viewpoints we began with from The Terminator and Predator. This last type of shots he describes as most successful, as the informatic display diegetically represents the uncomfortable suture of camera technology to subjectivity, a suture that will always fail to become natural. What Galloway calls a "technological patina" (56) we might define more precisely in terms of Bolter and Grusin's remediation theory as the hypermediacy of subjectivity.

This long segue from textual into visual subjectivity ends in Galloway's exploration of unusual, unnerving, and largely unpopular hand-holding-weapon shots in cinema as compared to the use of an identical visual convention in the first person shooter genre as a pervasive and popular mode of representing natural, immediate, unalienated agency. This stark contrast is described but barely explained:

As far as identification is concerned, film failed with the subjective shot, but where film failed, games succeed (due primarily to the fact that games have controllers and require player action). (69)

For the purposes of discussing interactivity we can formulate this more clearly. The cinematic subjective shot represent perspective necessarily divorced from agency, whereas the first person video game shot represents perspective fused with agency. Thus the same visual technique in two different media has different significance, different emergent aesthetics, different popularity levels, and so forth. Indeed, the most interesting lesson of Galloway's historical survey is not that the same mode of representation found a new life in video games, but instead that in a real sense the film Lady in the Lake and the first person shooter Half-Life are not in any useful sense the same mode of representation. The popular first person shooters treated by Galloway such as Wolfenstein 3D, Doom, and Half-Life are in fact not meaningfully examples of the rare "subjective" type he defines and documents in film    this is an unfortunate slippage in his mislabeling FPS a 'subjective' perspective (63). In these games, what is the separate consciousness or who is the diegetic character fused with the camera? What agency disturbs that of the interactor? There is no character, no willful separate self. There is only an avatar or puppet, located (but not active) in a stance analogous to what Branigan describes as the quite commonplace and popular POV shot in film    one that positions with great care not to disrupt the specular desire of the audience. The true video game analogs to unusual and disquieting moments of subjectivity in the film camera are Julian Oliver's unusual and disquieting 2ndPS and subjective POV works such as Battletoads. The aesthetic analog is structural rather than purely visual. This is true not only between film and game, but amongst games. While 2ndPS and Battletoads are not even in the same game genre (being a POV shooter and a side-scroller respectively), both introduce a camera whose subjectivity (that is, characterization in a disturbing otherness from the active desire of the interactor or passive desire of the audience) places the sympathetic protagonist in the crosshairs.

In summary, simulated immediacy is a formation with respect to agency and desire, neither comparable across apparently parallel grammatical construction (first person game does not equal first person prose) nor comparable across identical visual composition (Terminator POV does not equal Half-Life POV). Instead, superficial structural similarities disguise surprisingly profound disjunctions, for it is the continuity or discontinuity with agency and desire out of which strongly parallel aesthetics emerge in overtly dissimilar works.

How exactly might we implement such an external point of view in Shade, even if we chose to? Whose would it be? Our protagonist is the only 'living' being in the story other than the hyacinth / cactus plant. This isolation is for good reason; Shade is a fundamentally introspective and contemplative work. There is only second person address... at least, only up until the final disruptive moments of the text, when the second 'you' is finally addressed by a third: a person who is also 'you'.

Beyond yourself

Although the interface and description of Shade are rigorously constructed from the second person point of

view, from the outset there is another perspective present in the room, a kind of IF play-within-a-play or mise en abyme.

Right now, however, there's a game on the screen     one of the text adventures, or interactive fictions, or whatever they are this month     the only kind of game your beige antique can run, anyway.

The you-have-died message is blinking morosely at you. You started up Ready, Okay! last night, trying to distract yourself until morning. But you can't get even halfway through without running out of insulin.

The uncanny "you-have-died" foreshadows the end of Shade, and reads in retrospect like a message straight from the subconscious of the traveler. While Shade does not allow the protagonist or interactor to play Ready, Okay!, Emily Short convincingly argues in a Usenet discussion post (2000) that the description signals a tragedy foretold: "Ready, Okay!" is also the title of a conventional novel by IF author Adam Cadre, a novel which announces from its introduction that most of the high school cast of characters will be dead by the end of the book. What's more, Short points out that the mention of insulin identifies which of Cadre's characters may be the protagonist of Plotkin's IF     the younger sister, a character coincidentally inclined towards events like the desert rave. The traveler may have been playing a game that can't be won. Regardless, our story of the prelude to Shade is that the traveler sat down at an IF and tried to pretend to be someone else, eventually giving up. The problem of "being someone else" returns in the conclusion.

The final scenes of Shade are marked by a tiny scurrying figure hiding at the edge of the protagonist's vision. In the penultimate sequence, the interactor must interact-away the last illusory artifacts of the traveler's old life, revealing that the radio, futon, and so forth are all nothing more than sand. Throughout, the tiny figure hides until there is nowhere left to hide, at last emerging to trudge across the desert.

Shade is not a story about what is, but about how 'you' come to know what you know. It is almost certain that tiny figure is 'you' and that the illusion of the apartment must be stripped away in order to contemplate this self. That the apartment is an illusion is reemphasized by the lingering mirror, which can be re-entered after most of the apartment has been reduced to sand, restoring the protagonist suddenly to sunlit apartment and creating a moment of hope that it was all just a bad dream. But no. The apartment remains a lie. Worse, it is a lie that 'you' have been telling yourself.

It is here in the psychological bifurcation of "lying to yourself" that the stability of the second person protagonist character, the traveler, breaks down. If the traveler is this tiny figure desperately struggling to hide from the sand and the light and the truth, then who are 'you' now, this new point of view in the featureless desert, towering over the traveler and providing a third-person perspective? Are 'you' a ghost? Nature? Death? There is nothing left of the traveler's old illusions but the travel book, now changed:

The Desert Elemental's Handbook     you've been studying it for ages. Trace moisture segregation, arthropod ecocycles, sand / grit / fines sizing distributions. And, of course, the artistic aspects of heat, time, distance, and death.

In the beginning of the story this book is perhaps most indicative of the traveler's failure to prepare properly for a desert trip. Now it is a source of "tables of starvation," "chapters on bones," "a section on thirst" and so on.

With everything fallen before the protagonist's Midas touch and dissolved into sand, the only thing remaining to interact with is the tiny figure. The interactor can struggle against the inevitable logic of the text, but the only remaining choice is not to play. Playing on, each touch fells the wandering figure with fatigue and heatstroke. On the final touch, the figure finally lies still and is buried, only to return:

The tiny figure crawls out from under the sands. It's dead.

"You win," it says. "Okay, my turn again."

>...

Nothing left to do. Time passes.

The sun crawls higher.

Interestingly, the prompt and ellipsis in the final quote is not interactor input. It is provided by the parser, and as such is the final replacement of 'you' in your role as interactor. An ellipsis seems to be the only appropriate response to the dead figure's statement. What could winning mean anymore, and what are turns? Shade first dispensed with light, and space, and gradually with all the objects throughout it. Finally, here, it dispenses (and so dispenses with) time. By retelling a cross-country trip without ever leaving a small patch of sand, Shade presents a portrait of a personality even as the traveler unravels into nothing. By the time the second person has arrived on the scene, the first is no person at all.

# Chapter 3

:

The Aesthetics of Error:

IF expectation and frustration

Implied code helps us define how the experience of IF interaction occurs as a systematic process, and it also helps us to articulate the process of close interaction, or critical engagement with an interactive work. This chapter considers how the concept of a gap between code and its conception can become a general framework for considering much broader issues in IF as a genre, and how it might productively help us come to grips with some of the major trends in IF authoring over the past three decades (and those continuing into the future). My focus here is a set of IF authoring strategies or design patterns prevalent in the extant canon and growing in prominence during the contemporary era. These design patterns are nested, and include: the recurrent use of disabled or incapacitated protagonists to focalize interaction, the broader and encompassing use of error messages to construct the implied interactor actively during the course of exploration, and the more general uses of error and frustration as a form of IF aesthetics.

Like hypertext fiction after it, the commercial text adventures that inaugurated the personal computer game industry were heralded as liberatory, with command line interaction billed as an open-ended alternative to the novel    an alternative that promised to free the reader from the confines of linear authorial intention. Yet the genre of IF is often highly frustrating to newcomers and to seasoned interactors alike, who experience IF as a tightly defined system of rigid constraints, within which the reader struggles (often unsuccessfully) to read, and is forced instead into interaction via interrogation. As suggested both in a toy exploration of various kinds of 'gaps' in Ch. 2 and while reading error messages in Shade, implied code is an invitation to consider generally the many ways in which the IF experience unfolds across the gap between simulated state and its conception in the mind of the interactor. Of the many kinds of alternative code-gaps to "strategic advancement" suggested in the previous chapter (informative, exclusionary, optional, alternative), all are part of exploration and sense-making, yet most involve the deferral or betrayal (sometimes cruelly) of the interactor's desire to resolve the simulation and reach a terminal closure. While errors and failures in IF exist in a narrow technical sense, and the word 'error' can define such system events as the failure of the parser to understand an input, in a broad experiential sense the vast majority of IF interactions might be termed errors or failures: the failure of the interactor to achieve a preferred resolution, or to trace her optimal path through the labyrinth, or to uncover that "last lousy point" of potential experience she desires. The interactor may also simply fail to be within the work, and the experience of this failure is most often signified by the lack of verbs which the interactor feels should present real-world resolutions to the problem at hand (e.g. BRIBE GUARD, PROP DOOR) but are not afforded by the simulated world of the author's code.

Within the IF design community the frustrations of IF have been attributed on the one hand to the genre's tradition of puzzles, which strive to create difficult challenges through complex formulations of object relationships in the simulation code, and on the other hand to the inherent limitations of the command line interface, in particular the strategy of freeform language parsing that leaves open the continual possibility of misunderstanding and error on the part of the parser. As we shall see, the development of these aesthetics (complex simulation) in relation to these constraints (limited parsing) is not coincidental.

IF frustration in hypertextual and cybertextual context

Like designers, critics of IF continually return to discussing the problem of the interactor's experience of frustration, whether as a failure or a trope of design. Writing in Digital Fictions (2000), Sloane describes a failure:

The frustration that you the reader and 'you' in the text do not concur as far as actions taken, sentences spoken, or choices available is a frustration compounded by a parser's limited understandings of the reader's typed commands. (82)

Murray, conversely, sees a trope: "Zork transmuted the intellectual challenges and frustrations of programming into a mock-heroic quest" (76). Whether insufficiency of design or strategy of design (or both), frustration is a problem for the critic crafting an aesthetic account of IF, just as it is a key problematic of the command line. As Aarseth has it, the cybertext "puts its would-be reader at risk: the risk of rejection [...] trying to know a cybertext is an investment of personal improvisation that can result in either intimacy or failure" (4). Rejection by the command line parser is unique among cybertextual rejections, however, because the affordances or possibilities of the interface are ambiguous, and this fundamentally shifts the nature of risked failure to emphasize the state of liminal, unresolved frustration.

Consider a simple example which compares two difficult or frustrating potential rejections in hypertext fiction and IF respectively. A hypertext interactor arrives at a lexia in Michael Joyce's Afternoon. Sure that this is a significant juncture with unexplored possibilities, the interactor attempts to systematically explore for available egress (which the work, unknown to him, will not currently allow due to the state of guard fields which render the link inactive) by moving his mouse over each word of the lexia and clicking. No click is productive; therefore he concludes definitively that the current state of his reading denies egress from that lexia. Returning later after changing the state of the work through further navigation (such that, unknown to him, egress is now possible), he repeats the clicking process and this time discovers (as a systematic search of the lexia guaranteed he would) a now-unguarded link.

By comparison, consider an IF interactor arriving at a room in Emily Short's Metamorphoses. The interactor attempts to systematically explore for available egress (which the work, unknown to her, will not currently allow due to the state of the object tree which renders the exit unaddressable) first by typing her guess at likely commands, then by exhaustively typing her concept of possible commands. She is confronted, however, by several problems relating to the nature of free-form ambiguous input. First, because addressable objects in the system may be ambiguously identified (or sometimes not identified) in descriptive text, she cannot be sure she has addressed them all. Her implied code may lack anything (knowledge or intuition of a key verb, the name of a secret password, an addressable object from an unexplored part of the work, etc.) that, even were the system in an amicable state, would prevent her from formulating the proper input. Eventually, she hypothesizes (but cannot fully conclude) that egress is denied, and moves on. Returning later after changing the state through further interaction (such that, unknown to her, egress is now possible) she repeats the procedure to exhaust all possibilities as defined in her implied code, yet still risks failure. Both the hypertext lexia and the IF location are abstractly tractable, but without an unambiguously available, universally acquired, and exhaustively maintained set of concepts (that is, without the exorcism of ambiguity from cognition), the IF is often not concretely tractable. The IF cannot be merely navigated until exhausted, but must be investigated via interrogation.

In practice, some IF works do provide a complete list of verbs used in play, and a few IF works clearly identify all addressable objects by name. In these special cases the process of exhaustively exploring an IF might be described as topologically similar to the process of exhaustively attempting to explore a hypertext. Even in these special cases, however, this topological comparison misses both the quantity of effort involved (the combinatorial explosion, whereby each new element greatly increases the possibility space) and the quality of effort involved (the requirement to maintain an accurate mental or physical list of objects / locations / verbs / etc. and then perform that list through an errorless rendering of combinations via typing). Even in this rare case, the difference in degree often becomes a difference in kind.

In the normal case of possible ambiguity in IF work, however, the difference in potential frustration between Afternoon and Metamorphoses is quite simply a difference in kind. This difference has important consequences for interaction. Frustration in IF has often been commented on, described, and demonstrated by

example, but it has not yet been productively defined in criticism. We can summarize that difference by defining frustration at the command line as the experiential consequence of ambiguous input. Because signal processing in the text is a cybernetic feedback loop between simulation and mind, this might also be restated as the experiential consequence of ambiguous affordance, assuming that the possible ambiguity on one side of the loop propagates into possible ambiguity on the other side. Eliminating either the freeform ambiguous representation (as in a command line interface to a chess game) or the freeform input (as in an exclusively clickable interface to the game Adventure) breaks this loop, solving (by eliminating) the IF genre's key problematic and transforming it into not-IF (see Ch. 1).

This application of implied code to differentiating Afternoon and Metamorphoses also suggests another problem in coming to terms with one of IF's constitutive aesthetic features: insufficiency of existing new media typologies to account for the processes of IF. Perhaps the pre-eminent typology of this kind is Aarseth's "textonomy" (59-75), which systematizes and extends Ziegfeld's work into a grand project to locate any individual work in a seven-dimensional space of 567 "unique media positions" (64). Five of Aarseth's dimensions describe what we might term the topology of the work: the set of properties that define the possibility space of states and how those states are related. One dimension is rhetorical (perspective), and one (user functions) attempts to account for additional issues. One happy consequence of this focus on topology for Aarseth is that it justifies his objection to "material arguments of a peculiar fetishist nature" (16), as materially distinct works can be classified taxonomically in topologically identical terms. A key illustration of this material-independence for Aarseth is that the digital IF Adventure by Will Crowther and Don Woods and the print gamebook The Money Spider (1988) by Robin Waterfield and Wilfred Davies occupy the identical "unique media position" in the textonomy (68), despite being respectively computer-based and paper-based.

Figure 28. Identical unique media positions in Aarseth's textonomy

Adventure The Money Spider

Dynamics IDT IDT

Determinability Determinable Determinable

Transiency Intransient Intransient

Access Controlled Controlled

Linking Conditional Conditional

Perspective Personal Personal

User functions EF EF

The Money Spider is an interesting gamebook because it both branches and has a mechanism for recording state that functions much like the guard fields in hypertext fiction. When instructed, the gamebook interactor marks off one of seventy-two numbered registers printed on a special page. She subsequently may be asked to take the marked or unmarked state of a register into account while resolving a later branch. Unlike Adventure, The Money Spider neither displays ambiguous affordances nor accepts free-form, potentially ambiguous input. Entries afford their choices unambiguously, by number. All choices are made discretely, by number, from a known set. Although register-based state tracking is a form of computation, comparable to the software processes in Adventure, Money Spider's unambiguous affordance and interface means that none of the difficulties or strategies discussed above that strongly characterize IF interaction apply to the gamebook. An interactor with such a gamebook can only choose (not attempt to choose) and can only explore alternatives (not question possibilities). She can fail to achieve a desired outcome, but she cannot be frustrated in

interaction according to our technical definition of frustration. For this reason, not only the experiential texture but also the actual traversal paths of print gamebook interactors and digital IF interactors may diverge widely, even when presented with topologically identical sets of identical scriptons and textons. The textonomy's topology of the work is insufficient to its purpose, in other words, like a map that omits one-way streets or natural barriers and thus has no predictive power to describe navigating the territory.

Before generalizing this critique from the textonomy to media theory more generally, we should take head-on Aarseth's recurrent disclaimer that the textonomy is an approach rather than the sum of its parts: "If the model should be shown to contain errors (such as misreadings, inconsistencies, or idiosyncrasies) that render it unacceptable, a better model can be constructed and displayed following the same principles" (65). This would suggest that we might add a new valence to the User Function, such as a distinct "User Disambiguation Function (DF)," or else add a new column to the whole, such as "Ambiguity," which would then enable a better textonomy of 1152 unique media positions that could in turn accommodate the constitutive difference of frustration between these two otherwise similar works.

The difficulty of accommodating implied code and all its consequences into the textonomy, however, is not the omission of a particular feature specific to command line works, nor a specificity problem with a particular category. Rather, it is symptomatic of a pervasive lack in the interlocking theoretical structures of Cybertext. In spite of itself the theory systematically retreats from accounts of cognition, which in its terms should be descriptions of signal processing in the "operator" component of the textual machine. Without these accounts it is not in fact a cybernetic theory, but only a partial mapping of the feedback loop. Its formalisms are not of interaction as a process, but of interactive potentials independent of affordances or their apprehension. This is endemic to the model of formalism as conceived in Cybertext and cannot be easily supplemented away. For example, the gamebook The Money Spider is described as "controlled": like Afternoon or Adventure, a location, lexia, or state must be achieved in order to give access to another state. In Afternoon and Adventure this coincides with a particular system of interface (mouse click or command line) and initial knowledge of the system (hidden behind the interface). In The Money Spider, however, this coincides with the material reality of the codex, which remains a direct random-access medium despite the control topology specified within its pages. The thin volume affords easy access to an interactor wishing to scan its easily known number of lexias (there are 280), and turning the pages presents constant potential distractions, perhaps seducing an interactor into exploring some alternative glimpsed on the way to her appointed number. The codex form also presents a high likelihood of interesting misfires when a scrupulous interactor merely mistakes her appointed number for another. In truly cybernetic terms, these are formal properties of the textual machine, as at each choice operation the textual machine of a gamebook must transfer a number from stable long-term memory (the page) into unstable short-term memory (the mind) and then through a stored program (literacy) initiate a scanning process (flipping pages) in which each page number is compared to the remembered (or thumbed) number, until a match is found... so long as nothing goes wrong.

Gamebook authors, of course, are all too aware that something often goes wrong. Most artful gamebooks in fact make a point of acknowledging that process as part of their design. Kim Newman's Life's Lottery (1999), for example, includes:

* Directions that expose the interactor to risk of distraction

(e.g. "Read 18, go to 24" or "Read 13, then come back here").

* Directions that are required rhetorically, i.e. ones the author knows the interactor will almost certainly not perform ("Find a pack of cards. Take a card at random. Replace, shuffle well, draw again. If you got the Queen of Spades twice in a row, you are born dead. Go to 0").

* Floating lexias not formally reachable from any path, including ones that congratulate or berate the interactor for transgressing the rules.

* A technically or formally unreachable path of lexias that form a closed eternal loop.

Topologically, these last two examples are simple to describe in Cybertext terms: they are textons that are controlled in such a way that they are unreachable. Yet these textons are routinely commented on by delighted interactors, and so must be routinely reached, suggesting that describing a gamebook as controlled has not prepared us to understand the work or how it is traversed, but has instead obscured the process of traversal behind a metaphor, as if control were formal and objective rather than processual and negotiated.

Figure 29. Life's Lottery at the gamebook interface. An impossible instruction 'controls' access to a lexia in which Keith Marion wins the lottery... so the interactor goes anyway. (341)

Not only is this metaphor insufficiently descriptive of interaction for the purposes of criticism, it also cannot account for the design decisions of real artists who are attempting to anticipate and afford real interaction. Newman's work invites the interactor to build up quite complex ideas of what a gamebook is, and then plays with various attempted circumventions. Yet his authorial decision to create formally unreachable lexias is inexplicable in the context of a 'control' conceived as part of an ergodics innate in the work itself. It can only make sense if control is the process of a total textual machine including the interactor, her literacy, and her implied code. Most categories of the textonomy are subject to similar critique; they are superficially descriptive, but critically unproductive where they exclude cognition, which cannot be quarantined in a single "user function" nor attached to the object as a formally described interface. This cannot account for the process of interaction or for the authoring practices that shape and anticipate it.

My study owes much to Aarseth's work, and the approaches closest and dearest to our own sometimes evoke our harshest critiques. The Cybertext textonomy is a useful provocation for contemplating new media formalism. Yet it is fundamentally incomplete in a way that makes it systematically and predictably insufficient to account for the way interaction occurs. The textonomy approach cannot provide, in other words, "the playing ground of textology (the study of textual meaning)" (15) that it aspires to, whether on paper or on the screen, because it will provide as a foundation accounts which must first be questioned and undone (rather than supplemented) before proceeding. In order to examine frustration, we must recover the realities of interactive feedback loops from behind the metaphors of systems, and begin in the fact of interaction as a process and an experience.

IF aesthetics in critical theory: frustrating art

Despite the lack of contemporary critical consensus on either terms or a framework for discussing frustration, frustration has been a central concern    perhaps the central aesthetic concern    in the history of IF criticism. As outlined in Ch. 2, IF critics since 1984 have returned repeatedly to the figure of a gap in the IF work. In their analyses of interaction they have located these gaps variously between text and mind, between text and command line, between command and code, and so forth, although there have been scarce productive applications of these disparate gaps in specific analyses or close interactions. What is at stake in this ongoing discussion is not just a preferred theoretical apparatus for close interacting, but rather a larger question about the aesthetics and ethics of IF    how IF is experienced, how it should be experienced, and what trends have characterized work in the genre as it has emerged into itself.

Yet the critical conversation about IF's evolving essence and characteristic aesthetics has remained nascent and inchoate. This is not simply due to minor disorientations over the frequent re-application of Iser to different aspects of the same problem space. One cause for this incoherence has been widespread misinformation on the early history of IF, coupled with the widespread neglect of its more recent history (Ch. 1). The more fundamental problem has been scholars' lack of engagement with the wide diversity found even within the approximately fifty best-known works of the commercial period. Instead, the majority of IF scholarly analyses have been limited to the works Adventure, Zork, and Deadline. This limitation has necessarily made the extension of such analyses to general theories of the IF genre per se both tentative and

consistently skewed. I'd like to recapitulate that critical history one more time, however, with the purpose of evoking this tentative conversation on the past, present, and future of the genre's aesthetics, which I would characterize as a debate about the ethical stance and effect of the gap itself on interaction    that is, a debate over frustration aesthetics.

Writing in 1984 Niesz and Holland mention Blank's Deadline in passing but spend the majority of their time on a now-obscure work by Robert Lafore, His Majesty's Ship Impetuous (1980). Niesz and Holland suggest a bright but unknowable future for digital textuality generally:

What the genre might look like in two decades, it seems impossible to say, given the rate of technological change. As we write, for example, the genre is advancing yet another technological step. Nationwide computer networks connected by telephone now maintain programs called "electronic novels. (126)

In 1985 Buckles considers Adventure in great depth, and sees IF-proper as based in deep ethical structure (the scientific method). The potential in this is indicated by IF works increasingly emulating the tropes of mystery and science fiction literature, a trend likely to produce "works of high artistic value":

I believe this will be achieved when authors learn to use its feedback mechanism for the subtle control of readers' thought processes, and especially when the contemplative, reflective qualities inherent in the medium are artistically exploited as the central literary experience. (187-188)

In 1989 Randall argues that such high-art IF works have in fact already been produced, citing examples of unreliable narrators and challenging prose drawn primarily from a variety of high-concept commercial IF, particularly works from the Brøderbund-Synapse "Electronic Novels" catalog such as Robert Pinsky's Mindwheel. He uses Victor Shklovsky's ostranenie (defamiliarization, more literally 'estrangement') to argue that IF in its strangeness is necessarily artful. This argument exemplifies one ongoing tradition in IF criticism of turning to Russian Formalists, and another ongoing tradition of proposing an aesthetics of difficulty for IF. Randall's examples are largely works published in 1985-1986, a fact which makes his brief collection of readings the most 'contemporary' IF analysis published in academia for well over a decade to come. For Randall, frustration in IF arises out of a set of game design traditions that the more artful works are abandoning:

In early interactive fiction, the hurdles themselves provided the basis for the quest; to solve the quest the reader was forced to solve puzzle after frustrating puzzle. Recent works, though, such as those chosen for this article, do not usually allow a hurdle to stand between the reader and the completion of the text, because to do so would be to deny the traditional reading experience, the anticipation of the final page. As interactive fiction turns away from its origins in gaming and tries to attain some degree of literary stature, it has begun a process of considering the role of the new technology in the traditional relationships between the reader [...] and the literary text. (184)

In 1991 Sloane demurs that IF works are not in fact artful yet, arguing based primarily on the strength of an extended reading of Deadline (1982) that extant works are oppressively frustrating and hence woefully inadequate. IF software models are based on what Sloane terms "the Objectivist Paradigm" (111) or "Objectivism," which she describes as an antagonistic and inferior philosophy to her own "social constructionism." This understanding is grounded in debates from the fields of cognitive science and composition: if Objectivism is an over-simple account of the mind, it leads to an over-simple account of writing, and has manifested itself in IF as an over-simple affordance of interaction. To the extent that Oz Project prototypes and other examples are more complex than Deadline, Sloane finds they are implicitly critiquing Objectivism (112), but these critiques too are finally insufficient. Yet Sloane holds out hope for the future, and in fact suggests a fairly concrete research and development program into "deeper, subjective narratives" in which programmers and writers avoid "codifying their own visions of the world in their stories" and work instead to craft more complex worlds and characters (183-185). Because Sloane considers the

flawed designs of IF to be distinct from the medium of IF, she further recommends that future authors "explore this medium's bestimmt and unbestimmt, in Chatman's terms; I suggest looking for what the layered plasticity of this medium will support that other media will not" (185). This is a compelling charge, and such exploration has in fact been taken up, although perhaps not in the ways or with the results Sloane might have expected.

In 1997 Janet Murray marks the death of Floyd in Meretzky's Planetfall (1983) as a "minor milestone on the road from puzzle gaming to expressive narrative art. It demonstrates that the potential for compelling computer stories does not depend on high-tech animation or expensively produced video footage but on a shaping of such dramatic moments" (Hamlet on the Holodeck, 52-53). Her insights into the design are acute, and she identifies a design pattern with implications for future work:

The lesson in Zork is that the first step in making an enticing narrative world is to script the interactor. [...] The fantasy environment provided the interactor with a familiar role and made it possible for the programmers to anticipate the interactor's behaviors. By using these literary and gaming conventions to constrain the players' behaviors to a dramatically appropriate but limited set of commands, the designers could focus their inventive powers on making the virtual world as responsive as possible to every possible combination of commands. (79)

While Murray's emphasis on the necessity of structuring constraint (106) directly contradicts Sloane, Murray echoes Sloane in describing the future challenge: adapt this formula to "a wider range of behavior than treasure hunting and troll slaughter."

Also in 1997 Aarseth offers a fierce correction of the inaccurate or absent historical view of IF present in most previous criticism, observing that "while critics apply or suggest literary perspectives, they do not always treat adventure games as they would a literary work" (107). His historical sketch is fairly solid, but naming the problem and indicating future work to be done is the true breakthrough. Aarseth surmises that the non-commercial origins of Adventure may have obscured it from critical view (108), yet his own thoughts on the potential of IF as an "underrated aesthetic genre" strangely hinge on his doubts that it may ever be revived "as a commercial genre." Aarseth primarily follows Buckles in approach and theoretical framework, but he echoes Sloane both in focusing again on Deadline (1982) and in primarily discussing the many frustrating inadequacies of that work    an extended close interaction that he memorably dubs "The Autistic Detective Agency" (115). While omitting mention of contemporary work, Aarseth's general grasp of 1980s works is reflected in his useful abstract diagram of IF software architecture "A Generalized, Role-Playing Cybertext."

The 2000 release of Sloane's Digital Fictions re-presents and expands both her dissertation findings on Deadline (1982) and her condemnation of its frustrating elements, with some rejoinder to Aarseth's cybertext, in particular that his generalized roleplaying cybertext diagram is a formula for Objectivist design (73). Sloane does not take on more recent works in her reprise, which is unfortunate given that many IF other than Deadline exist which explore her interest in multiple viewpoints (e.g. Granade's Common Ground 1999) or her interest in rich, situated implementation (e.g. Barlow's Aisle 1999).

In 2001, Graham Nelson released the fourth edition of the Inform Designer's Manual, a programmer's guide for his IF development language Inform. The expanded edition contains the article "A short history of interactive fiction" (342-367) which opens with a periodization ending in an accounting of current aesthetic trends in IF away from the valorization of difficulty:

The history of interactive fiction in the 20th century has yet to be written. One outline might be as follows: an age of precursors and university games, 1972-81; the commercial boom, 1982-6; a period of nostalgia among Internet users for text while the industry completed the move to graphic games, 1987-91; and the age of the Usenet newsgroup rec.arts.int-fiction and its annual competition, of shorter stories moving away from genres and puzzles, 1992-9. (342)

Also in 2001, Dennis G. Jerz released his invaluable "Annotated Bibliography of Interactive Fiction Scholarship" (later published in TEXT Technology). While his extensive annotations have not yet been synthesized into a formal argument about IF, Jerz broke the silence on contemporary IF that had endured in academic criticism since Randall's article at the tail-end of the commercial IF era, and his bibliography notably includes reportage, personal essays, reviews, manifestos and so forth from outside academia (including Nelson's text). Together these paint a truer portrait of the past decade of IF authorship and critical theory.

In 2003 Montfort's Twisty Little Passages: an approach to interactive fiction was another breakthrough event — the first critical monograph exclusively devoted to IF. Setting out to make a forceful argument about IF and art, Montfort along the way becomes both ambassador and historian, providing a gentle introduction and detailed survey from the earliest works to the time of publication, including notably some consideration of international and multilingual work. Montfort's description of IF as artistic genre based in the riddle is a significant argument in the context of this ongoing conversation on frustration and IF aesthetics for several reasons. First, it ties structural critical analysis to an argument about aesthetics explicitly and convincingly for the first time. Literary riddles are not merely a metaphoric label for a deep structure (like Aarseth's intrigue) but presented as an actual ancestor genre to IF, which Montfort articulates as having related aesthetics and ethics. Second, this argument is delivered in the context of a survey of hundreds of widely disparate IF works from 1976-2002 — a welcome relief from endlessly rehashing Adventure and Deadline. Third, Montfort's account comes down definitively in the Buckles-Aarseth camp of productive frustration, and indeed is structurally and terminologically continuous with their arguments in many respects, yet it goes further in formulating a rhetorically elegant and concise explanation of the value-system whereby this difficulty-of-the-gap will be appreciated as art and literature. Comparing Montfort's "solve a riddle" (complete with classical examples) to Buckle's "conduct the scientific method" or to Aarseth's "be the innocent, but voluntary, target of an intrigue," Montfort has clearly been most successful in rhetorically recasting the core situation of IF (and hence its core problematic of frustration) in positive artistic terms explicable to a lay audience.

Once its thesis is established, Twisty Little Passages provides an accessible, descriptive survey with the overriding rhetorical intent of breaking silence on the diversity of innovative classic and contemporary IF works. Yet it is not a work of close analyses or close interactions. Montfort takes very seriously the premise that IF aesthetics are grounded in the riddle, to the extent that his book incorporates a convention for marking off in boxes any spoiler paragraphs that might discuss a work's premise or execution in enough detail to ruin an interactors' pleasure (15). Boxes do not overwhelm the prose, however. As the arguments must read without the support of spoilers, spoiler boxes are sharply delimited as occasional digressions from an otherwise responsible survey. Montfort's compunction over spoilers extends also to his treatment of the future of IF aesthetics. Gently mocking both Gary McGath (1984) and himself (1995) for believing that increased realism and real-time interaction would eventually become the dominant direction of future IF (which they clearly have not and probably will not), Montfort eschews further speculation:

Speculation about what sort of interactive fiction will be created in years to come not only is unusually unproductive, but can also be counterproductive. To blithely mention the riddle of a hypothetical IF work effectively ruins the work for any future interactors who read such a prognostication. The supposedly hypothetical work that is so ruined may in fact already be in development[...]. (228-229)

This sentiment compares to my foreword to this study on the concept of spoilers and foreclosure, although here as a pass from analysis rather than a license for it. It is difficult to entirely give Montfort such pass on prediction, however, given that describing structural innovations or design trends are not, in and of themselves, "spoilers."

The final work for our consideration in this aesthetic history is Maher's 2006 thesis Let's Tell a Story Together: a history of interactive fiction, which builds on Montfort's (among others). More detailed and

factual than abstractly conceptual, it is narrated from a strong insider point of view on the contemporary scene, and punctuated with appraisals of the design successes and failures of past works. These standards of evaluation are practical rather than formally articulated, and are primarily akin to the evaluation of artistic unities: instead of action, place, and time, they relate to strength of parser, coherence of story with environment, and balance of difficulty (a sort of undisrupted action, place, and time as experienced by the interactor).

Maher's primary commentary on contemporary works is to discuss those that mark the emergence of various significant authoring languages in the early 90s, or multimedia techniques in the late 90s, or rare commercial sales. Even he is too overwhelmed to undertake discussion of significant works since 1993. Suggesting instead some future book-length study, Maher restricts himself to brief capsule reviews of 99 chronologically listed works, a "wealth of riches" whose sampling will prove IF's progress: "I hope that one thing will soon become abundantly clear: the golden age of IF is now." Montfort, by comparison, is similarly bullish, also as matter of fact rather than speculation: "[I]t is hard not to notice the formal, thematic, computational, and literary innovation that is happening today and that promises to continue" (221).

IF and riddle aesthetics: care with a macro metaphor

At this point I'd like to draw the strands of this critical history together into a framing conversation about IF aesthetics. Many of the previous critics use methods or metaphors suggestive of a master trope for IF aesthetics. Buckles's scientific method, Randall's avant-garde defamiliarization, Sloane's Objectivist epistemology, Murray's trope-scripting, Aarseth's intrigue, and Montfort's puzzles all suggest not just a means of understanding the work, but specific interaction authoring strategies or design patterns that anticipate a particular interactor experience. Buckles, Aarseth, and Montfort's patterns might be described as designing for productive frustration. For Randall, Murray, and Sloane, frustration is unproductive. Randall sees this as a problem solved through the omission of puzzles; Murray sees good IF design as an exemplar of assuaging the problem of frustration through strongly framing expectations; and Sloane sees IF design as typified or even defined thus far by the failure to avoid frustration due to its ideological focus on unreasonably setting narrow expectations. Montfort, as described, frames frustrating art ("the puzzle") strongly in positive terms. His subsequent survey further lends this view considerable weight by grounding it in a previously absent range of examples.

Montfort's "riddle" approach is not the last word in IF theory, of course. Its very rhetorical elegance risks simplifying and confusing several important issues, and the work also fails (as have others) to respond adequately to Sloane's critique. On the issue of the riddle approach as a rhetorical oversimplification in particular, I have two concerns. My first concern is that a work of IF is seldom a riddle in anything but the most extended of senses, although most might be more credibly described as puzzles. This is because the riddle is ultimately a better metaphor for a small group of interactions or even a single interaction within a work of IF. The moment of closure of some state change that the interactor considers a strategic advancement is much like one question that demands one answer. Like the critics before him, Montfort is addressing the multitude of gaps that make up an IF work and characterize its aesthetics. Yet he does not present riddle-books or riddle-collections as an artistic ancestor (which in contemporary culture are generally seen as tawdry affairs), nor any form of riddle-networks (if such things exist and are acknowledged as art) but instead the riddle (singular) in itself. An IF work, however, is generally a network of riddles, often with complex inter-relationships, and traversals are often not the sequential negotiation of each, but some subset across their topology, a very different proposition than that presented by the Sphinx. IF works may be riddling in a sustained way, but the risk for critical theory here is what is known as the fallacy of composition: we may presume the operational behaviors of chemistry pertain in biology, so to speak, letting the overarching metaphor of the riddle mislead us in describing what an overall IF work does. The riddle is characterized primarily by unitary simplicity, the puzzle (and most IF) primarily by complex intricacy. This is not to say that a riddle cannot have several parts. The Sphinx riddle requires the interpretation of two interlocking metaphors, one for time (a life passes like a single day) and another for limbs (human limbs, including their

technological extensions such as the cane, remain like animal limbs). Taken as a whole, the Sphinx riddle is a parable for human humility, as it reflects a Sphinx-like world-view on humans as short-lived creatures that deem themselves superior to beasts.

My second concern in regard to the riddle approach to IF follows from my first concern, as the approach is (necessarily, as all approaches are) a lens and ideology of IF aesthetics, and one that (unlike Twisty Little Passages overall) tends to orient us towards a quite specific subset of IF works. For example, Montfort's chooses in his section The Independents (193-221) to discuss Graham Nelson's Curses, Rees's Christminster, the works of Andrew Plotkin, the works of Adam Cadre, and those of a few more recent authors, in particular Jon Ingold and Emily Short. Arguably these are all historically significant, critically well received, and representative of established authors with multiple works. They also generally reflect a particular kind of difficulty whose solution is a kind of tour de force of the work's machinations, crafted to be riddle-like en toto in a kind of macroscopic self-similarity of the way they are necessarily riddle-like in their particulars. Thus Montfort comments in passing that Ingold "does not yet bring puzzles together with the process of generating narrative as powerfully as in the riddle-like works of Plotkin," (220) in this moment echoing a general technique of evaluation common in hundreds of IF reviews in community journals and archives, and seen later in the writing of Maher. Seeking this parallel is not an unreasonable aesthetics or canon for IF; in fact, my own reading of Plotkin's Shade in Ch. 2 largely reflects this sensibility. This is only one potential IF aesthetics and canon, however, and not necessarily reflective of either dominant trends in authorship or even a comprehensive trend in the best received works, many of which can be deeply un-riddle-like. All emerge out of and in relation to the way the riddle-like gap shapes experience at the micro-level, but the ways this can be artfully incorporated are widely varied.

In summary, my caveats are that the riddle-approach may cause us to confuse the aesthetics of the gap with the genre's overall nature, and that this confusion can become an aesthetic program which, no matter how valid, risks creating a process of critical confirmation-bias that occludes how gap-aesthetics actually emerge in their variety. Still, these differences may be vanishing in their actual application. Montfort and I are both basically pursing an approach that Buckles initiated over twenty years ago, with Montfort emphasizing the guiding, overarching metaphor of beautiful difficulty and myself stressing a local, cognitivist / reader-response engagement with the unknown. The contribution of this study is its emphasis on analytic methodology as actually applied in close interaction.

IF and puppet theory: untenable expectations

The issue of Sloane's critique is a more serious one. Why is the interactor so frustratingly distanced from what she terms the puppet? I personally suspect that Sloane either misunderstands or is in the end uninterested in the semiotic simulation form of which IF is part. To the extent that it can ever address her interests, her more appropriate object of study is not Blank's Deadline but advanced research since the Oz Project, particularly Mateas and Stern's Façade, which provides an unambiguous, flexible, real-time environment wrapped around the permissive rather than prescriptive simulation of a dramatic conversation. Nevertheless, Sloane is unflinching in addressing some of the core aspects of IF that reliably alienate potential audiences, and in doing so repeatedly suggests one of the key issues of IF design and aesthetics: What should the role of the protagonist (or player character, puppet, agent) be in relation to the interactor's frustration?

Bypassing this problem is not unique to Montfort's book. Randall describes the problem of frustration as immanently solved; with two decades hindsight on literary IF this is clearly is not the case. By contrast, Aarseth registers an echo of Sloane's critique in his deep discomfort with how the 'intrigue' of Deadline breaks "the ergodic contract" with the interactor, as for example the replies when the interactor attempts to make the detective take a second drink of scotch ("you must resist the temptation to indulge too often") or hit a character ("You rethink your planned action"). For Aarseth, these are clear examples of code oppressing of the interactor: "to punish the noncooperative intriguee, the intrigant must break the illusion of free interaction [through] thought control" (121). This point of view is inherited more or less directly from his use of the term

"puppet" for protagonist, which, as with Sloane's earlier use of the same term (23-24), is a misappropriation from cyberspace and virtual reality (VR). Cyberspace and VR researchers have been primarily concerned with the direct projection of a controlled correspondence, or avatar. This scenario bears little relation to semiotic communications in which the protagonist serves as an agent or representative. The unnamed detective of Deadline, in other words, has a strong id in the interactor, but also a superego in the code: the detective may indulge his interactor's impulse to drink, but his code will quash the temptation to do so to excess while working; the detective may acknowledge his interactor's violent thoughts, yet suppress them with his code's conscience. Action is negotiated. Even should the interactor succeed in driving the detective to some act he would not normally perform (e.g. insisting on violence), the work may continue to display the superego's objection even in the aftermath of being overruled (e.g. "How could I have done it?").

I am not merely protesting that Deadline's rejections can be enjoyable if approached with the right attitude. Any conception of IF interaction through the metaphor of the puppet (whether termed puppet, player character, avatar etc.) is only of limited use in understanding a small subset of IF texts. Further, subscribing to such understandings engenders misconceptions and inappropriate expectations. This is because semiotic control (a description of how IF actually occurs, at the command line) and puppet control (a metaphor) bear little relation and only coincidentally overlap in effects. Puppet control is a negotiation between the embodied ability of the individual and the fixed limits of a discrete object (as with the flexible cloth of a Punch or Judy puppet occupied by an organic hand, or the jointed limbs of a marionette attached by strings to the naturally articulated fingers). Within that range, the puppeteer is free to act through the puppet. These free-ranging actions encounter interactions from surrounding theatrical mechanisms within the context of the stage, yet the strings remain the puppeteer's alone. This is often a quite good analogy for the way the interface to an avatar works as a locus of total control in a constraining world, as when a video game maps controller buttons onto physics-engine forces exerted on and by the avatar, attempting to maintain a very close low-level approximation between the push of a thumb-stick and the tug of a puppet string.

Under the surface, semiotic control at the command line does not function like a puppet, nor could it. The IF interactor is a poor puppeteer. Instead, a better metaphor is the id. Beginning in an impulse, the message passes into negotiation with a larger system of self (ego, superego) that first attempts to understand it, and then affirms it, modifies it, or disciplines it, sometimes in unpredictable ways. From the perspective of the id, external forces encountered in this negotiation may seem alien and other, but the whole makes up a set of desires and constraints that we might identify as a self. Just so, the interactor cannot be embodied through a constrained object as with a hand to a puppet. Language doesn't do that. Instead, the interactor must pass a message to a protagonist. This message may be from an inner standing point (as the id to the self), or a variety of other standing points, but regardless it must be interpreted. Such interpretations can be misunderstood, ignored, modified, or subjected to any of the other interesting effects that one might expect of an interlocutor addressed with a speech act but not expect of a puppet controlled by a hand (save an uncannily possessed puppet). Due to architectural necessity, the parser stands not beyond the puppet in the simulated world, but between the interactor and a character    a fact which makes the expectation of untangled strings difficult for an IF design to live up to. This character is the primary or focalizing locus of action and agency (both originating in the interactor and otherwise), and thus is best described as the "first actor"    that is, the protagonist.

Semiotic control cannot provide continuity as between a hand and a puppet. Still, does the command line have a moral or aesthetic responsibility to emulate such continuity? That is, is there an implicit 'contract' between code and interactor    a contract stating that the protagonist must embody the interactor's desires as faithfully as possible? It is certainly possible to design IF works around this premise. Yet such works are ultimately doomed at the fringes of their designs. A work of IF is finite, and hence necessarily constraining. Because the command line admits freeform input, interactors can and will inevitably interrogate unafforded objects, locations, and events. This is an innate situation of freeform input, and the only design recourse is to leave the form and create not-IF. As these limit-moments (or errors) are sure to arrive, the only question is how to represent them when they do. The protagonist arrives at the front door of her apartment during a work that

represents a living-room drama, and the interactor decides to leave. Yet the work is not a true world, and it does not extend beyond the house that bounds the author's intentions. How can this situation be accommodated when the interactor types "OPEN DOOR"? Here are a few methods:

1. Omit: Don't include a front door in any description, or allow navigation to anything like an entryway. The house as described has no front door. Of course, the interactor may still decide to type OPEN DOOR or LEAVE, in which case the author may still need to use one of the following methods as well.

2. Leave unimplemented: Describe a door, but ignore it completely in code ("I don't know what a 'DOOR' is") or catch it with a standard error ("You can't do that") with no explanation.

3. Constrain the world: Create an external, diegetic reason (environment) why the door can't be opened in setting the scene, physically delimiting the possibility space ("All snowed in, and the crew won't be around to help dig out the front door for hours.").

4. Constrain the protagonist: Create an internal, diegetic reason (superego) why the door shouldn't be opened, psychically delimiting the possibility space ("As you are about to step out, you remember your promise to baby-sit. Darn.").

5. Quit: Any attempt to leave the limits of the simulation ends it with a specific or general message ("Sure, you promised to baby-sit, but what could happen? You step out the door. THE END"). This is a small death for the story, so it may need to be forewarned, for example first indicating a psychic constraint and then terminating if the interactor insists.

Note that the first four messages are functionally similar. They are different text strings added to the events that inform the interactor that the state of the system has not changed in response to the OPEN DOOR request. Of those, however, the described constraints feel like a continuity of the simulation. They are limits, but limits within the bounding box of description rather than outside it. The possibility space of an IF work is bounded by a multitude of limits    both as many as are articulated in the work and as many as are interrogated by the interactor. Most designs will delimit the work and anticipate out-of-bounds interaction using some mix of all these methods. These will often be chosen based on prediction (some actions are not planned for incorporation, but are anticipated) and sometimes based on plausibility. The author could use an internal event to stop the curator from taking the gem without permission, or use an external event described in the form of a guard. One immediate consequence of denying the right of IF designs to explore the full range of semiotic (that is, negotiated) control, and instead demanding that they emulate a subset of puppet control, is that IF designs thus restricted become extremely limited in their range of allowable subjects. A puppet theory of IF allows that an author may create an IF about an elevator occupant trapped in an elevator (limit described as external), but proscribes that the author may create an IF about an elevator operator unwilling to leave her post (limit described as internal). Likewise under puppet theory one may perhaps create an IF about a baby-sitter who cannot DROP anything (consistent structural limit), but once implemented the DROP verb must allow the baby-sitter to both DROP TOY and DROP BABY, and this second action may not be blocked by the sitter's conscience (his inconsistent psychological limit), whether or not this violence is a scenario that the author is interested in exploring. In a sense, the argument against puppet theory is simultaneously an argument for artistic freedom: IF authors are writers of artful rules, and puppet theory is a proposed contract which sharply limits which rules they may write and how they are allowed to represent them.

Yet artistic freedom is a misleading invocation, as this recalls the original, almost primal complaint of puppet theory that certain kinds of constraint are an oppression of interactor freedom: my hand, my puppet, your world; don't tread on me. I have tried to outline a structural argument that the command line gives rise to certain fundamental situations (ambiguity and semiotic control) out of which certain aesthetics and metaphors for design and interaction (e.g. the id) are more aesthetically productive than others (e.g. the puppet) for both authors and interactors. Freedom, however, is a highly charged area of debate in critical theory across many

new media genres, and it often seems to become a protracted shouting match between artistic freedom and audience freedom. I'd like to modestly suggest a term substitution that frames a different discussion.

From freedom to enfranchisement

The open source and free software movements have made much in the past two decades over the unfortunate conjunction in English of the word free (as in freedom) with the word free (as in gratis), an overlap which tends to obscure the distinction between software that one obtains for no money and software that one is able to use to any purpose whatsoever.

Freedom is likewise a confusing concept in the discussion of textual media, as it tends to conflate the strict meaning of liberty, or acting within a set of rules or constraining context, with the strict meaning of anarchy, or acting outside a set of rules or constraining context. Anarchy is a politically charged word. I use it in this technical sense, not to imply that allowing an anarchic protagonist is desirable or undesirable, but rather to point out that realizing an anarchic protagonist is structurally improbable given the nature of the code art objects we are engaging. The etymology of anarchy or anarkhos    "without ruler"    recalls our previous uses of Derrida's Archive Fever in Ch. 2, and suggests that while the interactor might join with the ambivalent figure of the arkhon (or ruler), she may never truly escape the context of the archive (or rules). The only respite is outside this realm of art entirely in relation to codeless or completely non-semiotic objects    perhaps a blank sheet of paper or tabula rasa (if then).

If "freedom" in one of its more common and amorphous senses is impossible (or it least difficult to conceive) in the context of the IF work, then replacing it with "liberty" seems to me hardly more productive. While the term is technically more accurate, its common emotional valence is almost as skewed. As an alternative, I submit that the more helpful terminology might be enfranchisement and disenfranchisement, which brings with it both a descriptive specificity and an etymological history that elucidates the ambivalent relationship of action to the constraining context of (legal) code.

The root of enfranchisement, 'franchise,' has a businesslike connotation in contemporary culture (e.g. a fast food franchise), but it is essentially a license to carry out activities    that is, agency as codified in legal code. In its more sonorous form, "the franchise" signifies the rights of citizenship in terms of its responsibilities, such as voting. In the U.S., "enfranchisement" has historically been employed in discourses both on slavery and on women's 'suffrage' (an 18th century U.S. coinage for the right to vote). Suffrage has its own unique etymology in relation to the concept of engagement with rule (rather than release from rule), as the original and primary meaning of the word since late Middle English has always been "intercessory prayers." It is this idea of petition that crossed over from God to government.

Enfranchisement and its role in suffrage, I would suggest, is a productive alternative concept for use whenever conducting the "freedom vs. constraint" debates which periodically flare up between the more adventist or messianic liberation-theologians of new media (who in declaring periodic revolutions continually recognize in each new media form some kind of anarchic utopia for interactors) and their adversaries, reactionary or fascistic born-again formalists (who in their zeal for constitutive structures often cannot distinguish inspirational monument from oppressive bureaucracy). Rather than discussing whether the interactor is free or must be made free, we can discuss how the work does enfranchise or might enfranchise the interactor    that is, how it does or might bring the interactor fully into some level of participation and engagement with the code. This is not necessarily the same thing as to free the interactor from constraint or rule in the sense of anarkhos; in fact, it may often (but not always) be the opposite. Still, it may evoke a sensibility of ambivalent hope about the desired negotiation that resonates with the long history of civil rights. For an interactor to desire enfranchisement is not just a wish to throw off the chains of a work, but to become part of the work, and perhaps in doing so change it.

IF characterization: directing protagonists

Puppet theory encourages a systematic misunderstanding of semiotic simulation, and tends to inspire objections that are fundamentally anarchic    that is, against code. I have described puppet theory as a poor metaphor misappropriated from VR, and this is true, but the situation was exacerbated by a design pattern in early IF that tended to make the protagonist generic and implicitly (rather than explicitly) characterized. In particular, this design pattern is recognizable in the critical touchstones Adventure, Zork, and (to a lesser extent) Deadline. Still, it is found in neither the top-selling works of the era (e.g. Megler and Mitchell's The Hobbit, Adams and Meretzky's Hitchhiker's Guide to the Galaxy) nor the most critically acclaimed or provocative works (e.g. Meretzky's A Mind Forever Voyaging, Pinsky's Mindwheel). Perusing Montfort's list of one-sentence synopses for the 1980s commercial Infocom catalog (Twisty Little Passages, 122-124), one is struck by how few of these works eschew strongly characterizing the motivations (or superego) of a specific protagonist. Some of these protagonists are psychologically specific out of the necessities of literary adaptation, e.g. Watson from Bob Bates's Sherlock: The Riddle of the Crown Jewels, 1987. Others are psychologically specific due to the concept of the work, e.g. the small-time archaeological plunderer protagonist of Berlyn and Fogleman's Infidel is arrogant and avaricious, perfectly complimenting the work's larger tale of hubris and sacrilege.

The original implied interactors of Adventure were two young girls, the daughters of Will Crowther. The fact is often remarked anecdotally but seldom taken seriously for its aesthetic implications. This first 'uncharacterized' IF protagonist was located on an axis within an interpretive community of three actual (rather than implied) interactors, one of whom was the actual author. The protagonist figure was either a projection of the daughter-as-explorer or else a simulation of exploration as though experienced through the eyes of their father. This interactor-protagonist relationship was complicated by the subsequent co-authorships of Don Woods and the 'folk' period. By the corporate transfiguration of Adventure in Zork, Murray interprets the resultant figure, not as an adventurous daughter (whether filtered through the person of her absent father or not), but instead as a prototypical computer programmer turned fantastic adventurer (like Crowther). The interactor / protagonist roles of early IF suggest many contradictory figures: youth / adult, child / parent, female / male, introvert / extrovert, and so forth. Some of these reversals may not be accidents of history, but rather grounded in the way fiction and games can both provide safe spaces for representations or simulations of reality. If an adult parent first visits a real cave and then creates a safely simulated cave for the young, then that act of creation is based on the gap between the real interactor (child) and the protagonist (parent), and the resulting work contains its own built-in reversal.

Yet instead of exploring these provocative binaries critics usually arrive at a common misconception of IF as usually having an uncharacterized (and hence superego-less) protagonist. This may in part be attributable to the Infocom's Zork series, which worked particularly hard to maintain the adventurer as a featureless (but adventurous) figure. In Infonotes, Graeme Cree remarks part of this tradition:

In Zork: Grand Inquisitor, your character is known as AFGNCAAP (Ageless Faceless Gender Neutral Culturally Ambiguous Adventure Person), a description of a large number of main characters in Interactive Fiction. Indeed, in Zork 3, when you encounter the figure that looks like you, both ATTACK MAN and ATTACK WOMAN will work when you are fighting him / her / it. Nice touch.

The AFGNCAAP is indeed the culmination of a more general strategy on the part of Infocom to omit anything except those characteristics most central to the protagonist's ego and situation. Gender, for example, was routinely excluded from the description of works where it was deemed unnecessary, e.g. the Zork series. Other works were built around the concept of the protagonist's gender (as in Amy Briggs's Plundered Hearts, 1987). Still other works allowed the interactor to configure gender at the beginning, and then varied the gender representations of other characters in relation to the interactor's choice (as in Douglas Adams's Bureaucracy, 1987). Of these configurable IF works, Steve Meretzky's 1986 space-opera sex-farce Leather Goddesses of Phobos (LGOP) was particularly notorious for presenting a gender-configurable protagonist who might experience either of two structurally identical (but superficially gender-inverted) sexual escapades. The level of explicit sexual description or 'naughtiness' in the work could further be configured as 'tame',

'suggestive,' or 'lewd,' although this likewise changed the texture rather than the structure of the work. One of the interesting lessons of LGOP is that characterization in simulation is at least as much about possibility and afforded agency as it is about descriptive characteristics. LGOP is about a largely heteronormative escapade (in which opposites are the objects of desire), yet it is one in which gender representation lies lightly over a fixed logic of desire. The protagonist's dim-witted assistant Trent may instead be Tiffany, or a sultan's harem of wives may become a sultana's harem of husbands, but the attitudes and actions of sidekick and spouse remain identical. This is not to say that either spouse or sidekick is characterless. Their true characteristics are found in what they will or will not do, and in LGOP these characteristics transcend their descriptive configuration.

The AFGNCAPP, in other words, represented one particular approach to the question of protagonist characterization that was often minimal but seldom eliminated entirely. Even granting a predominant AFGNCAPP, there remains a substantial difference between attempting to represent a featureless humanoid (in as much as that is possible) and presenting one without superego, as the puppet theory demands. The Zork works are fairly meticulous about eschewing protagonist features, yet they do not attempt to offer up a puppet any more than Briggs's Plundered Hearts does; both involve desires, refusals, involuntary actions and so forth. Representations of internal constraint have been with IF since the beginning. Yet their misunderstanding has also been with IF since the beginning, in the routine misreading of a frequently quoted introductory line from the ur-text Adventure: "I will be your eyes and hands." This is commonly misinterpreted as either "This puppet will be your eyes and hands" or "I, the system, will give you this puppet, which will then be your eyes and hands." But no. We must read it again.

In his recent article "Fretting the Player Character," Nick Montfort puts forth a different but quite interesting suggestion that we should understand the protagonist (which he terms the "player character") as a vessel, like a ship, which is not played, but "steered." Montfort alludes to the inspiration for this conceit, which is worth our elaborating here: it is Norbert Weiner's Cybernetics (1948), the title being a neologism that used the Greek or kybernetes ("steersman") as a metaphor for "the study of control and communication in the animal and the machine." Like the steersman whose governance of the rudder is one part of a continuous feedback loop, Weiner's information theory considers systems (whether physical, biological, or mechanical) mathematically, as information processes. The subsequently named field of cybernetics and its central metaphor of the steersman physically and expressively united with his ship has inspired a number of critical theories in the humanities and arts, including Donna Haraway's A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century (1991) and, most significantly for this study, Espen Aarseth's Cybertext (1997). I have critiqued Cybertext twice in this study for being insufficiently cybernetic that is, neglecting to take seriously how the feedback loop requires that signals pass through cognition, with specific consequences for our models of how the total "textual machine" functions. Given my general bias towards taking feedback loops seriously, I'm interested in Montfort's approach to a cybernetic vocabulary of IF interaction, although I will later suggest a dramatic vocabulary as more appropriate and productive.

Montfort's concept of participation in the work begins in his observation of an interesting linguistic phenomenon:

[It] is not at all useful to consider that the player character is played by the interactor in any literal, typical sense of play: not in the dramatic sense, not in the gaming sense, and not even exactly in the sense of many other multi-party role-playing contexts, from Dungeons and Dragons to multi-user online environments. [...] I enjoyed playing Monopoly" but it would be strange to hear someone say "I enjoyed playing the car" or "I enjoyed playing the hat." Similarly, people frequently say how much they like "playing Zork," but it is unusual to hear them explain how much they got out of "playing the nameless adventurer." Or, if that seems a straw-adventurer argument, consider that they might say "I enjoyed playing The Hitchhiker's Guide to the Galaxy," but it would be much more unusual to hear them say "I enjoyed playing Arthur Dent." (139)

Coming on the heels of my protest that protagonists such as Arthur Dent are interlocutors, rather than mere

puppets, this is an interesting sociological observation: interactors describe playing works, not playing player characters. I agree that there is in fact a problem with the idea of "playing Arthur Dent" as thus conceived, and the suggested alternative "I enjoyed steering Arthur Dent" has two advantages. First, it is more likely to get actual use, because it is a better description of the experience. Second, it is less odious, because the role-playing fallacy Montfort describes is another angle on my critique of puppet theory    two facets of a larger problem in which critical rhetoric and audience expectation do not match the nature of the medium. Yet I disagree in part with Montfort's solution, again based on the level at which it operates. The interactor does not steer the player character. She steers the work.

When I say that the interactor steers the work, I mean this in part in a technical sense, correctly extending Weiner's original metaphor: the interactor is a part of a feedback loop with the work of IF as a whole, only part of which is the protagonist. The protagonist is at best the helm of this total helmsman-ship-ocean-wind system, but in fact is more precisely like the rudder, to which the helm of the command line is primarily connected, yet pinioned to the hull of the work's state. Yet this metaphor (already too complex compared to the elegance of Montfort's formulation) also breaks down, because a steersman plotting a course is a vivid example of the operation of continuous feedback in general (like the anti-aircraft gun research that originally inspired Weiner), but a poor analogy for how feedback works in IF. I may be being unnecessarily fastidious on this point. The belief that protagonists (rather than works) are cybernetically controlled is a welcome complication of puppet theories (it introduces negotiation and compromise), yet "steer" retains that misleadingly visceral physical metaphor (hand on helm), and the sense that compromises in the course of the occupied vessel (still empty, like the puppet) are only with forces external to the vessel (wind, currents). Some protagonists are hard to steer, but I would argue that their reticence against certain courses (e.g. the traveler in Shade's unwillingness to turn off the light or open the door) is constitutive, and a good thing. Are there ships that handle awkwardly, erratically, or reluctantly, not (switching to the parlance of programming) as a bug, but as a feature? If, as I suspect, there are not, then the metaphor of steerage is failing us for IF, because it encourages us to devalue artful work precisely to the extent it is artful.

Yet steering is a far more plausible term than extending my id metaphor to common use. "I enjoyed urging Arthur Dent" or "I enjoyed inspiring Arthur Dent" sounds ridiculous, and it lacks a key advantage of steer-speak: a great number of normal interactions in many IF works involve acts of compass-rose navigation (N, S, E, W) or simple direction, a sense that 'steer' reflects. Further, explicitly treating the protagonist as a vessel is a recognizable trope. Michael Berlyn's Suspended (1983) and Paul O'Brian's L.A.S.H.    Local Asynchronous Satellite Hookup (2000) both put the interactor in charge of robots to great effect, in part because controlling a robot is experientially continuous with many basic IF designs, in part because both works complicate that idea of steerage. Yet this whole discussion of how interactors describe protagonist control may be a solution in search of a problem. Just as cybernetics maps better onto steerage of the IF work than of the protagonist, Montfort has already observed that most interactors (like most game players, and perhaps for similar or culturally continuous reasons) already describe playing the work rather than the protagonist, and in this they are correctly describing their true engagement; there is no need to dissuade them from this practice. The verb is fine as far as it goes, but misses the main point of confusion: we must also develop a better description of the figure that focalizes identification and acts as a locus of agency.

Beyond "exchang[ing] the flawed idea that the player character is played with the idea, perhaps less or at least differently flawed, that the player character is steered" (141), as Montfort suggests, I'd suggest really "fretting the player character." The term "player character" is itself wrong, and rather than redefining it in cybernetic terms we should replace it with one that better reflects the ambivalent complexities of IF identification. This suggested renaming might be a self-contradiction, as I strenuously defend the use of the phrase "interactive fiction" based in part on popular use (Ch. 1) but here resist the term "player character," which also has a strong (if less universal) consensus in practical use. Yet the situation is not exactly the same. First, "player character" is a specific term of craft or criticism, and thus bears a certain responsibility for accuracy (and carries a certain consequence for inaccuracy) which genre labels do not. Terms of craft are also easier to change. Second, the term "player character" strongly implies that the player is embodied by her character, or

that the player character is occupied by the player. They term also implies that IF works (which may be played, used, read, interacted with, explored, tested, and so forth) are always played, which is particularly strange in relation to conversational or art show pieces, but generally limiting in even more conventional cases. Third, and most importantly, by implying that the player character stands in for the player, the term implicitly conflates focalization (how the interactor perceives the diegesis) with action (how the interactor affects the diegesis). In IF, these two are commonly but not necessarily the same. Indeed, several interesting works experiment with this difference (see Ch. 4), while much of the current research in IF architecture explores decoupling focalization from action at the system level. For this reason, I identify the figure through which interactor agency is focalized as the "protagonist," or first actor: one who usually performs the interactor's suggested acts. It might literally follow that multiple such figures (as in Berlyn's Suspended or Granade's Common Ground) are "agonists," but for the sake of elegance we can simply call them "actors": characters who perform the suggested acts of the interactor. Figures who are not conduits of agency therefore need not be called "non-player characters" (NPCs). They are simply "characters," and describing them in this way helps us to consider the many complex ways in which characters may be partial or contingent actors.

What shall we call the passing of potentially ambiguous commands via the command line to an actor? Direction. For example: "I enjoyed directing Ford Prefect more than Arthur Dent. I directed Trillian south, but then she wouldn't do anything I directed her to do." This sounds about right to my ears, although my assumption is that most interactors will continue saying "I enjoyed playing Hitchhiker's Guide to the Galaxy." In more technical discussions such as hints, walkthroughs, and IF criticism, "direction" could catch on, however. Instead of confusing and bizarre descriptions such as "Hit Mrs. Robner three times, and on the third time you try to hit her you will actually hit her," an IF reviewer might use a clearer description: "Direct the detective to hit Mrs. Robner. He'll refuse at first, but insist, after the third direction he will do it." The stem "direct" is simple, extremely flexible, and need not connote that the interactor is the dramatic director or auteur of the total work, just that she directs what is given to her to direct.

It may be merely serendipitous that this formulation for linguistic specification of action also strongly implies the traditional IF convention of compass direction. It is deeply logical, however, that "direction" correctly describes the most common way the command line has been used to indirect action among multiple characters: giving directions to others. The protagonist is the first actor, through whom agency is primarily focalized, but may be only the first of many such actors. There is another common form of secondary agency: the ability to pass on commands to other characters. Here are some fanciful examples to demonstrate the syntax, taken from the manuals for Zork I:

>UNCLE OTTO, GIVE ME YOUR WALLET

>MIGHTY WIZARD, TAKE THIS POISONED APPLE. EAT IT

>BOY, RUN HOME THEN CALL THE POLICE

Under the old terminology I propose retiring, the boy is an NPC    that is, any entity that is not the interactor's "eyes and hands." This is not a helpful description from the point of view of an interactor, however. What is important about the boy is that, unlike many characters who do not accept commands, this character is also an actor: a conduit for action who may be given commands (messages, passed to him via the protagonist) which he may then attempt to parse and act on, affecting the state of the simulation. Whether or not he at some point becomes the protagonist (that is, the work is focalized through him and BOY, TAKE THIS APPLE can instead be stated TAKE THE APPLE) his abilities and constraints are part of how the interactor may steer the work; he is one of the work's actors.

IF and genre fiction: beyond generic scripting

We have come a long way since addressing Sloane's puppet critique. Our new vocabulary for IF instead

describes how protagonists are directed. This vocabulary better reflects the actual aesthetic history of the genre, and better elucidates how the limits of directing protagonists form the core problematic of contemporary IF design. IF will not and indeed cannot completely eliminate the distance between an interactor and the protagonist that she directs, any more than it can eliminate the distance between the interactor and the work. This distance is inherent in the fact of language at the command line. Indeed, the challenge for IF today is not to close the gap as far as possible, but to open it up and truly explore the possibilities of that space. The corollary to this challenge is exploring the gap in ways that are enfranchising, inviting the interactor as a participant into the rules, laws, or codes that govern the standing point of the protagonist she directs.

This recalls Murray's oft-cited lesson from Zork that "the first step in making an enticing narrative world is to script the interactor" (79). She connects this lesson by example to the powerful expectation-framing forces of "genre fiction" that we are calling generic tropes. Murray's focus is not primarily on how to accommodate failure during interaction (frustration aesthetics, or the art of error message design) but rather how to anticipate and strongly frame expectations before interaction, heading-off potential errors which are conceptually excluded from the problem space. Generic tropes provide a widely recognized and easily understood set of interaction scripts that minimize the likelihood of a mismatch between interactor expectations and authorial anticipations. For Murray, the challenge to find "a wider range of behavior than treasure hunting and troll slaughter" is in part a problem born of success. IF successfully uses stereotypes to promote successful interaction, but this risks making IF a producer of only stereotypical work.

I'm at this point over-generalizing Murray's observations (who is herself generally up-beat on the potential for Hamlet-like new media) to make a larger point about our general thinking in new media about expectation and frustration in regards to interaction. If we assume that the goal of the design space is to conform to strongly understood, previously available schema and scripts about interaction, then we have in the process implicitly stated that IF can never be accessible or usable on the one hand while still being unexpected, surprising, or unique on the other. We are arguing instead that the pattern of being unsurprising is what causes interaction design to succeed. To restate, accepting the hallmark of successful IF design as "reinforcing genre expectations" might also be positing good IF design as the antithesis of "subverting genre expectations." To complete the syllogism: if subversion is a hallmark of artful literature, and the truly generic tropes are the opposite of subversion, does this mean that IF is in this sense the opposite of artful literature?

Yet it is not the case that good IF design is always based on generic expectation. First, the interactor may be scripted (as Murray's formula allows) at any time, whether before or during interaction. During interaction, that script may change, sometimes dramatically, as we see when the lethargic traveler of Shade rapidly shifts in the second act into the manic destroyer of her apartment. Scripting is reinforcing, subverting, and playing with expectation, and this is a process. There is also nothing to say that we should script the interactor to succeed. It may be more interesting to script the interactor's failure (as 9:05 and Bad Machine both demonstrate in very different ways). In fact, given the nature of the command line, it may be vital to script failure, as the gap (in understanding, in communication, in resolution) is the most consistently likely condition of any work. Failure is the assumed default scenario, and as such it seems a modest proposal to script failure.

Before continuing on this thread, however, I'd like to address a problem when Murray's useful formulation is over-generalized, reinforcing a general misimpression that most IF works (or most commercial IF works of the 1970s and 1980s) were generic fictions. In other words, we need to be careful that the myth of a "bygone commercial golden era of IF" (Ch. 1) not be replaced by an equally unhelpful myth of an "unimaginative genre fiction era of IF." For example, here is Aarseth on IF genre:

The formula was simple: take a popular fiction genre, for example, the detective novel, [and] create a background story (the more stereotypical the better, since the players would need less initiation) [...]. (Aarseth, 100)

Aarseth may be being a bit flippant about 'formula' here, as he does not claim all IF are necessarily formulaic, but rather implies most IF are broadly formulaic in leading up to a specific work: Blank's Deadline. As a stereotypical murder investigated by a stereotypical detective, Deadline arguably fits Aarseth's framing statement. Still, Aarseth's description of stereotyping as a general or pervasive design formula can serve as an explicit example of the problem we might encounter in generalizing Murray's line of thinking to an incorrect view of IF history. It gives the impression that the best known, top selling, or most significant works of the era were straight generic fictions with stereotypical background stories, none of which is true. As discussed in Ch. 1, contemporary IF is not aesthetically insignificant or technically unsophisticated as a result of being primarily non-commercial; it is not somehow "fallen" from the heights of a bygone commercial era, whether by the fact of defunding or by nature of its technical obsolescence. Conversely, commercial era IF was not primitive or aesthetically simple generic fiction, whether by virtue of its status as a product in the computer games market or by nature of its command line mode of interactivity.

Murray specifically identifies a very useful but minor design pattern in IF    using genre tropes to frame expectation    which was neither innate nor unusually dominant. Arguably, like the novels, film, and television of the 1980s, much of the total commercial output of IF was generic fictions, and a great deal of that output was workmanlike. But we would be mistaken in going any further, linking an audience standing point or medium (e.g. interacting at the command line) to generic tropes as a necessary or foundational aesthetic strategy.

Before going further theoretically, let's look at specific examples. The foundational work of the era is Adventure, and its three best-known commercial descendants are Adventureland, Zork I, and Acheton, all of whose back-stories are non-existent (rather than stereotypical) and whose mood and collection of tropes are unique unto itself. None of these works have the content or the tone either of a straight adaptation of Tolkien (which is primarily sonorous and pastoral). Nor do they resemble straight adaptations of Dungeons & Dragons (which emphasizes the grim elements of the forgoing). Adventure is fantasy to the extent that it contains magic, yet it is not high fantasy, as it also contains a bricolage of anachronisms, absurdities, and techno-archaeology quite particular to the IF cavern-crawl. Some of this unique tone and content could be attributed to the original tone of Crowther or the interests of Woods. Some might reflect the tendency of most multiple authorships to create pastiche as a byproduct of their activities. Some might be particular to cultural milieu specific to 1970s ARPANET, both the particular references and general sense of humor that make up its "folk tradition." Regardless, a novelization or film adaptation of Adventure (if such a thing could be contemplated) would resemble Terry Gilliam's Time Bandits more than any genre-typical fantasy or adventure. Cavern-crawl IF works are raucous    not for nothing does Buckles identify them with folk art as in an oral culture    and we can confirm this in them at every turn. Being an adventurer on an adventure does not reliably exclude the gestures of comedies, fairy tales, or romances: it merely interwingles them, as in the first interpersonal moment in Zork:

A nasty-looking troll, brandishing a bloody axe, blocks all passages out of the room.

> KISS TROLL

I'd sooner kiss a pig.

Ultimately, however, the entire idea of genre fiction (in which systematic audience knowledge of the genre precedes the fiction) is a poor match for the cavern-crawl works, which built a culture around the creation of the genre in the form of the original work. Is The Rocky Horror Picture Show genre fiction if everyone in the audience can anticipate the lines? This seems like a misapplication of the idea of intertextual familiarity.

Even if foundational works were complex, were top-selling commercial IF works stereotypical generic fictions? The most distributed IF work of all time was Veronika Megler and Philip Mitchell's 1982 adaptation of J.R.R. Tolkien's The Hobbit for Melbourne House, a work that, while high fantasy, was an adaptation of a

single unique and highly recognizable work. Many copies actually came bundled with Tolkien's text (Maher 91). This bundling was the single densest and most comprehensive paratext even in IF, and possibly the largest in eliterature or new media as well, literally "scripting the interactor" but in a concrete rather than an abstract or generic way. The second most widely distributed commercial IF work was Steve Meretzky's 1984 adaptation along with Douglas Adams of that author's The Hitchhiker's Guide to the Galaxy    a genre-defying intergalactic absurdist screwball black comedy with a similarly complex paratextual background for each of the four directed characters. Again, these works might certainly be said to script the interactor in Murray's specific sense, but hardly in relation to a formula with the most generic characters and back-story possible. Neither work was notably tractable without at least some familiarity with the print works, one reason why Randall chooses to exclude IF literary adaptations from his consideration of artful IF.

Were some of the best known or most critically acclaimed IF works of the commercial era generic fictions? Robert Pinsky's Mindwheel received significant press coverage, and the work's tropes are located more in an avant-garde mix of high- and post-modernism than in the popular, which is to say that it synthesizes many generic tropes into unrecognizability and makes hash of interactor preconceptions. Even many of the most celebrated works of Infocom's commercial catalog are not stereotypical in their frames or back-stories. In a 1984 interview, Implementer (i.e. author / designer / programmer) Michael Berlyn expressed this hybrid relationship:

In one sense we are working within traditional genres    mystery, fantasy, science fiction    and in another we are still teaching ourselves, laying out the groundwork for what these things could be. For the most part, we are working without pioneers. (Maher, 45)

Michael Berlyn and Patricia Fogleman's Infidel (1983) is in fact a brilliant example of this midpoint between framing expectation and its reversal, as it scripts an Adventure-like (or Indiana Jones-like) archaeologist-adventurer looting a tomb, but with a difference; the interactor / protagonist is ultimately the villain, and victory is ultimately defeat. Infidel should be a required text for any critique of generic trope use in early IF, particularly any ideological critiques of the kleptomaniacal adventurer figure of Adventure. As is often the case, such critique first arose from within.

Infocom's marketing may have exacerbated the perception of IF as generic fiction with its 1984 decision to distribute all works using standardized labels: "fantasy," "mystery," "science fiction," and "tales of adventure." However, as Maher points out, these labeling practices were eventually rescinded in later printed catalogs and omitted from the covers of later packaged editions. This may have been because the terms obfuscated rather than clarified the product's nature: "Brian Moriarty's mournful atomic age tragedy Trinity, for instance, was arbitrarily given the label of fantasy even though it bore little relation to what the average consumer might think of when hearing that label" (46-47). The same holds true for many other Infocom works. Protagonist Perry Simm's discovery at age 20 that he is a computer simulation hardly gives Meretzky's A Mind Forever Voyaging a stereotypical back story, while the work's uses of science fiction elements (a simulated American town visited over five decades as a critique of domestic political policies) remains remarkably singular. Berlyn's Suspended, by contrast, seems like a traditional work of science fiction in conception. It features a collection of robots with different characteristics and perceptions of the world, a description which on its face recalls large portions of Isaac Asimov's classic short story collection I, Robot (1950). Yet in its presentation, Suspended is focalized through these alien others and their unique and sometimes disorienting perceptions, a perspective consistently denied to Asimov's human investigators and more typical of high-concept writing like the Benjy Compson passages of Faulkner's The Sound and the Fury. If A Mind Forever Voyaging and Suspended are singular science fictions, Brian Moriarty's Wishbringer (1985) is likewise a singular fantasy    a bizarre comedic synthesis of a quaint 1980s town (during the day) with a nightmare kingdom (at night). A typical interaction in Wishbringer involves outwitting a magically possessed mailbox. As the interactor tries to understand her motivation and find her place in the work, she must do it through a protagonist postal clerk who promised a stranger to help find her cat. One fairly unlikely reaction is "Oh, THAT old stereotype again."

My purpose here is not to argue that the prominent IF works of the 1980s merely have singular characteristics and should not be oversimplified or underestimated. That protest can be raised for any beloved work of art. My purpose instead is to provoke a re-examination of the 1980s commercial canon, which I suggest has a deeply complex relationship in its implementation to the idea of generic tropes as devices that frame expectations. These specific critical examinations are the ultimate test of whether IF was founded in generic formulae, but I submit that this is highly unlikely. Even in the most stereotypical and hackneyed of IF, the framing story of a work can only script interaction so far from the top down. The rest of frustration must be designed for from the bottom up. Because IF must anticipate generic-subversion on the part of the protagonist, it must acknowledge transgressions in disallowing them, or otherwise incorporate transgressions into an expanded and always-troubled idea of generic tropes.

IF dysfunction: beyond autism and objectivism

Even if we grant that neither the protagonist-as-puppet nor the genre-as-script will resolve away the frustrating gaps that are inherent to the way IF is artful, we have still not fully addressed Sloane's objections, which are clearly visceral but also carefully articulated:

The frustration that you the reader and the "you" in the text do not concur as far as actions taken, sentences spoken, or choices available is a frustration compounded by a parser's limited understandings of the reader's typed commands. (73-74)

Given the limitations of the parser (and the limitations of the simulation or world model, that is, the limitations of the finitely available textual productions of an individual IF work) how is the interactor to relate to the protagonist and her limited world view, even once those are acknowledged as allowably separate from a puppet standing-point? One highly suggestive (but slightly confused) recurrent tope in IF criticism and commentary has been the metaphor of autism, a congenital mental condition characterized by "great difficulty in communicating and forming relationships with other people and in using language and abstract concepts." Sloane's descriptions of her frustrations with Deadline characters could be read as suggestive of autism, although she certainly never characterizes it as such. In his reading, Aarseth dubs Deadline the "Autistic Detective Agency," quoting at length a definition:

"a neurobiological disorder that affects physical, social, and language skills [...] it may be characterized by meaninglessness, noncontextual echolalia (constant repetition of what is said by others) or the replacement of speech by strange mechanical sounds. Inappropriate attachment to objects may occur." (115)

For Aarseth, this quote is evocative rather than descriptive in a clinical sense, and indeed we can see it is hardly an exact fit. The range of suggested dysfunctions maps in part onto the characters of Deadline, and in part onto the protagonist detective. Yet the characters repeat themselves, rather than exhibiting echolalia, while the detective is preoccupied with the accumulating potential evidence from around the murder scene perhaps a form of attachment to objects, but not entirely inappropriate to his vocation and situation. For Aarseth, autism is in the end only a metaphor for generalized unnatural dysfunction: the "contract between user and text" in IF is "a willing suspension of one's normal capacity for language, physical aptness, and social interaction as well" (116-117).

In the context of the present study we can restate this much more precisely: IF works exhibit a quality of language dysfunction (communication failure) that is a byproduct of command line / parser architecture. This problem for the interactor communicating with the parser is focalized into (but not entirely exclusive to) the problem of communicating with the protagonist, with the subsequent (and secondary) consequences that the separate protagonist is not as physically or socially versatile as the interactor might be in the same situation, often due to inability to understand her. This is in part a problem of ambiguity, but only in part. Communication failures will abound because the world of the work must always be fundamentally incomplete, hence limited and constrained. This manifests itself in all manner of social, cultural, and practical

ignorance. The work is our linguistic interlocutor, and it (not we) is inappropriately limited, requiring us to become likewise limited in discovering our agency within it.

Aarseth's quotation "inappropriate attachment to objects" is also provocative. In the specific sense of "obsession with taking" that he uses it, it suggests a critique of the kleptomaniacal adventurer. In a more general sense the phrase recalls Sloane's intense dislike of "objectivism." Indeed, we might productively re-imagine the critique of "objectivism," not as a critique of narrow perspective, but as a critique of "inappropriate attachment to objects." IF works might be objectivist, not only because they are fundamentally incomplete (as is any limited representation one may explore or interrogate), but also because they are discrete. Works of IF are made up of objects whose object-ness introduces myriad missing gaps that the interactor might reference, but cannot: ropes that cannot be cut into strings and then woven into knots, glasses of water that cannot be sprinkled one drop at a time across the landscape, planks that cannot be simultaneously situated in two rooms via a connecting doorway, and so forth. Like concepts, these objects are often indivisible or infinite. This speculation goes beyond the bounds of Sloane's work, so let us call this attachment to objects not objectivism but Platonic simulation, which in most IF languages and works involves the manipulation of the database aspect of the simulation known as the "object tree." As Roger Firth and Sonja Kesserich describe it to potential Inform 6 programmers in The Inform Beginner's Guide:

Not only is your game composed entirely of objects, but also Inform takes great care to keep track of the relationships between those objects. By "relationships" we don't mean that Walter is Wilhelm's son, while Helga and Wilhelm are just good friends; it is a much more comprehensive exercise in recording exactly where each object is located, relative to other objects in the game. (44)

The specific form of object tree simulation resembles all simulations in that the fundamental underlying reality of the simulation must be addressed in order for the simulation to be changed. These objects have names, which can be invoked to effect. In this sense, just as IF protagonists are limited, in that they have a code-superego which is distinct from the interactor, so too is the IF world limited, in that like any representation it reflects a worldview, a description of what things are important, what actions are possible, and how things do and do not relate. Note that the addressability of experience in terms of objects (Platonic simulationism) is quite different from making an assertion that the addressable objects of experience transcend that experience and represent a universal truth (Objectivism). In order to influence this world, the interactor must interrogate and come into an understanding of the particular worldview that grants a corresponding ability to perceive what things are important and how they interrelate. This is enfranchisement in code.

Figure 30. Representation of the object tree changing during interaction in Firth and Kesserich's Inform Beginner's Guide (46)

Precisely because a worldview is necessarily subjective rather than objective, the process of coming into a worldview will necessarily be shaped by its subjective limitations. In the post "Autism and Interactive Fiction," IF author Adam Cadre cites Aarseth's critique, but counters that the object-tree limitations of the medium appeal to a particular kind audience:

Look at the room you're in. Chances are it has thousands of objects in it. Imagine having to write a description of every single one of those objects and its relationship to every other. Eeeagh! Instead, you winnow it down to the objects you'll actually need, plus a bit of scenery. In other words, the author does for the player what the autistic person is incapable of doing for himself. No wonder there seems to be a disproportionate number of autistic-spectrum folk in IF fandom: it must be wonderful to wander around a virtual world where surroundings can be completely apprehended without being overwhelming (which isn't guaranteed even for graphical adventures).

Then throw in the fact that, yes, other characters generally don't speak unless spoken to, and when they do speak, stay on point. They don't make small talk, don't look at you expectantly, and in the very rare cases that

their facial expressions are important, those expressions are translated into words. Throw in the fact that there are usually clear goals, the fact that everything operates according to a set of rules that can be deduced, and that those rules can be synthesized into a strategy for achieving those goals. So it's not just that the characters in IF appear to be autistic    it's that the medium is geared towards the preferences of the autist.

Cadre's reference to "autistic-spectrum" reflects a general shift in recent medical thinking about autism, and a corresponding social shift in the idea that symptoms such as "inappropriate attachment to objects"    or to abstractions, Platonic forms, or ideal forms    might be congenital traits with mild to severe consequences for socialization. The conjunction of this general non-medical discourse about genetically occurring aesthetic preference with computer programming and geek culture is probably not coincidental. The idea of autism-spectrum behaviors can be used to describe a cause (or perhaps an effect) of an external vantage point on socialization with which geeks are all too familiar. Like contemplating the categorization of one's temperament (e.g. the Keirsey Temperament Sorter), or like contemplating the disposition of one's humors, contemplating one's autistic-spectrum position can provide a prime cause for everything from one's career to one's tastes in art. I'm generally skeptical of the formulation that a medium, genre, or form of entertainment (e.g. novels, IF) is sought out by a specific subset of the population predisposed to escaping some aspect of reality (e.g. women, autistics). This sounds too much like the critiques of escapist subcultures that have been applied over and over to novel readers, arcade patrons, console game players, and so forth. But let's follow the discussion through first.

In his post "Player Freedom," IF author Stephen Bond echoes Cadre's escapist formulation, although he identifies the interactor's standing point not with a needed respite from complexity, but a fantasy of freedom from constraint:

You don't have to get bogged down in someone else's story, someone else's opinions, someone else's life; all that matters is what you do with the objects at hand; you can decide on a story yourself, if you want to. You don't have to care about someone else's vision of the world; you can fill it all in with your own imagination, if you have one. With a poem or a novel or a newspaper article, you have to grapple in some way with the person who wrote it, but there is no such problem with the perfect text adventure. For the socially disadvantaged, it makes ideal reading material: the author is there only to offer the barest framework for the imagination, through which the player can wander freely, alone and uninhibited, creating and destroying at will. I'm not attempting an ad hoc psychiatric diagnosis of IF fans. But I think IF    and "interactive" art in general    does appeal to a certain autistic tendency that has become more prominent in society.

My own view is that this entire discourse is deeply flawed, and that Aarseth was right to disclaim any clinical sense of autism. The only way to responsibly discuss the idea of IF as the embodied aesthetics of one diagnosable margin of the population would be to survey the popularity of works with persons thus diagnosed, otherwise we should admit that the clinically diagnosed are being conscripted for symbolic use by their putative spectrum-sharers. Behind the problematic medical metaphor, however, each author raises an interesting theory. For Cadre, the IF object tree acts as a pleasurable filter of significance, making it a very specific kind of escape from the real into what we might call the ideal. For Bond, the IF object tree is a minimalist 'framework' that, in relation to interactivity, offers a pleasurable escape from limitation and constraint. Bond's argument sounds strongly to me like the recurring fallacy that interactive media is characterized by freedom rather than constraint, an idea that this study systematically rejects; a coloring book offers a far more pleasurable minimal framework for a truer escape from limitation. Likewise, as my critiques of Deadline readings and of puppet theory have shown, the engagement with another 'mind' or conception in a work of IF is fundamental to the genre, often uncomfortably so. As recent tropes like Montfort's 'riddle' and more longstanding ones like the 'crossword puzzle' suggest, most IF artists and designers have felt rather that IF interaction is a struggle to engage with the conceptions of another mind. It seems strange then to describe IF's attraction as an escape from such engagements.

Cadre's argument on the other hand has more subtle implications: the IF object tree must, by its nature,

differentiate between what is and is not important, which makes the IF world a place where significance is not the responsibility of the interactor. Yet I would counter that in artful IF the descriptive representation need not directly reflect significance on the surface of the text. In fact, much of the art of IF is centered around not just allowing the interactor to manipulate the object tree, but first concealing aspects such that they must be discovered. Important distinctions must be discerned, locations must be explored, items must be found, and so forth. It may be true that the interactor does not assign significance, but she must still discover and determine significance. IF grants her no respite into a world free of signification responsibilities. While the author's code determines significance in the world, the interactor is required to learn this private conceptual language of signification. Hence the difficulty of IF is the difficulty of the puzzle, the riddle, and the implied code.

This ability to interact and engage with another perspective through language is in many ways the exact opposite of the vaguely proposed medical dysfunction, which in this light posits the strange thesis that the interactor has sought out challenging language puzzles about foreign concepts because she herself has difficulty with language and foreign concepts and finds them unpleasant. The original confusion is in the idea of "language difficulty," which all parties have agreed is present. But whose language difficulty is it? The true limited figure is neither the interactor (as Cadre and Bond suggest) nor even the protagonist (as Aarseth implies), but the underlying parser and code. Through that code, the protagonist is subsequently limited in range of action. Due to that limited range of action, the interactor is subsequently limited in her range of interaction. In relation to the interactor's imagination and conception of the simulation, the parser is always manifestly more delimited in its understanding and more rigid in its conceptions. This creates the differential sensation of the process of interrogation that is misinterpreted either as poor embodiment (puppet theories) or pathology (autism theories). Instead, it is the nature and challenge of the necessarily unequal conversation (interrogation) that gives rise to difficulty. Interrogation also gives rise to one of the most consistent and recognizable emergent aesthetic techniques in IF, a return over and over to the central tropes of disability and incapacity.

Protagonist dysfunction: incapacity, disability, and frustration

While frustration is the core problematic of IF aesthetics, incapacity and disability are its core tropes. The term disability as used here may appear unnecessarily provocative, especially given my qualms about the metaphorical uses of persons diagnosed with autism in the service of critical theory. This provocation is intended, however. Command line interactions focalized on a protagonist are necessarily limiting, and have consistently focused artist and audience attention on limitations in relation to the normative ability to act that is, disability. This study unfortunately does not undertake to fully engage the branch of contemporary critical theory known as Disability Studies in detail (e.g. see Sharon Snyder et al.'s Disability Studies: Enabling the Humanities, 2002), but such theoretical analyses of IF can and should be undertaken for a number of reasons. First, and more generally, semiotic simulation (as a locus of speech acts) is a productive place to subject normative agency to ostranenie or defamiliarization. Defamiliarizing normative agency is one of the key goals of Disability Studies discourses with respect to the normatively 'able' body and mind. As such, the form of the critical approach and the form of the genre may be mutually well suited. Second, and more particularly, there is a historic confluence between disabled (particularly blind) new media gaming communities and semiotic simulations such as IF and MUDs, whose symbolic form has tended to render them tractable to technologies such as screen-readers, and hence accessible. As I suggest in my reading of Shade (Ch. 2), confluence also suggests the productive exploration of a strange contradiction. While this genre was materially constituted around highly blind-accessible technologies, it was conceptually constituted around a sighted assumption about the necessity of light, without which the protagonist is usually incapable of action. Beyond the mere fact of this irony is the possibility of developing alternative semiotic simulation architectures that might reflect the experiences and expectations of their disabled constituents.

The incapacity to act is one of IF's most fundamental delimiting gestures. As we considered in an earlier example, a front door that marks the edge of the simulated space may be omitted or unimplemented. It may also be coded such that the rejection of an error message ("You can't open that") is represented as either an

external, physical constraint ("You are snowed in") or internal, psychological constraint ("You promised to stay home"). For example, in Roger Firth and Sonja Kesserich's comedic coding example "Captain Fate" (Inform Beginner's Guide 105-150, 211-227), the unimpressive hero is constrained to the scene of action by his desperate need to find a private space (a bar bathroom) to change into his hero costume. Captain Fate is psychologically tied to this nearest available solution to his problem, yet frustrated by constant deferment and complication    needing a bathroom key from the barman, struggling with the light switch, worrying about the door being locked, and so forth. The elements that prevent simple resolution and constrain the elaborate solution are variously described in psychological, social, and physical terms, but they all converge thematically on Fate's comedic frustration.

Many works of IF create a unified language constraint, combining the description of most individual psychological, social, or physical constraints into powerful, comprehensive systems of constraint that are deeply tied to the concept of the respective work. These systematic sources of constraint might be a special situation of the world or a special condition of the protagonist. Of these two options, the move to formalize constraint in the protagonist is often more effective, as the protagonist is usually the consistent element in an often-varied environment. Yet the distinction is not always clear, as the modeled IF world may in fact reflect the protagonist's worldview, or some other special property of the protagonist's mind. Whether the world, the protagonist, or some combination is the origin of primary constraint, a host of foreclosed options may be attributed to a single cause. This single constraining cause then provides a compelling negative shape against which the remaining possibility space may be explored. The purpose of these limit-systems is to render the necessarily extreme constraints of the IF representation aesthetic by incorporating them into the diegesis.

Semiotic dysfunction: disability and amnesia

We have already seen how Andrew Plotkin's Shade deals with the problem of the door. The darkness it hides is merely a metaphor for the protagonist's impending or recent death. In Emily Short's Metamorphoses (2000), the world is likewise a dream    an astral plane into which a bonded servant is projected. That mystic space (like its code) has a deep logic that cannot be denied. Shade and Metamorphoses have respectively realistic and fantastic root causes (dying of exposure and magical transport) but in the end the two works are both about understanding the solipsistic sense of dream-logic. As they unfold, these IF dream-logics explain their own limitations, whether proactively or retroactively. The nature of the astral plane or the nature of death is in fact a code that contains the experiences of the protagonists. A myriad of causes for such containments are possible, and many are explored in a variety of IF works. Stephen Granade's Losing Your Grip (1998) involves the hallucinations brought on by an accidental reaction to a nicotine withdrawal treatment, while Chris Klimas's Mercy (1997) appears to trace (subjectively) an episode in the experience of an acute schizophrenic. In these cases the underlying realities over which the dream-logic lays and by which it is presumably constrained are only indistinctly seen. For the protagonists, real and imagined constraints are not meaningfully distinct: there are only constraints, although the interactor may urge the protagonist to push at these boundaries and perhaps even break out.

Systemic constraint can be physical. Andrew Plotkin's Hunter, in Darkness (1999) deals with the visceral, sensory experience of an injured hunter trapped in a cave system. Here the representation is of a realistically modeled (rather than dream) space, and the solution to escaping its maze is to travel such that the protagonist follows the sound or smell. Like the hidden tickets in Shade, this is dream-logic of a kind, albeit dream-logic in the service of realism. Egress is not a set of concrete coordinates or routes, as on a map, but instead a description of the act of tracking whose alternative is an experientially realistic portrayal of a physically disorienting space. While in the cave system, the distinction between incapacity and disability (that is, the difference between the dark as a set of external conditions and blindness as a personal limitation) is not important to the hunter's purpose. Whether due to self or circumstance, normal actions are not afforded, and the hunter must relate to the world in a new way. Dan Shiovitz's Bad Machine (1998) likewise represents crisis as a malfunction    consciousness    in the circuitry of a robot. Both the robot's environment and the robot's physical self are foreign to this consciousness, which is constituted by the explorations and

interrogations of the interactor. Like the hunter in darkness, the 'bad' machine consciousness is thrown into an unfamiliar, constrained situation. Both works present personal circumstances (injury, malfunction) combined with a hostile environment (a cave system, a dangerous factory) that urgently motivates a solution. The dire combination explains a huge range of actions that are out of scope of these works, and allows the constraining error messages to further elucidate the limits and urgencies of how the protagonist is situated. At the most basic level, this creates the possibility of a general rebuttal to all inputs that are not anticipated as pertinent. No matter what the interactor suggests, she won't be doing anything unless she resolves the most immediate and pressing problems.

By contrast, Ian Finley's Babel (1997) uses amnesia primarily to explain not what cannot be done, but what must be done: exploration. Set in an apparently abandoned artic research facility, the protagonist is in a familiar environment, but cannot remember it, putting the protagonist in the same state as the disoriented interactor. Because amnesia can be cured in the game (by wandering the environment and unlocking memories latent in objects) the interactor and the protagonist have the same quest. Both strive to recover and become the persona for whom the environment is not alien and other, but remembered and understood. Amnesia is a recurrent trope in IF, arising out of a variety of causes and contexts, but often reflecting some deeper trauma in the relationship between the self and the familiar space. In Babel, both amnesia and its recovery are byproducts of techno-scientific experimentation; in Suzanne Britton's amnesia-IF Worlds Apart (1999) the system of the world is fantastic magic. In Star Foster and Daniel Ravipinto's Slouching Towards Bedlam (2003) it is a byproduct of a techno-mystical process (see Ch. 4). The distinction blurs, because amnesia in IF (and games more generally) is always a logic of missing knowledge that will be recovered, restoring the protagonist (who has fallen to the alienated states of interactor) back to her former stature. Until then she must wander familiar spaces and peer at familiar objects. Amnesia, in other words, is the master trope of disorientation and the unfamiliar. In the semiotic logic of the simulation, disability (the incapacity to articulate or affect those signs that change the system) and disorientation (the inability to anticipate or recall those signs that constitute the system) are complementary arcs of a loop, and together encompass all of semiotic dysfunction.

"Frustration aesthetics" describes the diegetic accommodation of these twin semiotic simulation problems: disability and disorientation. Disability is generally experienced as extreme limitations on the protagonist's ability to act, while disorientation is generally experienced as a gap between what the protagonist and the interactor knows. Protagonist disabilities and unfamiliar and alienating situations justify the interactor's experience of some of these problems (because they define the protagonist's limitations), while amnesia justifies others (because it creates an unfamiliar situation for the protagonist out of a familiar one). Partly in consequence, examples of amnesic, broken, crazy, drunk, hallucinating, isolated, lost, malfunctioning, narcoleptic, possessed, sick, trapped, and otherwise circumstantially oppressed protagonists fill the IF canon from the earliest commercial works to today.

This is not to say that all IF are overtly themed around frustration and conflict. One major exception is IF art pieces, some of which may use a very simple set of commands (LOOK, GO, etc.) to arrange a kind of spatial-temporal hypertext. In the absence of a complex interaction model, frustration aesthetics becomes less useful. Conversational IF works are another interesting exception. Works such as Emily Short's Best of Three (2001) and Galatea (2000) or Jim Fisher's Medusa (2003) often focus on potentially frustrating conversations. To the extent that they focus on chatbot-like permissive parsing or drama management vs. prescriptive parsing and action management, frustration may not be the most productive lens for understanding them. Where frustration aesthetics tends to emphasize what is denied, modeling the logic of a conversation tends to be additive, emphasizing instead the logic that in improvisational acting is often described as "Yes, and." Galatea may be a frustrating conversational partner, and each conversational turn brings with it lost opportunities, yet her interlocutor's insensitivity or confusion is only marginally comparable to disability or disorientation.

Some IF works at first seem thematically antithetical to a frustration approach. The adventures of a teddy bear (David Dyte's A Bear's Night Out, 1997), or a story about buying a toy (Jim Aikin's Not Just an Ordinary

Ballerina, 1999) both sound a far cry from an injured hunter lost in a dark cave. Even in such works, however, we may still find that a thematically coherent pattern of limitations (e.g. the frustrations and oppressions of shopping on Christmas Eve, or the inadequacies and limits of being a two foot tall stuffed toy) reflect a similar deep pattern of code being used to anticipate and craft experience in ways specific not just to conflict, but conflict about fundamental agency. The frustration aesthetics approach is not about frustrating themes per se. Rather it considers how themes may reflect frustrating structures.

Through frustration aesthetics the IF work artfully defamiliarizes and denies interaction, the result is generally not a deconstruction of interaction typical of net.art such as the works of Jodi. Instead, IF frustrations often exist in order to be overcome. Whether they are in fact overcome or not, IF frustration aesthetics presents a set of capacities framed within a set of incapacities that reflect some underlying logic. Why can the protagonist not do? Why does the protagonist not know? Whatever complex riddle or simple linear ride-on-rails the IF work presents, it is the character of this vast and encompassing negative space that frustration aesthetics attempts to make beautiful.

## Chapter 4

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Minimal Interactivity:

IF defined at its limits

Thus far I have defined IF many times    as form, as historical development, as cultural concept, and as experience. Here I want to define IF one last time, focusing on very small intervals during which IF processes can be observed. These small IF    including minimal works, fragments, and hypothetical examples    reveal the essence of their larger counterparts. In contemporary experiments, small IF further suggest alternatives to traditional limits and conventions. Just as implied code illuminates the revelatory role of conclusions, and just as frustration aesthetics illuminates the limiting role of the protagonist, this chapter aims to illuminate small IF, both through structural theory and through close interactions with specific works. While many examples will be considered, our eventual focus is on how the experience of IF operates outside and across multiple traversals or play sessions, with special consideration of endings that invite replay (e.g. Adam Cadre's 9:05 (1999), Jon Ingolds's Fail-Safe (2000)) and extended close readings of works that occur in a replay-cycle or time loop: Sam Barlow's Aisle (1999), Adam Cadre's Shrapnel (2000), Star Foster and Daniel Ravipinto's Slouching Towards Bedlam (2003), and Andrew Pontious's Rematch (2000).

What is the essence of IF? While I've previously contrasted the expansive locations of Adventure with the contemporary "one-room" sub-genre (Ch. 2), I'll begin here with an even more radical set of constraints    a single situation at one moment in time coupled with one event and its outcome. A humorous example is provided by Mark J. Musante's Silence of the Lambs: an interactive horror (1996), a novelty work presented here in its entirety:

*Down on the farm*

The lambs are really noisy here.

> SILENCE LAMBS

The lambs are silent now.

Congratulations! You have won!

You have achieved the rank of FBI agent

Silence of the Lambs puns on the Thomas Harris's 1988 novel and 1991 film The Silence of the Lambs. The original stories center on trainee FBI agent Clarice Starling's interviews with incarcerated cannibal psychiatrist Dr. Hannibal Lector as she tracks a flaying serial killer. Relying on the title of the work, an interactor might expect a rendition of this popular story (or at least a substantial parody). Instead, she is surprised by a scene that is merely a literal rendition of the title... then surprised again when the rank of 'FBI agent' is granted, slyly reintroducing the allusion in response to an apparently innocuous action. Yet the act of silencing lambs has everything to do with Harris's original tale. Starling has a traumatic memory of butchered lambs screaming during a slaughter on her uncle's farm. This memory becomes a personal metaphor for her, both in her drive to save the victims of serial killers and in her search for inner peace    a peace that is alluded to as "the silence of the lambs" by both the escaped Lector and the narrator at the conclusion of the novel. Despite this, the descriptive ambiguity of the book title sets an ominous tone: are the silent lambs calm or dead? This ambiguity crosses over quite easily into the imperative ambiguity of the IF command: are the lambs silenced by the act of calming, or by killing? While the interactive joke helps us infer the correct action

(SILENCE) and reports the reaction, we are still left with a gap in the actual meaning that bridges the two states. The interactor who participates either plays the protector or the butcher. It is either a fairly mild joke or a fairly bleak one.

The minimal case of an art form is worthy of special consideration because it illuminates what is both necessary and sufficient for that form    in other words, minimal cases are definitive, either by formal definition or by example. Consider the entry from A Dictionary of Narratology in which Gerald Prince succinctly defines a "minimal story" and provides an example:

A narrative recounting only two states and one event, such that (1) one state precedes the event in time and the event precedes the other state in time (and causes it); (2) the second state constitutes the inverse (or the modification, including the "zero" modification) of the first. "John was happy, then he saw Peter, then, as a result, he was unhappy" is a minimal story. (53)

The minimal story is a story in its irreducible, essential form. By analogy to a minimal story, how might we define a minimal interactive fiction, and what is minimal interactivity? We could craft examples using any number of transcript fragments from the openings of well-known works such as Adventure or Zork. Yet classic examples would almost certainly involve a direct object manipulated in the classic era "two-word parser" style (e.g. OPEN MAILBOX, GET LAMP etc.), which is already too complex for our purposes. Instead let's begin with something simpler by following Prince in imagining a work of IF that might, during interaction, produce this parallel example:

You are happy.

> LOOK

You see Peter, which makes you unhappy.

My transcription introduces a number of changes, including changes from past to present tense, from third person to second person description, and from an event clause to an imperative tense command followed by a result verb. These changes serve to make the example appear prototypically IF-like, but their necessity for good IF design is arguable. Starting from this example, I'll spend the next several pages just considering these very aspects of prototypical IF. To what extent are these dominant in the IF canon? Why might they be preferred? What happens when authors experiment with other forms? Having proposed a minimal form, I'll interrogate it by asking if it must be as presented, and if so why. The exploration of alternatives will draw on fragments from a large number of contemporary works of IF, raising a number of issues along the way that will help frame our definition of minimal IF and provide a context for the subsequent readings of experimental short IF.

IF and the sequence of closure vs. comics

Perhaps the easiest change to explain is why the minimal input in our example has lost its direct object, becoming LOOK rather than LOOK AT PETER. This is necessary because only the simulation can supply objects, while the interactor can only refer to them. Presuming (as our minimal example does) that nothing has come before, it would be nonsensical for the user to suddenly refer to an object (Peter) that hadn't been implied in any way by the discourse    nonsensical, and also a breach virtually assured of resulting in an error message. Of course, the simulation might be elaborated to imply the presence of an addressable direct object in the code:

You are happy. A man is here.

> LOOK AT THE MAN

You see that the man is Peter, which makes you unhappy.

Our goal is minimalism, however, so we'll stick with the bare verb example for now. The larger point is that, unlike the verb-object "saw Peter" that Prince uses as a vector to effect a minimal story state change, in interactive fiction objects and states are the domain of the system while verbs are the domain of the user. Direct objects must either be provided before or revealed after the user's verb, with the suggested and actualized change never appearing as a unit (as in Prince), but rather straddling the divide of the interface.

Figure 31. For McCloud, comics closure is action that readers supply in the gap (or gutter) between panels.

Despite this difference, it is interesting to see how well Prince's model (an event transition between two states) maps against the interactive fiction model of story simulation on a computer. In IF the simulation presents a state (happy), to which the user reacts with an event (LOOK), to which the simulation re-reacts (that is, interacts) with a new state (unhappy). The input that makes up the event is a kind of externally supplied closure between two states, functioning not unlike the way Scott McCloud describes closure in the field of comics. In Understanding Comics McCloud describes closure as "the agent of change, time, and motion" (65-69), and identifies the site of comics closure as the gutter, or space between two panels. Interestingly, like the command line at which the IF user must supply a verb in order for the story to advance, McCloud conceives of the comics gutter as an external site of meaning, requiring a "willing and conscious collaborator" "accomplice" and "participant" (the comic reader) in order to transform two separate images (or states) into one narrative event. McCloud's emphasis on consensual, creative participation is provocative for thinking about continuities between comics and interactive art; the disjunctions are equally provocative. Typing at the command line is primarily a site of anticipatory or prospective closure    an attempt (which may be frustrated) to discover or solve the gap between the current state of the simulation and its next state. Reading comics, on the other hand, is only prospective in small part. Gutters are primarily sites of reactionary or retrospective closure. Although the gutter in what we might term the minimal comic is situated between the first and second panel in space, the meaning that it acquires through closure is situated last in time, resolving only after the second panel has been apprehended. The comics reader may anticipate the fall of the axe, but can begin to 'close' the axe motion after seeing the scream in the second panel. Narrative accrues in a stitching motion. This is a motion of the mind more than the eyes, but we might imagine the motion as a line looping back to each gutter in a stitch-step, assigning the gutter meaning before moving on.

Figure 32. The numbered line traces my representation of reading as it 'stitches' the gutter into comics.

McCloud makes several nuanced points about reading comics in space and time, but misses the last-ness of the gutter. This omission may be because he is focused on the motion of the reader's eyes rather than on the construction of the sjuzet. Another possibility is that it is a confusion inherited in McCloud's use of Will Eisner's coinage "sequential art" as a cornerstone for his work. In Graphic Storytelling (1996), Eisner expands on his ideas about sequence and arrangement from an author's perspective, defining for example story as "the narration of a sequence of events deliberately arranged for the telling" (9). Sequence for Eisner is telling-order, not reading order, and it is easy for the grand term "sequential" to eclipse Eisner's expansive sense of the possibilities for different forms of reader 'contracts' (49), or his nuanced views of the reader as actor (57) and participant (71). This easy oversimplification is encouraged by Eisner's many comparisons between sequential graphic narrative as it occurs in comics and film. While the arrangements of the artist may be spatially sequential, however, it is important to remember that the process of closure in comics, which Eisner describes as "surmising the intervening action" (49), not does not parallel this spatial sequence in time. Eisner's surmising is hitch-stepped and re-sequential, a mode in which cause always follows a half step behind the discovery of its effect.

The amazing thing about sequential art, then, is our ability to believe that it is sequential no matter how many times we cross the gutter in blankness and waiting, only discovering its role in the "sequence" as we mentally turn to look back. A structural parallel to this process of interpretation in IF would require the interactor to

deduce rather than direct the story:

You are happy.

Peter makes you unhappy.

What happened? > LOOKED

The minimal interactive fiction, by contrast, requires an alternating discourse between interactor and simulation in order to stage the play of state transition. Until the action is supplied, the second state cannot be known. Here Prince's example appears similar to IF in requiring that elements of a minimal story succeed each other in time (state-event-state). His example notwithstanding, Prince does not require that the three elements maintain this order in discourse: "John was happy, then he was unhappy because he saw Peter" is presumably a satisfactory alternative arrangement of a minimal story, whereas is it an unsatisfactory order for IF because it models only minimal reactivity (about which more later). Minimal interactive fiction is distinctive, therefore, in that in order to allow the prospective closure of agency it must require that both the narrative and the discourse proceed in the same order.

IF person and tense

The special relationship of a simulation like IF to linear time suggests that in IF tenses have special significations and limits. Before considering how minimal IF might work (or not work) in the past tense, I'd like to review tense and person together as a decision matrix and elaborate on the strong determining effect that input mode and person in IF have over descriptive tense. The goal remains to elucidate what is essential to IF, and what is not.

Revisiting the changes in my transcription of Prince: 'John' becomes 'You,' while "John saw Peter" becomes "LOOK" + "You see Peter..." etc. The shift to conventional second person may be prototypical of IF, but, unlike the order of input and result, this shift is not strictly necessary. Nor is the shift to the present tense strictly necessary. Rather than imagining alternate modes of IF, here we can consider examples as they have occurred in some recent experimental works. In the context of minimalism and definitions, my general goal is to analyze the logic of experimental IF discourse modes, and in doing so show how they are almost necessarily elaborations or complications of the relationships in conventional IF discourse modes. In addition to the history and theory already covered, statistics give a good sense of the relative frequency of what we might term conventionality and the relative frequency or infrequency of experimentalism in IF.

One source of statistics is Baf's Guide to the Interactive Fiction Archive, one of the most complete extant catalogues of IF from 1976 to the present. Baf's Guide numbers come with some caveats. First, the Guide largely catalogs the files available for public download on the Interactive Fiction Archive, and thus works not released into the public domain are not represented. While many previously commercial works have been so released, many are not available through the Archive for copyright reasons, and thus are not in the Guide including for example most works of Infocom. Another concern is that cataloging itself is also not complete. For example, the database form contains a checkbox indicating whether each work contains "third person narration" or not, but there may be works in the third person (or containing third person sections) which are not correctly marked. Finally, the institution of the Archive grew out of a culture surrounding the use of certain development languages and tools, and works written by these communities (ALAN, Hugo, Inform, TADS etc.) tend to be over-represented compared to other communities (e.g. Adrift, or the tool-agnostic AIF scene) whose authors have not organized around the Archive as their primary repository. Despite the representative bias towards a subset of contemporary and public domain IF, Baf's Guide provides an interesting representative sketch of IF distribution. Of the 2659 works currently catalogued in Baf's Guide, 137 (5%) are listed in the first person, and 57 (2%) are listed in the third, with the remainder listed in the second. Even more dramatically, only 19 (0.7%) are listed in the past tense. Of these, the use of the past tense

and the use of the second person have been nearly mutually exclusive. I have turned up only one example, an unfinished demo that was apparently written to showcase the ability of a library to allow the interactor to dynamically shift tense using the TENSE command. Prince's example mode of the third person past may be prototypical for stories, but the third person past in IF occurs at the intersection of the least common tense with the least common person, and has been documented in only 12 IF works.

Figure 33. Person and tense distribution in IF.

First Second Third

2659 137 2466 57

Present 2640 131 2465 45

Past 19 6 1 12

Why does the IF distribution look as dramatic as it does, and what can we deduce from it? One answer might be that the dominant mode was established as kind of historic accident by influential forbears such as Adventure and the products of companies like Infocom. This is not to say that alternate modes weren't explored early. 39 of the 57 catalogued third person IF are not contemporary experiments, but were commercial works written for the Sinclair ZX Spectrum and circulated primarily in British and European markets between 1985-1992. Most of these works are now available via the Zenobi catalog (which may contain more undocumented third person works), and most were written serially by a small group of authors, including Craig Davies, Scott Denyer, George E. Hoyle, John Wilson, and especially Fergus McNeill, who wrote prolifically in both the third person and the past tense. The works appear to have been predominantly parodies of popular cultural phenomena, beginning with the fantasy of J. R. R. Tolkien (e.g. Bored of the Rings, Balrog's Day Out etc.) but expanded to mock such disparate subjects as Star Wars (Star Flaws) Robin Hood (Robin of Sherlock), The Big Chill (The Big Sleaze), and so forth.

I am not certain whether third / past IF emerged from the default mode of a certain IF development tool, or followed the house style for an IF publishing group, or reflected a certain national outlook. Yet the fact that third / past IF flourished briefly as a kind of school and returned later in the form of experimentalism may only in part reflect cultural biases. There are more fundamental linguistic and technical factors that have helped to maintain the status of second person present tense IF as normative and other modes as experimental. One factor relates to verb construction in English, which is extremely simple in the present tense and thus more amenable to parsing as input, as well as to parser manipulation in constructed output sentences. Other modes require either more sophisticated systems or else customization to conjugate and smooth over rough patches in language. Parser-friendly verbs might be one partial explanation of the preference for first person over third person works: the command LOOK appears in the response "You look," as it does in the response "I look," but the third person "He looks" and the past tense "He looked" both require extra transformation, which is to say special handling. Unless the past tense is automatically and invisibly handled by development tools, the tense introduces authoring difficulties that act as a deterrent to common use. In the meantime, the complexities of English language conjugation are a problem for IF parsing, and present tense input is one partial solution that simplifies the problem. This further refines our idea of minimalism in IF. Just as IF is traditionally expansive (as a simulation), it is traditionally simple (as an interaction).

If English conjugation informed the design of many early works of IF, it likewise informed the design of IF developer toolsets and languages that became the standard middleware which replaced the from-scratch (or "roll-your-own") model of early IF design. These toolsets optimized around and defaulted to the second person, making the second person present not just a shared preference of IF authoring communities but a shared technique, materially inherited in the form of code. The tools modeled and replaced the language, and this model became the true context of IF, with the assumptions of the tool authors aesthetically embedded in

new works. These "default aesthetics" required substantial effort to escape, a fact that strongly influenced the long-term formation of the genre. While the most sophisticated and popular development languages of the 1990s allowed for the creation of other kinds of work through customization of default messages, extension libraries, parser hacking and so forth, such activities were generally limited to those few authors with both a dedicated interest in experimenting with narration (as opposed to storytelling) and the technical mastery to remake the system (or a willingness to eschew its luxuries and start from scratch). Those unable to do such a wall-to-wall rewrite would create Frankensteinian amalgamations, with pieces of third person or past tense description stitched together by second person present tense messages interjected by the parser. All this suggests that the second person is itself a mode of minimalism    not necessarily of expression or of interaction, but of authorial effort and of code. Much like the transition from two-word parsers to the current command line, major aesthetic shifts may accompany the introduction of new software development tools that make these complexities more tractable.

Person in IF: First and third as separate self

First and third person works may be statistically rare, but do they function differently in any important ways from more conventional IF? Turning now to examples, one of the striking aesthetic effects we encounter is a distinctly non-minimalist complication    the figure of the protagonist's separate self. This distinction exists in many second person works of IF as well. Yet the tendency of the second person (as with the first-person camera in video games) is to efface the protagonist, making him or her appear either invisible or trivially distinct from the interactor (and vice versa). While considering frustration aesthetics (Ch. 3) we saw how the situational and structural limits of interaction are incorporated into the narrative context and characterized in the person of the protagonist. In reading Shade we saw the traveler initially characterized as subtly continuous with the limits of the interactor's situation, but finally depicted as separate and alien in an uncanny moment of direct address that overthrows the illusion of the command line. Most first and third person works of IF invert this process, beginning with and foregrounding the distinction between interactor and protagonist. In confronting the character, the interactor asks "If this is the protagonist, who am I? What is my relationship, or my role here?" My proposition is that, much like the stance of metafiction, works that raise these questions tend to be artful by definition, in that they require more craft and artifice that elaborates on or reverses the norms of minimal interactive fiction.

Ian Haberkorn's Conan Kill Everything (2005) is a brief humorous work of IF whose use of relentless third person narration signifies the worldview of Conan, a brute so simple that he apparently refers to himself in the third person: "the evil wizard has destroyed all that Conan loved. Now, after years of searching, Conan has finally found him. Conan is ready for revenge". Whether Conan is narrated about or is himself narrating, he is distinct from the interactor. This distinction is made even more explicit each time the work ends, when it is revealed that 'Conan' is actually an actor on a low budget set. Take for example this rather gruesome sequence:

>EXAMINE WALL

Conan is too dumb to describe the walls and ceiling any better than that they really consist of yellowish clay.

>KILL LOINCLOTH

Conan stabs at his loincloth. Alas! Conan is bleeding to death!

*** Conan has died. ***

"Cut! CUT!"

Studio lights flare up and the crew breaks into disappointed chatter as the director rushes on stage, carefully

avoiding the fake blood on the floor.

"Sometimes I wonder, how dumb are you really? I mean, what's this movie called? Conan kill something? Conan kill himself halfway through? It's EVERYTHING, EVERYTHING, you hear?"

While Conan (rather than 'you') is too dumb to properly examine the wall, and too dumb to avoid bleeding to death, the real 'you' is an actor standing in a pool of fake blood, and this 'you' (rather than Conan) is held to a higher standard by the director. This actor-protagonist has the goal of acting out the one-liner premise of the script / game by killing everything; if the verb KILL is a hammer, then wizards, flies, doors, clothing, and indeed every addressable object in the system looks like a nail. Interactor and protagonist correspond here to the split personality stance of the method actor and his role, while the system disciplines the proceedings through the persona of the 'director.' While the interactor never has the opportunity to take the actor offstage, this narrative frame around Conan's adventure serves both as a self-conscious wink at the content and as a pointer towards the second self that is displaced by Conan's third person description. The persona of the actor creates a place for the interactor's perspective to enter the story in the form of this 'you.'

Most first person and third person IF still describe a 'you,' in fact. This 'you' is not the primary subject of discourse, however, and so stands a step removed or at a higher order of complexity, addressed in occasional interjections. An author can displace or defer the 'you', but it is difficult (or highly unusual) to remove it completely. Many works prefer to air the issue at once. Shay Caron's Chaos (1999) does this economically in the preface to the first interaction, introducing the protagonist in the figure of upstart supervillian Captain Chaos, then explaining 'your' role:

At any rate, this is where you come in. In just five minutes (more or less), he'll be struggling to stay in the air as his ship clips a huge tree, loses power, and starts to crash [....]

Despite being addressed, who 'you' are is difficult to determine. From the outset the interactor seems to have a very odd status functioning in a third-person simulated world.

> SOUTH

At the moment, Captain Chaos is soundly asleep. It's doubtful a herd of rhinos running through the room would wake *him* up.

> EXAMINE SWITCH

It looks like an ordinary autopilot switch.

> PUSH SWITCH

(trying to reach the autopilot switch first)

He'll have to get out of the hammock to reach the autopilot switch.

On the one hand, the interactor cannot move, because Captain Chaos (third person) is the body connected to agency, and that body is asleep. On the other hand, the interactor can view the environment without the Captain's eyes. Yet only the Captain can act on what is seen by these eyes. What is this entity at the command line? If the entity is not the Captain's id or subconscious, perhaps it is a ghost or astral projection? Since there is nothing in the diegesis to explain either this perspective or the Captain's receipt of impulses, the simplest answer seems to be 'the interactor'    a person sitting at a keyboard, manipulating a fictional character in a work of IF in purely extra-diegetic terms. If the tendency of the second person is generally to cast a curtain over this real self, here the third person instead brings the second into sharp relief, puncturing the fourth wall

of the interface.

It is difficult for me to say whether this puncture in Chaos is intentional or merely a design flaw that arises as an unintended consequence of the third person. Yet such punctures can be staged intentionally to great effect. In Valentine Kopteltsev's A Night Guest (2001), the whimsical, verse-based IF is narrated in first person by Lord Barkley, who after a night of hard drinking has collapsed in a stupor into his own fireplace. As Barkley narrates his actions in the first person, he (rather than the system) also has the opportunity to address the interactor directly. 'You' are the voice in Lord Barkley's head trying to guide him to bed.

>STAND

"No, I'm too drunk to stand. I could sit at best."

>EXAMINE ME

"Hey, you are sitting on the other side of the monitor screen from me, remember? Thus, I can't see you."

While 'ME' normally refers to the combined figure of the interactor / protagonist, the first person mode here emphasizes Lord Barkley's separate self. Thus he responds, not by reporting on his own condition, but by puncturing the fiction to remind the interactor that the usual situation has changed. This is an interesting twist, particularly because it pokes fun at one of the conventions of command line conversation. The parser (and, by extension, the protagonist) doesn't relate what the interactor says, but what she means. Thus inputs such as TELL GALATEA ABOUT ART and ASK ORC ABOUT AXE conventionally generate reactions that indicate the interactor's impulses have been translated into an appropriate corresponding elocution, just as EXAMINE ME can stand in for "(I would like to) examine myself." Here however, Barkley has heard not what was meant    "describe the body which has agency, i.e. yourself"    but what was said, as if the typed phrase EXAMINE ME were a literal utterance. Acknowledging the presence of the protagonist was never a problem for IF ("Greetings, Adventurer!"), but acknowledging the presence of the interactor here indeed resembles a fourth-wall violation in theatre, both as classically conceived (a disruptive breach of craft) and in the contemporary sense (an opportunity). This disruptive opportunity defamiliarizes the audience from the expected norms of the genre and enables the production to provoke broader questioning.

Of course, the goal of such disruptions may be humor. Indeed, just as humor became a staple of parser error messages in traditional IF as a method of rendering disruptive error messages aesthetic, experimental IF may disrupt the interactor role as a way of aesthetically underscoring its own cleverness in the tradition of self-referential literature and art. The monitor serves as a theatrical wall to be broken here for humorous effect. It also recalls the computer's function not only as a dividing wall but also as a connecting channel (that may likewise be broken).

Jon Ingold's Fail-Safe (2000) is a first person work that approaches these layered and separates selves of interactor and protagonist without humor. Where the previous examples depart from the second person by nodding or winking at 'you,' Ingold instead plays with their separation and disruption by dramatizing it within the story. With Captain Chaos or Lord Barkley, 'you' are a motive impulse or disembodied voice, and the lack of rationale for this becomes the occasion for pointed humor. In Fail-Safe, by contrast, there is a diegetic mechanism for that voice. The interactor's role is as an emergency radio operator on line with a crashing space vessel, assisting the lone survivor in surveying the damage and preparing for an emergency landing. Fail-Safe dumps the interactor into this situation, opening with static:

Bzzt. Crackle. *Static*

"...hello? Hello? Can... me? .. Anyone! Hel.... Need.. hello?"

Bleep    PLEASE WAIT    Locating/Tuning signal...

".. help. Repeat, can anybody hear me? Can you hear me? Hello.."

>> HELLO

"Hello? Hello! The .. pretty bad. Are you receiving this? Over."

>> YES

"Oh, thank God. Thank God.. ..emergency frequency.. We need help. This is the space pod 'Serpentine'. We've been attacked, a small cruiser. They.. they came out of nowhere.. tried to board us.. ...stly dead.. systems are all messed up, we're drifting.. I need help to fix this.."

"I'm by the console, there's wires everywhere. The computer flashing something. What do I do? Hello?"

>> WHO ARE YOU?

"Sorry? Do.. what? ..I can't hear you, too much static.."

Ingold's incorporation of the first / second person split (via the radio) in this work is transformative, influencing every aspect of his design. The device of radio communication naturalizes the use of first person present tense, as the speaker (the protagonist survivor) has a diegetic addressee (the emergency operator). It likewise naturalizes the common activity of requesting descriptions in IF. Now description requests are no longer a text-based approximation of vision, but rather radio transmissions with someone who actually serves as "your eyes and hands." Both perceptive and active commands make sense in the context of such transmissions, as extremely limited knowledge of the situation and the need to give simple, clear instructions are both normal conditions of the emergency operator role. Perhaps most importantly, the radio provides an alibi for any and all parser limitations. Rather than the system addressing the interactor with error messages about incomprehensible input, the survivor responds to the operator, complaining about incomprehensible transmissions due to static.

The sum effect of the radio communications link is to justify the disabilities and incapacities of the interactor as discourse (rather than characteristics) yet situate them within a diegesis. Unlike with alienated protagonists (Ch. 3), here the root of incapacity is not located in an alienating environment, nor in the physical or psychological limitations of the operator, but rather in the disconnect between motive impulse (the operator) and agency (the survivor) as separate selves. While the survivor undergoes the normal mode of alienation (here apparently caused by unfamiliar changes in the damaged vessel) the challenge of Fail-Safe is a second-order problem. The question is not how the survivor can repair the ship, but how the operator can direct such repair via radio. This distinction may seem like a fine one. After all, so long as a reason is given for the command voice being obscured, what matter if the difficulty with the command medium is either physical distance or rather the id suppressed by chemicals, dementia, dreams, and so forth? I believe it is important, however, because the division of impulse (the command line) and agency (the parser) into separate selves allows a clearer exploration of the issue of trust.

Fail-Safe is not ultimately about helping a disoriented survivor, nor about repairing a ship. Over the course of play small details accrue that reveal the survivor to be an unreliable interlocutor. The sole survivor of an alien attack, he is suspiciously unfamiliar with his crewmates and ship, he fixates on odd details (e.g. betraying surprise that blood is red), and his requests for aid with the engines eventually center on enabling the ship's weapons systems. The interactor's well-earned suspicions are nurtured by the operator's computer, which calls up supplemental information on the conversation as it progresses, in effect fact-checking the survivor without his knowledge. By the final scene the stage is set to reverse normal interactor-actor identification, as the

'survivor' is actually an alien invader intent on infiltrating the operator's base in a stolen ship. Hindrance rather than help should be the operator's appropriate response. The title foreshadows this reversal of expectations. "Fail-safe" refers to a backup mechanism in the event of breakdown, but could be read as a solution to the process of the work, as only failure to accomplish the survivor's repair goals leads to safety for the operator.

Figure 34. In Whalen's Space Refugees (2006), the unarmed alien protagonist dodges as his fellow refugees are slaughtered by Earth defenses.

While Fail-Safe is a science fiction tale of xenophobia and the unknown, its first person mode can barely avoid creating some sympathy for the wily, doomed interloper and his suicide mission. An interesting comparison is Zach Whalen's Space Refugees (2006), a Flash game which inverts Toshihiro Nishikado's classic arcade shooter Space Invaders by putting the player in control of one of the unarmed aliens facing slaughter at the hands of Earth's defenses. "As the player's character is inevitably disintegrated, a flashback animation tells the story of the aliens' home world being destroyed."

Abandoning the operator role at the conclusion of Fail-Safe resonates somewhat with Shade's final presentation of the command line as a relationship to be understood, then discarded. This self-defeating victory also recalls the hero Wander from Shadow of the Colossus in that the declared quests (to save the ship / defeat the colossi) result in self-made dooms. They are a type of tragedy in which the interactor takes unwitting part. Fail-Safe differs from Shade and Shadow of the Colossus in allowing two resolutions as opposed to one. In one resolution, the illusion is maintained, and the ship is repaired. This is a victory for the unreliable protagonist that has dire consequences for the operator. In the other resolution, the illusion is broken, with inverse results. A closer comparison in this regard is Adam Cadre's 9:05 (1999). In this short IF work the apparent goal (getting to work after oversleeping) leads to catastrophe for the protagonist if followed through (as it usually is), but can be avoided on a subsequent traversal. Both 9:05 and Fail-Safe encourage replay to get a more complete or deeper story, and both reach conclusions that retrospectively explain the odd unfamiliarity of their actors with their environments: the actors are interlopers.

Returning at last to our minimal IF example, we consider the significance of rendering it in the first or third person. For example:

I am happy.

> LOOK

Okay, I see Peter, which makes me unhappy.

Who orders John to look, by what means? The subtle shift in emphasis multiplies the verb, with the input changing from an internal impulse to a (spoken?) command. "John was happy, then the interactor ordered him to look, so he looked, and consequently he saw Peter, which made him unhappy."

This long exploration may seem to have sidetracked us from our discussion of minimalism, but in a sense this is the point. First and third person IF tend to complicate the narrative and functional relationships between interactor and protagonist by their nature, opening the distance between the two as separate selves. For this reason, first and third person increases the need for a framing tale to capture the separate self of the interactor in the diegesis; these modes thus encourage narrative elaboration. This is not to say that such elaboration is good or bad, nor must it follow that the minimalist mode of IF (second) be the dominant mode. Still, the fact that second person is by far the dominant mode might be telling about the general relationship of IF to framing complexity.

Tense in IF: Past and the problem of now

Of all the possible configurations of minimal IF, we arrive last at the one that is perhaps closest to Prince's example: tense, in particular the past tense.

John was happy.

> LOOK

John saw Peter, which made him unhappy.

By now we have indicated a confluence of factors that conspire to unravel past tense IF designs, but a number of such designs exist and we should consider past tense as it is worked out in examples. As with first or third person, past tense is exceptional, and as with person the predominance of the conventional (present tense) is in part a norm and in part a design consideration. While second person narration is a convention that helps the interactor to rationalize agency, present tense narration is pitched to match the present imperative tense of interactor input that is virtually an ironclad rule of all interactive fiction systems, languages, and libraries. I argue, in other words, that just as first and third person introduce discontinuity between interactor and protagonist that complicates the question of who, the past tense introduces discontinuity between the simulation output and the command line input that complicates the question of when.

Imperative input is a design decision so universal that it almost escapes notice. The reason is that the IF simulation is (nearly always) a time-based representation that allows interventions at a single moment (now). Modeling it otherwise raises a set of very difficult aesthetic and technical issues. By analogy, consider Nick Montfort's Winchester's Nightmare (1999), a present tense work that is perhaps the best-known example of experimental third person narrative in IF. Where Winchester's Nightmare differs from the examples given previously is in the decision to replace the traditional input prompt (">") with the sentence fragment "Sarah decides to." This fragment is then completed by user input:

A shell lies in the sand here, as if waiting for Sarah to pick it up.

Sarah decides to PICK UP THE SHELL

So she does.

All the arguments given about first and third person thus far have hinged on the disidentification of the command line with the protagonist, multiplying them into two separate selves. Here, Montfort sutures these separate selves by literally writing the protagonist back into the command line. As a side effect of eliminating this invitation to ambiguity, he simultaneously removes the imperative tense (and thus the question of an unknown imperious persona), as the input PICK UP THE SHELL is no longer a command, but instead a statement of fact. Montfort's third person command line radically changes the feel of the work, but it maintains an interactor-actor relationship whose simplicity is comparable to that of the second person. That this trick works so well without having to substantially alter the manner in which the interactor types input is a weird testimony to the flexibility of the English language in its simplest cases. Atypical though it may be for IF, it is worth noting that this style translates well into an even closer approximation of Prince:

John is happy.

John decides to LOOK

John sees Peter, which makes him unhappy.

Somewhat similar custom-command-line approaches have been tried in the past tense. One notable recent attempt is Scott Starkey's The Beetmonger's Journal (2001), whose frametale is narrated in the third person

past by Aubrey Foil, an archaeologist's assistant. Starkey's work may be the ultimate example of IF discourse complexity, not because of the intricacy of plot but because of the complexities that surround the command line situation. The interactor is a listener or reader of Foil's, and Foil is in turn a witness (after the manner of Dr. Watson to Sherlock Holmes) to the excavations of celebrity archaeologist Monsieur Lapot. Here is an excerpt centered on the first two interactions of the story.

My name is Aubrey Foil, Monsieur Lapot's chosen chronicler and assistant. I accompanied Lapot during many of his travels, and I will endeavor to provide you an accurate account of what proved to be his last adventure.

What did Monsieur Lapot do next? > INVENTORY

Monsieur Lapot took stock of his possessions. He had a rucksack. The rucksack seemed to contain an archaeologist's brush and a halogen torch.

What did he do next? > EXAMINE ME

Lapot looked over in my direction. I stood close by, available to offer my assistance in any way possible.

As we might expect from the prompt, the command to take inventory of one's possessions is acted upon by Lapot, while Foil reports the results. Stranger is the result of EXAMINE ME. The narrator we know is Foil, but the reflexive ME could plausibly refer to any of these three figures: Lapot, the actor, Foil, the narrator, or the addressee who is Foil's audience. Given the way that the convention of INVENTORY was adapted from its normal meaning of "examine my inventory," we might expect Lapot to look himself over. On the other hand, given the precedents discussed with Captain Chaos and Lord Barkley, we might expect ME to signify the interactor, and occasion a self-conscious nod along the lines of "Lapot gazed off into space, as if imagining those who would one day hear the tale I tell you now." Instead Lapot acts on EXAMINE ME as if Foil has spoken it (or rather willed it). Who addresses Foil to invoke this progression of events, and by what means? We might avoid this problem by borrowing Montfort's formula to shift out of the imperative and banish the separate interactor, using the command line form "Monsieur Lapot decided to EXAMINE ME." With this small change in inflection the underlying relationships of the code can now be understood more clearly, and the relationship of Lapot to the actions (they are his decisions) and of 'ME' to its referent (Foil is the narrator) make intuitive sense. If Foil tells us "Lapot decided to examine me," it makes perfect sense, whereas if we told Foil that Lapot decided to "examine me" it seems strange. In the second person, questioning the audience and telegraphing those suggestions to the protagonist both seem normal, but when these activities enter the diegesis with the third person, they seem strange. Yet the slightly revised inflection "decided to" makes this strangeness disappear again.

Winchester's Nightmare uses a solution (ban the imperative) that is not used in The Beetmonger's Journal, in part because Journal aspires to represent active agency in the past, rather then paint a patina of retrospective description over the prospective command line. This leads it to the nub of a very interesting problem. In the normative second person present, the command line prompt, ">" is generally (although not always) interpreted as shorthand for "What do you / I / we do next?" The same simple verb-noun phrase ("GO NORTH") is logically and grammatically consistent no matter which invisible phrase is imagined to be prompting the conjoined self of the interactor / protagonist. This is the same consistency that Winchester's Nightmare achieves by reframing the command line. Yet the verbose command line of The Beetmonger's Journal cannot suture the problem of time, as we see when we attempt to answer its questions in kind:

What did he do next?> HE WENT NORTH

[The word "went" is not necessary in this game.].

What did he do next?> GO NORTH

We scrambled through the trees and up a short incline to the north.

Just as Sarah decides to PICK UP THE SHELL, the correct answer to "What did he do next?" is HE WENT NORTH. The parser, however, does not this for two reasons. The first reason is an aesthetic issue relating to error messages. Imperative commands are in some sense propositions, and thus can be refused ("GO NORTH    You can't"). Past tense input, on the other hand, cannot be imperative, and thus cannot be refused, only contradicted. The result would be a debate over history ("WENT NORTH. No you didn't. WENT SOUTH. No you didn't..."), a mode of interaction that threatens to become merely gainsaying. The second reason is practical, and thus undergirds the first: parsing past tense input is just too much work. In addition to dealing with verb irregularity and needing a parallel architecture, there are other issues (such as handling direct address to non-protagonists in present tense within past scenes), and these issues multiply into system complexity. While simulator output can be varied with some expenditure of effort, present tense is built into the bones of IF command parsers.

We've arrived, in other words, at a fundamental underlying assumption of the command line. Its commands are always interactions with the now, and this restriction is a limitation of both simulation model and language. Minimal interactive fiction is, after all, about a single interactive event, which is to say one point in time that, for the interactor, must in a deep sense always be now. If the persistence of 'now' seems like a truism about interaction, it is also intended as a provocation    the exemplary works of minimalist IF that are analyzed at length in the second part of the chapter all reduce interactivity to the nub of now as a means of questioning, disrupting, and dissolving the role of time in the progress of storytelling.

Activity, reactivity, and interactivity

But before we go on to talk about one-move IF and time-loop fiction, an interlude. Having spent some time on what is sufficient for minimal interactivity, we can now look briefly at the insufficient cases that are themselves the components of minimal interactivity: activity and reactivity. This changes our focus from surplus complexity and excess to lack and insufficiency. First example:

You are happy.

You are unhappy.

This might be termed "minimal activity." The system prints two simulated states, but the action of the simulation cannot be said to react to or interact with anything. For that we need external input. Here is an example that accepts input and then reacts:

> JUMP

You jump on the spot, fruitlessly.

But this example omits an initial state, and for this reason it is better described as an example of "minimal reactivity." Without an initial context the user can only act (rather than react), while in the face of unilateral action the system can only react (rather than interact). We can thus say that interaction is the third stage of negotiated agency. An interactive act is a reaction to a reaction, or a re-reaction, at which point the feedback loop closes and responses become mutual. In the previous example the actor fails to close the loop and thus fails to become an interactor. In the following corollary, the simulation might likewise fail to re-react:

You are happy.

> LOOK

This example is again only a corollary of minimal reactivity; without providing a response, the simulation cannot be said to have interacted. Here, however, the reacting party is the user rather than the system. From the user's point of view, the distinction is dramatic; the earlier system may provide varied responses to blind input, while the later system will listen to the user, but will never respond. Both cases are examples of minimal reactivity, but each is of a very different nature. This illustrates that it is not enough merely to note the presence of activity, reactivity, or interactivity in relation to minimal systems. We must also identify where and how it appears in the process of user-system engagement. We can begin by distinguishing in minimal cases between the presence of an interactive user and an interactive system. The interactive user (or interactor) has the opportunity to re-react:

> LOOK

You see Peter, which makes you unhappy.

> LEAVE

Conversely, the interactive system corresponds to the Prince adaptation we began with:

You are happy.

> LOOK

You see Peter, which makes you unhappy.

Both satisfy a minimal case, but with different emphasis. Scholarship on interactivity and interactive media is generally more concerned with this second example, interactive systems (interactive behavior being presumed unremarkable in humans, while remarkable in machines). In minimal cases, however, we can observe unilateral interactive acts and differentiate between minimal interactivity for user and system. One important consequence of this distinction is that we can now talk about forms of interactivity that are not necessarily a symmetrical engagement. Another is that we can now distinguish formally between asymmetrical and symmetrical interactivity    between minimally interactive systems, and their superset, minimally interactive sessions. In systems, such as our first Prince-inspired example, the software participant re-reacts, whereas in sessions, both participants re-react. An interactive session involves at least two complete cycles of the feedback loop (e.g. two inputs and outputs), performed jointly. Any further actions pass out of the realm of minimalism and into an ongoing interactive session.

You are happy.

> LOOK

You see Peter, which makes you unhappy.

>LEAVE

You no longer see Peter, which makes you happy.

Two-move IF works, in other words, are symmetrical sessions, whereas one-move IF works are asymmetrical systems. Having carefully built up this distinction, however, we can complicate it with a crucial exception. The user is uniquely able to react to a one-move, minimally interactive system almost as if fully interacting, so long as she has the ability to continually restart the work. This can be done with a judicious bit of cheating called human memory. If the user simply restarts the simulation and then re-reacts differently based on the last response, this creates a reasonable facsimile of minimal (and, indeed, ongoing) interactivity on her part (with

some caveats    for example, action in the simulation cannot proceed serially, only in parallel). The user becomes an interactor as a kind of time-traveler, living out a lifespan longer than that of the simulated world an idea played with in the many time-loop fictions we will soon consider.

Minimalism and aesthetics in IF and games

While it is true that the pure minimal IF works are one-move, and it is true that one-move works have properties such as reactive users that encourage time-traveling reading, it is important to remember that minimal IF, while in some sense definitive, remain deeply atypical. The notable one-move IF that have been written number only a handful of highly experimental, plainly outrageous, or deeply strange works.

There is also a danger that the relationship between IF and minimalism will be misunderstood. IF interface structures and diegetic relationships tend towards minimalism, while IF simulations are historically excessive. Interface minimalism should not be confused with simulation minimalism, any more than Eisner's sequential presentation should be confused with sequential apprehension. Yet the idea of IF simulation as minimalist is widespread. Text adventure games and IF are often perceived in our contemporary game and media art culture as signifying a kind of radical asceticism on the part of their authors and audiences. This misperception largely arises out of a small set of historical misunderstandings    the assumption that text adventure games preceded video games (they did not), the assumption that text adventure games were evidently limited compared to their graphical counterparts (they were not), and the inference that contemporary IF authors and audiences must eschew graphics in order to deny themselves modern luxuries (e.g. 3D physics engines) and that such self-denial must therefore arise out of a self-disciplinary ideology akin to monasticism or stoicism (it does not). This last inference is easy to address on its own. In practice, most contemporary IF interactors are not morally opposed to graphics any more than most contemporary equestrians are morally opposed to cars. Certainly the use of the horse has changed dramatically in automotive societies, just as the uses of IF have changed in the presence of graphics. The analogy is appealing, yet it may encourage us to naturalize text parsers as "pre-graphics," which is not the case. Most graphical game types predate command line based text adventure games. Some landmarks include the first computer game (Chris Strachey's checkers, 1951), the first distributed computer video game (Steve Russell et. al's Spacewar!, 1962), the first coin-op arcade games (Computer Space, 1971 and Pong, 1972) and the first mass-produced home console system (The Magnavox Odyssey, 1972). Given these precedents, the first text adventure game in fact arrived quite late on the scene (Will Crowther's Colossal Cave Adventure, 1976). By the time Crowther and Wood's Adventure had been widely distributed and its descendents (Infocom's Zork I-III) had been central to shaping the home computer game industry in the early 1980s, text adventure games were becoming mass phenomena alongside a robust second-generation of video game consoles (e.g. the Atari 2600, 1977), video arcade games (e.g. Toshihiro Nishikado's Space Invaders, 1978), and computer games (e.g. Rogue, 1980). Rather than being a precursor to graphics simulation, in other words, IF emerged at the historical moment of all these second generations. It was already in dialog with graphical games from its conception. Contemporary IF players also play graphical games, just as IF players always have, yet IF has come to signify a different alternative mode than it once did.

Although it may seem counterintuitive today, IF aesthetics began not in austerity but rather in expansive excess, pushing at the limits of that era's available hardware, software, storage, and implementation languages. In the beginning, Crowther and Woods's Adventure was radically expansive, suggesting a kind of limitless experience undreamt of by the sharply constrained arcade or console offerings of their contemporaries. Adventure is a work about exploration which was simultaneously itself an exploration of programming simulations. On the one hand, it was a cavern crawl consisting of many hundreds of rooms and objects explored over an indefinite period, and on the other, an open code base ported across many languages and in many styles, constantly aggregating ideas and innovations. As it circulated through numerous adaptations and revisions, Adventure tended to accumulate objects, places, and events like an ever-expanding miscellany: an early canonical version awarded 350 points for treasures found and tasks accomplished, while some later versions awarded 370 points, 430 points, 550 points, and 660 points for interactions with new objects and puzzles ranging over a radically expanded landscape of locations.

All this is not to say that the scope of simulation in IF is never minimalist, just that trends towards minimal scope such as the one room sub-genre and the one move sub-genre are primarily a late development in IF, and that this recent minimalism is rarely ascetic. Eschewing graphics or indeed anything else is generally beside the point of contemporary IF experimentalism. This distinction is important to understanding two trends in IF works of the last decade: one trend towards greater unity of interaction (sharply limited spaces or time, fewer interactions and shorter traversals) and the other trend towards increased system intricacy (rich descriptive environments, complex objects and custom verbs). Thus, in sharp contrast to the prototypically expansive locations, objects, and durations of Adventure, a contemporary IF work such as Andrew Plotkin's Shade (2000) is set in one room and involves interactions with a small list of objects over the course of a few short hours.

While the average traversal length of works has dropped, our culture doesn't have a consistent story to tell about what limited scope or shorter interaction time means. At various points in history videogames have been criticized both for encouraging short reflex-style play (anti-social, addictive repetition-compulsion) and for long sustained strategic play (anti-social, escapist immersion). Narratives that demonize one sometimes describe positively socialized game behaviors as the opposite. Nowhere is this more evident than in reversals of common wisdom surrounding arcade and console games. By 1980, arcade games such as Space Invaders and home video game consoles such as the Atari 2600 were held accountable for addictive-pattern behavior gaming    as pinball had been since at least the 1930s and slot machines since the 1890s. Infocom advertised IF in contrast to this: long, contemplative works that were about reflection and immersion, not fast-twitch zombie-hood (I Was A Teenage Zombie, 1983). The zombie pictured is what we might call the 1980 concept of the "hardcore gamer"    someone who plays to a socially unacceptable level (like socially unacceptable levels of reading, etc.) The concept of the "hardcore gamer" by 2000, however, had been changed by three generations of home game consoles. Critiques of console gamers now described players obsessed with complex play mechanics and extremely wide-scoped content, e.g. a game with "40 hours of content" on the disk. Contrast this with Space Invaders or Pac-Man, which focused on the same game (taking 1-5 minutes to win) played as "levels" over and over again with slightly increased difficulty until skill failed or boredom set in.

The dangerously addictive (simple reflex, repetition-compulsion) hardcore games of the late 1970s and early 1980s are more comparable to what are now called "casual games." These are games with simple mechanics and the potential for short gameplay sessions. In fact, many popular casual games today are the dangerously addictive hardcore games of generations past    clones of games like Tetris or Pac Man available on an ever-expanding range of portable devices from the Game Boy (1989) to contemporary cellphones and PDAs. In recent years the video game industry has been slowly reawakened to the widespread appeal and economic potential of "casual games"    first as an online market and then as a major target demographic for seventh-generation consoles such as the Nintendo Wii (2006). Casual games are currently so-called in marked contrast to simply "games" by an industry that until recently has been conceptually dominated (especially in the console space) by the "hardcore gamer," a marketing profile of an industry-driving video game consumer which has (as noted) shifted significantly over time, and is now in the process of shifting again.

The important point here is that the terms "casual / hardcore" denote styles of play session (long / short), while game designs may vary drastically in the time it takes to traverse their content. Pac Man might take 2-3 minutes to finish a stage, with the content of every subsequent level being functionally identical, whereas Shadow of the Colossus might take an hour or two to finish a stage, with perhaps 20-30 hours of radically varied content before experiencing the game's final scenes. What is important is that this says little about how long and how often the game is played (although casual games and minigames are arguably more friendly to certain play styles). The most reductive form of minigame or microgame would consist of a single move.

In the time loop: Aisle, Shrapnel, and Rematch

Sam Barlow's Aisle (1999) and Andrew Pontious's Rematch (2000) are both examples of IF works with

apparently minimal traversals consisting of a single move. For Aisle, this move is a moment in the emotional life of a man as he passes down the pasta aisle of a supermarket. For Rematch, this move is a moment in the progress of a game of pool just before it is interrupted by a fatal car crash. Unlike the Silence of the Lambs example of a minimal traversal that begins this chapter, however, Aisle and Rematch are minimal in length but expansively complex in breadth of possible outcomes, anticipating more replay (if not more total moves) than is usual for a short work of IF by a couple orders of magnitude. The expected mode of engagement is cyclical, constantly exiting and re-entering the space of interaction. In doing so the interactor engages the limits and constraints of both the possibility space and the traversal length. Thus the edges of the work become even more important to the experience.

These IF works are characterized by the tropes of a larger family of fiction which I term "time loop fiction." Time loop fictions are not gardens of forking paths, nor labyrinths, but worlds that end only to begin again, which is to say that the time loop is a minimal case of the restartable or replayable simulation. Time loops have appeared in many forms. The time loop is presented in myths and philosophies of history such as Giambattista Vico's monograph Scienza Nuova (1730), which narrates history as three cyclical recurrent ages connected by a chaotic ricurso or return. The time loop has structured novels such as James Joyce's Finnegans Wake (1939), which both references Vico and enacts his ricurso when its final phrase "along the..." recirculates and reconnects to its opening "...riverrun," redirecting the text into a giant circle. The time loop also appears in a large number of late 20th century films such as the Harold Ramis film Groundhog Day (1993), which follows a weatherman who is forced to constantly relive the same day), and a multitude of interactive fiction.

Figure 35. Simulation fictions at the intersection of variation / repetition.

Part of the interest in the time loop as an aesthetic strategy relates to its function as both an escape valve for the limits of minimal fiction / simulation and an extension of those limits. The time loop takes surrounding questions of repeatability and replayability that exist only at the level of the reader / interactor and incorporates them into the diegesis of the work. Repetition with variation is the normal condition of re-engaging all art, but simulation-based artworks such as IF are based in a more specific tension between constant structure and variable interaction, and it is this more specific tension that the time loop describes. For this reason it is important that we distinguish the narrow category of the time loop and its narratively enacted ricursos from a much broader class of narratively represented variations we might term "time fiction."

Time fictions take place under the mark of implied variation but do not necessarily engage repeatability or replayability in any meaningful way. The most prominent examples of time fiction are technological and magical interventions in causality such as time travel fictions (primarily science fiction and fantasy). There are many other types, however. Allohistorical fictions vary (often silently) from an assumed history, and may appear either fantastic (e.g. steampunk) or realistic (e.g. geopolitical scenario fictions of alternate wars and empires). Finally, time fictions include what I term allomemorial fictions: remembrances of things past, recollections in tranquility, or indeed any narrations which are strongly marked by their presumed difference from the fact of their original events. To the degree that any narration is a self-aware re-telling and re-engagement, it already appears under the sign of variation, a variation that time travel (interventionism), and allohistory (systemicism) simply explores in its more specific instances.

The basis of the time loop is scene repetition, a feature that no other constituent group of time fiction (time travel fiction, allohistory, etc.) either necessitates or excludes. Scene repetitions can be structural or enacted. On the one hand, the body of the work can form the matter of a single loop structurally, as in print fictions such as Joyce's Finnegans Wake or Mark Danielewski's Only Revolutions, with a complete traversal of the text and a complete traversal of the loop being the same. Here, rereading is invited, yet the text itself excludes variation from repetitions of the single loop. On the other hand, the body of the work can enact repetition, becoming a meta-space in which variation is demonstrated, such as in the Rubin and Ramis film Groundhog Day, which revisits some scenes (e.g. the moment of waking up) dozens of times with variations large and

small. Simulation fictions such as video games or IF introduce variation via interaction, yet they may model the time loop in either manner. On the one hand, they may form a simple loop that continually restarts (as Aisle does, after the fashion of Finnegans Wake). On the other hand, they may represent a progressive sequence of complex variations (as Rematch does, after the fashion of Groundhog Day). While these two pairs of works manage the process of variation differently, all four locate the experience of frustration and alienation less in the figures of their protagonists than in the special state of the worlds, which are either dreams exhibiting heavy Freudian condensation or else traps of space-time crafted by something mystical or divine. The way in which the scenario suggests the separation of being from time is what gives time loop fiction its existential tenor and philosophical force.

Always beginning: Sam Barlow's Aisle

You are about to read a story. Or rather, part of a story. You will be asked to define the story by controlling one instant in the life of the man whose story it is. Your intervention will begin and end the story. But be warned; there are many stories and not all of the stories are about the same man.

   Introduction to Aisle

Sam Barlow's Aisle (1999) is such an existential IF, a fragmented, ambiguous set of narratives all anchored by a brief moment in the pasta-and-sauce aisle of a grocery store. Each time a command is entered, the narrative generates a brief passage that describes a memory, an action, or a possible future, then immediately begins again. All potentials begin in the interactor's control over a single moment in the life of a protagonist (or set of protagonists) we will call "the shopper." The possible resolutions for the shopper are wide ranging, including a quiet dinner alone, an assault, a date that leads to engagement, and a descent into madness.

Aisle is widely credited within IF for as pioneering the concept of the "one-move" sub-genre, although as we have seen Silence of the Lambs is an earlier one-move work from 1996. In addition to being serious in tone, Aisle differs in the breadth of its possibilities, and this changes the degree to which the work feels characterized by durations of a single input. Silence of the Lambs is a work waiting for a single input, but until that input (and no other) is given the interactor is suspended at the command line, with some inputs handled incidentally (as window dressing) and other inputs trapped by generic error messages that are the inherited voice of the library:

> EXAMINE LAMBS

They're bleating quite noisily.

> CONFUSE PARSER

I don't know the word "confuse."

Structurally, Aisle functions in exactly the same way, with disambiguation and special handling allowing several turns, and all other inputs trapped by generic error messages. Because a true action, move, or turn has not yet occurred, in each case control returns to the interactor for yet another input:

> REMEMBER

You'll have to say what you want to remember.

> CONFUSE PARSER

That's not a verb I recognise.

The distinction between a simple input and the more complex idea of a move is pervasive in IF architecture. An input is generally any command that is entered into the command line. A move, by contrast, is generally any command that is parsed, understood, refers to the diegesis rather than a meta-level such as save-restore, is acted upon, and advances time. While there are a number of one-move works, there are currently no one-input works. Neither Silence of the Lambs nor Aisle forces all inputs to resolve as events. Rather, they wait for understanding. By changing the breadth of implementation, however, Aisle causes the inputs to resolve the vast majority of the time. An interactor with Silence of the Lambs might load the work, attempt to look around or affect the empty farm locale for a few inputs, resolve the text (SILENCE LAMBS) and then poke around a bit more before quitting. The majority of her interactions would occur in a state of suspension, with input not resolving to action.

By contrast, the great majority of Aisle interactions produce resolutions, and this difference in degree feels like a difference in kind. In walkthrough documentation available for the work, Barlow includes a list of "all 136 actions that produce endings" (although these outcomes map against a significantly larger set of input words and phrases). Printing a transcript of these 136 typed commands and their corresponding unique responses renders roughly 60 pages of prose. This transcript still excludes several pages of incidental non-resolving interactions such as disambiguation (e.g. REMEMBER) and meta-verb interactions (e.g. ABOUT, AUTHOR, **CREDIT**

S, HELP, SAVE, QUIT, RESTART, RESTORE, VERSION). Perhaps more important than this raw scope is the completeness of implementation: the work affords a fairly large number of nouns and verbs, most of which resolve. Consider the opening passage:

Late Thursday night. You've had a hard day and the last thing you need is this: shopping. Luckily, the place is pretty empty and you're progressing rapidly.

On to the next aisle.

Interesting... fresh Gnocchi-you haven't had any of that since... Rome.

The aisle stretches to the north, and back to the south. The shelves on either side of you block your view of the rest of the supermarket, with only the brightly coloured aisle markers visible.

You have stopped your trolley next to the pasta section, bright plastic bags full of pale skin-tone shapes.

There is a brunette woman a few metres ahead, filling her trolley with sauces.

>

As presented, the interactor has no clear indications of what objects and concepts are afforded by the system. Instead, she has what implications she finds in the text. For the purposes of criticism, we can mark up this text here in order to make it appear less ambiguous and discuss what is afforded. Below I have bolded those terms that appear in the text and may also be used in inputs by the interactor (e.g. the word "aisle" may be used in such inputs as EXAMINE AISLE):

Late Thursday night. You've had a hard day and the last thing you need is this: shopping. Luckily, the place is pretty empty and you're progressing rapidly.

On to the next aisle.

Interesting... fresh Gnocchi-you haven't had any of that since... Rome.

The aisle stretches to the north, and back to the south. The shelves on either side of you block your view of the rest of the supermarket, with only the brightly coloured aisle markers visible.

You have stopped your trolley next to the pasta section, bright plastic bags full of pale skin-tone shapes.

There is a brunette woman a few metres ahead, filling her trolley with sauces.

>

While a few synonyms are unimplemented (the interactor can look at the SUPERMARKET but not the PLACE, the PASTA but not the SHAPES) and a few abstract concepts are unexplored (e.g. the idea of a meter), this representation makes Aisle's opening passage resemble the first page of a densely linked work of hypertext fiction    the more so because each response renders a similarly substantial, hypertext-lexia like passage. Even if Aisle were formatted in this manner it would still not be a hypertext, because these words are mere affordances to action. The word pasta cannot be merely selected (or typed in), although the simulated pasta can be examined, taken, given, eaten, broken, thrown, and forgotten (among other things).

One effect of such an approach towards exhaustive implementation is that Aisle interactions are typified by resolution. Another effect is that messages written by the author largely replace another voice that is typically present in most IF works: the default, built-in responses to stock actions that make up the voice of the library. Contemporary IF works are generally built with development languages (e.g. Inform and TADS) that come with default messages that handle a wide variety of fundamental situations. Even though the authored source code of the work makes no apparent reference to the verb or input pattern, a normal statement at the top of the source that includes standard code library of resources and behaviors (a header file) causes the behavior to become part of the work. Some messages handle meta-level interactions (e.g. RESTART "Are you sure you want to start over?") or return generic parsing error messages (e.g. "That's not a verb I recognise"). No matter how innocuous, however, it is important to recognize that the development library header-files and the programmer's authored text co-exist in the work, and that the production of text during interaction is usually complex and multi-vocal. Very few works of IF completely customize or replace this default text, and consequences can range from the dull (e.g. the remarkable sameness of meta-interaction text across otherwise disparate works) through the odd (e.g. British spellings such as "recognise" appearing amidst text that is otherwise normalized to American spelling) to the bizarre, as in this interaction with Silence of the Lambs:

> JUMP

Wheeee!

Musante did not author this response. Rather, it is the default text inherited from the TADS 2 library, and meant to indicate (playfully, in the tradition of Adventure and Zork) that the verb is not appropriate or consequential in context. Although something like "Your jumping further agitates the lambs" might have been more to the point, overall the default response has no serious repercussions for a light-hearted and thinly implemented work. Since the text is blindly inherited, however, a work set at the top of a cliff or focalized through a protagonist in a wheelchair can both inherit the highly inappropriate response "Wheeee!" unless anticipated and prevented by the author. While Aisle is written in Inform 6, which defines its own default for JUMP, this default has been replaced by custom text:

>JUMP

Staring at the gnocchi you feel a memory slowly, awkwardly, awfully rise to the surface.

-The scooter driver looks surprised. You grab for Clare and jump to the side-bounce across the road, scrape your head-

Scuffed and light headed you open your eyes... your hands are empty-Clare is a few metres away, lying awkwardly. Splattered with a thin red liquid, reflecting the scooter's bright red paintwork.

The scooter skids-you jump. You are in the supermarket. Your hands are empty, sweaty.

----------

A story finished. But there are others...

I have again added the bolded text here to indicate strings useable in crafting future inputs. Most of the major nouns in the passage were in fact already present in the initial passage (e.g. GNOCCHI, SUPERMARKET), and only a few (e.g. DRIVER) are unaddressable, reflecting Aisle's high degree of focused interiority. One (CLARE) is not present in the initial passage, but is pervasive throughout most other passages, and thus probably already familiar to the interactor. One (JUMP) is self-referential. By first suggesting this term, the interactor has subsequently discovered it in the text. The word SCOOTER, however, is new. After the coda line, the screen refreshes, Aisle restarts, and we re-confront the opening lexia about the aisle. It is a text we will come to see hundreds of times, and it will gradually grow invisible to us with repetition. Instead of re-engaging the visual passage, however, we can instead think about the possibility space exposed thus far. Time has restarted for the simulation, but not the interactor, who can choose to elaborate her exploration. As she explores, the implied code expands in her mind.

>THINK ABOUT SCOOTER

The accident. You had joked about the traffic, over the previous days. There is something about scooters and Italians that is comical. But the thin veneer of blood soon takes that away. You can't remember much more than the skid, the collision and the shock. Friends and relatives organised everything-getting the body flown over, the police, the papers, etc. Gave you room to grieve. But you'll always remember the way the scooter flicked her into the air as if she were a feather. And the way she fell as if she were lead.

Shopping doesn't seem so important-well, still as important, just not as easy.

----------

One more story over. Not the only one...

Again, the comparison and disjunction is with literary hypertext, whose lexias branch out to still further lexias. If we were to name clusters of passages by the nouns that evoke them and then organize those clusters in a map with links from the literal words in the passages, we would have something like a hypertext approximation of Aisle, although the experience of navigation (as opposed to exploration) would be quite different. Here the interactor may make similar explorations, but the process is not spatial mapping as in hyperlinked link navigation. Instead, the replaying interactor summons the scooter, not from the current lexia, but from her mind. Of course, she may not choose the scooter at all    at least, not literally. The input REMEMBER ACCIDENT renders the exact same lexia, even though neither the word "accident" nor the verb "remember" appeared anywhere in the scooter passage that originally prompted exploration ("wandering outcry") in this direction. The guiding principle of Aisle interaction is not what words lie on the surface of the work, but what objects and ideas it contains and what it is about.

What exactly is Aisle about? The narrative, as the introduction indicates, is unstable, with many different strongly characterized figures all resolving as a single 'you' figure. This unstable protagonist figure, here called "the shopper," is varied and yet coherent. Some versions of the shopper are very old or quite young, but all versions are adult males, and all are touched by disquiet. Most versions of the shopper are single, lonely, and socially awkward to varying degrees. Many versions are struggling with depression, grief, guilt, rage,

obsession, paranoia, nervous breakdown, or even insanity. Aisle introduces many characters in passing, but it has a cast of only three major characters, two of whom are mentioned in the opening passage: the shopper, and an unfamiliar brunette woman who is shopping on the same aisle. This woman is herself multiple both in personalities and possibilities, but her transcendental character is her unfamiliarity: there is no possible outcome in which the shopper will recognize her as someone already significant in his life. The third major character in Aisle is the shopper's absent romantic partner, Clare. Importantly, neither her existence nor her absence is specified in the opening passage, but she is either named or strongly implied in the majority of Aisle outcomes. In her varying incarnations Clare symbolizes many kinds of past loss: abandonment, death by accident, illness, murder, suicide, and more. The unfamiliar brunette, by contrast, is the most tangible sign of a possible present or future resolution, albeit often a negative one.

This opening configuration of loneliness-and-a-stranger is reflected in the relative implementation depth of the work. The vast majority of outcomes focus on how the shopper accounts for or copes with Clare's absence, and a substantial minority focus on how the brunette serves as the reminder, the absolver, or the supplement of that absence. Of the 136 Aisle commands resulting in distinct outcomes, 59 (or nearly half) refer to the brunette. Of the 59 commands referring to her, 34 are speech acts (asking, telling, and commanding), while the remaining 25 involving direct actions, many of them socially inappropriate (dancing with her, taking her trolley, etc.). Few outcomes of these direct actions are positive. In part this is due to the emotional situation of the shopper, whose loneliness provides an occasion for the exploration of anti-social behavior, misogyny, naked lust, and violence. At another level, Aisle uses this situation and configuration to explore one basic problem of IF    that the availability of other characters as objects of discourse tends to objectify those characters, and consequently expose them to a wide range of often-inappropriate explorative behaviors.

Figure 36. Partial list of commands that produce outcomes in Aisle

Ask woman about Clare

Ask woman about gnocchi

Ask woman about her day

Ask woman about her trolley

Ask woman about herself

Ask woman about me

Ask woman about other

Ask woman about pasta

Ask woman about Rome

Ask woman about sauces (same as help woman)

Ask woman her name

Ask woman on date

Attack gnocchi

Attack me

Attack pasta

Attack sauces

Attack shelves

Attack trolley

Attack woman

Call Clare

Call security guard

Climb shelves

Cry

Dance

Dance with woman

Dream

Eat gnocchi

Eat pasta

Empty trolley

Empty woman's trolley

Examine checkout

Examine gnocchi

Examine markers

Examine pasta

Examine sauces

Examine shelves

Examine woman

Examine woman's hair

Examine woman's trolley

Examine yourself

Fill trolley

Fill woman's trolley

Find Clare

Follow woman

Forget xxx

Frown

Get in trolley

Get in woman's trolley

Get sauces

Gibber (crack up)

Give gnocchi to woman

Go north

Go south

Go to checkout (exit)

Inventory

Jump

Kiss woman

Laugh

Laugh at woman

Listen

Listen to yourself

Look

Look in trolley

Look in woman's trolley

Marry woman

Mutter (speak to self)

Panic

Pray

Push my trolley at woman's trolley

Push trolley

Push trolley at shelves

Push trolley at woman

Push/attack woman's trolley

Remember accident

Remember Clare

Remember Clare's illness

Remember Clare's leaving you

Remember day's work

Remember gnocchi

Remember hospital

Remember Love

Remember meal

Remember pantheon

Remember Rome

Remember suicide

Remember your murder of Clare

Ride/Jump on trolley

Scream

Shout

Shout at woman

Sigh

Sing

Sit down

Sleep

Smell

Smell gnocchi

Smell woman

Smell yourself

Smile

Smile at woman

Spit at woman

Stalk woman

Swear

Take gnocchi

Take pasta

Tell woman about Clare

Tell woman about Clare's accident

Tell woman about Clare's illness

Tell woman about Clare's leaving you

Tell woman about Clare's suicide

Tell woman about Day's work

Tell woman about gnocchi

Tell woman about Love

Tell woman about me

Tell woman about other

Tell woman about Rome

Tell woman about Your murder of Clare

Throw gnocchi

Throw pasta

Throw pasta/gnocchi at woman

Throw sauces at woman

Undress

Wait

Wave

Whistle at woman

Woman, come home with me

Woman, come Rome with me

Woman, fuck me

Woman, give me sauce

Woman, hi

Woman, listen to me

Woman, look at me

Woman, take my trolley (give trolley to woman/woman, watch my trolley)

Woman, undress

Woman, wait

Yell at yourself

Most of the interactor's visual and mental explorations (LOOK / THINK ABOUT / REMEMBER) lead back into the shopper's past and circle around the central trauma that is the cause of Clare's absence. These can be traced, or they can be guessed at. The interactor may attempt to inductively arrive at the possibility of an ending, as in these example inputs:

> REMEMBER CLARE'S ACCIDENT

> REMEMBER CLARE'S ILLNESS

> REMEMBER CLARE'S LEAVING YOU

> REMEMBER CLARE'S SUICIDE

> REMEMBER CLARE'S MURDER

Exploration can occur by induction or deduction. While many interactors will guess at the possibility of

murder preemptively when exploring the cause of Clare's traumatic loss, the word "murder" does in fact appear as an explicit prompt exactly once in the outcome of WOMAN, LOOK AT ME. During this resolution the shopper assaults the brunette and is subsequently beaten unconscious by a security guard, awakening to overhear a familiar psychiatrist discussing "the anniversary of his girlfriend's murder." The psychiatrist omitting who killed Clare is typical of Aisle's use of ambiguity to motivate interactor exploration. On the one hand, the interactor may continue exploring social interaction with the woman, perhaps in a more socially acceptable form (WOMAN, HI). On the other hand, the interactor might veer off to investigate this ambiguous murder, which (having been mentioned in the text) is now implied in the code, and might be implemented and addressable. Here, the act of guessing at a back-story will make it so, for in order to explore whether the shopper can remember or speak of a murder, the interactor must first presume the fact of the murder in order to reference it. Even then, how it is presumed still affects the response. If the interactor chooses for the shopper to remember, she is confronted by disturbing yet still ambiguous imagery:

> REMEMBER CLARE'S MURDER

The one thing you didn't want to remember. A bloody smile drawn across the aisle, Gnocchi for teeth-punch them all out-A red, red smile-brighter than any lipstick-but wait-she speaks. No; she does not. The smile drips, runs into the carpet and blushes into a crimson flower. Purple bruises. Colourful scene don't you think? Of course it's all in the past now. And they said you were over it.

A bright red smile opens and devours you whole. Everything goes black.

When the shopper's first reaction to this vision of a pasta-and-sauce death mask is violence ("punch them all out"), is he violently rejecting the traumatic reminder of discovering his murdered lover, or is that a crazed episode indicating that he was her killer? There are several answers to this question scattered throughout the text, but the primary problem that confronts us here is that the shopper's basic mode of memory is usually imagistic, allusive and ambiguous. There is a way around this, however. The interactor can force the shopper to be literal by directing him to articulate himself (however inappropriately) to the unfamiliar brunette nearby.

> TELL WOMAN ABOUT MURDER

You scurry up to the brunette. "Excuse me-I probably ought to tell you this, now rather than later", she looks confused and you continue, "but I am a murderer. All very complicated complicated stuff-But basically I killed my girlfriend (my lover) and well I am over it now so there is no problem there but like I said just thought I would say."

With that off your chest you continue on your shop.

At last the ambiguity is resolved, and these interactions have led to a particular view of the shopper, a set of outcomes we might call the murderer cluster. The interactor's progressive exploration is a kind of suggesting or imagining, and it leads the interactor into proposing actions which seem reasonable by extension     such as having the shopper describe an otherwise intractably mysterious topic out loud     but which, in the context of the quotidian supermarket aisle, are sociopathic behaviors. What kind of man would explain a murder to a stranger? Perhaps a murderer? The projective gesture has colored the author's resolution, for the author is not creating or omitting links, but anticipating suggested inputs, choosing which will be accommodated, and then crafting the responses. Unlike hypertext, omission in Aisle is barely possible. Once a tipping point in the implication of mysterious trauma is reached, the interactor will supply questions about hypothetical traumas unbidden. We recapitulate what the author anticipates we will choose him to tell.

Choosing to tell the unfamiliar brunette about Clare's accident or about Clare's illness are different gestures from choosing to recount her murder. These tellings not only create different factual pasts, they likewise characterize different protagonists who in turn elicit different social reactions and different resolutions. In one

story we may find the shopper to be a protective partner at an accident scene, in another a devoted bedside mourner. All of these past traumas are possible, most are mutually exclusive, and some can be connected interchangeably to the imagery that preoccupies the many disturbed figures, allowing us to reconstruct mini-histories by assembling fragments of the past with fragments of the present.

While both reflections and observations in Aisle generally result in descriptions of the past, actions in Aisle also affect the present and the future. Some of these implement a traditional set of the basic verbs available since Adventure (ATTACK, CLIMB, HIT, THROW) but totally inappropriate to a supermarket, while other uncommon but appropriate verbs (BROWSE, SHOP, SHOPLIFT) are unimplemented. Even actions the interactor might use to intentionally cast a happy protagonist (DANCE, SING) are changed by context into signs of the tension between the individual and socialization / society. The idea of action as acting-out is part of the way trauma in Aisle is explored, but it is also an authoring method that anticipates interactor expectations. If the author / programmer expects real interactors to use basic, traditional or common verbs whether or not they are cued by the text, how should these anticipated commands be accommodated? Aisle's response is to make what would normally be semantically sensible (EAT GNOCCHI) but narratively senseless acts (eating un-cooked un-purchased food from a store shelf) not a violation of the diegesis, but part of its deepest sense.

Most of the basic verbs that make up Aisle's master list are such prior, traditional, and often contextually inappropriate commands. Aisle anticipates an interactor whose prior expectations must be accommodated by the code as much as created by it. The work becomes in part a commentary on the anti-social nature of the traditional adventurer role and its mode of interaction through objectification and inappropriate physical manipulation. Nowhere is this dialog between Aisle and the conventions of IF more clear than in the response to the command INVENTORY, a classic verb that lists any objects the protagonist possesses. In an attempt to head off the unmanageable combinatorial explosion that would be introduced by giving the protagonist even a single grocery-list to carry (which according to the exhaustive logic of the text might then be given, thrown, broken, eaten, etc.), Aisle intercepts any direct reference to the shopper's possessions ("Sorry, you can't use your possessions directly"), yet preserves the act of literally taking inventory itself as a ritualistic gesture:

>INVENTORY

Taking everything from your pockets you crouch down and line up your possessions on the floor:

Wallet: coins, bank card, store card, bookclub card, photo-

Each object, representing something else, is like a word. The inventory-sentence ends and begins with that photo. An attempt to possess Clare in her image, to hold her and to contain her. You rearrange the coins in a circle around the photo, a makeshift frame. A photo of Clare. If only you could lose those first few words: Clare. Then you could hold Clare, possess Clare. She would be yours...

With a furtive glance you scoop up your things and return them to your pockets.

The photo burns a hole in your pocket, through your heart and to the centre of your universe.

The "inventory-sentence" is made up of objects as words. It gives a general commentary on manipulable linguistic reality (or what we might call semiotic simulation) that is also a way of relating to the world. To put Aisle's critique in context, many other works of IF have parodied or critiqued the prototypical protagonist of Adventure as a looter and a thug    a violent kleptomaniac whose attempts to TAKE everything not nailed down and KILL everything else are rewarded with high scores. One reversal of the looting-to-score model of Adventure is Taro Ogawa's Enlightenment: a one-room absurdity (1998), whose ironic need to create a moment of darkness (discussed in Ch. 2) requires that the interactor break, lose, and otherwise divest the protagonist of a dozen magically glowing treasures in order that the protagonist may escape. A more pointed

parody is Cody Sandifer's dark comedy Zero Sum Game: an exercise in fantastic futility (1997), which begins when Charlotte Candy Mint arrives home:

You stumble across the threshold of your sweet abode, a magic bag full of rare, mystical, hard-won treasures swinging from your greedy little hands. In other words...

***You have won***

Victory is interrupted, however, when Charlotte's mother discovers her loot and requires that her 75-point scoreboard be reduced to zero.

"No daughter of mine is going to bring a bag of 'rare, mystical, hard-won treasures' into a God-fearing house such as ours. You hear me?"

You nod, your eyes welling up with tears.

"Good!" she says. "Now you give these stolen magical whoopdedoos back to their proper owners and make things right!"

Like Enlightenment, Zero Sum Game is about undoing what has been done. Unlike the Enlightenment inventory, however, Charlotte's score is comprised of points for both objects (a diamond ring and a ruby sapphire) and accomplishments, including a fair amount of violence and crime (slaying a dragon, cheating a merchant, making a troll cry, stealing candy). Predictably, attempting to undo these things leaves a fresh trail of chaos in their place. This violence gets its own critique in Cameron Wilkin's Bliss: an interactive harrowing (1999), which presents a straight-faced, classical fantasy scenario of a captured hero on a quest to slay a rampaging dragon after escaping the evil wizard Margoth's dungeons and orc guards. The ensuing mayhem is periodically punctuated by strange visions of contemporary architecture, and in the end the hero is revealed as an escaped mental patient whose bloody rampage has killed a number of innocent civilians.

A recurrent critique of IF claims that the figure of the adventurer is inextricable from antisocial fantasies of looting and violence. This idea has circulated in critiques of videogames, IF, and Role Playing Games (RPGs) since the 1970s, with RPGs drawing particular attention. As is often the case with external critiques, most provocative explorations of this idea have subsequently come from within the authoring communities themselves. Writing about his RPG Power Kill (1999) in "Prismatic Play: Games as Windows on the Real World," author John Tynes describes enacting the critique.

This engagist metagame posits that Dungeons & Dragons participants are living out their fantasies through real-world psychotic episodes in which they practice robbery and home invasion against ethnic and economic minorities    a violent incursion to a black ghetto is, to the participants, just another "dungeon crawl" in which orcs and their money are soon parted. They are asked to reconcile the differences between their Dungeons & Dragons character sheet of statistics and treasures with their Power Kill character sheet, a patient record from a mental ward for the dangerously insane. [...] Power Kill is intended as a Swiftian satire, an engagist attempt to take the escapism of Dungeons & Dragons and explore its connections to the real world of human behavior. (222)

Like the metaphor of autism discussed in the previous chapter, this satire hinges on the slide from characteristics of the protagonist to those of interactor due to mental dysfunction. Where some autistic critiques posited that the IF interactor has a genetically determined aesthetic aversion to reality, and thus prefers IF, the Power Kill scenario suggests schizophrenia that turns a preference for escapist fantasy into an in inability to distinguish it from reality. A parody of this threat appears in the lyrics from MC Frontalot's 2007 rap song about interactive fiction "It Is Pitch Dark":

That don't play in public life. You get arrested,

psychoactive medication daily in your big intestine

and attesting that the voices in your head

said the dwarf shot first, embedded arrow then you bled.

But doctors with needles posit repeatedly

that you knocked down that midget in the park unneededly.

This has seeded the idea that you should

never venture from the house, never get misunderstood

by the non-player characters inhabiting Earth

Figure 37. MC Frontalot's IF-themed music video It Is Pitch Dark (2007), directed by Jason Scott, filmmaker of the forthcoming Get Lamp IF documentary. Above: the rapper's live reflection is digitally remediated on the screen of an Apple II, while lyrics are typed as a game session. Below: Remediated IF maps (normally hand drawn) swirl, with video of Frontalot as one node in the pattern.

While Aisle contains many scenes of psychotic violence in conjunction with the real world, what is striking about the INVENTORY scene and its clear reference to the medium of IF is the difference of its critique from schizophrenic scenarios in Bliss, Power Kill, or "It Is Pitch Dark." Rather than damning escapism (which in these works is always represented in the form of generic fiction, i.e. high fantasy), Aisle instead repeatedly suggests that there may be something disturbingly wrong with objectification as the fundamental verb-object mode of relating to the world inherent in IF's command line interface. The desire to heal Clare's absence with some name-object-possession (rather than person) is likewise rebuffed in most ham-fisted attempts at romancing the unfamiliar brunette, as in "WOMAN, COME TO ROME WITH ME," in which the shopper seems both unconcerned about whether he knows the woman he is addressing and incapable of differentiating her from other women:

"We can go back to Rome, again. Should be even better than last time!" She steps back, blushing, "I'm sorry. I don't know you." She hurries round the corner of the aisle. You shout after her, "Course you do, Clare! Cathy? Amanda? Sophie?" You never were one for names.

Other resolutions situate "Clare" as a multiple personality in the mind of the shopper. In this scenario the shopper is a private transvestite whose public male personality "Clark" sexually harasses the unfamiliar woman on the way to buying "gnocchi for two"   himself and the female alter ego signified by his wearing women's underwear. Like many Aisle outcomes, this resolves the question of Clare. Still, it is important to point out that there are some less traumatic resolutions, which (given the overall tenor of the work) take on special significance in their exceptionality. While these may outcomes be encountered in any order due to the structure of the work, they suggest solutions to problems presented in many other outcomes. For example, interrogating or commanding the woman often carries is often marked (among other things) with the basic social stress of attempting any kind of serious interaction without knowing a person's name. An alternative is to simply to ASK THE WOMAN ABOUT HER NAME:

"Now I'm at a disadvantage-you know my name, but I don't know yours..." She smiles, "I'm Clare" (she doesn't say whether it's with an 'i' or not, we'll just assume). In a whipcrack chain of rather bizarre events, you end up in the supermarket cafe surrounded by a pile of shopping bags.

Aisle delivers closure here with a wink ("we'll just assume"), fusing the figure of Clare with the unfamiliar woman. If the two are one and the same, then a traumatic past has been replaced by a pleasant date, and perhaps a promising future. There are other ways to find Clare, however. Both FIND CLARE and CALL CLARE evoke a short romantic scene with a Clare who is the shopper's present life-partner. As it transpires, she is just around the corner, helping out with the household shop. What is remarkable about these outcomes is that they are simple, obvious, and logically continuous with the initial passage as given, and totally contrary to the presumption of over 95% of Aisle outcomes. Although we are warned at the outset that "not all stories are about the same man" we can come to know this transcendental traumatized shopper in many incarnations, and it takes real positive thinking to imagine him otherwise. Just as presuming the murder confirms it, we must presume the fact of Clare in the code in order to refer to her, even though (like the shopper's memories) she only exists offstage from the opening passage    not a link, but a blind leap of faith. If Aisle has an implied programmer / author, this is its deeper and fairly consistent morality: physical actions are easy, but social outcomes are hard, and the important thing is respect, honesty, appropriate listening, and the power and responsibility of negative and positive thinking.

Never ending? Adam Cadre's Shrapnel

Beginning with minimal definitions of IF and the limits of the single interaction, the move, and the short traversal, we've gone in-depth into Aisle, a work whose primary mode of interaction is reading across the limits of its one-turn traversal. We might almost call this mode a kind of extradiegetic cheating. Like Aisle, Rematch is ostensibly a one-move work, yet it is crucially different in the way it complicates the model of interacting outside the traversal. Shrapnel is neither minimalist nor one-move, yet it provides the perfect transitional example to understanding this complication. It is an example of unreliable code, in particular the unreliable traversal that misrepresents closure.

Adam Cadre's Shrapnel (2000) is a surreal work even by IF standards    a southern gothic themed horror story featuring elements of time-travel. Shrapnel begins with the status bar flashing six phrases:

You are standing *** You have died. *** west of a white house *** You have died. *** with a boarded front door. *** You have died. ***

This echo of the opening location from Zork, rendered uncanny by grim interjections, is then restated.

West of the house

You are standing west of a white house with a boarded front door.

You blink. Boarded? You came all this way and the door is boarded?

Is this supposed to be some sort of game?

The interjections are replaced by the reaction of the nominal protagonist Billy Blake who has been summoned out to his business partner Whitman's house only to find it boarded. In the moment of asking "Is this supposed to be some sort of game?" Shrapnel simultaneously questions both its ancestor Zork and itself. Zork was definitely supposed to be "some sort of game," and the boarded door was the very first of many obstacles placed in the adventurer's way for the purpose of being overcome. Both Shrapnel and Zork begin with an awareness of the interactor's disorientation and uncertainty as to motivation. Zork addresses this through the device of the mailbox flier, directly addressing the protagonist as an adventurer and providing an ironic self-aware moment to set the appropriately playful mood. This mood is continuous with the wry tone of the parser-narrator throughout the game. Shrapnel on the other hand, begins in a different kind self-awareness, alluding to the founding text of the genre only as a way of indicating an intention to be something else altogether.

> LOOK

West of the house

You are standing in an open field west of a white house with a boarded front door. Towering Carolina pines loom all around this clearing, silhouetted in the dusk; soon it will be night.

Differing from the normally austere language of Zork, the expanded description is simultaneously lyrical and foreboding. From it, Shrapnel proceeds immediately into horror. When the interactor attempts to bypass the boards by moving around the house in either direction (as was the solution in the clearly referenced ancestor text), the protagonist is suddenly set upon and killed by a pack of dogs. "*** You have died. ***" again appears on the screen, this time accompanied as part of what appears to be a standard parser-generated offer to RESTART, RESTORE a saved game, or QUIT?" commonly displayed after any IF ends. While many readers may choose to restart, attempting anything else reveals that, no matter what is typed, RESTART is spelled out on the screen, one letter appearing for each key pressed by the interactor. Not only was the death sudden and unfair, but also any option other than force-terminating the program is a false choice. Inevitably, the reader is back among the Carolina pines, but with a difference.

Three snarling attack dogs fight with one another over the remains of your corpse.

The moment presents two apparent impossibilities. In the narrative, the discourse of realism suggested by the "Carolina pines" is disrupted by a confrontation with the protagonist's corpse. Outside the narrative, what has occurred is a violation of the norms of IF simulation. The RESTART command should wipe the memory of the runtime environment and return the IF text to its initial state. How is the presence of the corpse possible? The moment calls attention to the fact that the RESTART command is itself a convention that may be deliberately broken. The parser has not reset the game but has instead played with the interactor's literacy, in this case a set of assumptions about how code may structure the narrative. While the RESTART command is present in almost all contemporary IF by default and by convention, this initial condition (like any) can be reconfigured or hacked. The corpse reveals that what appeared to be two traversals of the work were in fact continuous; a difference between code and implied code has been opened and then quickly closed again.

Figure 38. Staging IF endings first. Above: Langridge's Bugsy (1986) invites the interactor to "try again" as her first move. Below: Seebach and Lynn's Janitor (2002) begins by displaying a fictitious adventurer type q u i t.

Shrapnel is not the first or the last work to play with the idea of a game stretching across traversals. Priscilla Langridge's Bugsy (1986) is a comedic gangster-themed work of IF that begins with the protagonist (a cartoon rabbit) already mortally wounded. A confidant suggests "a sucker to advise you from a computer keyboard" and promises, "It's no hardship to die in an adventure game. You just get a message saying: END OF GAME: Do you want to try again?" The statement has become a prompt, and at this point the interactor can supply her first input: YES. By comparison, Peter Seebach and Kevin Lynn's Janitor (2002), also begins at the ending, with an animation of the typed input Q U I T appearing on screen as soon as the game begins. Janitor is a meta-fictional IF work in which a janitor must restore the set of a traditional IF adventure quest after it has been completed, much as if he were cleaning an amusement park. Barriers must be fixed; looted treasures must be returned to their places, and so forth. While the work begins with quitting time, the janitor is an after-hours persona who enacts the process of restarting from the point of view of the simulation rather than the typical interactor. This behind-the-scenes representation of IF is also taken in J. D. Berry's When Help Collides (2002), a comedy whose actor is the personification of an interactive fiction help or hint system who must advise players on their games in progress. By comparison, Jonathan Fry's A New Day (1997) uses "an unfinished work of IF" as the setting for a mystery involving the death of the work's author. All of these works begin with the conceit that, like actors in a play, the constituent actors of IF are part of some larger world. The great precedent for this in IF is the Adventure Repository locale in Adventure. Other meta-IF

works reframe interactivity as play-testing, including Neil deMause's Undo (1995), Wesley Osam's Cheater (1996), and Anssi Raisanen's Bugged (2001). Some even feature the direct manipulation of programming, such as William J. Shlaer's Informatory (1998) and Inform School (1999).

In our survey of tense at the command line and how it tends to reveal or conceal the separate self of the interactor, we have seen two consistent strategies by IF artists for breaking the fourth wall: either humor, or the attempt to incorporate an extra frame or level into the diegesis that will contain the violation (or both). The same is true in these examples, where self-conscious humor is the usual response to what we might call breaking the first wall. The first wall is the back curtain, behind which crouches the mechanism of the parser. While this man-behind-the-curtain may usually be addressed directly about the most basic mechanics of the simulation (ABOUT, CREDITS, HELP, RESTART, RESTORE, SAVE, UNDO, QUIT, etc.), drawing further attention to him is generally an invitation to comedy. Indeed, some games disable meta-commands altogether, either to defend choices from being rendered trivial at crucial junctures of the work (you can't UNDO, you have to go back and replay) or to avoid disrupting the work's tone. Jon Ingold's Fail-Safe, for example, preserves the illusion of command line radio transmission almost entirely. It prints bursts of static in response to all traditional meta-commands save one, QUIT, which renders a perfectly diegetic effect before ending the session: "-Click-".

Ingold's approach represents one serious method of treating the meta-commands   ignoring them   but others have woven them into their dierges. Daniel Ravipinto and Star Foster's Slouching Towards Bedlam (2003) in particular makes the acts of saving, restoring, and restarting part of the core fabric of the work. The gothic steampunk IF focuses on the investigation of Bethlehem Hospital administrator Dr. Thomas Xavier into the mysterious case of an incarcerated lunatic named Cleve who is pathologically averse to speaking. As it transpires, the lunatic is a Gnostic cryptographer. While attempting to commune technologically with the divine, he becomes infected with a consciousness-consuming mental virus called the Logos that spreads between humans via glossolalic speech. One of the interesting side-effects of the Logos infection is the way it allows humans to subvert linear time in a fashion much like IF, as Xavier discovers in a written psychiatric interview with Cleve:

The patient has   in his mind   somehow come unstuck in time. He speaks of it as if it were a malleable thing. He mentioned several times in his notes to me that he could 'save' moments, as if in a delaying glass. He kept several of them with him, and 'restored' them as he wished, reliving the past/present/future.

When asked about the 'different' me he replied that he'd tried restoring several times, changing them   seeing different paths that resulted. This, he said, was the best he could find.

I asked him if he had saved a moment from before this all happened, before his 'infection'. Back when he was simply Cleve.

He said he'd 'restarted' from time to time, but that it only took him as far back as his 'new creation'.

Interestingly, the Logos infection is both a mode of consciousness (the ability to experience sequences of non-linear time) and a consciousness (a separate self) that comments on Xavier and the interactor's situations and acts of its own accord.

The dim light glinting off the small badge he wears   James   Assistant

/(livinggrowthfrictionfurtherspreadingoutwardstretchingyestouchingyes)\

  Bethlehem   Hospital

"All right then, sir."

And then he is nodding and returning to his seat, somehow both more and less nervous.

/(yesdoneyes)\

The first strangely runtogethersentence indicates that the Logos has spoken through Xavier's mouth (although the interactor may not yet understand this). This speech in turn infects his assistant James, as it infects every character that Xavier meets for the first time. People react with mildly dazed confusion upon becoming infected, and their symptoms of preoccupied disorientation provide a further diegetic justification for the limits of their simulated abilities as interlocutors (although only a partial justification, due to its slow onset). As the Logos can comment and act, it can also be directly addressed, taking on some of the duties of the parser:

>RESTART

/(?? RESTARTperiodfirstrevisit ??)\

Strangely, however, many of the design conceits of Slouching Towards Bedlam are not taken to their logical conclusion. Basic error messages for parsing and disambiguation are not explained as Logos-related seizures or interruptions, and a host of common meta-verbs are left exposed (ABOUT, CREDITS, HELP, etc.).

>TALK TO JAMES

[Conversation is best done by ASK ABOUT or TELL ABOUT . People can be ordered to do things by , .]

James licks his lips nervously.

>CONFUSE PARSER

That is not a recognized verb.

Although it is an excellent conceit for doing so, in other words, the Logos has not been used to bring the majority of the parser into the diegesis. Instead, it treats one small aspect of the parser thematically    traversal management such as RESTART. This is done through introducing yet another actor, a bifurcation of Xavier's personality with plausible access not just to traversal-time, but to session-time. The Logos weirdly is-and-is-not the parser, constantly forgetting on restart what it yet asserts that the transcendental Xavier-interactor remembers. As Cleve describes in his journal: "I understand all. I (if I can still lay claim to I) have moved through time, backwards and forwards...I have tried every way imaginable to make it not so. Once...once I tried to make it finally so."

In Aisle, extra-diegetic "cheating" is the encouraged mode of reading. Aisle thematizes the process of beginning again, reducing the length of the traversal until almost all interactor knowledge comes from other traversals. In Slouching Towards Bedlam, by contrast, no information from other traversals can be truly extra-diegetic. All restarting and restoring, all outcomes and all explored alternatives are anticipated and explained as part of the experience of the infected Dr. Xavier, whose aggregated experiments playing with the possibilities of his fate become trivially distinct from the experiments of the interactor with the text.

Shrapnel takes a third path, blurring the line between continuity and discontinuity by staging the "beginning again" of a RESTART and carefully managing the result as part of a single simulation traversal. Each of the five brutal death scenes and coerced RESTARTs in the work is a fake, and the bodies pile up as a grim reminder of the interactor attempting to exhaust the fatal logic of the geography. Unlike Slouching Towards Bedlam, Shrapnel controls the progression of various scenarios and uses spatial representation to stage them. Time here is an unstable quality of space, and thus time can be navigated by wandering the grounds and

rooms of Whitman's house. This creates odd effects, such as a door being boarded from outside the house (the future) but open and unboarded from inside the house (the past), and these confusions are exacerbated by the temporal status of each location shifting several times as the exploration progresses. Complicating this representation even further is the odd condition of the unreliable protagonist. "Billy Blake" is actually an alter ego and split personality of William Whitman. The constant uncanny moments in Shrapnel mark Blake's ambivalence, both recognizing and resisting the knowledge that the figure and the family of Whitman are in fact his own. Upon first beginning the work, the disoriented interactor necessarily emulates the willfully ignorant part of Blake / Whitman's multiple personality disorder. Much like Shade, the logic of most of the work (up to the coda) is to resolve this ignorance, forcing the acknowledgment of what Whitman already knows to be the truth.

The truth of William Whitman's past is a terrible place to explore. Whitman is wounded by shrapnel during the Civil War and adopts the persona of dead comrade Blake to cope with the pain, but this persona (racist, sexist, hateful and bullying) spirals into terrible domestic violence: harassing his daughter Ann, abusing and embezzling from his son Junior, brain damaging and then locking away his son Gregory, instigating his son Johnny's suicide by forcing him into the role of Gregory's care-taker, and finally raping his daughter Betty. After Betty's suicide, Whitman's surviving children come together and murder him. Blake / Whitman's multiple personality disorder does explain the interactor's disorientation. It does not explain his status as murdered man reflecting on his own death(s), nor the special state of the world he encounters in Shrapnel — a traumatic dreamwork typified by both condensation and repression. Like Aisle, whose quotidian space becomes the occasion for many excursions into repression-breaching associations and recollections, Shrapnel provides an occasion to excavate and reconstruct history. Unlike the supermarket aisle and shopper, whose possibilities multiply without diegetic explanation, the white house in the Carolina pines has become an occasion for historical excavation for a reason that the work clearly defines. This rationale is a time-travel device that detonated into shrapnel during a Civil War bombardment, fragmenting the future events and possibilities of Whitman's life.

Figure 39. Scenes from Cadre's Shrapnel. Above: An opening interaction, with the parser reinterpreting any input as r e s t a r t. Below: The closing sequence descends into chaos just before the screen goes blank.

Although we witness a glimpse of the temporal accident midway through the work, Shrapnel's rationale arrives mainly as an explanatory coda (to paraphrase: a time-traveler came back to prevent Whitman's wound, but his time machine was wounded by shrapnel instead, destroying Whitman's temporality). This coda is optional, and in either case the true end comes when the parsed description text collapses into a jumble, dissolves into a mass of nonsense letters, and then suddenly terminates. Explaining definitively that this signifies the technologically induced dissolution of time may be an unnecessary elaboration, like many final explanations of many central conceits in fiction. Still, I'd like to use this rationale — the experience of time damaged by the conjunction of war and technology — as the occasion to suggest a context for Shrapnel. The context is a group of works at the intersection of the time-loop and the traumatic dreamwork, particularly works of literature and film. This brief bibliography of temporal trauma begins with Ambrose Bierce's 1890 short story An Occurrence at Owl Creek Bridge, in which Confederate sympathizer Peyton Farquhar is set up and then executed for sabotage, but dreams a fantastic escape in the moment before the rope breaks his neck. While the noose is perhaps not a standout example of technologically mediated trauma, it is the operation of the noose (the physical-temporal distance the rope creates between the act of execution and the fact of death) that creates the pocket of time in which Peyton's hopes and dreams exist. By contrast, Dalton Trumbo's 1938 novel Johnny Got His Gun accommodates the reflective dreamwork within the life support systems that preserve a deaf, blind, mute, and quadriplegic World War I veteran after he is maimed by shelling. In Kurt Vonnegut's 1969 novel Slaughterhouse Five, World War II veteran Billy Pilgrim ascribes his experience of being "unstuck in time" to being kidnapped and incarcerated by the 4-dimensional alien Tralfamadorians, although his incarceration in the titular slaughterhouse during the firebombing of Dresden seems a more likely cause. Like the interrogation chair in the 1985 Terry Gilliam film Brazil, external, unnatural technology creates the occasion for the occupant's special state of mind — an escape into fantasy that can never fully

repress the terrible reality of the situation. Gilliam's 1988 film The Adventures of Baron Munchhausen provides a more specific example of this traumatic techno-dreamwork's specific conjunction with war. In it, a Turkish army bombards an unidentified European city during "The Age of Reason." Bombardment of the city theatre creates the conjunction of elaborate theatrical set technology and disruptive violence necessary to produce the film's immersive dreamscape, a state in which the Baron's audience believes his description of "the many occasions on which I met my death." The 1990 Adrian Lyne film Jacob's Ladder also concerns the dreamwork of a bayoneted U.S. soldier of the Vietnam War, Jacob Singer, whose understanding and eventual acceptance of his life and death is prevented and enabled by "The Ladder," both a metaphor and an experimental military hallucinogen secretly administered to his troop.

There are endless other narrative associations of the dreamwork with technology, from the explorations of the traumatized mind in films like Alejandro Amenábar's Abre los ojos (1997) or Mark Protosevich and Tarsem Singh's The Cell (2000) to the virtual reality fictions of Vernor Vinge, William Gibson, Neal Stephenson, and so forth. For coherence, however, I am focusing on military techno-trauma, especially bombardments, and the purpose of this focus is to provoke general reflection on where the technical representation of disjointed or condensed time usually appears in fiction and to what ends. Although Shrapnel is such a traumatic representation born out of the Civil War, it differs from the works of Bierce, Trumbo, Vonnegut, Gilliam, and Lyne in that the work seems particular to Whitman and his exceptional southern-gothic life, rather than an indictment of the Civil War in general. His shrapnel wound does not ultimately comment on national policies nor reflect shameful histories (such as the state of veteran's hospitals, the fact of the Dresden firebombing, or the controversy over the use of 3-quinuclidinyl benzilate on Vietnam soldiers). Rather than a red badge of courage, Whitman's wound and his method of coping with it are personal and domestic tragedies    or horrors. The subsequent escalation of his wounding into a temporal crisis is not a national narrative, but a senseless accident    a kind of crash that cannot be averted, only understood.

Always rushing, always late: Andrew Pontious's Rematch

Andrew Pontious's Rematch: an interactive repetition (2000) is an IF work whose goal is to avert a personal, senseless accident. Rematch begins in a cavernous pool hall, where pool hall patrons and friends Kurt, Ines, and Nick's playful tension over a game of pool lasts exactly one turn... before being suddenly interrupted by a black SUV crashing through the window. All three friends are instantly killed, but after his death Kurt finds himself constantly restarting, trapped in a cycle of recombinant moments each of which leads up to the fatal accident. Struggling to find an outcome to the scenario that will save the lives of both his friends, Kurt discovers that both the social mores that govern his friendships and the social ecology of the pool hall form two halves of a single Rube-Goldberg-esque message machine. Kurt must construct the first half of this machine through social engineering, whispering a message into Nick's ear to begin a complex process that culminates in a falling ceiling fan that scatters the crowd and averts disaster. As the interactor guides Kurt through the process of discovering an escape, she simultaneously explores Kurt's frustration over his relationships with Nick and with Ines. Rematch's true resolution is simultaneously instrumental, as everyone lives, and philosophical, as Kurt discovers how to understand and accept the hidden codes that underlie his friendships.

Most of my analyses of individual IF works thus far have focused on progress through a work (coming into understanding) rather than the rupture of progress and failure of understanding that is the first experience of many puzzles in IF's puzzle tradition. My investigation of IF understanding has come with a corresponding emphasis on shorter and less difficult (or less 'cruel') IF throughout, reflecting both a contemporary authoring trend and a particular bias of this study towards accessible experiences. Challenging works (e.g. Enlightenment) have been discussed generally for the overall significance of their themes or structures rather than analyzed as puzzles, while in-depth engagements have involved works whose difficulty was either negligible (e.g. Aisle) or relatively low (e.g. Shrapnel). In Rematch, however, we confront true difficulty in IF closely and in its particulars, considering how attention to implied code and the aesthetics of frustration can give us a deeper understanding of difficult IF works.

Rematch begins with Kurt, Nick, and Ines gathered around a pool table. From the opening lines, it is clear that the friends are playing out not only a game, but also their allegiances, rivalries, and desires.

You thought you were such a great pool player.

But Nick has beaten you once tonight already, and Ines is watching him more closely than you would like. So you challenge him to a rematch. "Sure, Kurt!" Nick laughs. "You break."

A description of the pool hall follows, and the interactor is given a single opportunity to interact    perhaps attempting to play pool, make conversation, or simply wander around. As in Aisle, the surrounding environment is rich with a wide variety of interactive possibilities. What happens next, however, is certain. The delicate social dance is interrupted by sudden, gruesome death.

The glass from the front windows disintegrates and sprays like water in all directions as a black SUV explodes into the pool hall. Its wheels locked, it fishtails across the smooth floor tiles.

Nick, the closest to the window, disappears under the vehicle's wheels.

Before you can move, the SUV hits your pool table head-on, crushing Ines into the tabletop with a wet thump.

The pool balls swarm toward your face

- You have lost -

This crash is a violation on several levels. First, the SUV literally violates the space of the pool hall and then the bodies of the crash victims. Second, the crash violates the interactor's initial expectations as a reader about the genre of the work, transforming an intimate character drama into the bloody spectacle of a "wet thump" without warning. Third, the crash violates the interactor's expectations as a player of games and puzzles. The sudden termination of the simulation in loss seems arbitrary and capricious. The approach of the car was not signaled, and if the work was in fact a game that the interactor failed to play, it is not immediately apparent how a better outcome might have been chosen. Such a forced-outcome might be understood as part of an interactive prelude to a larger work, were it not for the fact that the parser makes clear that the work has ended:

You may restore a saved game, start over, quit, undo the current command, or "auto-undo" to undo both this command and always undo at the end of a turn (type ABOUT at any prompt for more information).

Please enter RESTORE, RESTART, QUIT, UNDO, or AUTO: >

By now we have seen the moment of the IF traversal ending staged in a wide variety of ways. Unlike previous works that open with a dramatized death that is in fact part of a sequence (e.g. Bugsy, Shrapnel), Rematch presents a fatal accident that appears to be the actual ending of the traversal. Unlike Slouching Towards Bedlam, which dramatizes the act of restarting as discourse within the pan-temporal consciousness of Xavier and The Logos, in Rematch the parser directly addresses the interactor rather than Kurt ("Please enter") with a set of actually afforded meta-commands. Only the "auto-undo" option is unfamiliar, and its introduction is our first indication of what kind of work Rematch is, although it may take several more turns before this sinks in. As death arrives at the pool table repeatedly and relentlessly over the following several moves, the purpose of AUTO becomes clear. It is a commitment to undo each time without fuss or comment, streamlining the process of acknowledging each new mistake and every nearly-inevitable defeat. Put another way, the AUTO command (issued only once) appears to invest the UNDO command with autonomous, automatic procedural force, like an automaton... or an automobile.

The larger convention violated by the black SUV both before and after being invested with automatic power is the convention against game designs which require "learning-by-death." This common misnomer for learning-by-restart indicates that an interactor has been forced to proceed by trial-and-error, restarting the simulation over and over again in order to discover correct outcomes rather than arriving at those outcomes through successful implications. The interactor of Rematch, who has always already "lost," is initiated from the outset into a world that is deeply unfair.

The measure of this unfairness is epitextual. A page header or banner reading "Beaten once/1" appears before the first interaction turn even begins, referencing the game of pool which Kurt has just lost to Nick. If the interactor chooses to UNDO after the fatal crash, the pre-accident situation is restored, but the banner now reads "Beaten twice/2." 'Beaten' is now a reference not only to pool but also to the scenario of Rematch itself, which has bested the interactor through Kurt's violent death. Subsequent death messages are signaled with the less confrontational and more poetic "You have not broken the cycle." "The cycle" is the process whereby Rematch is read    an oppressive state of constant death and failure which, no matter how often the interactor undoes, always repeats, helpfully iterating the number of times 'beaten' to indicate how often Kurt and the interactor have allowed yet another horrific accident to occur. Like the corpse that greets Shrapnel's restart, this counter is evidence of past failure, and as it grows it quickly becomes overwhelming. The problem at the heart of Rematch is a difficult one, and failures may mount into hundreds of accidents before it is resolved. With between one and three deaths per accident, the sheer weight of being beaten comes to stand for a crushing    or numbing    body count. Rematch is keeping score, and this is our first indication that the code is not in fact reverting to the previous state when it acts to UNDO. The interactor has undone, but the system carries on, tallying Kurt's mounting losses in the cycle.

Rematch is ostensibly a one-move work, and its publication in 2000 after the striking novelty of Sam Barlow's one-move Aisle in 1999 was widely hailed as a further innovation in a similar vein, prompting Duncan Stevens to declare in his SPAG #28 review of Rematch that "we have a new genre on our hands." This sub-genre is defined by technique (one-move structure) rather than by tropes. Rematch is not a one-move work, however. Like Shrapnel, Rematch blurs the line where the traversal ends, disguising continuity as discontinuity. In Rematch this blurring depends on the interactor's initial misunderstanding of the effects of system meta-commands (RESTART, UNDO) in order to create a particular impression (although Shrapnel dramatizes this, while Rematch downplays it). Whereas Aisle ends after a single turn, Rematch refuses to end; it is rather an infinite text, a hidden cyclical process that must be discerned in order for the story to be escaped. Aisle and Rematch might in fact be members of a nascent genre, but if so their commonality is their topical (rather than technical) engagement with the problem of the moment in time through representations of the time-loop    not the same sub-genre, but the same generic trope. Like the uncertain identity of the nameless man in Aisle, and like the unstable persona of Blake in Shrapnel, Kurt's experiences in Rematch are a crisis of socialization, and the disruption of linear time marks both his profound investment in and profound alienation from the people around him. While thematically parallel, there are huge distinctions between how the supposedly similar Aisle and Rematch function technically and unfold experientially. In the code behind the command line, Rematch is actually more like a Shrapnel-in-Aisle's-clothing, constituted not by the abortive parallel engagements of the pasta aisle, but by the ongoing serial nature of the cycle.

Figure 40. The falling flaps of the mechanical-numeric clock-radio come to symbolize the identical initial conditions of each day in Groundhog Day.

Oddly, "the cycle" does not at first appear to be truly cyclical. As the moment of the accident replays and the count rises, events repeat, but never perfectly. Instead, random and seemingly meaningless variations are everywhere    in the background music and the fragments of conversation, in the colors of jackets and the logos on hats, in the arrangement of surrounding tables. At times almost everything seems to vary except the fatal conjunction of Kurt's table and the oncoming car. What is the nature of the cyclical time is depicted in Rematch? It is interesting to compare and contrast time in Rematch with depictions of cyclical time in two films: Groundhog Day (1993) and Lola rennt (1998). In the 1993 Danny Rubin and Harold Ramis film

Groundhog Day, cantankerous and misanthropic weatherman Phil Connors (Bill Murray) finds himself trapped inside a fixed twenty-four hour temporal loop within the snow-locked town of Punxsutawney, Pennsylvania. Regardless of what happens, Phil always regains consciousness a moment before 6:00 am on the same day, in the same hotel room, listening to the same repetitive song on a mechanical-numeric clock radio. Like the mechanism of falling plastic flaps that wakes him each morning, the automatic and perfect sameness of each repetitive day presents Phil with a Victorian clockwork universe. Left to his own existential devices, he masters various causal mechanisms of the world around him and optimizes for various kinds of success, but eventually bores of mastery. Mastery of outcomes is generally easy in the deterministic time-loop of Groundhog Day, whose causality is troubled by neither chaos theory nor the butterfly effect. As all actions are limited to clearly defined reactions, Phil's most bizarre interventions in the morning create few noteworthy surprises for him in the evening. This determinism is part of Punxsutawney's crushing tedium. Floundering for purpose, Phil eventually experiments (among other things) with a series of efficient, dramatic, and totally ineffective suicides. After setting out to win the affections of his coworker Rita within his allotted twenty-four hours, and failing (some lines he finds cannot be crossed, and some social interactions cannot merely be mastered), Phil next turns to a long project of self-improvement and good works that develops eventually into a confrontation with his own nature.

Citing Groundhog Day is quite common in interactive media and games circles, but uses of the work are surprisingly varied. In Hamlet on the Holodeck, Janet Murray describes Groundhog Day as "the most successful attempt to portray alternate realities within a coherent linear story [...] Because of [Phil's] simulation structure, Groundhog Day, though it has none of the shoot-'em'up content of videogames, is as much like a videogame as a linear film can be" (35-36). By contrast, in "The Five Stages of Writing for Interactive" (1999), Noah Falstein wryly appropriates Groundhog Day's structure of stages-of-grieving as a parable for the trauma of linear writers struggling to adapt their craft to writing for 'interactive' [media]. Just as Groundhog Day "shows us what it might be like to live in a program with a bug in its loop termination conditions," the aspiring interactive author experiences choice structures as a disruption of the natural order of narrative, and must learn to cope. This analogy contains a fascinating inversion of Murray's apparently straightforward formula time-loop = game. Just as preconceptions about linear narrative trap an author, and she must struggle in order to achieve full interactive media authorship, so Phil's interactive-media-like structure of experience traps him, and he must struggle to achieve a normal experience of linear time.

There is a commonality in Murray and Falstein's thinking best exemplified by a further contrast with Ken Sanes argument in "More on Groundhog Day" (1998). In it, Sanes wields the film to critique Sherry Turkle's concept of the virtual exploration of many selves. Sanes sees postmodern multiple-identity as a morally vacant, anti-humanist concept, and offers Groundhog Day as an alternate parable of finding the one true self:

The timeless middle of the movie has some of the characteristics of a virtual world in which [Bill] Murray can experiment with alternative ways of living and being. In that, it is like forms of fiction, including imagination. Since he participates in this virtual world, perhaps it is most like participatory fictions    MUDs, video games, virtual realities. The movie similarly seeks to be our timeless interlude in which we can try on different ways of living.

Sherry Turkle [...] sees MUDs or text-based, interactive fictional worlds on the Internet as such a virtual world, allowing one to try on different selves. But she believes that they (and other participatory forms of fiction) allow us to discover that we are many selves, all of which turn out to be fictions. In Turkle's view, life is a kind of game, a form of theater, and the fiction in stories isn't much different than the fiction of life.

I believe the correct conclusion is precisely the opposite: fiction, whether participatory or vicarious, allows us to identify with and play characters who find their true selves, thereby putting us in touch with the universal human nature in each of us.

What kind of cyclical time is Groundhog Day, and how does its representation serve these quite different

positions? Writing in a 1996 class of Janet Murray's on Non-Linear Narrative and Interactive Fiction, Freedom Baird charts the plot arc of Groundhog Day as an engagement with responsibility. Phil's initial reaction to consequence-less experience is to make increasingly irresponsible, meaningless choices, but his choices must become responsible (that is, invested with meaning) before they can become consequential (literally, restored to the flow of time and thus capable of consequence).

Figure 41. Baird traces engagement with responsibility as it fluctuates over the course of Groundhog Day.

Baird's chart suggests a shared term. The strange instability in discussing Groundhog Day has to do with our deepest ambivalences regarding consequential choice. Does simulation obscure and debase meaningful actions, or does it inform and vindicate them? Groundhog Day narrates how simulation-repetition might do both. Phil's progress toward embracing meaningful choices thus serves as a parable for Falstein's ideas of good interactive writing, just as it serves Sanes in his rejection of postmodern proliferation of identity and the alleged arbitrary or meaningless quality of multiple virtual selves. Groundhog Day is a parable about a sandbox simulation that matters    a Bildungsroman of interactivity. The ethical stake in this player's-progress is located differently depending on each critic's sympathies. For simulationists, the Groundhog Day loop is rhetorically potent and inspires growth, validating the potential of simulations. For anti-simulationists, the loop's main significance is that, like childish things, it can be outgrown and put aside. Sanes goes so far as to argue that "[Bill] Murray's character treats his life as a game only when he is in despair," although this is clearly not the case; the final quarter of the movie deals with a visibly hopeful Phil as he daily negotiates his clockwork town with the brisk mastery of an expert player at a well-loved game. But Sanes's misstep reflects a common confusion in the easy slide from speaking of a game (or rule-bounded repeatable scenario) as "a thing of no consequence" to later speaking of a game as "a thing of no significance." Sanes may have meant that Phil treats life as insignificant (having no worth or meaning) while in despair, and this would be true, but it is an observation that should lead us to the film's unique existential position    an ethics of simulation. Phil eventually decides that his actions, while profoundly inconsequential (having no lasting impact), are still significant (i.e. important). Thereafter, Phil plays on, but chooses a serious game. This idea of repetition engagement as a moral discourse will permeate our close interactions with Rematch.

Like Phil, Kurt moves through a deterministic universe in Rematch in which interactions, once known, are repeatable. Unlike Phil, however, this mastery is only quantitative exploration, not qualitative improvement. Phil masters tossing playing cards into a hat (in "about six months"), but no matter how many times Kurt attempts to break the formation of pool balls, the result never changes. Like Phil, Kurt begins as a profoundly isolated individual who becomes further isolated by his knowledge of the past and future. But while Phil moves through the seamless looping of Groundhog Day's clockwork universe alone, and thus must ultimately look into himself to find meaning and significance, Kurt senses in Rematch's jarring retakes the presence of an active, external "hand," which intervenes every time the interactor chooses to UNDO:

You feel a tremendous wrench    the hand of God coming down to wipe clean the temporal chalkboard. Somehow things aren't set up exactly the same as last time....

Kurt's feeling of divine intervention does not indicate the direct action of the interactor, who has not and cannot specify a different "set up." Rather, "the hand" signifies the author, system, or code, which constantly resets the pieces of the simulation, but with a difference.

Figure 42. The cartoon-staircase sequence of Lola rennt (1998) locates the original source of chaos and variation outside the cinematic realism that characterizes the rest of the film.

In the 1998 Tom Tykwer film Lola rennt (a.k.a. Run Lola Run), small-time smuggler Manni loses a bag of one hundred thousand Deutsche Marks on the subway. With twenty minutes before his boss is due to pick up the money, Manni calls his girlfriend Lola for help, leaving her dashing to borrow the money from her banker father and get the money to Manni in time. Unlike the town of Punxsutawny, which soon holds few surprises

for Phil, the Berlin of Lola rennt is a chaotic landscape in which each small change is a new butterfly effect spawning unintended consequences. Lola races the streets three times, each course intricately and increasingly different in its particulars as it progresses. The initial source of variations, strangely, is not Lola herself, who makes an identical decision in all three runs to visit her father's bank. Instead, the camera deviates each time she enters the staircase of her apartment complex, zooming tight to her mother's television screen as it displays a cartoon version of Lola descending stairs only to be confronted by a cartoon man and dog. In each encounter the pair respectively glower at her, trip her, and attempt to block her way, and the outcome of this altercation appears to affect the real Lola who we next see emerge from the bottom of her real stairwell. For both Kurt and Lola variation has an almost mystic origin, located both outside the protagonists' agency and outside the predominant generic discourse of the works (realism). Like Lola, Kurt encounters a world of changes. This world is not chaotic, but it is apparently arbitrary and even hostile in its variety. Unlike Lola, for whom apparently negative variations hold the potential for new positive possibilities, the differences that confront Kurt seem purely oppressive, as they complicate his struggle to discern an alternative to the fatal accident.

An additional complication to locating Kurt in relation to these time-loop films is the knowledge of the protagonists. Where Phil Connors is the only one in Punxsutawney whose consciousness transcends the limits of the repeating Groundhog Day, and he acts in full knowledge of every previous day, Lola's consciousness is bounded by the limits of her allotted twenty-minute run. Only Lola's unconscious has knowledge of her previous runs, and she appears to experience this as a kind of premonition or déjà vu (in the simulation, these are generally topologically equivalent). We might first glimpse an example of this in her more confident second reaction to the cartoon dog (which she attempts to pass without fear, perhaps based on their last encounter), but a more definitive example appears in the second scenario in which she uses a stolen gun to rob her father's bank. In the act of threatening her father, Lola pauses and the camera focuses suddenly on the gun safety, which she calmly disengages, reenacting the instructions Manni gave her during the botched grocery store robbery that ended her previous life.

Kurt's consciousness is both constrained by the operations of time (like Lola, or Billy Blake) and at the same time unconstrained (like Phil Connors or Thomas Xavier). His consciousness is largely trapped within the cycle, where it cannot learn to throw a ball, master the art of persuasion, or effect any of the changes that might be available to someone like Phil Connors. Like Lola's déjà vu, Kurt has paranormal access to information through the interactor and the system, which together serve as his transcendental consciousness. Unlike Lola's moments of unspoken and understated intuition, Kurt's knowledge can surge to the forefront:

TELL NICK AND INES ABOUT SUV

Nick: You tell Nick about the black SUV, but he doesn't believe your crazy story about premonitions and repeated lives.

Ines: You tell Ines about the black SUV, but she says, "C'mon, Kurt, how would you know that?"

[...]

The glass...a black SUV...you watch yourself and Ines and Nick die as if in a dream, as if you've experienced it before.

That Kurt can first describe the SUV crash and then die with a dull, detached recognition as if he has experienced it before is a sign of the difficult balancing act Rematch is attempting to maintain, not always successfully. At stake is Kurt's relationship to the time-loop and the cycle, which the interactor eventually realizes are not in fact the same.

The key is variation. Variation in the pool hall is also an implicit challenge to both Kurt and the interactor: a

game is afoot, and may be won if properly understood. The trick is in discerning significance. Rematch is extremely verbose, and the transcript is awash with incidental details that seem immaterial to the survival of Kurt and his friends. Conversational patter fills the air, different music plays across loudspeaker in the background, and the numbering tables constantly shift each time we UNDO. One man wears a different sports cap each time. Ines's jacket and cell phone cycle through a variety of colors. Rematch exists within the possibility space of these variables, but unlike any of the examples considered thus far these examples also precede the work. The causes of these differences (wearing a hat or buying a phone) should precede not only the moment of the accident but also the entire evening. Unlike Groundhog Day, this is not a deterministically invariant world, but neither is it a chaotic butterfly effect world, in which rooting for a different team or buying a different phone in the past should lead to a significantly different present    in particular, one without the accident. Instead, we experience a set of closely parallel universes appearing together, either joined by the inexorable approach of a black SUV or perhaps (as in Shrapnel) fragmented apart around the event of its impact. At the center of this impact is Kurt, a possibility-hopping protagonist whose only distinguishing feature on self-examination is "the indistinct, mismatched demeanor and apparel of someone who's not quite sure if he's in the right lifetime."

While not deterministic or chaotic, neither is Rematch totally random nor exhaustively combinatorial. Instead, a sequence of nine variations is signaled as the interactor's session progresses via Kurt's increasingly algorithmic sense of déjà vu, as seen here in his 47th attempt to prevent the accident:

Somehow things aren't set up exactly the same as last time....

...though you do feel a sense of déjà vu to the initial surroundings 9 and 18 and 27 (and so on) turns ago.

At Pool Table 82 Beaten forty-five times/2

Of millions of potential scenarios, only nine are randomly generated at the beginning of each session, and these nine are then repeated in sequence for the duration of interactions    not a time-loop, but a cycle of loops. While Kurt's growing certainty that the period of the cycle is nine appears as diegetic déjà vu, the "/2" is an extradiegetic address to the interactor that indicates the step in that sequence. In this case, the situation is identical to the second crash ever experienced. This is the true "cycle," and it is discernible to the interactor by careful observation, but also directly perceived and reported on by Kurt. This excessively particular description "9 and 18 and 27" strikes me as an error of style on Rematch's part. The text doesn't provide much more information than if Kurt were to recall seeing a similar detail "about nine accidents ago," but the precise tone stretches an already thin fiction about Kurt's remarkable memory, making the text instead appear as what it is: no part of Kurt, but rather an emanation from the code. Regardless of whether it is implied in too heavy-handed a fashion or not, understanding this period of repetition is crucial to breaking the true cycle. Where Shrapnel purports to RESTART (yet obviously does not), Rematch pretends to UNDO (that is, restore the state of the previous turn), then describes itself as randomizing ("things aren't set up exactly the same"), and finally reveals itself as sequencing a continuous traversal (through "a sense of déjà vu"). The actual work situates itself halfway between a pure determinism and pure change. In Rematch, the hand of God does "play dice" for a time, but it leaves off so that Kurt may study the throws, predict the next outcome, and successfully intervene.

Rematch and the cavernous story space

Before discussing either how the problem of random complexity is resolved in Rematch or the significance of that resolution, let's consider how this complexity is aesthetically accommodated by the design and description of the work. Consider the introductory description: a largely non-random passage which, like the challenge with Nick, appears only in the annex of time before the first interaction and crash, but which can be consulted thereafter via LOOK:

At Pool Table 84

You are in a cavernous pool hall.

Around you through the gloom, the walls and rusted pipes are caked with faded gray paint. Scuffed black and white floor tiles remind you of a disused old barber shop. The fans overhead resemble buttons on a giant's overcoat, trim except for one to the south which wobbles on a loose thread.

Your peers, the youth of the city, with their sleek attire, bright expressions, and sharp caws of laughter, flitter in and out of the dim cones of light illuminating the pool tables that encircle yours in almost every direction.

The vast pool hall resembles a purgatory for young singles, perhaps foreshadowing the purgation-like experience that Kurt will soon enter. By now, we are also attuned to the description "cavernous" as surely referencing the Colossal Cave. This opening homage to Adventure indicates that Rematch is situating itself in IF traditions. While setting this traditionally appropriate tone, the cavernous nature of the pool hall also reinforces the structural design of the work, for the work randomizes a crucial location within an extremely large set of pool tables that the correspondingly cavernous hall must therefore contain. As such, the word "cavernous" marks the place where realism is first undermined and then re-inscribed. Permit a bit of back-of-the-napkin math illustrating this connection: using the smallest regulation pool table (3.5' x 7') and adding a small buffer for play around it (3' on a side), two-hundred tables could be tightly packed into an otherwise empty 180' x 130' room. The pool hall is thus slightly smaller than half an American football field, although we know from the description and arrangement of several table-less areas that the floor plan is certainly bigger than this minimum size. Cavernous indeed. This abundance of tables provides for an impressive range of numerical reconfigurations, and thus serve as a disincentive to trial-and-error attempts to "break the cycle" by referencing tables at random, creating a challenge that a nine-table pool hall could not. This disincentive reinforces the sense of Rematch as a puzzle design. Only intelligent insights (rather than exhaustive explorations) will lead to escape.

Figure 43. Rematch's conceptual geography. Kurt's table name is randomly chosen out of twenty, yet is always nearest the path of the oncoming SUV, just as the confused patron's table is always located by the fan controls.

One might argue that the mere word "cavernous" has very little to do with the design or the experience of Rematch. Unlike most visual / spatial simulation systems, textual simulations have no strict need to reconcile such measures and spaces. The hall could be described in scriptons as "tiny" while code randomizes the texton numbers of ten thousand pool tables, and the process of interrogating and solving Rematch would remain structurally the same. This is true. In fact, the vast scope or scale of pool tables in the cavernous hall probably do not register with most Rematch interactors, at least not to the extent of equating it to a football field. If Rematch doesn't feel vast, what is the point of expounding on its vastness? What is important I would argue is the very possibility of this gap in IF between how the prose evokes the concept of the cavernous (e.g. do pool halls this big even exist?) and how the simulation code conveys the experience of the cavernous (e.g. are actions such as observing, throwing, yelling, and so forth credible in the space as described, are imaginable actions afforded, and are afforded actions imaginable?). Taken together, these twin representations of the pool hall determine the work's relationship to mimetic realism or abstract impressionism. Whether as concrete as the supermarket of Aisle or as shifting as the dreamscape of Shrapnel, any representation of space is important to the extent that it allows the interactor to imagine and assert appropriate events at the command line.

Semiotic simulation creates the possibility of an evocatively huge and systematically huge space that is then examined and interacted with in the mode of a comfortably intimate realism. Kurt, Nick and Ines interact casually with an intricate expanse that extends out around them in all directions because its extent only represents one kind of difficulty (Kurt's formal struggle with meaning) but not another (the group's ease and comfort in the space, which renders the accident more appalling). This special screening effect is beyond the

power of 2D and 3D graphical representations, in which the depiction of a cavernous space simultaneously frames the experience of perception / interaction in that space. Space in Rematch can be mapped literally indeed, to a certain degree it must be    but it also has a literal (that is, linguistic) essence separate from any possible quantitative representation.

Take for example the two hundred pool tables. Regardless of what table Kurt find's himself at (and the number constantly changes) he always finds himself in the center section of the hall (tables 81-100), with the eight other sections of the hall arranged around him according to the cardinal and ordinal directions of the traditional IF compass rose. Kurt has one turn in which to navigate within this rough-grained, nine-section grid. Other than being randomized, the arrangement of tables within this grid is neither addressable by the interactor nor apparently modeled by the system. Yet no matter which number table out of twenty Kurt cycles through, that table is always closest to the south windows and thus always in the path of the crashing SUV. It is almost impossible to reconcile this outcome with a numerically fixed floor plan in which Kurt finds himself at different tables. Similarly, out of one hundred tables in the southwest section of the hall, the confused patron is always at a different table, yet inevitably by the wall-mounted fan control panel. It is very difficult to provide a floor plan such that one hundred tables (all visible to Kurt) are all conveniently located by a wall, let alone the same panel; one is tempted to call it impossible.

How are we as interactors to visualize this cavernous space? Should we visualize it at all? In order to make sense of the events that transpire, we must assume a relatively fixed floor plan. This in turn requires that we reconcile the transcript's constantly shifting table numbers by imagining a bizarrely haphazard sequence of alternate table numbering schemes applied to that fixed floor plan across the various realities in which Kurt appears at the same (renamed) physical position. Kurt's table, by any other name, is always closest to the window, and thus is always hit by the SUV    that is its transcendental nature.

Rematch and parallel language games

My goal in drawing out the difficulty of visualizing, mapping, or generally orienting ourselves to Rematch's representations is not to argue that the space of Rematch is either flawed as a simulation or imperfectly realist as a narrative (although certainly there are other design choices which could close this gap). Rather, interacting closely with Rematch reveals that the work makes its own kind of sense. Like Shade's potted plant   be it hyacinth, spider-plant, palm, or cactus    some aspects of Kurt's world have consistent identities in code that are distinct from their names. These logical essences are based in what they do, not what they are called. Rematch is an economy of references. In this language game, incidentals (jacket colors, table numbers) are constantly reshuffled by a hidden hand, yet the underlying relationships between those relabeled surfaces remain fixed. The laws of temporal flux in which Kurt finds himself trapped resemble the laws of the TADS source code with which Rematch was written    a collection of objects shuffling their names but not their properties.

Figure 44. Logic of the pool hall as a single-pole, double-throw switch: The loudmouth's message might be redirected from the northwest tables to the southwest fan controls.

This name shuffling has two primary significances for our close interacting. First, it reflects a general functionalist worldview, and is thus crucial to the solution to the problem of the pool hall accident. Second, it serves as a specific parable for Kurt's emotional frustrations, and is thus crucial to the meaning of the work. Beginning with an exploration of the pool hall reveals a basic circuit of social communication resembling a switch. By the bathrooms, a loudmouthed customer bellows numerically-loaded phrases. These appear to have an unusual unintended effect:

The girl behind the counter squeals and sniggers with her bearlike boyfriend.

Upon hearing an explosive "4!" from the north, the girl gives a little start and turns on the microphone to say

in a bored monotone, "Table 4, table 4, your time is up, please bring your equipment to the counter." Then, with a dreamy smile, she turns back to her boyfriend.

In response, you see a commotion at the pool tables numbered 1-20 to the northwest and, curiously enough, at the pool tables numbered 101-200 to the west.

The narrator apparently disapproves of the attendant's romantic preoccupations. This is not entirely without cause, as the attendant's distraction leaves her an impressionable automaton or message-passer. Prompted by whatever number the loudmouth yells, she recalls the corresponding table, directing the occupants to cease playing pool before their allotted time has expired. This leads to a commotion in the northwest, the first position of the metaphoric 'switch' where the message grounds out and customers are unjustly recalled early. A second, potential position is indicated by a simultaneous commotion in the southwest, where another angry customer mishears the recalled number, but is reassured by a friend... just in time to avert him smashing his pool cue into the ceiling fan controls. These controls are significant. An unsteady ceiling fan hangs along the path of the incoming SUV, and disrupting it might cause the disturbance needed to rout Kurt's group and save them from the accident. There are many ways to attempt to affect the fan, either directly or via the panel, via the customer, via the attendant, and so forth. All of these possibilities have been disallowed. As with a Rube Goldberg machine, in which only the crowing of a rooster can (eventually) butter the toast, the only way to drop the fan will be to prompt the loudmouth with a number and watch the logic of the pool hall work itself out. Only the unjust recall of the angry customer's table can affect the fan, so the message content must be the number of that customer's table number. Unfortunately, there is no way for Kurt to both investigate the number and pass it on during his allotted span of time. Only through learning and recording the steps of the cycle can the number later be 'foreseen' and its recurrence acted upon. Once Kurt has mastered the recurrent future of the cycle, all that remains is for him to transmit the correct number to the loudmouth. As it turns out, one person has both the instrument (a desk calendar with numbered pages) and the means (a strong throwing arm) of transmitting this number: Ines.

It is thematically significant that the pool-hall's communication system is misfiring due to the romantic relationship of the attendant. Just as the shifting namespace of the landscape reflects the operations of the underlying code, so too it seems to echo the shape of Kurt's relationships to Nick and Ines. Kurt, having failed either to best Nick or to woo Ines, finds himself clinging to the dwindling hope that there are social means of achieving his dreams. Yet small talk and banter seem to lie on the surface of the deep structures of his already-determined and immutable relationships. Verbal sparring and conversational antics cannot prevent the growing intimacy between Nick and Ines, nor can they reverse Kurt's inevitable drift into the position of third wheel. Social interactions become mere surface details, whose superficial content (what specific words are whispered, which specific dares are exchanged, etc.) belies the deeper meanings that Kurt can discern but feels powerless to alter.

Kurt's imprisonment in the cycle, in other words, is only the overt form of constraint that makes up this work's frustration aesthetics. While the external oppression of the cycle limits him as harshly as the protagonists of other works when they are crazed, drugged, enchanted and so forth, Kurt's frustrated functionalist goal (the inability to save the lives of his social circle) is an intensified form of his earlier frustrated emotional goal (his inability to feel significant or meaningful within his social circle). The process of the cycle amplifies Kurt's pre-existing sense of alienation from before and outside the cycle, introducing a further set of social alienations familiar to time travelers: having one's past interactions constantly forgotten, having one's credibility discounted, and so forth. Yet if the cycle hurts Kurt, it also helps him, because it rationalizes Kurt's feelings, both in the sense of making them justified (he is, in fact, objectively trapped in an unfair situation) and in the sense of making them logically tractable (becoming worthwhile is now an objective problem of life and death rather than a subjective problem of popularity). In this sense, the SUV's violation, while horrific, is a welcome shift away from the un-winnable social drama around the pool table. Where his intractable interpersonal problems were almost beyond words, here they are reframed in terms of functional causality. Like a Newtonian physics problem, or like the toy-physics problems of the pool table, the question concerns

the proper application of forces necessary to displace three bodies in space. Most importantly, Kurt's desire to win a rematch is at last ennobled by virtue of his new situation. While initially wanting to influence his peers in order to gain their love and respect, his hope is transmuted by the presence of dire emergency into needing to manipulate them in order to save their lives.

Yet this life-and-death context does not reveal to Kurt the triviality of his previous social problems. Rather, it reinforces and legitimates his preexisting frustrations with his friends. Their intricate social interactions and precious languages games, which normally mark their superiority in what Kurt describes as "this swirling menagerie of life" are revealed in the shadow of the crash to be mere obstructions when plain talk and simple actions are required, counting for little except to commit them to their deaths. Just as the nature of the pool hall is such that Kurt is always at the table where he dies, the natures of his friendships are such that he cannot lead his friends to safety    at least, not directly.

Figure 45. Communication relationships in Rematch. Kurt's commands are interdicted by either direct refusal (gaps) or indirect refusal (dashes). The correct solution is for Kurt to WHISPER to Nick that he should DARE Ines to take some action.

How do these friendships work? Rematch constantly demonstrates possibilities for social interaction as part of its varied background chatter, and these include four major methods of communication between the friends: TELL, ASK, WHISPER, and DARE. Rematch already allows the interactor to suggest complex actions, e.g. THROW YOUR CUE STICK AND NICK'S CUE STICK AT THE CEILING FAN. Communicating in Rematch allows Kurt to raise topics and ask questions, but it also allows him to suggest complex actions to his friends, including message passing. This results in some of the most complex utterances yet supported by any IF parser. Unfortunately, whether orders, challenges, or polite requests, these command lines are usually refused. Part of the reason for this is the immutable character that underlies each friend's varied antics. Ines is innately contrary and standoffish, but quick to take a dare, while Nick is innately too proud to be ordered or dared, but responds to both polite requests and whispered secrets. What further complicates this situation is the dynamic introduced by their imminent romance. Ines will not respond now even to dares from Kurt, or indeed to any idea originating from him whatsoever:

> ASK NICK TO DARE INES TO THROW THE EIGHT BALL AT THE CEILING FAN

"Well, since you asked nicely...." he says, thinking about it. Nick turns to Ines and dares her, "Throw the eight ball at the wobbling ceiling fan."

Ines wavers, watching Nick closely. Following a dare from you, albeit indirectly, apparently will cost her some standing in Nick's eyes. "Nah," she tells you finally. "Sorry."

From an emotional standpoint, this is a blow to Kurt, both as a judgment on him and an exclusion from dares as a form of intimacy. Indeed, part of Kurt's freedom to act throughout the cycle stems from the fact that Nick and Ines are periodically asking and daring each other to do things but leaving him to his own devices. From a functionalist standpoint, this exclusion is not a slight but a crisis. Kurt is physically ineffectual and Nick is injured, so only Ines has the throwing arm to propel Kurt's signal into the circuit of the pool hall. Unable to act on his own, Ines is the body through which Kurt can find agency. Yet she will have nothing to do with him, and so dooms them to death.

As with the pool hall, romantic distractions at Kurt's table engender broken communications. Romance is in fact killing him. As with the pool hall, the workaround is indirection. Kurt can WHISPER to Nick that he should DARE Ines to pass the proper message to the loudmouth. This move effectively conceals his involvement, thus allowing Ines to act on the dare without losing face. This parallel solution joins the two indirect message systems into one large system    a circular signal that loops around the pool hall before bringing the fan down and dispersing the potential accident victims. It is an impossibly intricate solution to an

intractable situation.

> WHISPER TO NICK, DARE INES TO HIT THE LOUDMOUTH WITH PAGE 164 WITH CUE BALL

You whisper your idea into Nick's ear without Ines noticing. "Okay...." he says, thinking about it. Nick turns to Ines and dares her, "Throw page 164, 'Lone Ranger in bathroom as music starts' at the loudmouth with the cue ball."

"You dare me, eh?" she baits him.

"I double dare you," he counters.

Figure 46. Logic of the solution as a loop. Once the switch is thrown, the message circulates, beginning at the pool table and eventually returning there.

Both the apparently arbitrary nature of naming in the cycle and the apparently unproductive nature of social interaction are in the end part of the puzzle of Rematch. Like the shopper of Aisle whose positive outcomes were generally social interactions (FIND CLARE, ASK WOMAN ABOUT NAME) rather than physical actions, Kurt comes to understand both the pool hall and his social circle not as physics problems, but as language games that he alone can learn to play, and his quest for words of power culminates in discovering a speech act that can actually do something, changing the course of life around him. The final resolution is the closed circuit, a Rube Goldberg machine indeed: Nick is prompted, Ines is dared, the number is chosen and a ball is used to throw it, the loudmouth exclaims, the attendant mis-recalls that table number, the angry customer strikes the fan controls, and at last the fan falls, scattering Kurt's table before the accident hits (see Appendix A: Rematch, the final move).

Rematch beyond the "wet thump" of endings

With the black SUV avoided, Kurt's triumph culminates in a final exchange among the three friends.

Nick whoops. "Ines, you saved us!"

Ines looks a little stunned. "Did I?"

"Yes!" Nick assures her. He kisses her fiercely. "You saved us all! Kurt, isn't that great?"

"But she didn't  " you begin.

Ines and Nick, flush and happy, turn to you.

You pause. There won't be any way to redo this moment.

"Nothing," you say slowly. "I'm glad everybody's safe."

"I'm glad too," Ines says quietly, smiles at you, and takes Nick's hand.

---- You have finally broken the cycle ----

That Kurt is at last truly released is signaled by the AUTO command failing to restart the simulation although the curious or perverse interactor can always choose to re-enter the cycle after it has been broken. Perhaps unsurprisingly, Kurt's intellectual progress in overcoming the accident is paralleled by the progress in emotional maturity that finally enables him to accept his friends' budding relationship. It is in fact quite

possible that this second progress is the true accomplishment that stills the "hand of God." Just as the lost pool game ("Beaten once") and Nick's invitation to break was the true initiation into the cycle that preceded the first accident, so this quiet exchange with his friends may be the true cycle-breaking event, a change of heart not unlike the moment that releases Coleridge's ancient mariner from his curse in The Rime of the Ancient Mariner (1798):

O happy living things! no tongue

Their beauty might declare:

A spring of love gushed from my heart,

And I blessed them unaware:

Sure my kind saint took pity on me,

And I blessed them unaware.

While the final passage demonstrates that Kurt has made progress both intellectually and emotionally, the mechanism for the interactor tracing and reenacting this second, emotional progress is not as clear, and the outcome ("you pause") is both automatic and considerably more guarded and ambivalent than the mariner's blessings. It may be that incidental exposure to his friends' foibles over several hundred repetitions has prepared Kurt to appreciate them as individuals and release them to their own fates. On the other hand, it may also be that the act of diagramming the limits of their social communications has prepared Kurt to accept the fact that he can only relate to Ines indirectly through Nick. If so, the interactor implicitly accepts this lesson by solving the puzzle of the game using a whisper. This act of whispering comes to stand for Kurt's assuming his place willingly, forsaking the role of hero, and realizing that he doesn't need to overcome Nick or win anything. It is the end of agon, and what matters is that everyone is safe.

There is a dark side to this reading, however. If Kurt's familiarity with Nick and Ines may have bred acceptance, that familiarity may also have bred contempt. This interpretation is grounded in part in the fact that Rematch's resolution is fundamentally manipulative. Where other deterministic works such as Groundhog Day address the potentials of manipulation in the middle act but ultimately dismiss them as cheapening the human spirit, Rematch elevates manipulation to an art, and it is difficult not to be a bit troubled by how Nick and Ines are reduced to mechanisms in the service of that process. Other reservations about Kurt's metamorphosis are grounded in the many failed outcomes of Rematch and the portrait they paint of his friends, particularly how they comport themselves as accident survivors and as collaborators.

Most accidents in Rematch are of two types: either the normal triple-manslaughter that proceeds so long as the three main characters remain at their table, or the death of Nick and Ines, which Kurt witnesses if he explores in any direction other than the south. Just as the death of Manni in the second scenario of Lola rennt restarts the time-loop despite the ongoing survival of nominal protagonist Lola, Kurt's survival as the protagonist is not enough to escape the time-loop because the crisis is not about individual success, but about maintaining relationships    Kurt, Ines, and Nick must all survive.

The detached "you watch yourself" notwithstanding, Rematch is consistently narrated in the second person from Kurt's limited point of view. The best examples of this limited viewpoint is "The pool balls swarm toward your face  " an almost cinematic sentence whose interruption usually signals Kurt's first of many deaths. Likewise, Kurt is interrupted after walking towards the window as the SUV approaches.

> WALK SOUTH

Right by the front, you are crushed immediately, and so you don't survive long enough to see your friends die.

His limited viewpoint combined with the fact that Kurt can only push a friend to safety by being killed himself means that we normally get only the briefest glimpses of Ines and Nick as survivors. Yet what we do see is very revealing. After Kurt's pleading and prognosticating fails to alter the triple-manslaughter, a more direct approaching brings limited success. "PUSH NICK NORTH" for example leaves Nick on the sidelines of the accident, shouting, "My God, Ines, get out of there!" as both Kurt and Ines suffer their usual fate. Nick's callous priorities are unsurprising, if perhaps a little hurtful to the martyr who saved him. Yet there is one exception, a moment at which Kurt sees and hears beyond death.

> PUSH NICK AND INES NORTH

[...]

Nick shouts out, "My God, Kurt, get out of there!"

Ines says, "Kurt, no!"

Before you can move, the SUV hits your pool table head-on, crushing you into the tabletop with a wet thump.

Ines cries, "Kurt! My God, Kurt!" She turns to Nick. "He sacrificed himself to save us!"

A little grudgingly, Nick says, "He was a great guy."

"I...I love him," Ines says. "I didn't realize it, but I do." She bursts into tears, and Nick comforts her.

While neither push breaks the cycle, the second push breaks the narrator. Who listens in on Nick and Ines after Kurt has been reduced to this "wet thump"? While this wet thump might differ from the multitude of others in Rematch by leaving Kurt lying wounded, this seems unlikely. The couple's behavior at his martyring makes it seem even more unlikely, as the scene looks strikingly like the fulfillment of Kurt's deepest fantasies. Ines declares her love for Kurt, while Nick is shamed into showing Kurt respect. Out of all possible worlds, this is the world where he has finally, irrevocably won. The scene might be legitimately glimpsed in Kurt's last moments. Alternately, it may be the slip of an unreliable narrator, indicating that Kurt controls more of Rematch than he is letting on. In either case this victory scene is the other desire of Rematch, a desire best articulated in Kurt's contemplation of Nick.

> EXAMINE NICK

You've been rivals with him since high school: for grades, for friends, for social status    and for dates. He's always been taller, more ruggedly handsome than you, more wise and cunning    this pool hall, this swirling menagerie of life, has always been more his arena than yours. But you came anyway, even though you're bound to lose, again and again, out of some perverse, weatherbeaten weed of hope yet to be uprooted.

Yet although Kurt's hope has improbably been fulfilled in winning Ines's love, the victory is pyrrhic. Here, too, the inevitable logic of Kurt's social world plays itself out. As a martyr, all he can accomplish is to lead his friends literally into each other's arms. Kurt's posthumous glimpse or imagining of Nick and Ines further reconfirms his hostility and contempt towards them: the normally polite Nick's grudging manner reveals that he remains an entrenched rival even when owing his life, while the normally tough and self-possessed Ines is apparently revealed in her shock as something of a changeable flake. Certainly her dramatic declaration of love is hard to reconcile with the comprehensive and systematic knowledge of her disinterest that Kurt has and will acquire. There is a fine line between acceptance of his friends and indictment of them, and in the context of the martyr ending it is hard to know just where Kurt's final emotional victory stands.

If surviving the accident does not show Nick and Ines in their best lights, their roles as his message-collaborators are significantly more damning. In the victorious conclusion, Kurt secretly tells Nick (apropos of nothing) to dare Ines to pelt a random stranger with a particular significant number. Moments later, a fan falls, and lives are saved. Can Nick perceive the causal connections between Ines's throwing and the fan falling? That is, does he notice that number Kurt suggested is yelled, then rebroadcast, then reacted to across the room? It would not be strange if Nick could not perceive these connections. The only reason that the interactor-as-Kurt understands them is because she has explored the hall in parallel timelines, witnessed its patterns at painstaking length, and learned to read its relationships via the cycle. Yet, at the conclusion, the specificity of Kurt's request and Nick's participation in the chain has apparently also prepared Nick to track the number as it passes around the room. Unless Nick has perceived the number in transit, his statement that Ines "saved" everyone is bizarre. How could pelting a loudmouth affect a car crash? In order to make his claim, Nick must understand its basis, which means that he must also know that Kurt is the source of his salvation. Nevertheless, Nick chooses to suppress this knowledge because it does not suit his romantic purposes.

It may seem vindictive to argue that Nick willfully misunderstands and ignores Kurt's solution. One of the joys of Rematch, however, is that we can test this hypothesis by recruiting Nick and Ines to pass a different message that they are less satisfied with    for example, triggering the premature recall of their own pool game:

The girl behind the counter to the southeast gives a little start and turns on the microphone to say in a bored monotone, "Table 81, table 81, your time is up, please bring your equipment to the counter." Then, with a dreamy smile, she turns back to her boyfriend.

"Kurt, why'd you do that?" Nick demands.

"Yeah, that's our table," Ines adds. "Now we have to stop playing."

The glass...a black SUV...

Ironically, instigating the recall of Kurt's own table should save the group by removing them from their situation. Uncovering this outcome makes the true ending seem deeply ironic. Due to the secrecy required while asking Ines for help, Nick holds the secret of what Kurt asked him to say. When the outcome is bad, he immediately reveals Kurt's involvement and Ines joins him in blaming Kurt for the loss of the table; while they are objecting, they die. When the outcome is good, however, Nick conveniently forgets Kurt's involvement, and his crediting Ines as a hero becomes yet another move in their coalescing courtship dance. In fact, as in the martyr ending, Kurt's heroism becomes the pretext for their first embrace. Nick moves boldly to declare Ines the hero, disclaiming his own role as a way of neatly snipping Kurt out of the relationship at the site of their shared secret. He has enabled Kurt to communicate with Ines for the moment of the cycle, but that moment is now over. Ines, for her part, is "stunned" and uncharacteristically pliant in accepting Nick's assertion. She either doesn't know what Nick is talking about or knows better, but regardless she accepts whatever story is his pretext for their romance. Ines and Nick turn to face a bright future together, willfully blind to Kurt's preternatural intuition and the tenuous causal chain that has saved their lives.

I'm left fascinated and deeply uncomfortable with Kurt's experience after it concludes. If the basis of the car accident cycle is displaced aggression    a kind of passive revenge fantasy in which the fools who wouldn't listen must sadly get what they deserve    then the victory outcome is perhaps an incomplete transcendence of that fantasy. It can only resolve such that Kurt goes on as a secret hero, a kind of gentler version of the dead martyr outcome. It is also hard not to be suspicious of Kurt's newly gained perspective and transcendence of pettiness, given that his scrupulously maintained mental count (e.g. "Beaten 136 times") is always an amalgam of petty loss with brutal death (1 pool game lost + 135 fatal accidents). This speaks to a certain inherent lack of perspective that the mere fact of victory cannot entirely erase. Yet I'm also aware that my

close interaction has strongly privileged some interactions over others, in particular omitting most of the rich texture of Nick and Ines as they bustle about within the cycle. They are aggravating, yet charming as well. That these are not simple people or relationships is evident, and the interactor with the courage to stand in the headlights and simply chat with Kurt's friends may come to appreciate them. Part of the triumph of Rematch is that the work has evoked such moral anxiety in me: has Kurt has failed to achieve his potential, eking a cheap moral superiority out of what could be a deep reconciliation? He has broken the cycle, but what can such a break mean?

Rematch rewards the exploration of some such questions, and this is one of them. The ending takes on special poignancy if the interactor actually attempts to play on, ignoring the oncoming SUV and accepting Nick's rematch invitation to 'break'.

> BREAK

First, you take your cuestick. Then, nervous, you don't put enough force behind your shot, and you merely graze the foremost pool ball. The formation barely trembles.

"Aw," Ines says, "You'll do better next time!"

Yet Kurt never does better next time, neither in the world in which he is immediately killed nor in the world beyond the cycle where everyone is okay. No matter how many times he breaks, the formation barely trembles. The racked table is a perfect metaphor for his situation    three balls at the center of a tightly packed formation, waiting for Kurt's turn to pass so that the onrushing impact can blow them apart. In victory, as in defeat, the pool balls will be scattered    and not by Kurt. An open question is whether breaking the cycle has successfully split the three friends up, or, alternately, has successfully allowed them to remain together.

Appendix A: Rematch, the final move

The solution to Rematch uses possibly the most complex parsed command in IF to date. One of the striking things about this solution is that the text is itself dynamically generated as a long series of actions computed. For the interactor, the first half of the passage is a tour de force of previously explored affordances in the simulated environment, while the text unique to this particular outcome begins around "smacks the ceiling fan controls." Because text is generated as each action is resolved, the language has heavy artifacts typical of generators    most strikingly, the constant repetition of full names rather than short names or pronouns.

> WHISPER TO NICK, DARE INES TO HIT LOUDMOUTH WITH PAGE 164 WITH CUE BALL

You whisper your idea into Nick's ear without Ines noticing. "Okay...." he says, thinking about it. Nick turns to Ines and dares her, "Throw page 164, 'Lone Ranger in bathroom as music starts' at the loudmouth with the cue ball."

"You dare me, eh?" she baits him.

"I double dare you," he counters.

"Well, if you put it that way..." she drawls. First, Ines takes Ines's Far Side calendar out of Ines's knapsack. Then, Ines rips page 164, 'Lone Ranger in bathroom as music starts' from Ines's Far Side calendar. Then, "I'm only doing this because you dared me," Ines grumbles to Nick. "This is a collectible."

First, Ines takes the cue ball. Then, Ines wraps page 164, 'Lone Ranger in bathroom as music starts' around the cue ball carefully. Ines winds up and pitches it at the loudmouth. It plunges into the loudmouth's stomach    a direct hit!

The paper comes off and flutters in the air as the ball drops to the floor. The loudmouth snatches it, uncurls it, reads it, and hollers, "Page 164, 'Lone Ranger in bathroom as music starts', the best Far Side cartoon of all time?!?"

The girl behind the counter to the southeast gives a little start and turns on the microphone to say in a bored monotone, "Table 164, table 164, your time is up, please bring your equipment to the counter." Then, with a dreamy smile, she turns back to her boyfriend.

One of the people at table 164 grasps a cuestick as if to smash against the nearest surface (in this case, the wall dangerously close to what looks like the control panel for the ceiling fans) and exclaims, "Aw, damn it, we just started!"

When no one responds, slam! the cuestick smacks the ceiling fan controls, turning them all off.

Most of the fans slow down gradually, but the one directly to the south, which had a severe wobble to begin with, begins to keen.

Before anyone can react, it wrenches itself off its mooring and plummets to the empty space in front of the windows with a resounding crash. Ines and Nick scramble into other parts of the hall to avoid flying fragments of plastic and metal. The entire pool hall stops and gapes at the spectacle.

The glass from the front windows disintegrates and sprays like water in all directions as a black SUV explodes into the pool hall. It crunches over the ruined ceiling fan.

Nick shouts out, "My God, Kurt, get out of there!"

Ines says, "Kurt, get away from the table!"

Forewarned, you scramble away from the table before the SUV hits it, head-on, spraying pool balls like spittle farther into the hall, before lurching to a stop.

"Oh my God," Ines exclaims as she picks herself up off the floor. "Are you both all right?"

Nick nods, as do you. Ines hugs you both. You survey the damage.

The driver is still sitting wide-eyed in the SUV, a cell phone forgotten in one hand. Other pool players are just beginning to pick themselves up. No one seems injured.

Nick whoops. "Ines, you saved us!"

Ines looks a little stunned. "Did I?"

"Yes!" Nick assures her. He kisses her fiercely. "You saved us all! Kurt, isn't that great?"

"But she didn't  " you begin.

Ines and Nick, flush and happy, turn to you.

You pause. There won't be any way to redo this moment.

"Nothing," you say slowly. "I'm glad everybody's safe."

"I'm glad too," Ines says quietly, smiles at you, and takes Nick's hand.

---- You have finally broken the cycle ----

Glossary

Terms are defined to elucidate their technical, comparative, or metaphoric uses in this study rather than in general. Founding authorities of concepts are indicated where appropriate, but their ideas are likewise described in a sense applied to IF rather than purely within the context of their own terminologies. Terms marked * are coinages unique to this work.

3D: Three dimensional computer graphic simulations. By comparison to dimensions, most IF works model abstract relations (such as relative location).

activity: First (projective) stage of negotiated agency, in which the actor acts. Compare reactivity, interactivity.

actor: Figure that focalizes interactor agency in IF, either directly or indirectly.

address: Grammatical person, as in first, second, and third. IF strongly tends towards second person for both aesthetic and parser design reasons.

Adrift: IF authoring system based on graphical integrated development environment. Its accessibility has been widely popular with non-programmers, but its inflexibility has limited its uses for experimental and literary IF.

adult interactive fiction (AIF): Generally pornographic works of IF focused on modeling bodies and their constituent parts in relation to sex acts. Compare objectification.

advancement: A change in the state of the IF simulation that brings the work closer to resolution.

affordance: An interaction potential in an environment (Gibson). Affordance is one way of describing how IF enfranchises the interactor, although such affordances must be denoted or implied.

agency: The interactor's ability to affect the simulation. Agency in IF is commonly focalized through one actor, the protagonist, but may be distributed sequentially or indirectly through many.

allohistorical fiction: Fiction characterized by a world whose historical events diverged significantly from those of our own.

allomemorial fiction *: Fiction characterized by the difference between an assumed set of events and their recollection. To an extent this encompasses all fiction, but it is particularly that fiction whose narrator is unreliable to herself, as in amnesia, aporia, hallucination, and trauma.

alternate reality game (ARG): Interactive experience characterized by dissemination across multiple media channels with conventional non-fictional uses, or by the embedding of diegetic content in 'real-world' contexts. ARGs are usually multi-player and may involve participant collaboration and/or paratextual authorship. ARGs are often revised during and around ongoing participant behavior.

alternative resolution advancement *: Change in simulation state toward some undesired or non-traditional end.

amnesia: Loss of memory, both as a common conceit of IF situations and as a fundamental trope for the initial disjunction between the protagonist (who should remember) and the interactor (who must direct)

AMUSING: IF meta-verb conventionally available only after a successful conclusion, it often suggests alternate interaction strategies to explore obscure aspects of the work.

anticipation: Process by which the IF author imagines and accommodates (or denies) probable and potential interrogations of the code by the interactor. Before the interactor engages the implied code, the author has engaged the (immanently interventionist) anticipated interactor.

archaeology: A master trope of early IF like the Zork series and many notable works like Infidel and Glowgrass, it provides a basic metaphor for the confrontation of the interactor with strange architecture.

architecture: The art of building design; more generally the design of a complex structure, as in computer and software architecture. IF are generally both thematically and systemically architectural.

archive: Repository of information, originally repository of law and legal code (the house of the archon). A figure for code and the IF database.

archive fever: An informatic desire constituted in opposition to the death drive. (Derrida) A metaphor for the motivation of the IF interactor.

archon: Arkheion, the original archivist figure, keeper and pronouncer of law, (compare arkhos, ruler). A figure for code processes and the IF parser which provides and controls access to the simulation object tree.

artificial intelligence (AI): Agent that exhibits cognition-like adaptive behaviors. AI is a recurrent red herring in IF design when it is incorrectly suggested that lifelike characters would also solve the deeper problems of drama management.

author: The creative authority of an IF work, usually a single writer-designer-programmer who produces the final work in conjunction with several credited "beta testers that copy edit both prose and interaction design. Some independent and commercial IF teams divide the author function into separate responsibilities for writers and programmers, although it is rare for this division to remain clean, and both parties are usually co-credited as authors (e.g. Douglas Adams and Steve Meretzky's Hitchhiker's Guide to the Galaxy). Critiques of the author function apply here, as do critiques of the auteur theory of film, but to a lesser degree. Even large scale commercial IF were generally implemented by extremely small design groups with editorial support, more comparable to novellas than to big budget films or console video games.

AUTO: Meta-command unique to Rematch which undoes (supposedly) the simulation after each failure.

canon: A collection of recognized or exemplary works. In IF an inclusive corpus of known available works, with notable omission of commercially unavailable but still copyrighted 1980s 'abandonware.'

capitalism: Socio-economic paradigm based on the abstraction of everything into universal exchange value. Tends to discount arts (e.g. poetry, IF) whenever not circulating as commodities.

cartography: The practice of drawing maps. A fact of IF practical interaction since the earliest days, interactor-drawn maps are commonly noted in IF ethnography. (Scott)

cave: Origin scene of foundational IF (Adventure, Acheton, Zork) with far-reaching influence on the genre, both through allusions and through inheritance aesthetics such as the modeling of light.

character: A figure or persona in IF. May be an actor or the protagonist.

chatbot: Program that simulates conversations with humans, generally via permissive rather than prescriptive pattern recognition. Most verbose IF characters do not resemble chatbots at a technical level.

cheating: Humorous term for using knowledge from past simulation sessions to inform interaction strategy. Arguably the fundamental condition of simulation interaction.

close interaction *: Sustained analysis of an interactive work through a detailed account of interaction.

close reading: Sustained exegesis of a text through a detailed account of reading.

closure: Resolution of one state into another, as in the advancement of either simulation state or understanding. Compare foreclosure.

code: Operational or procedural logic of a system, as in legal code and computer code. Used here with IF to refer to source code but more immediately to the compiled virtual machine byte code encountered at runtime.

code-gap *: Identification, following reader response (Iser), of a gap between states in the simulation.

code-resolution-gaps *: Identification, following reader response (Iser), of a gap between states in the simulation that are significant to resolution.

command line: Computer interface accepting a string of free-form symbolic input, generally typed textual commands (alternately: handwriting and voice recognition, etc.). Usually signified by a prompt, as in terminal mode computing, chatbots, MUDs, and IF, for which it is constitutive.

command line literature (CLL) *: Formalist term specifying an interactive genre with input via command line and textual output. Roughly corresponds to the genre IF, although it might be said to include chatbots, MUDs, or other command-line textual systems. The term 'literature' is used in its most basic sense ("made of letters"); CLL remains neutral on whether those letters are approached as art, played as a game, both, or neither. Proposed but not used extensively in this study; see instead IF.

command-gaps *: Identification, following reader response (Iser), of a gap between simulation outputs closed by the occasion of interactor input.

commands: Textual inputs at the command line. In IF, these often take the form of 'parser-ese' characterized by abbreviation and omission, e.g.: GO N, TELL ABOUT ART.

compiler: Program that renders IF source code into virtual machine byte code that then affords interaction via an interpreter program.

computer game: Game proceeding through stored program computation. To the extent they are games, IF are computer games in that they require computation. Compare video game.

conceptual foreclosure *: Advance knowledge of the meaning of the work; resolution of the meaning of the work prior to its experience. Tends to prevent hypothetical interpretation, e.g. advance resolution of suspense. Compare procedural f.

CONFUSE: A verb implemented in no known IF works. Good for testing basic error handling.

constraint: The necessary limits that constitute a work, in IF both what is disallowed and what is unanticipated

and unimplemented in code.

contract: Normative expectations between interactor and system, frequently misunderstood in IF to guarantee an avatar or puppet for the interactor's unfettered and free use.

Critical Code Studies: Critical approach to the humanistic interpretation of source code as an object circulating in culture, as distinct from its processual effects (Marino).

critical theory: Philosophical approaches to art and culture.

cruel: IF cruelty rating for silently irrevocably unwinnable works.

cruelty: A scale describing how IF works become unwinnable, and how and when the interactor discovers an unwinnable state (Plotkin). See merciful, polite, tough, nasty, and cruel.

cybernetics: Critical approach to control and communication in informatic systems, de-emphasizing the distinction between human and machine roles (Weiner). See also feedback loop.

cybertext: Works that involve computation in their production of scriptons, i.e. visible text. (Aarseth). IF works are always cybertextual. Compare electronic literature.

de(con)structive code: Code that orients the interactor to a set of interfaces or affordances that are then disrupted and removed, as in net.art.

death drive: Urge to restore an earlier state of thing, e.g. chaos, dissolution, and forgetting (Freud).

detective fiction: Fiction characterized by a detective figure who undertakes to resolve some central mystery, traditionally a crime such as murder or theft. A trope for the IF interactor's search for resolution.

diegesis: Fictional world in which events occur; an element pertaining to a given diegesis is diegetic (Genette).

electronic literature (eliterature, elit): Literature dependent in its effects on computation. IF works are always eliterature to the extent they are literature. Compare cybertext.

enfranchisement *: Cooperation between interactor and code experienced as exposure to and opportunity to participate in the necessary limits that constitute the work. Achieved in IF through convention, affordance, implication, and reduced cruelty.

epistemology: Theory of knowledge. Some IF works model protagonist knowledge of the world separately from the world itself, although these models are ad hoc. Adding an epistemic (or discourse) layer is a recent trend in IF architecture and development language research (Montfort, Peinado). Compare ontology.

epitexts: Paratextual materials external to yet connected by association to the narrative (Genette), as in IF manuals and "feelies."

ergodic literature: Works requiring non-trivial effort to traverse (Aarseth), here taken in IF taken in the sense of 'novel' rather than 'onerous.' An IF work is always innately ergodic, in that it "includes the rules for its own use," although it may become experientially trivial once traversed.

error: Specifically, a mistaken interactor input. Generally, the work's aesthetic representation of interactions that fail to change the simulation state.

estate: Both a locality (as a house and grounds) and a collection of property at death. Provides a metaphor for IF objects and locations as resolved by the executor-like interactor.

exclusionary advancement *: Process of eliminating potential alternatives towards a desired end.

executor: One who executes the legal will of the deceased. A figure for program execution and for the IF interactor, who attempts to fulfill desires implied in the code by resolving the estate of the simulation object tree.

expectation: Anticipations external or prior to the work, including modes of engagement such as literacies and sets of conventions such as generic tropes. With implication, co-constructor of the implied code. Compare foreclosure.

exploration *: Wandering outcry. In art and literature, the general process of imaginatively completing the unfamiliar work (Rosenblatt). In cybertext and interactive art, the process of traversing the unfamiliar work, i.e. navigation. See ergodic. In semiotic simulation (e.g. IF), the process of wandering "outcry" (ex-plorare), interacting with a semiotic simulation by inputting text. Particularly appropriate to IF's common trope of navigating unfamiliar geographies. Compare interrogation.

fabula: The story. Audience-reconstructed in the mentally inferred order of occurrence (Shklovsky). Compare sjuzet.

fantasy: Fiction characterized by magic or the supernatural, often identified as the ur-genre of IF. Compare quotidian.

feedback loop: Cybernetic representation of a closed mutually reinforcing informatic system (Weiner). A figure for the IF interactor-simulation relationship during the process of interaction.

feelies: Multimedia epitexts such as journals, maps, and artifacts, bundled to illustrate or enrich the IF work. Popularized by Infocom.

folk art: Art characterized by the collective development of communal techniques and traditions specific to a region or subculture with reduced emphasis on innovation and the auteur. Due to its provenance and characteristics, Buckles identifies Adventure as folk art. Today, references to the IF "community" both from within and without continue the idea of IF authorship as a kind of subculture or enclave with an internally coherent identity and set of interests and practices.

foreclosure *: Advance knowledge of the work; resolution of understanding which is external and prior to the experience of the work itself, as in reviews or spoilers.

game: A set of rules or structure played with a goal. Many IF are games, but to the extent they obscure basic rules or are engaged without goals, many are not.

Game Studies: Critical approach to computer and video games, currently based primarily in rhetorical and functional structuralism. Compare Ludology.

gamebooks: Codices with linked lexias forming a decision tree or network, conventionally presenting a second person simulation and sometimes requiring additional statistical paraphernalia. Compare IF, RPGs.

genre: Family resemblances connecting a group of works, either formally (as in command line semiotic simulations) or thematically (as in alienated interactive protagonists). These conventions or tropes are in embedded relationship to a specific media form, as the feature film to the film, the novella to the codex, or IF

to the computer. Compare generic tropes.

generic tropes: What family resemblances connect a group of works thematically independent of media, as in genre fiction: cyberpunk, detective fiction, high fantasy etc. Characterized by pre-existing expectations. Compare genre.

header file: Method of including pre-existing source code libraries to reduce development time, major vector in IF of inheritance aesthetics, particularly through ubiquitous use of 'standard' libraries which constitute in themselves a norm.

historiographic metafiction: Fiction characterized by self-reflexive play combined with historical events and personages (Hutcheon).

Hugo: IF authoring system with powerful multimedia support (Tessman).

hypertext fiction: Link-and-lexia navigated eliterature, sometimes with computationally variable links. Hypertexts may include stretchtext, transclusion, and other document representations (Nelson), but are not simulations. IF may use hypertext elements as secondary interfaces.

IF: Computed semiotic simulations constituted by a command line interface, a parser, and a database. Unlike chatbots, the database is generally an object tree simulating a story world, and the parser is primarily prescriptive, attempting to apply navigations and actions against that world. Unlike MUDs, most IF works support one interactor rather than many and are turn-based rather than real-time. IF is an acronym for the phrase "interactive fiction," that general phrase being commonly applied to many other types of media. IF are conventionally but not necessarily in the second person. Compare gamebooks and RPGs.

implication: Subtle prompting. Where inferences are taken, implications are given, indicating either the work's parsimony with direct statement or generosity with secrets. With expectation, co-constructor of the implied code. Contrast foreclosure.

implied code *: The interactor's mental model of operational logic in an interactive work. The model is schematically developed as a process in time. In IF, implied code is a co-construction: half expectations of the interactor, half implications of the work.

Inform: IF authoring system originally offering Infocom (z-machine) compatibility, v7 now focuses on natural language programming and rule-based drama management (Nelson).

information fetish *: Motivation of the interactor in resolving the puzzle or riddle of code. Compare archive fever.

informative advancement *: Process of identifying a path towards a desired end.

intentional fallacy: Judging the meaning of a work against the author's intentions (Wimsatt and Beardsley).

interactive fiction: See IF.

interactivity: Third (contextual) and final stage of negotiated agency, in which the interactor interacts (re-re-acts) to a reactor or interactor. Compare activity, reactivity.

interpreter: Program that implements one or more IF virtual machines used to execute compiled byte code files and present them as interactive works.

interrogation *: Forceful asking. In art and literature, a general process of questioning (ideologically, rhetorically) the work. In semiotic simulation (e.g. IF), a process of imperative asking through which the interactor directs the simulation, as a lawyer directing testimony ("I put it to you that"). E.g. OPEN MAILBOX is implicitly "I put it to you that you can open the mailbox" i.e. "Can you open the mailbox?" Compare exploration.

INVENTORY: Conventional IF command for listing objects in the possession of the protagonist. A design element implicated in various critiques of IF (and RPGs) as tales for kleptomaniacal looters.

literature: "Made of letters." Although it extends far beyond the scope of this study, all alphanumeric art is literature.

Ludology: Critical approach to game studies based primarily on rules and play (Frasca).

mailbox: A recurrent trope in the Infocom catalog, it served in Zork to present orientation text.

media-specific analysis (MSA): Critical approach to texts through their material instantiation (Hayles).

medium: What substrate lies below whatever depth is currently discussed as genre. For IF the medium is the drive, RAM, processor, OS, interpreter program, and/or virtual machine process.

merciful: IF cruelty rating for always winnable works.

meta-commands: Commands from the interactor directed not to an actor, but to the parser, generally to access peritexts (HELP) or manage the simulation state (SAVE).

MUDs: Multi-User Dungeons (also MOOs, MUCKs, MUSHes etc.) combine the command line interface with real time network interaction. For IF, ifMUD has served as a communal space, but not as a strong alternative to the constraints of the IF form.

narratee: One addressed by narration within the diegesis (Prince). In IF often but not always corresponding to the protagonist.

narration: Process of representing an event, as the activity of a focalizing narrator.

narrative: Representation of an event (Prince). IF are narratives (among other things) in a literal rather than figurative sense, in that their events are narrated.

Narratology: Critical approach to narrative, generally in structuralist and media-independent fashion.

narrator: One who narrates (Prince). Most IF is typified by a hybrid second person narrator, both focalized and limited on the protagonist and simultaneously expressing the extradiegetic voice of the parser.

nasty: IF cruelty rating for abruptly irrevocably unwinnable works.

new media: Computationally based or enabled media, typified by numerical representation, modularity, automation, variability, and transcoding (Manovich). IF works are prototypical new media.

nonfiction: A representation presented as fact. Very few command line based semiotic simulations have attempted this type of discourse; IF are almost without exception fictional.

non-player character (NPC): Antonym of PC, commonly misappropriated to describe IF characters.

object tree: Code representation of the simulated world model of an IF work, typified by locations, objects, and their relationships (Firth and Kesserich).

objectification *: To elevate the abstract to concrete expression, as art, language, and programming objectify thought. Alternately, to degrade the human to a mere object, as sexism objectifies women. One danger and opportunity of IF is its representation of everything as objects. Compare object tree, objectivism.

Objectivism: The Objectivist paradigm, an objectionable focus on a limited, codified view of the world that oppresses the interactor (Sloane).

ontology: Theory of being. Most IF code is ontological, in that even the protagonists knowledge is reflected in a real object tree (e.g. a subtle object is moved into the world when the protagonist learns of it). Compare epistemology.

oppression: Antagonism between interactor and code experienced as control, discipline, regulation, and rejection of reasonable expectations for interaction. Compare enfranchisement.

optional advancement *: Process of including desired interactions that unnecessarily elaborate or defer resolution of the simulation.

overcoming code: Understanding in an agonistic or triumphal sense. Distinct from victory or winning, as code can still be overcome to undesired or tragic effect.

paratexts: Materials external to yet connected to the narrative, classified as peritexts and epitexts (Genette).

parkour: Physical art of efficient movement past obstacles, particularly urban geography and architecture (Belle). A master trope for platformer video games.

peritexts: Paratextual materials external to yet directly connected to the narrative (Genette), as in IF meta-commands such as HELP.

platformer: 2D or 3D video game characterized by jumping and otherwise moving to negotiate the platforms of an often-hostile architecture.

player character (PC): Persona adopted by the player of an RPG. Commonly misappropriated to describe the IF protagonist.

polite: IF cruelty rating for forewarned unwinnable works.

procedural foreclosure*: Advance knowledge of the method of the interactive work; resolution of the process of or path through the work prior to its experience. Tends to prevent exploration of interaction, e.g. strategy guides or walkthroughs. Compare conceptual f.

protagonist: "First actor," the figure through whom interactor agency is directly focalized.

quotidian: The daily and unremarkable. IF simulations tend to model mundane objects and actions omitted from other fictional representations and even from other second person simulations, such as the opening and closing of doors. Compare fantasy.

reactivity: Second (responsive) stage of negotiated agency, in which the reactor reacts (re-acts) to the actor. Compare activity, interactivity.

reading-gaps: Identification of a gap between meanings or interpretations in a text during reader response (Iser).

role playing games (RPGs): Participatory stories conventionally simulated through live second person narration (by game masters and players), often requiring additional statistical paraphernalia. Compare gamebooks, IF.

romance: Fiction characterized by optimistic tales of romantic love. In IF, pioneered by Plundered Hearts.

room: Basic unit of space, locality, and proximity in IF design. Compare architecture.

Russian Formalists: 1914-1930s critical school influential on structuralist thought, taken up by Buckles (Propp) and Randall (Shklovsky) in their analyses of IF as art.

schema: A mental structure that represents some aspect of the world (cognitive science). Implied code might be codified as a special type of schema.

science fiction: Fiction characterized by speculations on science or technology. Even fantastical magic is generally operationally scientific in IF, as it is systematic, rule based, and testable via hypotheses.

score: Mechanism of tracking player progress through points once quite common in IF, now fading in a general shift away from the rhetoric of mastery and winning. IF scores may or may not be necessary to resolution, but always specify an implied interactor.

scriptons: Text as it appears to the reader of a computational work (Aarseth), e.g. a turn sequence as displayed to an IF interactor. Compare textons.

semiotic simulation *: A simulation fundamentally comprised of symbols, specifically linguistic symbols such as utterances or text that may be ambiguously read and ambiguously written. Table-top role playing games, MUDs, and IF works are generally full semiotic simulations.

separate self *: Any figure required in accounting for interactor-IF communication and agency in a given work, including but not limited to the fact of the protagonist as a non-avatar, direct address from the parser, and the technique of narrative focalization through any actor, character, or figure other than the protagonist.

simulated immediacy *: Techniques that promote the interactor's situated understanding or immersion in the simulation. The first person shooter video game 'camera' and second person narration in IF, gamebooks, and RPGs are all examples of simulated immediacy.

simulation: An interactive representation of events.

simulation fiction *: Fiction characterized by representing the conditions of simulation, particularly repeatability (as in time-loop fiction) and low-level or high-level interventions in the rules or code of representation. Includes novels and films. Narratives often depict without themselves being simulations, and vice versa. Frametales are often simulation fictions to the extent they are self-consciously narrated.

sjuzet (sju  et, sjuzhet, syuzhet): The plot. Author-represented and received by the audience in order of presentation (Shklovsky). Compare fabula.

source code: Precompiled program designs, usually composed in IF as text files using a development language such as Alan, Hugo, Inform, or TADS.

small IF *: IF characterized by limited traversal duration and scope of variation, often humorous or light (as with flash fiction). Small IF may be one-move, one-room, or both, yet many one-move works are expansive in scope and many one-room works are extensive in duration, hence not small IF.

speculative fiction: Fiction characterized by counter-realist elements, including science fiction, fantasy, magical realism, etc.

spoiler: Undesirable foreclosure, whether conceptual or procedural.

strategic advancement: Change in simulation state toward some desired end (Aarseth).

TADS: IF authoring system with a focus on robust powerful simulation, particularly sense handling and message passing (Roberts).

textons: Text as it exists within a computational work (Aarseth), e.g. the strings specified within IF source code. Compare scriptons.

tough: IF cruelty rating for irrevocably unwinnable works.

transcript: In IF an output log of text from a traversal or session, often interleaving interactor input. Compare walkthrough.

tutorial: Common early phase in video games that quickly familiarizes the player with basic rules and possibilities. The design space of IF explores these often-dispensed-with ambiguities.

understanding: Comprehension as in a spatial relationship: to come into and stand under. An appropriate metaphor for progress in location- and navigation-oriented IF.

unreliable code *: Code that, like an unreliable narrator in fiction, attests to its own status but is caught lying.

unreliable traversal *: Code that appears to reset state or restart, but actually makes use of continuous information.

video game: Games proceeding through video display, in practice almost always involving computation and generally taken as synonymous with "video graphic" (vs. text mode video). In this sense illustrated IF are only incidentally video games, as they do not require their video graphics to function. Compare computer game.

virtual reality (VR): Technologies and discourses focused on transparent participation rather than opaque representation. Commonly avatar-based real-time video graphic spaces, as compared to IF's protagonist-based turn-measured textual representations.

walkthrough: In IF an input log or series of inputs with descriptive comments, intended to help recreate (rather than represent) a traversal or session. Compare transcript.

will: Legal document instructor the executor on disposition of the estate; an onus of the dead on the living. Also a metaphor for the IF code's motivation of the interactor to resolve the simulation.

you: Conventional term of second person address in semiotic simulations (e.g. gamebooks, RPGs, IF) used variously to address both the protagonist and the implied interactor, with various treatments of the common conflation and necessary diegetic gap that closes and reopens between these figures (e.g. "You cross the bridge. Would you like to save now?")

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Full Table of Contents

Foreword: Foreclosure and Interactive Fiction

* SPOILERS WARNING *

# Chapter 1

: The Command Line and the Second Person

IF is history!

What has IF been? IF as genre

What has 'interactive fiction' meant? Interactivity and narrative

What isn't IF? Chatbots, MUDs, and more

Representations of the Command Line

Chat clients

Chatbots

MUDs and MOOs

Façade

Abuses

Hypertext Fiction

Nonfiction

Overview

# Chapter 2

: The Implied Code: IF as mental model, mystery, and tradition

Expectation and diegesis in video game tutorials

Availability of transcript and ethics of code

Implied code and critical theory

Figuring the interactor: archon, detective, executor

Enlightening IF: Andrew Plotkin's Shade

Light and dark

The source

Figures

Figure 1. The hero Wander charges to climb the leg of Valus in the video game Shadow of the Colossus.

Figure 2. Possessed by Dormin, the doomed hero Wander attacks four soldiers (upper right) as a dark colossus.

Figure 3. Above: The opening screen of Blank and Lebling's Zork I (1981). Below: The interface to Cadre's Lock & Key (2002).

Figure 4. De-periodizing our thinking: from marketplace to production

Figure 5. Some things that have been termed "interactive fiction" (clockwise from left): Choose Your Own Adventure #1, Zork I, Myst, Dragon's Lair, Patchwork Girl

Figure 6. A.L.I.C.E. chatbot with Oddcast avatar. Bots emphasize breadth of varied short-term reactions over IF's depth of logical chained interactions.

Figure 7. Façade: looking with graphics, holding a glass with the mouse, speaking in text.

Figure 8. An IF "abuse": Plotkin's adaptation of Tetris written and run using IF development tools.

Figure 9. Emily Short's City of Secrets interface, featuring traditional command line, ambient illustrations, and clickable links.

Figure 10. Peter Nepstad's 1893: a World's Fair Mystery (2002) featuring historically descriptive text and period photography.

Figure 11. Peritext controller diagrams from Prince of Persia: The Sands of Time.

Figure 12. An avatar of the game director explains interaction on a virtual film set in Indigo Prophecy.

Figure 13. A projection of Oleander (left) lectures Raz, while system text (bottom) instructs the player of Psychonauts.

Figure 14. Tutorial captions accompany an in-game progression of challenges in Shadow of the Colossus and The Sands of Time.

Figure 15. The character Issun mixing diegetic and extra-diegetic explanations of saving in Ōkami.

Figure 16. First person view of a vision test in Halo, which calibrates the Master Chief's (that is, the player's) "vertical looking" controls.

Figure 17. Lessig's four-regulator model as depicted in Code 2.0. Here law is shown exerting indirect regulation via the others.

Figure 18. Evaluating cruelty in works of IF

Figure 19. Parallels between fabula and implied code.

Figure 20. Implied code as a fusion of implied reader / author

Figure 21. Distinguishing strategically significant gaps in code, considered as a hypothetical toy IF work.

Figure 22. Comparing Detective, Archivist, and Executor figures: six Venn diagrams.

Figure 23. Infocom ad parodies cult deprogramming, contrasting the mindlessness of joystick video games with IF's imagination-evoking text.

Figure 24. Significant dates in the rise of second person simulation genres.

Figure 25. In Oliver's 2ndPS: second person shooter, we are looking out of the eyes of our opponent "You" and see the successful targeting of our avatar, "Me," which is incorrectly looking left. To succeed, we must turn "Me" right and fire at the camera position. In the two-player version under development, our act of targeting will give our (currently oblivious) opponent like information to return fire with "You."

Figure 26. In Battletoads (1991), the side-scrolling camera (1) switches to a second person boss camera view (2) and attacks (3). Player avatar Rash counterattacks by hurling rocks directly at the player's own perspective (4), disrupting the camera function (5) and leaving "crack" artifacts on the view (6).

Figure 27. In The Terminator (1984) a first person shot of the T-101 antagonist HUD as it considers conversational responses to a man yelling from behind a closed door, while in Predator (1987) the Yautija alien antagonist HUD analyzes the voice pattern of a laughing soldier seen in thermal image. Both modes of apprehending the world depict human language as a visible artifice.

Figure 28. Identical unique media positions in Aarseth's textonomy

Figure 29. Life's Lottery at the gamebook interface. An impossible instruction 'controls' access to a lexia in which Keith Marion wins the lottery... so the interactor goes anyway. (341)

Figure 30. Representation of the object tree changing during interaction in Firth and Kesserich's Inform Beginner's Guide (46)

Figure 31. For McCloud, comics closure is action that readers supply in the gap (or gutter) between panels.

Figure 32. The numbered line traces my representation of reading as it 'stitches' the gutter into comics.

Figure 33. Person and tense distribution in IF.

Figure 34. In Whalen's Space Refugees (2006), the unarmed alien protagonist dodges as his fellow refugees are slaughtered by Earth defenses.

Figure 35. Simulation fictions at the intersection of variation / repetition.

Figure 36. Partial list of commands that produce outcomes in Aisle

Figure 37. MC Frontalot's IF-themed music video It Is Pitch Dark (2007), directed by Jason Scott, filmmaker of the forthcoming Get Lamp IF documentary. Above: the rapper's live reflection is digitally remediated on the screen of an Apple ][, while lyrics are typed as a game session. Below: Remediated IF maps (normally hand drawn) swirl, with video of Frontalot as one node in the pattern.

Figure 38. Staging IF endings first. Above: Langridge's Bugsy (1986) invites the interactor to "try again" as her first move. Below: Seebach and Lynn's Janitor (2002) begins by displaying a fictitious adventurer type q u i t.

Figure 39. Scenes from Cadre's Shrapnel. Above: An opening interaction, with the parser reinterpreting any input as r e s t a r t. Below: The closing sequence descends into chaos just before the screen goes blank.

Figure 40. The falling flaps of the mechanical-numeric clock-radio come to symbolize the identical initial conditions of each day in Groundhog Day.

Figure 41. Baird traces engagement with responsibility as it fluctuates over the course of Groundhog Day.

Figure 42. The cartoon-staircase sequence of Lola rennt (1998) locates the original source of chaos and variation outside the cinematic realism that characterizes the rest of the film.

Figure 43. Rematch's conceptual geography. Kurt's table name is randomly chosen out of twenty, yet is always nearest the path of the oncoming SUV, just as the confused patron's table is always located by the fan controls.

Figure 44. Logic of the pool hall as a single-pole, double-throw switch: The loudmouth's message might be redirected from the northwest tables to the southwest fan controls.

Figure 45. Communication relationships in Rematch. Kurt's commands are interdicted by either direct refusal (gaps) or indirect refusal (dashes). The correct solution is for Kurt to WHISPER to Nick that he should DARE Ines to take some action.

Figure 46. Logic of the solution as a loop. Once the switch is thrown, the message circulates, beginning at the pool table and eventually returning there.

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