

Toward a Theory of Interactive Fiction*

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Spoilers: Details of several games are mentioned. The final reply of *Infidel* and the nature of the scientists in *Babel* is discussed. *Adventure* is used for a detailed discussion of puzzles, and every puzzle in it is mentioned.

Theorizing Interactive Fiction

Interactive fiction (IF), a category that is typically represented by the text adventure or text game, has literary, gaming, and other important aspects. Well-known text-based interactive fiction includes *Adventure* (1975-76), *Zork* (1977-78), *A Mind Forever Voyaging* (1985), *The Knight Orc* (1987), and *Curses* (1993). In the first book-length discussion of interactive fiction {Montfort 2003} I have

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introduced the form in detail, discussed its important historical precursors and cultural contexts, and described a figurative way to think about its poetics and aesthetics. Here, I focus on ways that narratology can inform a rigorous, formal theory of interactive fiction, a theory that remains sensitive to the many-faceted nature of this new media form.

If interactive fiction is to be related to "game" and "story" in certain ways, merely opening a bag of theory and drawing forth various literary, narratological, and gaming implements from it - and then starting in on interactive fiction - cannot suffice. Such an approach may be good enough for a butcher, but will have poor results when used by a surgeon. Although humanists and scientists can be prodded toward insight by *ad hoc* approaches, deeper insights and more substantial progress require a methodological framework, a way to evaluate results, and (if more than one person is to participate) some sort of common language and understanding about the nature of the topic under consideration. To build a theory of interactive fiction that is useful in deeply understanding how interactive fiction is experienced, and how better sorts of works can be created, a stronger approach than that of the theory-bag is necessary, one which distinguishes those elements of interactive fiction that result from it being

- a text-accepting, text-generating computer program;
- a potential narrative, that is, a system which produces narrative during interaction;
- a simulation of an environment or world; and
- a structure of rules within which an outcome is sought, also known as a game.

Interactive fiction was, for a long time, almost entirely neglected in academic discussion. In the IF community, discussion has touched on many important aspects of interactive fiction, but no theory of this sort has been developed. Marnie Parker's "Iffy Theory" is an attempt to categorize people's taste in interactive fiction; it is not about aesthetics or poetics as it does not explain, for instance, how one 'auditory' IF work might be better or worse than another {Parker 2000}. Graham Nelson's "The Craft of Adventure" consists of advice about how to write interactive fiction well, as its title suggests. It discusses many related topics in depth but does not present the beginnings of a systematic theory. Nelson calls it "a string of grits of wisdom and half-baked critical opinions," {1995} which sells it quite short, but the collection, insightful as it is, does not offer a framework for a new theory.

One interesting attempt to offer such a framework is "Towards a Theory of Narrative in Interactive Fiction" by Sean Smith and Joseph Bates¹, a result of research at Carnegie Mellon's Oz Project. This report was an attempt to formulate interactive fiction in terms of cinema, based on "an art-film text taken at random from the shelves at CMU's library" {Smith & Bates 1989 p. 6}. No distinction was made between techniques specifically tied to time-based and visual effects and those generic to narration in any medium {Chatman 1975

¹This essay's title is clearly similar to that of other related essays, not only "Towards a Theory of Interactive Narrative" but "Toward a Theory of the Literary Riddle" by Dan Pagis and "Towards a Theory of Narrative" by Seymour Chatman. But this essay is so named simply because it is intended as a step toward a theory of interactive fiction, not specifically in answer to or extension of any of those articles.

pp. 299-300}. While the paper does describe a series of techniques for interactive fiction that is inspired by cinema, the mappings between film and IF techniques are arbitrary and unsystematic. The ideas may be of interest to IF creators, but this essay does not actually propose a solid theory.

Roger Carbol's "Locational Puzzle Theory" is interesting in that it attempts a strict definition of certain elements of interactive fiction {Carbol 2001}. Unfortunately there are numerous difficulties with the approach. To begin with, Carbol defines a game only as "a collection of objects, in the object-oriented programming sense," which does not distinguish games from non-games, as any definition should. Furthermore, "object" is not defined by Carbol as it is in any thorough discussion of object-oriented programming, but as simply "a collection of properties." The impulse to define puzzles precisely and examine their nature is a good one, but the confusion in this approach - on the one hand between a software development methodology, objects in the IF world, and narration, for instance, and on the other hand between location in the space of the IF world, the awareness of the interactor, and the properties of programmatic objects) is far too profound, and the resulting distinctions between classes of puzzles are no better than have already been devised in *ad hoc* classifications {Rees 1993}.

Emily Short's essay "What's IF?" makes several points of interest, although it does not define interactive fiction well enough to distinguish it from chatterbots and other programs {Short 2001}. The concept of the *benchmark* as an unique action that makes progress toward an ending is a useful one, although the discussion in "What's IF?" is preliminary, with *action* not defined, for instance, and with the

supposedly formal benchmark being defined with appeal to the interactor's anticipation and other possibly interpretive factors. The discussion of puzzle has interesting aspects but does not conclude with a definition of puzzle that can be applied consistently by other theorists. This essay is a good effort to not only define qualities of a puzzle but also place puzzles in the overall context of an IF work. Difficulties with this essay's approach make it clear, however, that a theory that distinguishes formal aspects from those related to interpretation will be very helpful.

Since a work of IF can be implemented in different ways and function identically, there is another space besides that of the interactor's interpretation which a formal theory should not enter. Definitions of the elements of an IF work from a theoretical perspective should be done without making reference to a program's specific data structures, functions, objects, and so forth, considering the program instead as a black box that accepts input and generates output. (The clearest justification for this is seen in cases where two programs that are identical from the standpoint of the interactor are implemented in radically different ways - for instance, first using a functional programming language and then using a procedural one. Different objects can of course also be used in two different object-oriented implementations.) It may happen that sensible programmers developing IF works have found it convenient to encapsulate certain fundamental elements as discrete entities in code. Those studying IF while using a theory of this sort should not need to refer to the internals of a program, however; it should not be necessary to describe the important elements of interactive fiction as experienced in interaction.

This essay considers the nature of interactive fiction as *program*, *potential narrative*, *world*, and *game*, describes how the perspective of the person interacting can be represented, and starts in on the difficult issue of how to conceptualize the puzzle.

Interactive Fiction and the Interactor

A work of interactive fiction is, among other things, a computer program that accepts text input from a user and produces text output in reply. This user of an IF work is the *interactor*, following the terminology of the major academic effort in interactive fiction so far, the Oz Project; the term has been adopted by others {Murray 1995 p. 161}. It is synonymous with *player* as that term is usually used in the IF community, but *player* has other meanings related to games and drama while *interactor* has a history of being used only to refer to the person who interacts with an IF work. In the case of a work of IF that has no multimedia elements at all and uses only text for a medium, *text* simply refers to a string of words in the ordinary sense. However, *text* can also be considered semiotically to be any set of signifiers; thus IF works (and perhaps other works as well) that contain graphics, sound, or video can be accommodated in this way. Using *text* more specifically, to mean "strings of words," *interactive fiction* indicates a category of text-based works, works that can contain other media elements but where text and textual exchange are central. *Computer program* could also be generalized to include other sorts of text machines in the broader *Cybertext* sense - written-out instructions that a person could follow, for instance, or Scott Adams mimicking Adventureland by uttering the output it would give in reply to someone's spoken input. For the purposes of this essay,

only computer programs in the usual sense need to be considered as interactive fiction, although the theory presented should be extensible to other types of systems.

Rather than state, as Short does, that "IF *tends* to represent, in some form, an environment or imagined world whose physical space we can explore," {2001} it seems better to say that a simulated world, the IF world {"Cycles, Exchanges..." section}, is essential to interactive fiction. The only counterexample Short advanced was Andrew Plotkin's 1997 *The Space Under The Window*. This is a work of hypertext implemented in Inform; instead of clicking on a word as would be typical on the Web, typing one of the words displayed causes a new lexia (in George Landow's sense) to appear. Plotkin refers to this work as "Not standard interactive fiction" {Plotkin 2001}. None of the theoretical discussion that Short develops in her essay applies to this work, which clearly seems better considered as hypertext than as interactive fiction. Requiring a simulated world does not mean that any particular code is required in a work of IF. Whether a work simulates a world or not can be determined from outside, by an interactor studying the work.

Since a simulated world and textual description of events in it is entailed by a program's being interactive fiction, an IF work is also necessarily a generator of narratives. The distinction between what can be simulated and what can be narrated is particularly important to understanding the workings of interactive fiction; although the *potential narrative* aspect of interactive fiction is produced based on events in the *world*, there may be things that are narrated during an interaction but are not simulated {"Player Characters..." section}.

It is standard to refer to IF works as “games,” but a work of IF is not necessarily a game {Giner-Sorolla 1996}. A work can present a world which is pleasant to explore, but which has no quest or intrigue. There may be no final reply that is a “winning” one, perhaps no final reply at all. Because of this it makes more sense in theoretical discussion to refer to a *work* of IF, rather than using *game* as the generic term for everything in the form. Even in the case of works that are actually games, using the former term can help to signal that it is interactive fiction from all relevant perspectives, rather than interactive fiction *only* as game, that we are principally interested in. The advantage of using a term like “work” is most clear in the case of certain IF works that do have no optimal outcome (i.e., cannot be won), do not keep score, and contain no puzzles. Ian Finley’s simulated gallery opening *Exhibition* provides a simulated space in which the player character can look at paintings while chatting with four characters who have very different perspectives on the artist and his work; there is no way to win or lose it. Calling this a “game” is unfair to *Exhibition*, which is not actually a game. Calling *Exhibition* a game is also unfair to IF works such as Dave Anderson’s *Hollywood Hijinks*, which simulates a treasure hunt in a mansion and has a very definite an explicit goal. Works of this sort clearly are games. But in a careful discussion, the generic use of the term “game” to refer to every interactive fiction work would denude that term of its particular meaning. The term “game” is the norm in casual discussion, and is admittedly used by this author in those contexts. Another theorist and author refers to her own (clearly non-game) work by making reference to “a game like Galatea” {Short 2001}. “Work” has real advantages as a term, however, in discussions where we are trying to

be as clear and precise as possible, rather than simply using those terms which have become customary.

Sessions, Interactions, Traversals

As computer literature pioneer Rob Wittig describes, while it is commonly thought that the reading of a book proceeds as “the reader dutifully trudges the linear track prescribed by the author,” this is certainly not always the case. A reading of a book may involve browsing it in the bookstore, reading in short bursts in different places, skipping ahead to see if it gets any better at the end, looking through bits in the middle to then figure out what happened, and giving up without actually reading everything {Wittig 1994 pp. 81-83}. It is difficult today to understand the reading process - studied for centuries - without appreciating that “readings” may not be done in the intended sequence and may not be total. The nature of interaction and interactivity in interactive fiction, which has been studied hardly at all and which in general allows for no “total reading” of the book sort to be done, will be even harder to theorize without making distinctions between aspects of interactive fiction as computer program; ways in which IF works are world, game, and potential narrative; and the interactor’s own interpretation and experience.

A *session* is what happens during the execution of an IF program. The session begins when an IF program starts running. It ends when the program terminates. The text that results (both text typed by the interactor and text produced by the program) is the *session text*.

An *interaction* describes a series of continuous exchanges of texts between the program and the interactor. "Continuous" does not have a formal meaning, nor is it a property of the text or program. The interactor's sense of continuity and unity is what makes a certain experience a single interaction; different interactors may have different opinions of what an interaction is. The text (from both interactor and program) that corresponds to an interaction is an *interaction text*.

The experience of interaction belongs to the person² involved. The session, on the other hand, is a property of the program and its execution. Still, interactions and sessions often correspond: an interactor starts the IF program, reads and types for a while, perhaps saves (allowing the current state to be restored later on) or perhaps arrives at a conclusion, and then terminates the program. However, one interaction may take place over many sessions, because the interactor may terminate a program and then start it again immediately, interacting with the program repeatedly in what is to her a continuous interaction. Similarly, an interactor can start a session (and an interaction), go on vacation for a week while leaving the computer and the program running, and then return to have another, different interaction that is part of that same session. Of course, the point of many works of IF is to win them, that is, to proceed towards a certain goal or outcome; "winning" can be seen as one analogue to having "read the whole book." (This is not the only

²Or to the people involved. It is common for several people to interact with one IF work at the same time, although this reality is seldom mentioned in any discussions of interactive fiction. The issue of multiple interactors, and how they can experience of a single IF session together, is not going to be taken up in any detail this essay, however, which also will not deal with the interesting fact that an interactor could actually be a computer program rather than a person.

such analogue.) Winning cannot be described in terms of *session* or *interaction* alone.

A *traversal* is what happens in one or more sessions, and one or more interactions, when the interactor “completes” a work of IF by going from the beginning until no more can be narrated. The full definition of *traversal* is given later in this essay {“Initial Situation...” section}; to define the term exactly is it is necessary to describe more about IF as simulated world and potential narrative. It is mentioned here because of its relationship to *session* and *interaction*. Of course the text corresponding to a traversal is called a *traversal text*.

Cycles, Exchanges, and the IF World

Anything contributed by the interactor, from a press of the spacebar to a long typed text, is an *input*. The texts produced by the program are *output*. If the program outputs some text that the interactor originally typed, that is nevertheless output, just as whatever the interactor types (even something previously output by the program) is input. A *cycle* is one input and all the output that follows it until the next input. The *initial output* is whatever output is produced before the first opportunity for input; this is before the first cycle. All of this is defined formally with regard to an IF work’s nature as a computer program. Pressing the space bar in response to “[MORE]” is an input, for instance, even though it normally provides the interactor no opportunity to influence the course of the narrative that is being produced. It is simply because interactive fiction works are interactive computer programs that they have input and output.

In the sense that scholars of the story and of narrative (that is, narratologists) use the terms, a work of IF is not a narrative. An IF work is an interactive computer program, but not directly a *narrative*, “the representation of real or fictive events and situations in a time sequence” {Prince 1980 p. 180}. Similarly, interactive fiction is not a *story* in the sense of the things that happen in a narrative, or more precisely, “the content plane of narrative as opposed to its expression or discourse; the ‘what’ of a narrative as opposed to its ‘how’” {Prince 1987 p. 91}. In everyday speech, of course, “story” also refers to a particular genre, the type of thing people expect to hear when they say in conversation “so, tell me the story” or that a child expects to hear after asking to be read a story. Interactive fiction is not precisely this sort of story, either, although there may be a “frame story” provided in the documentation or there may be a certain type of story which is always generated in successfully traversing the work. An IF work is always related to story and narrative in their narratological sense, even if a particular work does not have a “story” in this ordinary sense.

The distinction narratology makes between story and narrative has been noted in various ways since Aristotle, who distinguished the argument, *logos*, and how it was arranged into plot, or *mythos*; the Russian formalists also distinguished the material of the story or *fabula* from how it was told in the *sjuzet* {Chatman 1975 p. 295}. Interactive fiction has the potential to produce narratives, usually as a result of the interactor typing things to effect action in the IF world. In fact IF works are *potential literature* in the sense of the Ouvroir de Littérature Potentielle (Workshop for Potential Literature, abbreviated Oulipo) {Mathews & Brotchie 1998, Motte 1986}, and specifically they are potential narratives.

IF works also present simulated worlds. These *IF worlds* are not merely the setting of the literature that is realized; they also, among other things, serve to constrain and define the operation of the narrative-generating program. IF worlds are reflected in, but not equivalent to, maps, object trees, and descriptive texts. In fact, the IF world is the content plane of interactive fiction, just as story is the content plane of a narrative. The interactor typically types what one or more *player characters*, who exist within the IF world, are to do. The nature of the player character, and other sorts of characters, is discussed in greater detail later {"Player Characters..." section}.

An input that refers to an action in the IF world is a *command*. In narratological terms, a command is *diegetic* {Genette 1980 pp. 227-234, Cadre 2002}. This command is usually in the form of an imperative to the player character, and does not have to refer to a physical action. Commands include THINK, any input directing the player character to speak, and any input directing the player character to examine something or otherwise sense something about the IF world. Commands that do not succeed are still considered commands, as long as they are understood by the parser and interpreted as attempts at action. The input given to clarify a command (e.g., KILL THE TROLL What do you want to kill the troll with? THE SWORD) is considered part of the command being clarified. An input that refers to several actions (e.g., TAKE ALL) consists of the several commands into which it is decomposed by the parser.

All other inputs, such as those that save, restore, quit, restart, change the level of detail in the room descriptions, or address some

entity that is not part of the IF world - to ask for hints, for instance - are *directives*. A directive is, in narratological terms, *extradiegetic* {Genette 1980 pp. 227-231}. Commands and directives are two distinct sets; all inputs are one or the other. Directives include what Graham Nelson refers to as "meta" actions in Inform {Nelson 2001 p. 90}. Based on this, "meta-command" has been previously suggested to refer to actions outside the game world {Olsson 1997}, but it confuses the matter somewhat that "meta" has already been used by Genette in the opposite direction - to refer to narratives within narratives rather than to refer to the level of narration itself. To avoid confusion the term "meta-command" is left, in this discussion, to refer only to its specific meaning within Inform programming, and "directive" is used for all inputs that do not refer to the IF world. There are actually certain directives that are not meta-commands; any input that is unrecognized provides an example. It may seem surprising, at first, that a typo is a directive, but this follows directly from the definition of a directive as any input that is not a command.

Considering all inputs rather than just text entered at the prompt, it is still easy to classify inputs into directives and commands. Pressing the spacebar when "[MORE]" is displayed is a directive, for instance, while typing a number to select one of several conversation options is a command. "WHAT IS A GRUE?" in *Zork* (1979, Tim Anderson, Marc Blank, Bruce Daniels, and Dave Lebling) appears to be a directive, since there is no one within the IF world to whom this question is addressed; the information is apparently related to the interactor outside the IF world. On the other hand "PLUGH" in *Zork* is a command, because it refers to the player character speaking the word "plugh," and it results in a hollow voice within the IF world saying "Cretin" in reply.

Outputs that follow input from the interactor and describe anything about the IF world and events in it (including the inability of the player character to enact a particular action as commanded) are *replies*. Whether the text is a direct result of what the interactor typed or whether the event it describes occurred because of a timed or random event, it is considered a reply, as long as it describes something about the IF world. All other outputs - that is, all outputs that do not describe the IF world - are *reports*. "[MORE]" and "[Press space to continue]" as they usually appear are reports, as are "Are you sure you want to quit?" "Your score is 0 out of a possible 100, in 2 moves." and "Brief descriptions."

	Extradiegetic	Diegetic
	Interactor	Player Character
Input	Directive	Command
<i>e.g.</i>	<i>QUIT</i>	<i>PICK UP THE PHONE BOOTH</i>
Output	Report	Reply
<i>e.g.</i>	<i>Are you sure you want to quit?</i>	<i>You find nothing of interest there.</i>

An *exchange* is one command and the reply that follows it; the reply in this case includes all references to the IF world in all the output, up until the next command is entered. As command and reply correspond to input and output, so exchange corresponds to cycle.

The following excerpt from a session text of *Zork* presents two exchanges, in bold:

>open the mailbox

Opening the small mailbox reveals:

A leaflet.

>ear the leaflet

I don't understand "ear".

>eat the leaflet

Taken.

I don't think that the leaflet would agree with you.

In the first exchange, the player character is ordered to open a mailbox. This is accomplished and the result is narrated: a leaflet is now visible. Next there is an input that is not a command, since it is not understood to refer to the IF world. This is a directive that produces a report, "I don't know the word 'ear'" - revealing the limited vocabulary and brittle nature of interaction in early interactive fiction, problems which have only been mitigated in part. That cycle does not constitute an exchange. Finally there is a command for the player character to eat the leaflet. This results in the player character taking possession of it but not actually eating it. The reply seems bizarre in context; an understanding of the distinction between the diegetic and the extradiegetic, and between the command and directive, helps to explain why. "I don't think that the leaflet would agree with you," coming at this point in this session text, makes it seem as if the extradiegetic "I" in the previous report (the "I" who cannot understand certain words and translate them into actions) is now somehow within the IF world, counseling the player character not to eat a piece of direct mail. Further implications of this sort of transgression, and other sorts, are discussed later {"Diegesis, Hypodiegesis,..." section}.

Initial Situation to Final Situation, Prologue to Final Reply

The IF world can be described before the first opportunity for a command. It usually is. Such a description is the *prologue*. The term is used here much as it was in the PrologueComp, a 2001 writing contest announced on rec.*.int-fiction {Myers 2001}, except that, strictly speaking, any of this initial text that does not describe the IF world is not considered part of the prologue. This concept is similar to that of the *overture* {Nelson 2001 p. 370}.

The state of the IF world after the prologue, when the first opportunity to enter a command is presented, is the *initial situation*. A single IF work may have multiple initial situations, but because of how the initial situation is defined these cannot possibly be determined by the interactor's input. This is because the first input that can influence the world in any way is the first command; the opportunity to enter this command comes after this initial situation. Different initial situations might be determined by randomness {Short 2001}, by the presence or absence of a particular file on the computer's hard disk, by the date and time, or by any other factor besides interactor input. The initial situation refers to the state of the IF world, not how that state is described. A work of IF may begin immediately with a prompt, describing nothing about the IF world. Jon Ingold's 2001 *All Roads* begins with a quotation and a menu but does not state anything about the IF world or the player character's situation. Thus, it has a *null prologue*. Similarly, the 1998 *Bad Machine* by Dan Shiovitz begins with just a prompt and has a null prologue. Nevertheless, like all IF works, these have an initial

situation - this situation is simply not described before the first prompt for input. As commands are provided by the interactor, the replies reveal what this initial situation was.

The *final reply* is that reply after which the narration of events in the IF world cannot be continued. This text indicates what is usually called an ending {Short 2001}. After the final reply either the program terminates or the only option is to input a directive. The state of the IF world that is described in the final reply cannot be changed by any commands made after the final reply. In traditional interactive fiction, the final reply usually narrates either the player character's death or ultimate triumph. A final reply is not required for a work to be interactive fiction, and some works, by design, do not produce a final reply. An unfinished or bug-ridden work might also not produce a final reply at all; it might instead only manage to produce a final report that is an extradiegetic error message, explaining what caused the program to crash.

By convention, some directives, such as QUIT, RESTORE, and RESTART, are allowed after the final reply. Neither RESTORE nor RESTART allow the narrations of the IF world to continue, however, after a true final reply; they revert the IF world to some other saved state or to an initial situation. Similarly, UNDO in this situation does not allow a narration to continue; it simply restores the previous state of the IF world and allows the narrative to continue from that point. Adam Cadre's 2000 *Shrapnel* achieved its effect by presenting what seemed to be final narrations while actually continuing to narrate events in the same IF world in reply to subsequent commands, suggesting a transgression. The transgression is between what will be called different *courses*.

A series of exchanges that are part of the same narration, and are presented along with all the directives and reports embedded in it, constitutes a *course*. The earlier excerpt from *Zork* describes a course, for instance. In Andrew Pontius's *Rematch* and Sam Barlow's *Aisle* there can be no courses longer than one exchange. The following session text, from Emily Short's 2000 *Metamorphoses*, illustrates how - because of certain directives - a single session text can contain several courses. It also shows how an exchange can be part of more than one course. Exchanges, which have been numbered, are in bold:

1 >**get the rock**

Taken.

2 >**put the rock in the water**

Anything you dropped in there, you would be unable to retrieve.

>undo

Shore of An Underground Lake

[Previous turn undone.]

3 >**hit the bell**

You slap ineffectually at the bell.

4 >**hit the bell with the rock**

The peal is deep and resonant; the surface of the lake stands up in ripples; the darkness grows (if that is possible) more dark. Even when the sound has died and the water stilled, you find yourself waiting.

>undo

Shore of An Underground Lake

[Previous turn undone.]

5 >listen to the bell

You hear nothing unexpected.

1-2 is a course; nothing occurs after exchange 2 because that command is undone. 1-3-4 is another course. To quote this course we simply include everything up through exchange 4; 2 is now considered as directive because the UNDO directive was input after it, rendering that input hypothetical and meaningless within the IF world. What was the reply to 2 can be considered a report: because of the effect of UNDO this text now tells the interactor, outside the IF world, what would have happened had the command "put the rock in the water" been issued at that point in time - or, in a work of IF that does not depend on time or chance, what will happen if that command is then entered. Similarly, 1-3-5 is a course. Since any portion of a course containing at least one exchange is also a course, 1-2, 1-3-4, and 1-3-5 are only the longest three courses of fifteen in this session text.

Typing RESTORE and restoring an earlier situation brings one to the end of an earlier course, where the SAVE directive was issued. This allows a single course to extend across several sessions. A course can also extend across several interactions.

Can the same situation recur within a course? This depends on the nature of the IF world. In a world in which time always progresses, one cannot return to the same situation within a course - it will be later, so at least one aspect of the situation will have changed. But if time does not exist or if its laws are different, it may be possible. In fact, it is only impossible for a situation to occur twice in a course if an irreversible event occurs after every command. The progression of

time is a special case of this. Note that keeping a count of how many “moves” have been made may or may not pertain to the IF world. If events always occur in the IF world after a certain number of moves have been made, this is relevant to that IF world, but the number of moves made may just be provided (in a report) for the interactor’s information. The player, of course, may not be stepping in the same stream twice when a situation recurs, since she may have a different level of knowledge the second time. But “situation” refers only to the state of the IF world, not to that of the interactor.

The state of the IF world after a true final reply is a *final situation*. So a *traversal* of an IF work is the course extending from a prologue to a final reply, and from an initial situation to a final situation. A *successful traversal* ends with a final situation that corresponds to winning; this seems consistent with what is meant by *playthrough*, {Short 2001} a term that has only been used on rec.arts.int-fiction recently {Schmidt 1999} despite its longer history of use pertaining to video games. Since that term has been used in video gaming to refer to something more like a *traversal* in general, or to refer to the completion of a level, the terminology presented here seems preferable.

Player Characters, Non-Player Characters, and Other Persons

A *character* in interactive fiction is a person who is simulated within the IF world. A character’s actions as narrated can differ depending upon the input provided. The term as it pertains to interactive fiction derives not only from dramatic use and from discussion of the novel, but also from the specific use of the terms *player character* and *non-*

player character in the prototypical fantasy roleplaying game, *Dungeons and Dragons*. These terms have a similar special meaning in interactive fiction.

A *player character* or PC is a character directly commanded by the interactor. Any other character is a *non-player character* or NPC. The interactor may request that an NPC do something, or even command an NPC to do something, but such a request or command will always be done via the PC, who is directly commanded. NPCs certainly include entities that can take actions within the IF world like the PC can - called *actors* {Lebling et al. 1979} - but they may appear in other forms, as long as they are simulated within the world and not under direct command of the interactor.

There are also *other persons* who are mentioned but who are neither PCs nor NPCs. (Since the terms *player character* and *non-player character* seem to complete the set of characters, these other persons are better not called characters; besides, in the study of narratives the term "characters" only refers to those people who actually exist within the story, not those who are simply mentioned.) Marshall Robner, the man whose death sets up the initial situation in Mark Blank's 1982 *Deadline*, is not a character in that work of IF. Lord Dimwit Flathead is not a character in *Zork I*, either, since he is mentioned but not simulated. In Brian Moriarty's 1985 *Wishbringer*, the dragon Thermofax appears alive (albeit in a daydream) in the prologue, but it is not possible at any other point during an interaction for Thermofax to be mentioned again in a reply, and thus no input causes his actions to vary and he is not simulated. Thermofax is a person, but not a character. Three scientists who appear at various points in an interaction as if they were in the room

with the player character in Ian Finley's 1997 *Babel* are also not characters, since they can be recalled by touching objects but are not simulated in the IF world; no actions can influence what happens (or rather, what happened) to them.

The idea of a *character* (including player characters and non-player characters) in interactive fiction is analogous to the idea of a character in a narrative, defined as "an EXISTENT endowed with anthropomorphic traits and engaged in anthropomorphic actions; an ACTOR with anthropomorphic attributes." {Prince 1987 p. 12} The difference is that a character in interactive fiction must be an existent who acts within the IF world. Being a part of the simulation, rather than being a part of the story that the generated narrative tells, is essential for a character in interactive fiction. Since people may disagree about what traits are sufficiently anthropomorphic to allow an entity to be a character in a story, there are sure to be some similar disagreements about whether something is a character (or indeed, whether it is even in the broader anthropomorphic category "person") in interactive fiction. But the category "character" in interactive fiction is similar to that category in narrative, and should be as useful. The presence of entities that cannot easily be seen as anthropomorphic or not, as in Dan Schmidt's 1999 *For a Change*, has an interesting effect, in part, because it tends to defy the easy categorization that we would like to make when thinking about characters.

Aside from the issue of how anthropomorphic a person has to be, there may be dispute about what constitutes "simulation," and therefore whether a person exists as part of the simulated world and

should be considered an NPC. Sean Barrett gives the case of the Implementors in *Enchanter*, who appear as a result of the player character casting a spell, then immediately disappear {Barrett 2002}. They have a sort of existence within the IF world, but there is no opportunity to interact with them. Therefore, although they are narrated and their narration is the result of a command, they are not simulated in the way that the thief, the robot, or the troll is in *Zork*. An opportunity for the interactor's input to influence the behavior of a person - not simply to cue an appearance - would seem to be important in designating this person an NPC. Thus, the Implementors are other persons and not NPCs in *Enchanter*.

World, Rooms

As has been discussed already, a defining characteristic of interactive fiction is the simulation of a world. This is one aspect that distinguishes an IF work from, for instance, a chatterbot like ELIZA/DOCTOR {Weizenbaum 1966}.

The IF world is divided into discrete locations known as *rooms*, which have also been called *locations* and *areas*. Like other essential elements of the form, rooms are defined independent of their implementation. A room is a simulated place from which a certain set of elements in the IF world can be sensed, manipulated, or otherwise acted upon. A room quite often contains *objects*; of course portable objects may be present or absent in different situations and objects that are present may be configured differently (e.g., open or closed). A different configuration of objects does not make for a different room. Rather, if a command is required to move the player character in space before certain other objects can be manipulated, those

objects are said to be in a different room. Rooms, like characters, are simulated and are part of the IF world; they are not just mentioned in some of the narrations that are produced.

Shade, for instance, is aptly described as “a one-room game set in your apartment,” {Plotkin 2001} even though the player character *can* be commanded to move between the futon, the main room, the bathroom nook, and the kitchen nook. There is, by the definition presented here, only one room, because all the actions that are possible in one part of this apartment can be conducted from any other part of it, with the movement between parts of the apartment automatically entailed. The only exception is that the interactor must command the player character to stand up initially, but this is part of waking up rather than being a restriction on moving around in general. After this, any action in any location is possible with a single command, even if the player character is back on the futon.

Even if there were works of IF that allowed the interactor to type a command like MOVE THREE CENTIMETERS LEFT, represented the position of the interaction is a seemingly-continuous way, and thus described an environment not broken into discrete rooms the way that traditional interactive fiction is, there would still be certain sets of actions that were possible at all the different potential locations of the player character. Thus, this definition of *room*, although possibly less useful in this circumstance, would still apply.

Rooms are *adjacent* if the player character can move between them as a result of a single command that represents a single action in the IF world. Thus, *End of Road* and *Inside Building* in William Crowther

and Don Wood's 1976 *Adventure* are adjacent, as are *Inside Building* and *Y2*, since a magic word will move the player character between these rooms immediately. However, even though the robots in Michael Berlyn's 1983 *Suspended* can be commanded to move to any room from any other room, all rooms are not adjacent to all other rooms because movement between rooms occurs as a series of discrete actions, each of which is simulated in sequence over time. A robot's movement may be interrupted along the way by some obstacle or by a new command that countermands the previous one; the whole trip is not atomic, as it is when moving from one room to an adjacent one. Opening a door usually changes the adjacency of rooms.

After a player character has been to every room, the IF work has been *fully explored*.

Diegesis, Hypodiegesis, and Extradiegesis

Up to now "IF world" has been used as if there were a single world for each IF work. Actually, there may be many worlds in a given IF work, just as there may be several stories told in a single text. (The "frame story" of the *1001 Nights* is diegetic, for example, while the stories Scheherazade tells are hypodiegetic³.) IF worlds, like the stories in a text, may be linked in certain ways. In Steven Meretzky's 1985 *A*

³In early versions, "metadiegesis" was used instead of "hypodiegesis" in keeping with Genette's terminology. As was briefly mentioned in the discussion of "meta-command" {"Cycles, Exchanges ..." section}, this can be confusing. Genette admits that in his usage, "this term functions in a way opposite to that of its model in logic and linguistics" {1980 pp. 227-234, p. 228}. Since other narratologists have used "hypodiegesis" to refer (less confusingly) to narration at this same level, "hypodiegesis" is the term used in the current version of this article.

Mind Forever Voyaging there are six simulated future worlds in which Perry Simm is the player character; these occur in a framework in which PRISM, a sentient computer, is the player character. The world with PRISM is *diegetic*, while the worlds with Perry Simm are *hypodiegetic*. Commands that refer to action in such a world can be called *hypodiegetic commands*. In *A Mind Forever Voyaging*, an hypodiegetic world can be reached by putting the player character into Simulation Mode, one of several modes that are available. As Perry Simm, the player character then walks around a simulated version of the city Rockvil. Typing NORTH in this mode provides an hypodiegetic command (it is an instruction for the simulated human being Perry Simm to go north), while RECORD ON is a command of the usual sort (it is an instruction for the computer PRISM, in the frame world, to begin recording what Perry Simm is seeing).

Suspended presents an interesting case in which the player character is in partial suspended animation in a cylinder, and only a few commands (e.g., WAIT) refer directly to actions of the PC. Most commands are hypodiegetic commands issued to robots, who, although they are described by the generated narratives as being in the same physical space, an underground complex, are really in a different IF world. The robots, unlike the immobile human player character, can be told to go to different parts of the complex, can sense things, and can manipulate the environment to effect repairs. They exist and act in the IF world of this underground complex. The human "controller," fixed in the canister in the middle of a large room in the complex and unable to take any physical action at all, is most clearly seen as being part of a different (but linked) IF world. Rather than seeing the robots (who are under the complete command of the

interactor) as non-player characters, it makes sense to see them as player characters in a hypodiegetic world, similar to Perry Simm in one of the simulated futures of Rockvil. That the top-level world can be breached by a robot in the second-level world, who can be commanded to open the cylinder, ripping wires from and killing the player character in the frame world, can be seen as an instance of fatal *metalepsis* {Genette 1980 pp. 234-237}, a transgression between different levels of story or between story and narration. This fatal variety, specifically as encountered in interactive fiction, has been called *dyslepsis* {Aarseth 1997 p. 118}; of course a sort of dyslepsis can occur in narrative also, as in Julio Cortázar's short story "Continuidad de los Parques" ("Continuity of Parks.")

Reference to the nature of interactive fiction as a program is no novelty. When Don Woods first expanded *Adventure* to create the canonical work of interactive fiction, he added a segment that would be encountered at the end of a successful traversal; in this segment, the "closed" cave was fairly explicitly presented as a computer program that was not running. This is an example of one other type of *metalepsis*. Another clear and memorable instance of *metalepsis* early on in the history of the form is in Steve Meretzky's *Planetfall*: Floyd (within the IF world) comments amusingly on the use of the SAVE directive, which is extradiegetic and which Floyd should not know about. In *Planetfall*, the awareness of *metalepsis* allowed humorous use of it; the unintentional *metalepsis* shown in the *Zork* session text is, instead, awkward.

Understanding the basics of diegesis, hypodiegesis, and extradiegesis allows us to make more sense of the seeming polyphony of voices in which statements are made in the computer-generated text of

interactive fiction. "There are at least three identities involved in play: the person typing and reading ('player'), the main character within the story ('protagonist'), and the voice speaking about what this character sees and feels ('narrator')" {Nelson 2002 p. 368}. Nelson states that this narrator speaks the prologue, but notes that "in some games it might be said that the parser, who asks questions like 'Which do you mean...?'" and in some games speaks only in square brackets, is a fourth character, quite different from the narrator" {Nelson 2001 p. 373}. These different speakers in the computer-generated text are what have led others to identify the narrative voice not "as a singular speaker but, rather, as a composite, mechanical chorus coming from both inside and outside the intrigue envelope" {Aarseth 1997 p. 120}.

Just as a work of interactive fiction can have many worlds, it can have many different narrators - which need not all correspond neatly to each of the worlds. For instance, at different times, different narrators might report the events that transpire in a single world. The voice of the parser (and of other parts of the program, such as those responsible for the ability to SAVE and RESTORE a particular situation) is extranarrative, and need not correspond to any of these narrators. Similarly, the voice that reports on hypodiegetic events (those that happen in a world within the main IF world) is hyponarrative. The numerous voices evident in even a simple work of interactive fiction are not a undifferentiated confusion or chorus, but typically correspond to different functions in interactive fiction which can be separated. Even in those cases where different voices are confused (as with the example from *Zork* given earlier) the particular

voices which are being confused, intentionally or unintentionally, can be identified.

Winning and Losing

Many IF works have a goal that is explicitly presented or that becomes clear during interaction. Such works often indicate during their final reply whether or not this goal has been achieved. By several definitions, works of this sort, as with any rule-based activity engaged in for an outcome or for symbolic rewards, are games {Aarseth 2001, Zimmerman 2000, Zimmerman 2001}. Reaching a final reply that indicates the achievement of the IF work's goal is *winning*, and a traversal that ends in such a reply is a *successful traversal*. Similarly, reaching a final reply that indicates failure is *losing*, which concludes an *unsuccessful traversal*.

It seems the first work of IF to problematize the concept of "winning" was Michael Berlyn and Patricia Fogleman's 1983 *Infidel*. The final reply in *Infidel*, after completing the final task and achieving the highest possible score, includes the text "You will never get out of this pyramid alive. You earned this treasure. But it cost you your life." Despite the attainment of the maximum score, the goal of *Infidel* was clearly not to perish inside its pyramid, having collected all the treasure. But the goal - to plunder the pyramid and escape - could not be achieved; it was possible to attain the top score and solve all of the puzzles, but only possible to win this sort of pyrrhic victory. Still, interactors could state that they "won" *Infidel* after getting to this final reply. Later works, including *Galatea*, *Exhibition*, and *Aisle*, offer no optimal final reply; it would be bizarre for an interactor to claim to have won one of these. The 2001 work *Schroedinger's Cat* by

James Willson does not even produce a final reply, so it is impossible to traverse at all. However, it can be solved in a certain sense, since it presents a world that the interactor can understand; this notion of solution is discussed later {Puzzles and Their Solution section}.

In Michael Gentry's 1998 *Little Blue Men*, in contrast, it is possible to win after entering only a few of the most obvious commands. (*Little Blue Men* can be won in 10 commands; an interaction that results in a successful traversal might take only two minutes.) The optimal score is achieved in this outcome, and the final reply includes the text "*** You have learned to love yourself *** // In this game, you have finally managed to love life." *Little Blue Men* is a much more intricate and complex work than such a victory would suggest, however. A different choice of commands brings the player character into an office environment that holds many puzzles and conceals something bizarre and horrifying.

An IF work has been *won* after a successful traversal, when a winning final reply is produced and a winning final situation reached. Since *Adventure* and *Zork* there has been a tradition of "the last lousy point." Because of this and for other reasons, many IF works can be won without achieving the full score. Winning, besides not necessarily corresponding to attaining the maximum score, also does not particularly correspond to *full exploration*. It also may not correspond to the *solution* of the work.

Although IF works are always called games, and almost all of them are games, their nature as game has hardly been explored at all. A common idea is that the author competes against the player in the

“game” of interactive fiction, but this makes no sense when considered in the context of other games. The inventor of Monopoly does not compete with the people playing Monopoly; Will Wright does not compete with a person playing *The Sims*; the inventor of Hackeysack does not compete with a Hackeysack player. Nor is the computer the opponent in interactive fiction, any more than a computer version of solitaire opposes the player. In interactive fiction, the computer serves as a referee rather than an opponent {Solomon 1984 p. 20}. (If the computer provides hints it may be acting in a different role, that of a second.) “An Adventure game is an example of what a games theorist would call a cooperative game. If there are many players, as is often the case, they function as a team” {Solomon 1984 p. 21}. The myth that interaction in these sorts of games is solitary and is done by a lone interactor contributes to this misunderstanding of the form.

From the standpoint of game theory, the typical interactive fiction game differs from a game like chess not only because the players in chess oppose one another but because in that game total information about the game state is always available to players. Not only is the state of the game (or the state of the IF world) known only in part in interactive fiction, but the workings of this world (and of the particular interface to it) are also unknown. Thus “the discovery of the rules, through trial and error, is one of the principal attractions of the game. The mark of a well-designed game of this type is that the rules reveal a consistent style, and are not merely arbitrary” {Solomon 1984 p. 20}. The nature of IF as game is too complex a topic to explore further in the current discussion, but clearly it is necessary here as well to recognize what type of game it is and what aspects of that sort of game help to make it interesting. It is worth

noting that the perspective of game theory does support the figure of the riddle as a way of understanding interactive fiction, although the riddle may not formally be the same type of game. The text of a riddle itself is completely known to a riddlee, but solving a riddle requires that the workings of the riddle's world be explored and understood, that its rules be discovered.

Puzzles and Their Solution

One way of understanding the relationship between the literary and the puzzling aspects of interactive fiction is by reference to the riddle, a figure that - unlike "puzzle," "problem," "game," "world," and many other commonly-invoked figures, can actually help to explain how the literary and puzzling aspects of the form work together {Montfort 2003, Montfort 2004}. The riddle is seldom invoked directly as a figure - at best, it is discussed as one type of puzzle that might be presented. But the figure of the riddle is consistent with some discussion of the puzzle in the IF community. Gregory Cox suggested two requirements for a puzzle: "a puzzle has to have an objective" and "a puzzle can't be obvious" {Cox 1999}. This is quite similar to a definition of the riddle that has been advanced: "Every proper riddle must fulfill two conditions: the first is its social function as a competition between the riddler and riddlees; the second is its literary form, which must be difficult and enigmatic, yet containing the clues necessary to decipher it" {Pagis 1996 p. 81}. A similar definition of puzzle is a good start, but it leaves several questions open. Is a puzzle posed to the player character or to the interactor? Does a puzzle have to be "required" for a successful traversal in order for it to be considered a puzzle?

This section uses the earliest version of *Adventure* now publicly available, the 1976 350-point version, to discuss puzzles in depth. If theorists can agree about how many puzzles *Adventure* has and what they are - or even if they can disagree and articulate exactly how they disagree and why - this will be a good sign that the concept of a puzzle can be sensibly discussed as it pertains to IF works in general.

It seems possible to fruitfully discuss puzzles as formal elements of an IF work. In fact, it makes little sense to seek the puzzle in the mind of the author. What if the author is persuaded that it is a puzzle for the interactor to figure out how to type GO NORTH when the player character is in a room where a doorway is clearly described as being to the north? The author's belief does not, by itself, make this a puzzle. Similarly, we should not simply believe an author who denies that a certain intricate and difficult-to-discover series of required actions constitutes a puzzle.

It will also not do to rely too much on the interactor's state of mind and level of intelligence. Clearly, since puzzles are constructed to challenge people, a definition must refer to the thought process of the interactor in some way. Still, it makes little sense to consider that Graham Nelson's 1993 *Curses*, for instance, actually contains more puzzles when a novice sits down at the computer than it does when an expert begins to interact⁴. Also, puzzles should remain puzzles

⁴Since *Adventure* was the first work of IF, this case is unusual; people did not know anything about how to interact, and just discovering how to move around and get into the cave was challenging. Even in this case, figuring out how to operate the work of IF in general, and how to move the player character about, is best not considered as a puzzle itself, although it may be essential to the pleasure of (or disappointments with) interaction. A difficulty that can reasonably be considered a puzzle is seen when the

even if a particular interactor knows how to solve them. However, a puzzle does need to be presented as a challenge and to be non-obvious to the *interactor*, not necessarily to the player character. This is seen most clearly in part of Jeff O'Neill's 1987 *Nord and Bert Couldn't Make Head or Tail of It* and in this author's 2000 *Ad Verbum*, where the solution of puzzles relies on expressing a command properly rather than actually determining the correct action that the player character should perform. Although the IF world is essential to puzzles, puzzles are ultimately posed to the interactor outside the level of the IF world.

There is no necessary relationship between the score and the solution of puzzles. The most obvious way to see this is in a work such as Andrew Plotkin's 1995 *A Change in the Weather*, which has puzzles but no score. In *Adventure*, score has little to do, directly, with solving puzzles; it is mostly tied to picking up and dropping treasures. Driving away the snake, which clearly seems a puzzle, does not, in itself, earn the interactor any points. Yet *Adventure* awards 25 points for "getting well into the cave," although nothing special needs to be done to get that far. Crowther's original version of *Adventure* did not keep score {Peterson 1983 p. 188}.

There is also no requirement that anything immediate happen in the world when a puzzle is solved: the player character may only later visit another part of the world to see the result of solving a puzzle. Solving puzzles does not always unlock new parts of the IF world, or

general operation of an IF work differs from the standard operation of interactive fiction, and thus presents a special challenge, as in Carl Muckenhoupt's 2001 *The Gostak*.

unfold some larger space; a solution may restrict rather than enlarge a player character's, and therefore the interactor's, options. As a result of collecting all the treasures in *Adventure*, for instance, the cave closes and the player character is teleported to a new and much smaller location.

A *puzzle* is a challenge in a work of IF that requires a non-obvious set of commands in order to be met. Non-obvious refers to a hypothetical, typical interactor encountering the work for the first time; puzzles do remain puzzles, in this formulation, after an interactor discovers how to solve them. Unlocking the grate with a ring of keys, found in plain sight a few rooms away, is not a puzzle, since it is obvious. Obviously, there may be disagreement about what is "obvious" and what is not, but this criterion at least suggests an independent way of determining what is a puzzle and what isn't, one that does not refer to the author's intentions and the interactor's specific knowledge and aspirations. Any typical interactor should be able to determine what is or isn't a puzzle simply by studying the IF work in question, without needing to interview the author or take a survey of other interactors. The other factors essential to the determination of "obviousness" should be not the mindset of the author or of a particular interactor, but the culture or subculture within which the work was published - along with the conventions of interactive fiction.

There is no requirement that a puzzle's challenge relate to any other elements of an IF work in order for it be a puzzle. It simply has to be presented as a challenge. While the typical way of doing this is to make the solution to a puzzle a requisite for a successful traversal, puzzles can be presented in some other way. Formally, the *solution*

to a puzzle is the series of commands that meet the challenge of a puzzle. A *solution to a work of IF* is a series of commands that result in a *successful traversal*, with puzzles solved along the way. The typical walkthrough, of the sort often found online, records a solution to a work of IF. It is important to note that "solution" has not only a formal meaning but also a meaning that refers to an interactor's interpretation, operation, and understanding of an interactive fiction work. An interactor who, by interacting with a work, comprehends the entire system of the IF world - why it is arranged as it is and why it functions as it does - has solved the interactive fiction work in this sense.

The puzzles in *Adventure* are:

- Driving the snake away
- Getting the gold nugget out
- Getting the emerald out
- Lighting the dark room
- Killing the dragon
- Creating a bridge
- Dropping the vase safely
- Watering the beanstalk twice
- Oiling the door
- Opening the oyster
- Replacing the troll's treasure
- Feeding the bear to calm it
- Deploying the bear against the troll
- Finding the way through the Pirate's maze
- Finding and purchasing lamp batteries in the other maze

- Blasting out of the repository
- Dropping the magazine at Witt's End and leaving the area

The last of these presents what is probably the most questionable case. Puzzles do not have to be required for a successful traversal of a work in order to be puzzles, according to this definition; they do not have to be tied to any benchmark or other plot element. In the case of dropping the magazine at Witt's End and leaving the area, this is a puzzle because *Adventure* clearly presents a challenge to the interactor: to get the last lousy point, independent of successfully traversing and winning *Adventure*. If the interactor had 350 points beforehand and dropping the magazine gave the interactor 351 points - and there was thus no way to know beforehand that an extra point could be obtained - this could be referred to as an *Easter egg* but would not be a puzzle. A challenge would not have been presented initially.

This last lousy point also demonstrates that solving a puzzle does not have to relate to anything meaningful in the IF world. Since this puzzle does not, it may make for a lousy puzzle, but the meaningless commands to drop the magazine and leave Witt's End are nevertheless the solution to an actual puzzle. The typical method of solving this - which involves reverse-engineering the program and actually reading through the resulting assembly language to figure out where the last point is assigned in the code - is certainly challenging for the interactor, despite the lack of any relationship to the IF world.

Finding the batteries in the other maze is a puzzle since it is presented as a challenge, issued rather directly when the lamp runs

low. It is not required for a successful traversal, however. In fact, buying a lamp battery deprives the player character of one treasure and the possibility of gaining the full score.

Collecting the remaining treasures and depositing them in the building is not a puzzle or set of puzzles, because, although the pirate might steal a treasure to thwart its being moved, in general these actions are no more difficult than picking up other objects and moving them around - they just happen to be scored. A series of actions that is required for a *successful traversal* but is not a puzzle can be considered a *task*. In *A Mind Forever Voyaging*, there are no puzzles presented in the initial Rockvil simulation in Part I, only a list of tasks. The interactor is challenged to carry out these tasks, and it is enjoyable to explore and experience the IF world while doing them, but they do not require the interactor to do anything non-obvious.

Conclusion and Introduction

This essay aims to begin some useful discussion of the elements of interactive fiction from a theoretical standpoint. This article explored only a few of the implications of clearly distinguishing the simulated from the non-simulated, the IF world from the text that describes it, and the diegetic from the extradiegetic. Perhaps the few points that have been made are at least adequate to demonstrate that a better perspective on IF can result from making such distinctions.

The first test of the more formal concepts defined here will be if they are understood and can be applied unambiguously, in a consistent way, by different theorists. The only way of knowing whether this can

be done or not, and what the failings of the concepts presented here are, will be in another theorist taking up these terms in discussion of other specific IF works. Of course, some concepts introduced may also be of little or no use, even if well-defined, or we may not be at a stage in discussion where they are useful.

Whether or not others choose to adopt the specific terms provided here, it will be valuable to have more discussion of the nature of interactive fiction that

- focuses on specific works in giving examples of what the elements of the form are;
- distinguishes between elements in terms of their being formal or interpretive; and
- makes strong and meaningful claims that can be evaluated by others and, if useful, built upon by others.

As should be clear from the title of this section, from the discussion of puzzles, and indeed from the title of this essay, the intention here is to help begin a strong theoretical discussion of interactive fiction rather than to conclude it. There is much that remains in considering the nature of puzzles and how they fit into an IF work overall, relating to its aspects as program, potential narrative, world, and game. Clearly, people in the IF community are beginning to think about theorizing interactive fiction in a stronger way than can be done in casual discussion. There are certain to be benefits for interactive fiction if this more verbose and strict discussion of the nature of the form continues. Approaches from other fields of study (such as narratology, game theory, and game studies) can result in a better

understanding of interactive fiction and should also allow the many of us who author IF works to make advances in our art.

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