Interactive Fiction's Fourth Era

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For thirty years certain people have been having strange conversations with their computers. It is possible that one of your friends or co-workers is such an interlocutor, and this may have even escaped your attention — in these exchanges, people seldom speak aloud beyond the occasional mumble or gasp of surprise. The discourse itself is typically conducted by keyboard and on screen. Indicators of such an activity include hastily-drawn and highly abstract maps, expressions of deep and puzzled thought, and, at times, a transformed perspective on the world.

A bit of a conversation with the comptuer might begin with this utterance from the machine: "You are standing at the end of a road before a small brick building. Around you is a forest. A small stream flows out of the building and down a gully." In response, the person might type "building", expressing an intention to go inside. Then the computer would continue, "You are inside a building, a well house for a large spring. ..."

Or, during a different conversation, the person might type "read the letter", to which the comptuer would respond:

> A page delivered this letter bearing the Queen's seal shortly before one o'clock. It reads:
>
> "THE KING IS DED AND YOU HAV TO MAK SHUR THAT NOTHENG BAD HAPENS! I TOLED THE GARDS NOT TO TEL ANYWON BUT I DONT THINK THERE GOENG TO LISEN AND HOO NOS WAT IS GOENG TO HAPEN NOW -- YOU HAV TO MAK SHUR THAT NUN OF THE MINESTERS TRYS ANYTHENG CRAZEY BECAS IF ANYTHENG HAPENS TO ME OR TO CHARLES THEN I AM GOENG TO HAV THE GARDS KIL YOU AND YOR MOM TOO -- IT IS YOR RESPONSEBILTY!!"
>
> You were quite astonished to receive this letter -- you'd been under the impression that the Queen was completely illiterate. Apparently she's been cribbing from the young prince's homework on the sly.

The person might continue at this point, having noticed earlier that the palace chef is in the area, by typing "ask the chef about the king", which would elicit this reply

from the the computer:

> "What can you tell me about King Charles?" you ask.
>
> "Well apparantement 'ee ees dead," the chef says. "Ah know no more zen what ze page said. Ah em afraid mah knowledge een zees matters ees leemeeted to death bah chocolate."

Computer programs that are able to talk like this are referred to, in English, as "interactive fiction," or "text adventures," or sometimes simply "text games." The Spanish term "aventuras conversacionales" is also a very appropriate one, because a natural-language exchange, which is a sort of conversation, is a very important feature of these programs. Games that just involve pointing and clicking are seldom considered interactive fiction.

A work of interactive fiction (IF) doesn't produce small talk when a person types to it; in addition to being a form of dialog system, it is a text-based computer simulation, often a challenging and puzzling one, and a kind of literary art. By simulating a world to some extent, IF programs go beyond one of their clever ancestors, *Eliza/Doctor,* the simulated Rogerian psychoterapist that Joseph Weizenbaum developed at MIT during 1964-1966. That system, and the chatterbots that have followed it, can amuse and can sometimes converse in uncanny ways. But the simulated world in IF means that there is more to do than chat: The system can narrate what has happened and can represent the effects of the commands that are entered by the person, or "interactor."

Interactive fiction, by offering to take part in these strange conversations, can provide transformative experiences that can help readers to understand the world from new perspectives. It is difficult to explain the literary and reflective qualities of IF without actually starting up the computer and beginning one of these conversations, just as it would be difficult to explain a motion picture a hundred years ago without showing one. Cinema was initially dismissed as a novelty, as entertainment, and as not being suitable for artistic expression, and interactive fiction is often dismissed both by those interested in commercial video games and by those interested in literary work. From the standpoint of a video game developer, player, or critic, interactive fiction is sometimes considered a historical curiosity, sadly lacking in commercial potential. To many (but fortunately not all) in contemporary poetics and literature, IF is, ironically, just a game. Yet, oddly enough, brilliant new works continue to be written, programmed, and published by IF authors; interactive fiction is written internationally and is often challenging and provocative to its readers; and work on novel new interactive fiction development systems continues as well.

Origins and Three Eras

The history of interactive fiction begins with the 1975-1976 game *Adventure,* which provided the first bit of example conversation. (The second excerpt is from a much more recent work, Adam Cadre's 1999 *Varicella.*) Before the development of *Adventure* began, however, certain advances helped to lay the foundation for a program of this sort.

Important pre-IF development included the already-mentioned *Eliza/Doctor,* the mother of all chatterbots, and a variety of other research projects and examples of recreational programming. The first modern-day game premiered at MIT in 1962; while the graphical *Spacewar* may not have contributed very directly to the turn-based, all-text *Adventure,* it did make a difference by showing how computers could be used for fun as well as work. About a decade later, but still before the time of personal or home computers, the number of people with access to computers had increased and many of them had taken to writing games in BASIC. These usually implemented games on simple Cartesian grids, but an early cave-crawl game, Gregory Yob's *Hunt the Wumpus,* broke this mold by being set on a dodecahedron. While much simpler than *Adventure* and not allowing anything like a conversation, it not only was set in a cave — it also encouraged the map-making that interactors would later use to find their way around *Adventure* and other works of IF. Some official research explored the relationship between a natural language conversation and world model, too. Terry Winograd's 1972 SHRDLU was a system with simulated blocks that could be manipulated by a simulated robot, and demonstrated how one could carry on a natural-language dialogue about a restricted domain. It wasn't an exciting adventure, but it revealed how a person and a computer could usefully talk about a particular, restricted world. Plenty of other early work in computer poetry and playful text generation had been done by the early 1970s, too. The creators of *Adventure* did not carve their colossal cave completely from scratch. Rather, they brought together several aspects of earlier systems to define a lasting form of computer game and electronic literature.

It was Will Crowther, a programmer at BBN, who developed the first version of *Adventure,* probably in 1975. At the time, he was helping to develop some of the workings of the ARPANET, predecessor to the Internet, at Bolt, Beranek, and Newman in Cambridge, Massachusetts. He was a caver, and he had recently been playing a new game, *Dungeons and Dragons.* He decided to code up a game for his two young daughters, so he simulated, in text, an actual cave that he had explored, and he used an interactive framework that resembles how a player speaks to the game master, or dungeon master, in *Dungeons and Dragons.* The most famous early version of *Adventure* was not this "original," however. It was a version that Don Woods, working independently across the country, fixed up and expanded. This version came out in 1976, complete with puzzles and fantasy elements, and it was an instant hit — work in the computer industry supposedly ground to a halt while practially every person with access to a computer tried to solve *Adventure.*

Some people managed to waste even more of their time by writing their own expanded, modified, or reimagined version of *Adventure.* The mainframe era of interactive fiction started up as other users of time-sharing systems build their own

"adventures," or "adventure games." A haunted house game, *Haunt,* was developed at Carnegie Mellon University. What may have been the first game developed outside the United States was the massive *Acheton,* developed on University of Cambridge's Phoenix system — which hosted a long series of other adventures. Back in Cambridge, Massachusetts, at MIT, four collaborators developed *Zork,* a cave-crawl that had a very different tone from Adventure, and which incorporated many technological advances. *Zork* also included a memorable character and antagonist, "the thief." One version of *Zork,* known as *Dungeon,* was the inspiration for Multiple User Dungeons (MUDs) and, through the MUD, for all sorts of multiplayer online adventures. Another version was the *Zork* trilogy for personal computers, which was published by the company Infocom, founded by *Zork* creators and other from MIT. This series turned out to be a solid start for what would become the most significant interactive fiction company in the United States.

As home computer use boomed, the commercial era of interactive fiction took off as well. Infocom may have been the biggest U.S. interactive fiction company, but the first was Adventure International, which got its start by publishing a miniaturized version of Adventure. Infocom was notable for high-quality games that were well-tested and well-written. The company also explored numerous popular genres, first breaking away from the "dungeon" milieu in 1982 with *Deadline,* a detective story. Following this were science fiction games of several sorts (from hard science fiction to ribald space opera to politicized dystopia), an archeological adventure, a romance-novel style game, a mansion treasure hunt, a game based on wordplay, two juvenile fiction pieces, and many others.

Popular genres weren't the only thing being taken over by interactive fiction. In the 1980s, it also became popular to adapt existing books. Infocom had Douglas Adams collaborate with an experienced IF implementor to create an interactive *The Hitchhiker's Guide to the Galaxy*; another famous based-on-a-book interactive fiction was *The Hobbit,* from the Australian company Melbourne House. The Hobbit was a graphical adventure, but, like many early graphical adventures, it followed in the tradition of the text adventure by offering a text-based, conversational exchange in addition to images of each location. During the 1980s, a few established print authors worked with programmers to develop original interactive fiction. Among these were Robert Pinsky, whose *Mindwheel* was developed at Synapse and published by Broderbund in 1984, and Thomas M. Disch, whose *Amnesia* was developed with the Cognetics Corporation and published by Electronic Arts in 1986. Other companies in the U.S., elsewhere in the English-speaking world, and elsewhere helped to push interactive fiction in new directions. In England, there were numerous developers of interactive fiction with graphics. Level 9 developed numerous quality titles, while Magnetic Scrolls came into the game later with innovating and high-quality interactive fiction. In Spain, Aventuras AD produced adventures games for the Spectrum. While there were IF companies in many different national markets, differences in platforms and barriers to international software distribution limited the flow of interactive fiction across national boundaries, even when language was not an issue.

By the end of 1980s, when screenshots on boxes sold games and computer interaction was taking a more graphical turn, the market for interactive fiction had started to evaporate. Interactive fiction no longer topped the entertainment software charts and powered major game companies, but there was still a current of interest in the form. By the early 1990s, several interesting developments meant that interactive fiction would migrate rather than become extict. For one thing, powerful systems for creating interactive fiction had become available: first TADS and then Inform, which allowed anyone to create games in the same format as Infocom's. While there had been do-it-yourself interactive fiction kits for a long time, the sophistication of these new systems made it possible to create something on the scale and level of complexity of a commercial piece. Additionally, the public had been gaining access to a new channel that allowed anyone to distribute interactive fiction internationally, essentially without cost to the interactor or author — the Internet. Several other institutions sprung up to support interactive fiction in its new context: newsgroups to allow discussion; the annual Interactive Fiction Competition, now entering its 12th year; and the IF archive, a repository for IF and IF development tools.

So, while the disappearance of commercial text adventures from store shelves saddened many fans — not to mention the authors who were employed creating interactive fiction — these curious conversations continue to be developed by hackers and writers, much as they had been before home computing. The independent era has provided many interesting experiments and powerful innovations, pieces of interactive fiction which would have been far too interesting and unusual to have ever made it into an Infocom box. It is possible to catalog several of these recent innovations, but it is also interesting to focus on one.

The Bizarre Workings of *Bad Machine*

In 1998, Dan Shiovitz released an intricate, compelling work of interactive fiction. Many in the IF community spent dozens of hours unlocking the secret workings of Shiovitz's simulated world. But although *Bad Machine* was released for free and remains freely available on the IF Archive, few outside that community — even those interested in codework, layers of signification, the use of database in digital art, and the complexity of interface and underlying systems — had been alerted to it until it was published in *Poems that Go* in Fall 2003, running in Shiovitz's own Jetty interpreter. Even then, many may have turned away from the work upon finding that it is neither clickable nor instantly understandable.

William Carlos Williams described a poem as a "small (or large) machine made of words." *Bad Machine* is a large poem/machine, a computer program that accepts language input and provides language in reply. Like a literary riddle, it is literary and also can be solved. (Such poems have, in English, compelled people to simultaneously read and solve since the Anglo-Saxon *Exeter Book.* They have been even more prominent in other literary traditions.) *Bad Machine* is different in

appearance and in several other ways from the stereotype of interactive fiction that is based on the famous early cave-crawls *Adventure* and *Zork.* Still, it is a simulated world that is described in text and affected by meaningful, typed commands from the interactor, e.g., 'INDEX SALVAGER', 'GO NORTH', 'TRANSMIT 11000011 TO MONITOR'.

Bad Machine begins with just '?' and a blinking cursor, asking 'What do you want to do?' and also reflecting the reader's puzzlement — even one experienced with interactive fiction expects some prologue, some description of what is going on at first. Since the '?' is not the ordinary '>' prompt, it signals that this experience will be substantially unusual. Indeed, *Bad Machine,* after beginning in an even less intelligible way, provides this sort of text:

> Dir ALT{ER}DDDisplace-: 1 [northeast -> north]
>
> Reclamation Sector (1)
>
> (clear*space) open -> bare floor. (insersection / entrance?) line delimiter cross=north: wider space. south: rec. secctoor.
>
> Sector->Content_list: a disabled climber-class machine
>
> Salvager-class machine is here.
>
> Salvager #231 :: Mover #005 | [Salvager-class machine * Serial 14-231 * Power: 249 * GOOD MACHINE]
>
> Salvager #231 detach()e()s leg {type #0275} frOm disabled climber-class machine
>
> Salvager #231 picks the leg {type #0275} up.

Through the corrupted and intermixed code and English that is displayed, in reading the special commands that are available, and in wandering and encountering various machines it can become apparent that the player character is itself a mover-class machine, a six-limbed robot that is part of a collective known as the Warehouse. The Warehouse has complex fortifications and defences and construction sites and workings, and its sole purpose seems to be the creation of something known only as Product. The player character is, however, a defective mover — a bad machine — and the interactor is almost certain to soon encounter an ending in which, detected by a drone, the mover is taken to be 'fixed'. The result is tantamount to death: the mover is reintegrated into the workings of the Warehouse and can no longer be commanded to explore and understand the place. After the interactor has seen the mover become a good machine, the nature of the initial error becomes clearer: the bug that supposedly afflicts the mover is individual consciousness.

Bad Machine was almost certainly influenced by two of Michael Berlyn's interactive fiction works, *Cyborg* and *Suspended*, but Shiovitz also cites (with links from his

cryptic Web page for the project) The Digital Landfill, meta.am, jodi.org, and Frank Garvey's robot theatre group Omnicircus. Although at first *Bad Machine* seems to resist reading, it teaches the persistent interactor to read in a new way — not to glance at a surface and appreciate the play of symbols, not to see a confusion of code that communicates only through its visual aesthetic, but to read and understand the novel description of the IF world, and then to move on to understanding its systematic nature. To gradually accomplish this, it's necessary to investigate the world, manipulating it. Just as we may bring forth our attempts at an answer to a literary riddle, testing them against each figure and adjective, the interactor must issue commands to prod at the world and see what happens. To do so requires commands and thinking appropriate to a mover, rather than a cave explorer; a new writing must be done to develop an understanding of the IF world.

The Warehouse is a reflection on the nature of work in post-industrial society, where the daytime environments of factory workers and information technology professionals alike can seem automatic and meaningless. The IF world also bears upon the nature of individuality, offering an alternate origin myth for consciousness, which here has arisen as a defect in a collective system. Some of the conclusions that the interactor can, with concerted effort, arrive at — there are several 'successful' ones — manage to unfold more dazzling questions than they answer — just as a great riddle does. This can only be accomplished because the interactor, like one who solves a literary riddle, has deeply understood the workings of this unusual world. In *The Riddle of Creation* Ruth Wehlau described the Anglo-Saxon riddler:

> ... making familiar objects into something completely new, re-arranging the parts of pieces of things to produce creatures with strange combinations of arms, legs, eyes and mouths. In this transformed world, a distorted mirror of the real world, the riddler is in control, but the reader has the ability to break the code and solve the mystery.

In *Bad Machine,* Shiovitz offers exactly this sort of exquisite cosmos, this sort of crackable codework. The dazzling, intricate, and highly relevant riddle offered in this piece makes it a good starting point for those interested in digital poetry and how language and code can collide, and it shows some of the unusual potential of interactive fiction.

How I Wrote and Shaped My *Book and Volume*

As I write and program interactive fiction, I am quite interested in creating riddle-like systems and in simulating spaces that undergo transformations. My most recent work, which was released in November 2005 on the [auto mata] label, is *Book and Volume.* This piece, as with my other interactive fiction, is freely available at <http://nickm.com>. The setting is a newly-built desert city that is run by a giant software and media corporation. The interactor controls a system administrator who, at first, must scuttle about performing menial information technology tasks.

Over time, the interactor may learn that there is more to life than this, and may start to puzzle out some of the strange things that are going on all around.

The conversation that *Book and Volume* offers begins like so:

> Your pager tickles you awake.
>
> Upstairs in the house of your childhood, in your room, and it must be time for school because -- no, it's the weekend, you remember, but your alarm is going off anyway. You should have been awake already. You're going to miss the bus. Your mother climbs in the window. You're dreaming.
>
> You're a grown-up: It opens to you again, a sluggish window summoned by a mouse click. Waking up now in your own apartment, your new apartment. Your pager is buzzing and vibrating both, serious. It is in fact the weekend, but you're not in elementary school. No one is crawling in through the window. You're a system administrator for nWare. Waking up urgently, here in nTopia.
>
> *Home*
>
> The constellations on the ceiling are as you left them: Pisces, Cetus, Aquarius, and the ones without celestial referent, left by some crazed astronomer in residence here before you. What could you call them? The Cradle, The Way, The Burning Book...
>
> They're still glowing, too. Must not have napped for long.
>
> >

This beginning uses text from Stuart Moulthrop's hypertext novel *Victory Garden* and Rainer Maria Rilke's *Duino Elegies*, moves through levels of dream and reality, and situates the main character in this unusual city, in a dark apartment. After working through the initial frustrations of answering the pager, the interactor can guide this character out into the rather expansive city which reflects on the urban experience of a Western worker/consumer. The functioning of the city is obscure, since non-disclosure agreements and corporate subdivisions keep the character from knowing what it going on. But nTopia's system, folded in upon itself, can be figured out to some extent, and the way that it is described in writing is meant to allow things about our world to be contemplated in terms of this simulacrum.

There are several capable interactive fiction development systems available for free. The one I used to create *Book and Volume* and my earlier pieces *Ad Verbum* and *Winchester's Nightmare* is Inform 6. Since then, Inform 7, a considerable upgrade, has been released. Inform 6, like its successor and like other development systems such as TADS and Hugo, offers a programming language capable of general computation but is crafted especially for interactive fiction. A simulated object in the world, such as a lamp, is represented by an object in code. The character controlled by the interactor, represented by an object as well, becomes the parent of the lamp object

when the character picks up the lamp. Certain aspects of perception are simulated along with the basic workings of the physical world. For instance, a light source must be present in order to see in an otherwise dark room; if the light source is inside a closed container that is not transparent, the room will not be illuminated.

In addition to allowing for world simulation, interactive fiction development systems provide mechanisms for understanding input. The standard sort of input to be understood is, in English, a command that begins with a verb and is followed by zero to two nouns with some prepositions and possibly adjectives thrown in. This considerably simplifies the task of language understanding. Commands are generally supposed to refer to something in the immediate area, which simplifies things further. As a result, few substantial advances beyond those made in *Zork* have been needed to do a decent job at understanding commands.

The subsystem that processes input in interactive fiction is called the *parser*, while the one that simulates a physical space, the things in it, and the laws that govern their behavior is called the *world model.* Many of the most often-discussed applications of artificial intelligence technology target the world model: individual characters who act purposefully are in this category, as is drama management to orchestrate character behavior overall. Advances do not need to be limited to the simulated world, however. In *Book and Volume,* I incorporated a perceptron classifier to distinguish typical male and female first names (a somewhat challenging task in English) so that the output text could be subtly adjusted based on the main character's first name. While this is only a minor detail in the overall experience of *Book and Volume,* it was an attempt to integrate a statistical machine learning method into the rule-based "good old fashioned artificial intelligence" framework of interactive fiction.

Narration and the Next Era

Where is interactive fiction, in this third, independent era, headed? Although the practice of interactive fiction development and the contexts in which these works are encountered are important, I believe that the seeds of next revolution can be found within. A reconfiguration of how interactive fiction functions, rather than commercial opportunity lost or gained, may be the impetus for change. I envision a fourth era of new interactive fiction machines, literary machines. The standard, basic architecture has commands processed by the parser and passed to the world model, which runs a simulation, throwing off descriptive text as events happen. Inform 7 is an advance on this in that it recognizes that there should be way in which the world model's production of output is managed. I propose, however, a more radical reordering of interactive fiction's internals, in which a *narrator* subsystem joins the world model and parser, sharing discourse information with the parser so that the conversation can be maintained and providing flexible, powerful ways to vary the narration of simulated events. This narrator uses natural language

generation techniques, rather than the fixed orthographic strings that are used in current systems.

A fundamental distinction is made in the study of narratives, which is in modern times called narratology, between the content plane of a story and its expression plane. Events happen in a certain chronological order, linked by causality, in the underlying story that is being told; the discourses that narrate this story may vary in all sorts of ways. The events could be related out of chronological order, some of them could be represented at length and others elided entirely, and the same event might even be told multiple times for emphasis. The basic distinction between content and expression was known since Aristotle and has been explored in depth in recent decades by Seymour Chatman, Gérard Genette, Gerald Prince, Mieke Bal, and others. But interactive fiction, accomplished as it is at simulating the content plane, has not been organized to incorporate this distinction. Since text fires off as events happen, it is extremely difficult to tell the things that have happened in a different order. The basic framework of interactive fiction, in which approximately one event happens per conversational turn, means that this deficiency does not cause too many problems. But it also rules out richer simulation in which many things happen per turn (and are narrated in an interesting way), the use of flashbacks to events that occurred earlier in the interaction, and the ability to narrate events from different perspectives.

By modeling the narration of events separately, interactive fiction will be able to more easily do the work of simulation — which has recently brought us the challenges of computer gaming — and the work of literature, which has transformed readers and their relationship to language for thousands of years. While interactive fiction has always had literary aspects, the further development of the ability to narrate could be significant enough to extend the current era into a new one. Interactive fiction could be seen by the literary establishment, the art world, and academia as an expressive, provocative form, as legitimate as the painting or the poem. By combining the power to compute and simulate with the ability to narrate, to make strange, and to reveal the textures and complexities of language, interactive fiction's potential to be more than an addictive game, and more than best-selling software, could be more widely recognized. That could allow interactive fiction to be the point at which the depth of the literary tradition and the full power of computing fuse.

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