

WINSIDE OUT

An Introduction to the Convergence of Computers, Games, and Art

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Life is the game that must be played

—Edwin Arlington Robinson, *Ballade by the Fire*

Life is the greatest interactive fiction of them all

—Donald Westlake, *Drowned Hopes*

I have been playing games all my life, but I do not think I would now be writing about them if it weren't for the explosion in the popularity of games that has taken place over the last couple of decades in tandem with the rise of digital technologies. After the years of childhood dress-up games had passed, the number of my friends who enjoyed games remained a small and diminishing percentage of the total. In America, there is a general cultural understanding—an unwritten rule—that games are by and large for children and retirees, with the major exceptions of sports and chess, which adults respect (though for rather different reasons). I believe that this is now changing with the advent of computer and console games, and I expect that for the generations now coming to maturity, games will become as much a part of the cultural landscape as art, music, or movies [1].

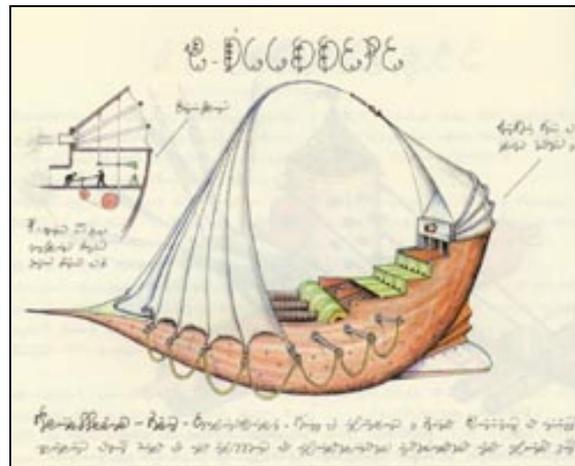
Where does this change come from, and what is driving it? People have been playing games for millennia, after all, so why is it that only now should there be a major shift in the cultural terrain occupied by games? Certainly the proliferation of home computer and gaming systems provides a proximate cause—if you build it, they will play it—but the real issue is not the technology itself, but certain developments in the structures and types of games that have been enabled both by the technology and by broader changes in the culture at large. It was to highlight these developments that Robert Nideffer and I curated the 2000 exhibition "SHIFT-CTRL: Computers, Games, and Art" at UC-Irvine's Beall Center for Art and Technology. Here I will focus on just a few areas of change that I feel are particularly important, including the convergence of games with fiction and art; shifts in representation and the deployment of information in games; the assimilation of a filmic first-person point of view; the growth of a

culture of cheating and hacking; rethinking of the win-lose dichotomy; and the development of immersive role-playing and emergence of cooperative relationships as central to game play. Under pressure of these and other factors, games are metamorphosing into a richly expressive medium.

Fiction, Art, and Games

Authors of fiction have a long history of playing games with their readers. From *Tristram Shandy's* narrative tricks to *Alice in Wonderland's* riddles and acrostics to *Pale Fire's* unreliable narrator, authors play fast and loose with the unwritten rules of fiction to thwart their readers' expectations [2]. An entire genre, the detective story, is set up as nothing less than a guessing game in which the author seeks to outwit the reader; every possible variant on the Who's the Murderer? game has been played in this genre except having the reader herself turn out to be the murderer.

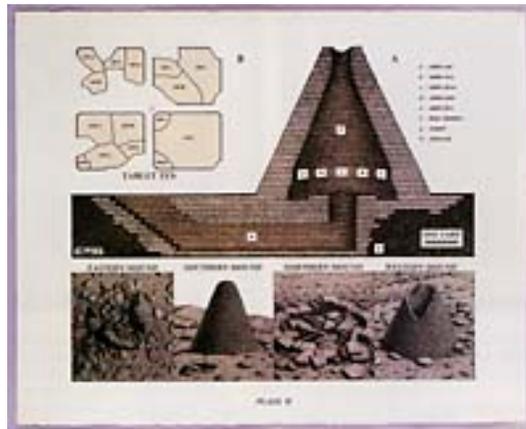
Particularly in the 20th century, the game-fiction has become practically a genre in its own right; there is, for instance, *A Void*, a novel written by Georges Perec entirely without the use of the letter 'e' (the most common letter in both English and French, the language in which the novel was originally written). Perec is a member of a group called Oulipo, or Ouvroir de Litterature Potentielle (Workshop for Potential Literature), which was founded in Paris in the early 1960s by mathematician and writer Raymond Queneau and François Le Lionnais. Oulipian writers deliberately set restrictions on their writings (like Perec's avoidance of the letter 'e') in order to force their writing out of habitual courses and into new terrain. While some of their experiments can seem outlandish, they are not fundamentally different from requiring words to rhyme or working within strict metrical constraints. The basic idea is an old one: constraints free creativity. And games are all about the constraints called rules.



Detail from the *Codex Seraphinianus*.

Falling across the boundary between fiction and art is the 1983 *Codex Seraphinianus*, an illustrated encyclopedia by Italian artist Luigi Serafini that is written entirely in a secret code—an invented script, presumably concealing an invented language that has not yet been deciphered [3]. Published in the same year as the *Codex* is *Masquerade*, an illustrated children's book by Kit Williams containing a number of puzzles that on decipherment would lead the reader to a spot where a valuable gold necklace had been buried (this puzzle was solved several years after the book was published). The act of reading always requires a form of linguistic and cultural decoding, as semioticians are quick to remind us, and to this pleasure has been superadded more overt forms of decoding.

Working in similar terrain is the artist Beauvais Lyons, who describes himself as a mock-archeologist and mock-academic. His major projects involve creating the artifacts of fictional civilizations—ceramics, mosaics, frescoes, tombs, not to mention entire mythologies—and then publishing them as lithographs with accompanying articles done in the style of 18th and 19th century scholarship. His work is intended to, and does very often, deceive the viewer; Lyons plays this game of hoaxing his audience in order to "awaken people to their own gullability and promote a healthy skepticism" [4].



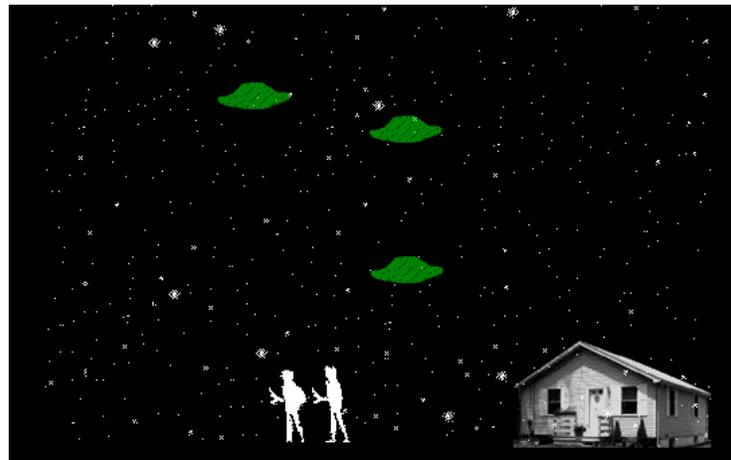
Excavation of the nonexistent
"Apasht" culture by Beauvais Lyons.

A similar line of thought is apparent in the work of Marcel Duchamp, who had an abiding interest in games (he was even for a time a member of the French chess team, competing in international tournaments). It can even be argued that much of Duchamp's oeuvre constitutes a series of moves designed to rewrite the rules of the art game. Like later artists such as John Cage, Duchamp used chance as a constraint in many of his works. In 1924, he issued a mock certificate called the *Monte-Carlo Bond*, featuring a photo of his face half-covered in shaving cream. With this bond, he intended to raise money so that he could go to Monte Carlo and gamble for a month—with the express (and quite unusual) aim of *breaking even*. In the end he never actually carried out his experiment, but the idea is certainly provocative, raising as it does questions about the tangled relationship of effort, chance, and desire.



Detail of Marcel Duchamp's
Monte-Carlo Bond.

As fiction and art have increasingly incorporated games, so it is not surprising that games should likewise be incorporating fiction. Two quite different works in SHIFT-CTRL are directly based on fiction—Natalie Bookchin's *Intruder*, an adaptation of a short story by Jorge Luis Borges; and Janine Cirincione and Michael Ferraro's *Dead Souls*, based on Nikolai Gogol's novel of the same title. *Intruder* uses the Borges text as just one of several narrative approaches, together with cinema and arcade games, while *Dead Souls* uses the Gogol story as the basis for an interactive piece in which the player must adventure into a computer-generated world.

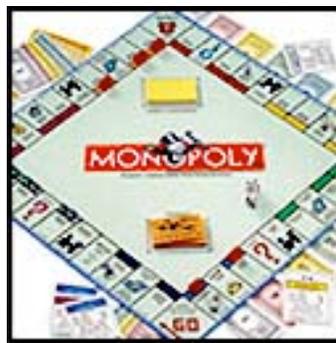


A screen shot from *Intruder*

A third work, Lev Manovich and Norman Klein's *Freud-Lissitzky Navigator*, creates a convergence of fiction, science, history, and detective games by treating the entire 20th century as part of an enormous game whose rules and goals must be deduced from existing evidence, including such seemingly random facts as Freud's visit to Coney Island in 1908 and the unrealized plans for Euro Disney in 1990. The game is to figure out the game; "doing history" becomes not so much a search for truth or a matter of interpretation as an attempt to solve a meta-puzzle (what is behind history?). Dispersed narrative, fiction-as-adventure, and figuring out the game itself are major recurring themes in today's games.

The recent convergence of games and fiction can be traced to the advent of ever more elaborate board and miniature-figure games in the last quarter of the 20th century—especially war games, like *Plot to Assassinate Hitler*, *Battle for the Ardennes*, *Blitzkrieg*, and *Jutland* (since ported to the computer). (War games themselves are not new, but their broad extension outside the military itself is.) Simply in order to play these games, one had to assimilate a moderate dose of history. Some players who were interested in more than just military combat developed these

games into a new genre, the fantasy role-playing game. Rather than playing opposite sides in a war, players in a role-playing game work together as a team to solve problems encountered in an imaginary world designed by a gamemaster. This format allows for different styles of play for differing temperaments: combat for those who enjoy wargaming, storytelling for those who enjoy fiction, and role-play for those who enjoy acting. Dungeons and Dragons, the best known of the early role-playing games, swept college campuses in the 1970s [5]. It was, however, self-published by its creators as the new concept did not appeal to the traditional game industry, which initially had trouble imagining how it might sell a game that consisted entirely of a rulebook and a scenario (which functioned somewhat as a script does for a play).



Monopoly's board, an abstraction of a street map.

In type, role-playing games most closely resemble the game of make-believe that children play, which is the one game that has been all but immune to marketing; and both have a close affinity with storytelling. From arguing over whether a bow-and-arrow can outshoot a six-gun ("You're dead!" "I am not!") to calculating whether a rogue has enough health points left to survive a cobra strike is not a very large step. It can be argued that these stories are trivial escapist fantasies, and some certainly are; but it should be recalled that similar charges have been leveled at every new medium of expression from novels to comics to movies. And, as with fairy tales, game narratives embody broad cultural fears and desires that are a story in themselves. For example, Monopoly and the many types of stock market games [6] embody a narrative—the fiction of monopoly capitalism as a desirable system—in a highly generalized and abstracted form. Likewise, a more recent computer game like Maxis's SimCity embodies a generalized narrative about the necessary features of a city—there are fire stations but no whorehouses, parks but no sandlot baseball fields, houses but no shacks—and the likely consequences of certain types of development. These deserve and are receiving critical examination, as are the cultural

assumptions that lie behind the current popularity of certain genres, such as medievalist fantasies based on feudal systems. (A related question, beyond the scope of this essay, is whether social and political games are in the process of being trivialized. Day trading, for example, could be said to have reduced the chance-based game that is the modern stock market to a purer form of gambling, while the monopoly of democratic capitalism—the only political game in town if you live in the United States—looks more and more like a rigged game we are all forced to play.)

It has been said that the essence of a story is its details—there are only a couple dozen plots in all of literature, but a million million stories. Dungeons and Dragons and its progeny opened the door to game fictions and interactive fictions developed with almost overwhelming amounts of detail. Playing such games involves mastery of the story as much as mastery of the rules and skill sets. Many computer games still rely on only the most basic of stories ("Evil Lord X has subjugated land Y..."), but games like Cyan's *Myst* and Simutronic's role-playing game *Gemstone III* embody highly elaborated fictions, including types of narrative ranging from history, myth, journals, and songs to detailed social and political systems, geographies, and languages. Many of these games are set in alternate worlds precisely in order to allow for these kinds of creations, in much the same spirit that underlies the *Codex Seraphinianus*, the work of Beauvais Lyons, science and fantasy fiction, and movies such as *Blade Runner*.

The convergence of fiction and games is perhaps seen most clearly in the text-based role-playing and adventure games that sprang from early attempts to create a software version of Dungeons and Dragons. These games exist purely as text—one reads them as one plays them, indeed, one plays them by reading and writing (entering commands and sometimes dialogue on a keyboard). Because they exist purely as text, they appeal to that part of ourselves that wants to imagine what Captain Ahab looked like rather than see him represented, wooden leg and all. Among the earliest interactive fictions were the text-based adventure games *Colossal Cave Adventure* (usually just called *Adventure*), created by Willie Crowther and Don Woods in the early 1970s, and *Zork*, created by Mark Blank, Bruce Daniels, Tim Anderson, and Dave Lebling a few years later [7]. *Zork* was actually referred to as a "computerized fiction" in an early review. So popular was *Adventure* that wags have estimated that it set the entire computer industry back about two weeks while the first attempts to solve it were under way. And even as graphical MUDs like Origin's *Ultima Online* and *EverQuest* are burgeoning in popularity today, the text-based *Gemstone III* still attracts thousands of players to its half-dozen worlds; in 1999 its manufacturer, Simutronics, ranked at number 295 in a list of the 500 fastest-growing privately held companies in America [8].



A battle in Ultima Online.

Closely related to the Zork type of electronic text adventure game is hypertext fiction, which is fiction one reads (or navigates) in a nonlinear fashion, jumping from one small chunk of text to another. Usually, one can jump through a text in many different sequences, each of which makes up a version of the text, a story of its own. Hypertexts are gamelike in that one must usually struggle to attain a goal (reaching the end of the story—a goal that some hypertexts actually make impossible) and likewise to unravel the narrative itself. Landmark hypertexts include Rob Swigart's "interactive novel" *Portal* (1984), Michael Joyce's *afternoon, a story* (1986), and George Landow's *Dickens Web* (built with the help of students at Brown University between 1986 and 1990) [9]. In the early 1990s, hypertext became a subset of hypermedia with the advent of the World Wide Web as a space allowing images, movies, and sound files to coexist with text. Some hypertext writers now focus their efforts on ways to allow readers to take an active role in the construction and expansion of their hypertexts. And it can be argued that the user-constructed, text-based online worlds called MOOs are, among other things, a form of casual or undirected hypertext.

Representation and Information

Until the 20th century, the most popular and widely played games like chess, backgammon, parcheesi, dice, and go were highly abstract. Chess pieces are instances of feudal social roles (king, bishop, peasant), while the board itself is a terrain on which the pieces move, and at the same time a kind of generalized map standing in for any battlefield, with the middle of the board being the front and the rear rank behind the lines. With the improvement of printing technologies

in the 19th century, more elaborate and representational game maps became more common, although board games were still limited by their necessarily small size. With computers, games have entered a mode where there is a greater emphasis on representation than on abstraction, at least at the level of play. (Outside of the scope of this article is a consideration of the highly abstract programming languages that underlie what the player sees on the screen.) Many different representational strategies are featured in computer games, ranging from quite abstract icons (buttons) to highly detailed pictures of rooms, to full-motion video and animated sequences.



The home island of Myst, with an important note lying beside the path.

One obvious reason for this is that there is more room, so to speak, in a computer than on a board. The ability of computers to store and quickly process large amounts of information translates easily into larger and more elaborate games, while the traditional abstract board maps have been expanded into entire virtual terrains (which usually now come with their own maps). Leaving aside aesthetic issues, representation in a game can be seen as a way to give players more information—you are not just in a generic library, as in the classic board game Clue, you are in a singular library with books that can (and must be) read, as in Myst.

Interestingly, however, the overload of visual and narrative information also leads to more information being concealed. On a computer, one need not show the whole board or terrain at once; in fact, concealing part of the terrain is a favorite strategy of computer games, whether by showing only one room or level at a time, or by temporarily blanking out certain areas with what is commonly called the "fog of war." Concealment is also made easier by the fact that many

computer games are based on a first-person point of view, a point I shall return to later. Indeed, so much is concealed in many computer games (places, treasures, nonplayer characters, even objectives) that the games are often as much about discovery and exploration as about playing by the rules—an important distinction between these games and most of their predecessors.



Crossing a river in *Myst*.

Game theory divides games into two basic types, games of perfect information and games of imperfect information. In games of perfect information, like chess, checkers, or go, all the players know everything about the game at all times. By contrast, in an imperfect game like poker, the players are ignorant of what the others have been dealt—thus, they have imperfect information of the current state of the game at any given moment. Many, if not most, computer games are games of imperfect information, with a great deal concealed from the players at any given moment. An extreme case of concealment was presented by the computer game *Myst*, in which at the outset the player did not even know what the goal of the game was—figuring out the goal was, in effect, one of the game's major puzzles—and may also not have known its few rules, since it is perfectly possible to play *Myst* without ever reading its instruction sheet. (It is, however, difficult to win *Myst* without taking notes—keeping track of the information gained in the course of the game.)

The role of representation in computer games supports their convergence with fiction and art. A detailed representation of a temple, a priest's costume, a sacred book can be used to convey general information about the history, the culture, and the language of the game world—the game's back story—in addition to specific information that may be important to winning the game. The use of imagery in games thus belongs to a long history of pictorial and multimodal storytelling, ranging from Egyptian tomb frescoes to the Bayeux tapestry, religious paintings

depicting the entire life history of a saint, and cartoons and movies. Computer games have gone further in finding ways to disperse the elements of a narrative among not only text, sound, and image, but also puzzles, problems, collectible items, and objectives. And this fracturing of the narrative usually acts as another form of concealment, even more effective than that practiced by novelists (one can always turn to the last page in a novel, but there is no equivalent move in a game short of cheating).

Representation in computer games is also linked directly to the functioning of the game. What one sees on a computer screen represents not only the imaginary world of the game but also the current state of the underlying software. If a door appears to open, it is because commands have been processed that cause a closed-door image to be swapped for an open-door image, or a brief animation of a door opening to be loaded. One tends to think of a computer game interface as the collection of visible controls, but in reality everything one sees—the controls, the landscape, the avatars, items that can be picked up—is an interface to the software. Usually one's awareness that one is interacting with the underlying code is deliberately obscured (which is why it is so jarring to run into a software bug while playing a game), but one whole class of games brings this awareness to the surface.

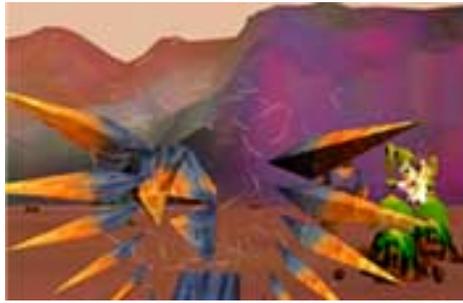


A SimLife world populated by a range of life forms from algae to elephants.

These are the artificial life games that allow players to create and control virtual life forms; the best known of these are probably the "virtual pet" games like Tamagotchi and the "sim" games from Maxis, including SimLife, SimEarth, SimAnt, The Sims, and, most recently, Spore

[10]. In these games, bits of underlying code (based on what are called evolutionary algorithms) interact with a relatively high degree of autonomy, and the player's job is to manage them like an ecosystem, tinkering with parameters to achieve certain outcomes. These games are about indirection; in SimCity, for example, one doesn't just build 40 houses to create a neighborhood; instead, one creates a residential zone with electricity and plumbing and waits for 40 virtual householders to move in—or not. In SimLife, the underlying algorithms are represented as life forms (insects, plants, mammals), and by tinkering with software settings represented as geography, climate, rainfall, relative numbers of different life forms, breeding rates, and so on, one attempts to create a self-sustaining world in which the life forms can breed and evolve on their own, without further interference from the player (failure in this game means that all life disappears). While playing these games, one never quite loses one's awareness that the crucial parts of the game—the underlying codes—are hidden from one, and that one is accessing them through an interface. The idea of the interface thus dominates the nominal representation (in the case of SimLife, familiar life forms).

Central to sim games is modeling the functions of a system, rather than simply representing how it appears. Historically speaking, they owe less to the static representations of two-dimensional media like painting than to the tradition of automata, such as Jacques Vaucanson's 18th century mechanical duck that not only looked like a duck, but was designed to quack, eat, and digest like a duck. The life forms of SimLife, for example could be made to look very different—they could be modeled as pink blobs or paperclips—and the game would still be about managing the same system. SHIFT-CTRL includes a number of works that examine what the player's role is in a game that is also a modeled system. Rebecca Allen's *Bush Soul #3* connects the player's physical self to an artificial life form represented as a virtual soul. Jane Prophet, Gordon Selley, and Mark Hurry's web-based *Technosphere* is a kind of animal park for virtual life forms. Players can create life forms for this park, but once created, their creature's destiny is entirely out of their hands; it lives or dies according to what happens in the virtual ecosystem as a whole—if your virtual herbivore meets a pack of carnivores, it's curtains for the herbivore. Christa Sommerer and Laurent Mignonneau's *Life Species II* uses text that players write as the 'genetic code' of its artificial creatures, making a direct link between two different kinds of meaningful expression, thought expressed as speech and code expressed as life.



A screen shot from *Bush Soul #3*

Point of View

In all but solitaire games, there is someone else present—the player or players one plays with or against. How one perceives this presence takes several forms. In board games like chess or Monopoly, where players move counters representing themselves, there are both the physical self and one or more token selves. In addition, most traditional games are played in such a way that one feels physically separate from them (major exceptions include sports and make-believe). One looks down on the Monopoly board where one's puny top hat rests next to a puny dog, a position offering a sense of godlike omniscience and detachment.



A wizardly avatar in *Ultima Online*.

Computer games have expanded the notion of the token self in what are broadly called avatars—representations of one's self in the game that take various forms. In some cases there are quite detailed representations of the self (this is often the case in graphical MUDs like *Ultima Online*), while in other cases one's avatar may be no more than a hand holding a weapon. At the same time, while some games (like Blizzard's *Starcraft*, Microsoft's *Age of Empires*, and *Ultima Online*) continue to provide the familiar top-down perspective, some of the most successful games have shifted to a first-person point of view. Effective use of first-person point of view can

be traced back to the early text adventure games like Zork, and is still common in adventure, action, and quest games. It is especially common in games now being built with 3D software, such as Bungie's Marathon games, though it also exists in such games as Myst and Riven, which employ 2D graphics. The effect is intentionally illusionistic, an expansion of the Renaissance idea of the picture-as-window which puts the player just on the other side of the frame, inside the picture (game) space itself. This perceptual shift gives the player the feeling of being inside the game, so that whatever happens, happens to the self and not to the avatar. Indeed, an avatar could be defined as a substitute self from whom one does not feel the expected level of detachment.



Top-down view of Age of Empires.



First-person point of view in Marathon.

Many computer games incorporate the rules of physical reality as part of their rule system. Running is faster than walking; you can't see around corners or in the dark; gravity means that if you step into a pit, you'll fall down. In first-person point-of-view games, these rules enhance game play by providing for suspense (will I get killed if I turn that corner?) and problems that must be solved (how do I get that elevator down here where I need it?). A certain amount of

tedious literalism—these games feature an appalling number of corridors and stairs—is traded for the familiarity of entire problem classes, like opening locked doors or getting something that is out of reach.

With first-person point of view, it can be argued that a higher degree of narcissism creeps into games. One perceives such games as focused on oneself in the same way that in life one always feels secretly that the entire universe revolves around oneself. This, in turn, leads to a sense of investment in the game that I believe is partly responsible for the culture of external activities that has developed around these games—from trading of customized game patches, to demands that the manufacturer provide more levels, to whole web sites devoted to one's avatars (Gemstone III's web site lists close to 200 such player-run sites).

Cheats and Hacks

Games of imperfect information offer great potential for cheating—essentially a way to gain and use extra information in a game—so it's no surprise that an entire culture of finding and disseminating hints, cheat codes, and game hacks has grown up around computer games. Outright cheating—using stolen codes that give one infinite money or life, for example—is of no more interest than it ever has been, but most of these activities fall into a gray area and raise important questions about the very nature of games. All rule-driven systems—the law, for instance—are susceptible to ambiguous activities, either because rules conflict or because no rule explicitly covers the case in question (very few games include as one of their rules "everything not allowed is forbidden"). Is it cheating or a sign of game intelligence to find and exploit such opportunities? Computer games may have rules no more elaborate than those of other kinds of games, but it must be held in mind that they are constructed out of thousands of lines of software that constitute a highly elaborate second-level rule set. Is it cheating or a sign of intelligence to exploit the fact that by logging out and waiting five minutes, one can avoid getting killed by a monster because the game's program will automatically recycle it in the interim? (To put it in computer terms, is it a feature or is it a bug?)

Another gray area involves customizing games by writing software patches that sit on top of and work with the original game code. Customizing games is nothing new—many people play a nonstandard version of Monopoly in which anyone landing on Free Parking wins a pool of collected monies; and there are a legion of variations on such popular childhood games as stickball and croquet. Indeed, customizing games was undoubtedly much more widespread before the era of copyright. So it is not surprising to find, for example, that someone has written

a patch to the game Tomb Raider in which Lara Croft, the protagonist, is made to appear stark naked.



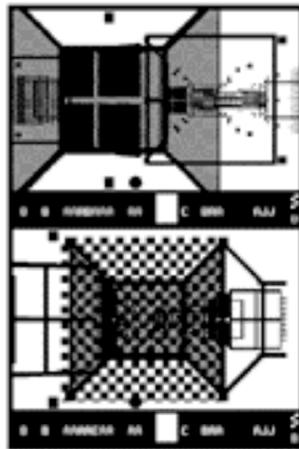
A player-designed level map for Starcraft.

A number of game companies have tried to encourage this sense of investment in their games by channeling it into sanctioned activities, like developing new levels or maps (Quake, Marathon, Myth), trading customized avatars and virtual objects (The Sims), or writing guides with tips for more successful game play. All these varied activities tend to give players a sense of ownership in the game, which in turn raises issues of control. To what extent are a game's creators answerable to its players? When the graphical role-playing game Ultima Online first went public, a large controversy arose over whether players should be allowed to kill other players (as opposed to killing non-player characters, or NPCs). Eventually, the disgruntled players persuaded Ultima's makers to change the rules of the game to limit player-killing. It can be argued that this was purely an economic decision on the part of the manufacturers, as the game otherwise risked losing many of its players (who pay a monthly fee to play the game). The fact remains that such responsiveness has been comparatively rare in the past, due to lengthy manufacturing and distribution cycles, the repressive nature of copyright law, and the lack of a culture of involvement on the part of players.

In effect, what has happened is that the activity of adding to the structure and/or rewriting the rules of the game—hacking the game—has become a kind of meta-game applying to many games. Indeed, there is even a game called Nomic (conceived and designed by Peter Suber, and first published in Douglas Hofstadter's column "Metamagical Themas" in *Scientific American* in 1982) whose entire purpose is to rewrite its rules [11]. As Suber writes, "Nomic is a game in which changing the rules is a move....The primary activity of Nomic is proposing changes in the

rules, debating the wisdom of changing them in that way, voting on the changes, deciding what can and cannot be done afterwards, and doing it. Even this core of the game, of course, can be changed."

SHIFT-CTRL includes a game hack by Dirk Paesmans and Joan Heemskerk, who work together under the name jodi and are well-known for their innovative web site jodi.org. Their game Sod takes the standard structure of an action game—run down tunnels and shoot anything that moves—but changes the usual literal architecture to an abstract world of black, white, and gray planes. Sod is highly disorienting as a result; not only is there is no visible difference between floors, walls, and ceiling, (which way is up?), but it is very strange to find oneself menaced by geometric abstractions (what was that I just shot? can I even call what I just did 'shooting'?)



A pair of screen shots from jodi's game Sod.

A different combination of perceptual and conceptual challenges is offered by two other games in SHIFT-CTRL, both of which satirize cultural assumptions embedded in games. The London-based group Mongrel's game backlash takes on the role stereotypes of standard action games, as players get to choose their avatars among black stereotypes and the "anything that moves" that they get to shoot at includes insectlike cops, Nazis, and Ku Klux Klansmen. Eric Zimmerman's SiSSY FiGHT 2000 takes the social game that links women's status with their physical appearance and codifies it as an action game for young girls. Within the game, the players attack each other in ways designed to ruin their appearance and thus humiliate them. This is satire in the tradition of Charlie Chaplin's "The Great Dictator"—derailing something that people take too seriously by exposing its innate absurdity.



A screen shot from SiSSY FiGHT 2000

Winning and Losing

One of the chief attractions of games, of course, is that unlike life they are (mostly) infinitely replayable. And, within the given set of rules that define the game, almost infinitely variable. It has been argued that the rules are the game, and it has been shown that any rule-driven system, whether the etiquette of social intercourse or the strategies of war, constitutes a kind of game [12]. Nonetheless, for many people, games lack appeal because the risk of losing is normally much bigger than the chance of winning. This is an issue not just for risk-averse types but for most of us, and it follows from the fact that in all games we have at least one opponent with whom we are in competition [13]. We are taught from an early age that losing is a form of social failure that places the loser in a position of humiliation and subordination to the winner, which only adds to the disappointment of not gaining the desired object. For the most part, people simply do not play games which they cannot win a reasonable percentage of the time; or which they do not expect, however unreasonably, to win (like lotteries).

Moreover, in playing a game we project ourselves into it and the game onto our life. Our pieces on the Monopoly board stand in for our real selves, and the chance that gives us a full house in poker stands in for our luck at other pursuits. Thus we tend to generalize our losses in a way that turns them into explanations for or harbingers of other kinds of loss and failure. The invocation "unlucky at cards, lucky at love" is a classic attempt to invert the tie we create between our game fortunes and the rest of our lives. The consequence of this is that losses at

games tend to loom greater in our psyches than they ought; losing a single game can make one feel generally worthless, clumsy, unloved, unlucky, and so on.

There are various ways to mitigate the pain of losing. One way is to make the game play itself so rich or exciting that the importance of winning and the peril of losing recedes. Backgammon, for example, is made much more exciting by the use of the doubling cube, and it is my own experience that losing 32 games at a shot, while a much bigger actual loss than a single game without the doubling cube, stings less because the adventure of risking 32 games intensifies the game play at the expense of the outcome. Making games more complicated or lengthy is a related strategy. Starting around the middle of the 20th century, board game manufacturers began producing ever more elaborate games that required many hours to learn and to play. Many of these were war games mimicking famous historical battles, such as Jutland or the Battle of Midway. It is not uncommon for such games to be played over days rather than hours, and then to be abandoned uncompleted—thus short-circuiting the win-lose dilemma altogether, but leaving one without the sense of closure that a completed game provides.



A level in Quake—and yet another corridor.

But it is with computer games that we see some of the most interesting strategies for redefining the role of winning and losing. In effect, these are all attempts to make games in which loss is banished and every player wins. The first strategy of note is what might be called the partial or progressive win—the player accomplishes small goals on the way to a final goal. Many computer games, from Pac Man to Prince of Persia to Marathon, are organized into levels, and as one wins a level, one is allowed to progress to a higher or more difficult level. A related approach, taken with Starcraft for example, is to set up the game so that it can be played in easy, moderate, or difficult modes; winning the game in the easy mode is rather like winning a level,

except that in this case one starts the whole game over from scratch and plays it again. In both cases, the interim wins are real wins, and rewarded as such with some kind of closure—commonly, a message, a sound, or a vision of the defeated enemy.

Just as importantly, loss is indefinitely deferred; getting stuck in such a game still leaves open the hope that one will win another day. This is quite different from games like solitaire or chess, where permanent stalemates are the only alternative to winning or losing. And just as there are partial wins, there are partial losses; in many games one's character may die, only to be resurrected. Game death is a temporary setback rather than a final event.

From deferred and partial loss to the truly lossless game is a small step, and that is where some role-playing games have opened new terrain. These games are designed to be endless or open-ended, with new levels and challenges added on a rolling basis. One may still achieve small wins—finding treasure, learning skills, killing enemies—but there is no final obstacle to overcome that signals the end of the game. One may become the oldest or most highly-skilled player in such a game, which brings with it a status not unlike winning, but the game can still be played with enjoyment because of the changes that its creators continue to make. In addition, games such as Ultima Online, EverQuest, and Gemstone III are designed in such a way that players are all but forced to help each other out; for older characters, helping younger players can become an end in itself, providing an indefinite extension of the game. With such open-ended games, the player's only way out is to stop playing—to leave. When this happens, one achieves closure through something reminiscent of the grieving process that follows other kinds of loss, as many writings now testify [14]. Some MUDs even incorporate a form of programmed suicide for players who want to leave, a process that serves the same social function as other passage rituals.



Riven's scarab room is both a place and a puzzle.

One notable variation on the theme of winning and losing is embodied in Cyan's game *Riven* (the sequel to *Myst*, which was for about four years the best-selling computer game in America). *Riven* has a number of possible endings; there is one way to win and quite a few different ways to lose (in this case, losing means your character dies). *Riven*'s unusual feature is to have, in addition, an outcome that is not quite a win and not quite a loss—a situation in which the player completes just one of the game's two major tasks. In this case, the player is congratulated and sent home—the same denouement as in the case of a full win—but in a way that makes it clear that she could have done a lot better. This is a rare instance of a game in which it is possible to technically win and still feel like a loser; it is oddly reminiscent of the way it feels to win by cheating.

In *Hamlet on the Holodeck*, Janet H. Murray notes that winning in *Myst* is less dramatically satisfying than losing (something that is also true, to a lesser extent, in *Riven*). Win *Myst*, and you go to a special dead-end room—no puzzles, little interaction—and get thanked by a key character named Atrus. Lose, and you are suddenly and jarringly teleported into a tiny and claustrophobic prison, where you are mocked by one of the game's evil twin brothers, Sirrus and Achenar. As Murray points out, narrative satisfaction and game satisfaction are completely at odds. In my opinion, the fact that games are moving beyond simple happy endings is another signal of emerging maturity in the form.

Once one starts to think outside the duality of win-lose, it is striking how many other approaches there are. Strip poker is an instance of a game in which winning may be a form of losing and vice versa. One of the works in *SHIFT-CTRL*, Ken Feingold's *JCJ Junkman*, is a piece that deliberately and in extreme fashion thwarts the player's attempts to win against the computer; indeed, it might almost be called a lose-lose game. Flying icons move almost too fast for the human hand to click, resulting in intense frustration; then, when one does succeed in clicking an icon, one is treated to an annoying sound. And nearly everything in the game, icons and sounds alike, has been taken from the web, ripped from any context in which it might have some meaning and reduced by recontextualization to the status of pointless prizes.



A screen shot from *JCJ Junkman*.

As interactive video artist Grahame Weinbren points out, computer games are as much about adaptability and mastery as they are about winning and losing. "The point of the game is to keep the player between two edges—on the verge of mastery, on the verge of losing control, so that a little more effort...will allow him to reach the next level—and a little less will result in a death" [15]. In other words, the small wins and losses are not designed as outcomes of the game so much as parameters of the game—ways to keep the player within a space of psychic uncertainty that compels continuation. The little losses are little deaths, both practice runs for the big one and ways of staving it off.

Cooperation, Relationship, and Role-Play

There have always been games that reward inter-player cooperation in addition to competition. Team games, like bridge, war games, or many sports, provide one kind of example, although here the cooperation is limited to those on a single side, so that the team itself becomes a kind of super-player (the team wins, not the individual player). More interesting are those games in which alliances are fluid and only temporary (because in the end there can still be only one winner), such as the board game Diplomacy, or those variations of Monopoly in which players are allowed to form consortia with each other. Here, an element of excitement is added by the uncertainty of when cooperating players will defect from their agreements.

Games in which it is to the players' advantage both to cooperate and to compete with each other are rarer (unless one includes social games such as collective bargaining). Many of the multiplayer role-playing games are in fact designed like social systems, and made so that players either cannot succeed at all without helping each other, or will do much better if they do help each other. For example, on the MUD Gemstone III a wizard might offer a weaker rogue defense spells in exchange for having the locks on some treasure boxes picked; both players gain from

the exchange, and both would be worse off without it. It is quite usual in such games for players in direct competition—trying to kill the very same monster, for example—to stop and help each other out if one gets wounded or killed. In effect, the golden rule becomes an unwritten rule of such games. In terms of game theory, these are nonzero-sum games because all of the players can come out ahead. (Zero-sum games, by contrast, are those like poker in which the total that can be gained stays constant, so that if one player gains, someone else must lose.)



The Gemstone III interface, with game window at center, typing window at bottom, and status icons to either side.

One effect of cooperation-intensive games like many role-playing games is that the development of relationships with other players becomes a dominant activity in the game even if nothing in the actual rules requires it. To put it another way, relationships are an emergent form in these games, a kind of secondary game that highlights the strategic and negotiatory aspects of all relationships. Is that warrior striking up a conversation with you because she feels like being friendly or because she wants you to do her a favor?

The complexity of relationship-based gaming is perhaps most clearly seen in MOOs, which are a type of text-based virtual world descended from MUDs but without the specific goals and narrative structures that characterize MUDs. Instead they exist as social spaces in which the only goals are (1) to build the world and (2) to role-play in it. MOOs are unusual in that language is used both instrumentally, as is usual in games ("on your mark, get set, go" "@quit") and expressively, as is usual in stories ("Hello, stranger" "You find yourself alone in a dark wood").

Not unlike Nomic, MOOs are games in which the game itself (together with its rules) is being made up all the time. Because MOO players have the power to add to the underlying software, it often happens that the rules of social interchange become codified in the game itself at the most fundamental level. Don't like how someone is behaving in your MOO room? No tricky negotiation is necessary; the @gag command shuts them up as far as you're concerned (other players can still hear the offender), and the @boot command kicks them right out the door. Social rules written into MOO software range from emotional display (using the 'hug' verb invariably causes you to hug someone 'in a warm and loving manner', regardless of what kind of hug you intended) to the ability to vote on issues that affect all players (what should the procedure be for banning unwelcome players from the game?). Many MOOs have no monetary system but are based instead on a quota system—you can own, say, 10 game objects and no more—an economy of scarcity that leads to players to devote much energy to getting more quota than their normal allowance. Topping up quota thus becomes an emergent subgame played within the MOO, a game that only exists because of the preexisting rules. These emergent subgames, or secondary games, contribute enormously to the flavor of different MOOs.

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Riverbank
You fall into a crevice, at the bottom of which runs a swift river.

It sweeps you over a waterfull, and plunges you into a tumbling pool.

Seconds later the current pulls you downstream and washes you up on the bank
not far from the edge of the tent city. You catch your breath and wring out
your wet clothes before moving on.
Obvious exits:[EXIT], [out] to Winding dirt road
Dog Guest has arrived.
Dog_Guest says, "hello"
█
```

An area of YinMOO where players fall into a river and get swept downstream.

As used to describe what people do in MOOs and MUDs, 'role-play' is a rather misleading term, as both elements ('role' and 'play') underscore the artificiality and triviality of the effort. A *role* is, by definition, something distinct from the intrinsic person—something assumed and often temporary—while *play* signifies something done in time-out from the normal pursuits of life and of lesser significance than its cultural opposite, work. Role-play is thus doubly impossible to take seriously outside the socially sanctioned arena of therapy or the culturally circumscribed activity

of acting. Role-playing games seem to have the power to preoccupy people to an even greater extent than other types of games. The difference, I think, has to do with the greater sense of immersion that comes from a reduced sense of surrogacy. In MOOs, MUDs, and other types of role-playing games, players feel that they themselves are in the game rather than that they are controlling stand-ins like the pieces on a chess board.

In addition, the fact that most role-players are physically separated makes the virtual relationship the primary one, flipping the usual hierarchy. In a Monopoly game, for instance, it's common for players (especially children) to set up relationships among the pieces—the dog chases the car and barks at the battleship if it lands on the same space—or even have the pieces 'talk' to each other as a form of back-channel or secondary communication. However, the primary relationships are carried on among the human players—it's always you trying to beat your brother, not the dog trying to beat the car. It's not surprising that this should be so, because physical communication provides an information-rich medium for relationship—seeing, hearing, speaking, touching, and smelling are all involved. In a role-playing game, by contrast, the primary communication is that which takes place through the game itself because the players are widely separated in physical space. There is either no back-channel communication at all, or it is of reduced importance (players may exchange emails as their real-world selves, for example) [16]. In a text-based world, primary communication consists of the written word; in a graphical game, of images and written words.

In other words, in such games the fiction can be maintained that one is always and only one's game character, which is likely to be strikingly different from one's real-world self. Or at least that one is an indistinct hybrid of one's real-world self and one's game character, with the latter being dominant. One consequence of this is that it can be very jarring when role players suddenly speak as their real-world selves instead of as their game characters. Indeed, some role-playing games have special methods for out-of-character (or OOC) communication—you might have to whisper to another character, or at least prefix what you say by 'OOO'. It is worth noting that some recent networked strategy games like Starcraft do have back-channel communication enabled with a chat window, and these games are much less immersive than MUDs and MOOs

Some recent writers on role-playing games have emphasized that in the fantasy relationships of role-playing games, it is impossible to step outside the real-world self in any meaningful way. The argument holds that a man role-playing online as an attractive woman neither explores any real part of himself nor gains real insight into what it is to be female. If this argument holds for role-playing games, it holds with even more force for other expressive forms such as books,

theater, and movies, as the latter project secondhand experiences (or firsthand experiences at secondhand, as in the case of autobiography), while in role-playing games one can actually have certain kinds of firsthand experience. Watching someone onscreen being called a bimbo is a different kind of experience from being called a bimbo yourself, as can happen in a virtual world. Virtual role-playing worlds thus stand between the worlds of the real and the imaginal [17].

Two quite different works in SHIFT-CTRL use role-playing spaces to create collaborative theatrical dramas. Adriene Jenik and Lise Brenneis use a graphical chat world called the Palace for what they term "desktop theater"—dramatic interruptions of the Palace inhabitants' everyday conversations that take advantage of the pseudonymity of chat worlds ("Who IS that masked man?"). In one such project, for example, they put on Samuel Beckett's play *Waiting for Godot* in the Palace world, complete with set (bare landscape with tree) and costumes. Partly rehearsed and partly spontaneous, partly scripted and partly improvised, the effect is something like a cross between puppet theater and a Monty Python cartoon. Their piece for SHIFT-CTRL, *a bag full of Cats*, draws on the show itself for some of its themes.

Honorio in Ciberspazio is a collaborative opera with roots in text-based MOOs (the pseudonymous honorio is a longtime MOOer). Its theme is cyberlife and cybercommunication, and its libretto includes contributions from over 60 denizens of the Net. Just as anyone can play in MOOspace, so the authors of *Honorio in Ciberspazio* are treating their opera as another virtual play space, open to all (although they reserve final say on what to include in the libretto).

Beyond How-To

We think of games in terms of play, but in fact they generally embody notions of efficiency that have nothing to do with the sloppiness of real play. As Aristotle pointed out long ago (though in other terms), games tend to focus on how to make something happen at the expense of what the ultimate purpose is, what actually happens, and who or what is affected. In other words, how to win dominates what the game is about (blowing up other beings), what happens (enormous carnage) and who is affected (lots of aliens get murdered). When the 'how to' is the key, then one doesn't care so much what happens, to whom it happens, or why or to what end it happens. The Jungian psychologist James Hillman gives the Nazi death camp as the extreme example of this: the fact that what happens is essentially murder, that the material worked upon is human, and that the purpose is mass death—all these considerations were pushed aside by the camp officials in favor of narrow focus on making the how-to as efficient as possible [18].

The preoccupation with how-to will continue, by definition, to be a feature of games. Where the nature of games is changing today is in the expansion of importance of the what and the who. In the mature game-fiction genre of detective stories, those writers who are generally acknowledged to be among the best, like Raymond Chandler or Sara Paretsky, are those for whom the how-to of the murder takes a back seat to whom it happens to and what it means— issues that preoccupy all writers. Among computer games, SimCity is a game that is as much about what it takes to build a city—any city—as about figuring out how to win the game. For many SimCity fans, playing the built-in scenarios (where how to beat the clock completely dominates play) is much less interesting than experimenting with building different types of cities, some of which may be wildly unsuccessful within the terms of the game [19]. Myst and Riven are games in which what happens is deliberately de-intensified to encourage a kind of meditative engagement not possible in adrenaline-driven games: there is no mass killing and very little sense of threat to the player; no direct competition with anyone else; no time constraints; no way to avoid reading and understanding the journals that are found within the game. In role-playing games like EverQuest, Ultima Online, and Gemstone III, the who is the players themselves, so these games are dominated by what happens to the players and what it means to them. In short, the changing nature of games is opening the medium to a breadth of imaginative considerations that have hitherto largely been excluded, creating a ferment out of which more thought-provoking and richly expressive games are already beginning to arise.

END NOTES AND ONLINE RESOURCES

1. The history of videogames and computer games lies outside the scope of this essay. Readers who are interested in videogame history can find several very comprehensive histories on the web, including the book-length *I.C. When: The Chronological History of Videogames and Computers* by Donald A. Thomas Jr. (<http://www.icwhen.com/index1.html>); *The Dot Eaters Videogame History 101* (www.emuunlim.com/doteaters/play1sta1.htm); and Sam Hart's *Guns Games and Glory: The Birth of Home Video Games* (newton.physics.arizona.edu/~hart/vgh/main.html). Computer game history is covered in Dan Finkelstein's *History of Computer Games* (www.suite101.com/article.cfm/computer_gaming/444); and a chronology of computer game development can be found at mobygames.com.

2. Books referenced in this and succeeding paragraphs include Lawrence Sterne, *Tristram Shandy*; Lewis Carroll, *Alice in Wonderland* and its sequel *Alice Through the Looking-Glass*;

Vladimir Nabokov, *Pale Fire*; Georges Perec, *A Void*; Luigi Serafini, *Codex Seraphinianus*; and Kit Williams, *Masquerade*. Readers interested in literary games might also want to look at Jorge Luis Borges, *Labyrinths*, Milorad Pavic, *Dictionary of the Khazars*; and Raymond Roussel, *How I Wrote Some of My Books*. Readers interested in the detective story should be sure not to miss Agatha Christie's classics *Who Killed Roger Ackroyd?* and *Murder on the Orient Express*, both of which offer highly unusual solutions to the Who's the Murderer? game.

3. See an attempt to make sense of the *Codex Seraphinianus* on the web at www.math.bas.bg/~iad/serafin.html.

4. See Roy R. Behrens, "History in the Mocking," *Print*, vol. 51, no. 3 (May/June 1997), pp. 70-77.

5. Information on the controversy surrounding TSR, the parent company of the commercial game Advanced Dungeons and Dragons can be found on the web at www.cs.ualberta.ca/~wade/HyperDnd/TSR/tennis.html.

6. I recall playing a rather dull board game called Stock Market back in the 1970s. With the advent of the web, however, virtual stock market games have proliferated. Many only require players to pony up virtual capital, but some require that players invest real money. One of the latter type was recently written up in the *Wired* magazine article "Money for Nothing" by Dan Brekke as a classic case of a pyramid scam (www.wired.com/wired/archive/8.09/stock.html).

7. See the "History of Zork," by Tim Anderson and Stu Galley (www.bf.rmit.edu.au/~fayep/Zork/zorkhist.html); it was first published in *The New York Times* in three parts in 1985. See also a history of Adventure on the web at people.delphi.com/rickadams/adventure/a_history.html.

8. From an Inc. magazine survey on the web at www.play.net/simUNET_public/corporate/press24.asp.

9. See Stuart Moulthrop's chronology of the development of hypertext as a medium from 1945 to the present, on the web at raven.ubalt.edu/staff/moulthrop/chrono.html.

10. Many artificial life games can be found on the web. A good starting point is the Santa Fe Institute's artificial life software links at alife.santafe.edu/alife/software/index.html.

11. A Nomic FAQ can be found on the web at www.cse.unsw.edu.au/~malcolmr/nomic/FAQ.html. A set of links to Nomic games can be found on the web at www.cse.unsw.edu.au/~malcolmr/nomic/.

12. There are many different definitions of games in current circulation. I prefer a minimalist definition myself, as I find that more elaborate definitions result in too many exceptions. I

consider something a game if (1) it has a defined rule set and (2) it has at least one player, who must take an active part in the game. Even the goal of winning, which many writers take to be fundamental to games, I take to be merely a specialized aspect of some rule sets (e.g., the rule is that a player wins if she does such-and-such).

13. In solo games, this opponent is either an abstraction, chance personified as Lady Luck, or ourselves, as we try to beat our previous best finish. In some cases we are testing ourselves against the game's remote creator, as Gary Kasparov did when beating the computer program Deep Blue—it would be truer to say that he beat the scientists who wrote the program.

14. See, for example, Julian Dibbell's book *My Tiny Life*, an excellent account of his alternate life in LambdaMOO, which is still the largest and most popular of the American MOOs.

15. Grahame String Weinbren, "Mastery: Computer Games, Intuitive Interfaces, and Interactive Multimedia," *Leonardo*, vo. 28, no. 5 (1995), p 404.

16. There are exceptions to this; for instance, some players on MUDs and networked strategy games like to talk to fellow players by phone while playing the game, using the phone as a kind of back channel for out-of-character communication.

17. In a different way, actors and con men also straddle the line between the real and imaginal selves. For a perspective on role playing as a nontrivial activity, see for example the book *Black Like Me*, John Howard Griffin's account of what happened when he stained his white skin to pass as a black man in the American South in 1959.

18. James Hillman, *Kinds of Power* (New York: Doubleday, 1995), pp. 33-41.

19. I have known some players of SimCity whose chief delight is in sculpting the terrain on which the city will be built—an activity that is supposed to be a minor feature of the game, not its primary object.

GLOSSARY: COMPUTER GAME TYPES AND DEFINITIONS

ACTION GAMES are games whose primary characteristic is an emphasis on physical action and reaction. The player's onscreen character can usually run, jump, shoot, roll, and even fly. These games require quick hand-eye coordination on the part of the player to meet the game's challenges, which focus on physical obstacles and enemies that must be fought. Popular early videogames like Donkey Kong fall into this category, as do more recent computer games such as Jumping Flash. A subcategory of action games is the side-scrolling game, in which the player's onscreen character moves more or less continuously from left to right in order to progress through the game; this genre has become less popular with the advent of 3D games.

ADVENTURE or **QUEST GAMES** are modeled on the idea of a journey in which the player character undergoes various adventures, from meeting and slaying monsters to finding treasure, acquiring weapons, and solving puzzles, all in pursuit of a purpose that is usually set out at the beginning, such as rescuing a captive or overthrowing an evil power or 'boss'. Games in this genre range from the Mario World series to Zelda 2 and Myst. The first adventure games were text-only, as they predated the advent of screen graphics; pioneer text adventure games include the eponymous Adventure and Zork. The action-adventure hybrid places more emphasis on action than on problem-solving.

CHEAT CODES and **GAME HACKS**: Cheat codes are special programming codes written into computer games that give players advantages like infinite money, extra weapons, or the ability to teleport around obstacles. Often these codes are written to aid in testing the game for bugs during its development and are left in the final code to provide challenges for determined and savvy players to find, either by trial-and-error or by cracking the underlying software, just as 'Easter eggs' are hidden in other kinds of software. Discovering cheats is a status activity in some gaming circles, and many computer sites and game magazines publish cheat codes as they are discovered. Game hacks refers both to the cheat codes so discovered and to game alterations and variants created by programmers who have gained access to the underlying game code and actually rewritten parts of it or added to it.

FIGHTING GAMES are a subset of action games in which two players (or the player and a computer-generated character) fight each other in single combat. Some such combats are hand-to-hand duels between the players' onscreen characters, but more often they involve the use of elaborate and often alien or supernatural weapons. Players can normally choose their onscreen character from a small group of preconfigured roles, each with its own special abilities.

FINITE AND INFINITE GAMES: Games consist of turns or steps in which decisions must be made, leading to a new state of the game with its own set of decisions. Theorists divide games into the finite and the infinite types depending how many decisions are at stake. In finite games, each player has a finite (even if possibly very large) number of decisions to make and only a finite number of alternatives for each decision. Chess, checkers, parcheesi, and many card games are finite. More complicated are infinite games, in which there are an infinite number of decisions or alternatives for each decision.

GAMES AND INFORMATION: Information is crucial to game play because information that a player can gain at the expense of other players may well give an advantage. The first information all players require is knowledge of the rules, but other kinds of information can affect a game's outcome. Cheating, for example, is essentially a way to gain and use extra information in a game; for example, by marking cards or using loaded dice. Game theory divides games into two basic types, games of perfect information and games of imperfect information. In games of perfect information, like chess, checkers, or go, all the players know everything about the game at all times. In an imperfect game like poker, by contrast, the players are ignorant of what the others have been dealt—they have imperfect information of the current state of the game at any given moment. The outcome of perfect games is preordained, and they are of minor theoretical interest because a sufficiently fast computer could analyze them completely (even if none of today's computers are actually fast enough to completely analyze a game of chess). Imperfect games make up the majority of the games that people play.

GOD GAMES are a subset of strategy games in which the player manages an entire civilization instead of individual characters. The evolution of the civilization is represented onscreen as the player tweaks various settings, ranging from geography to economics, religion, and war. Usually the player sees the world as a god would—looking down on it from above. The genre includes such standards as Populous together with Maxis's "sim" games such as SimLife, SimAnt, SimCity, and The Sims.

MAZE GAMES are games that consist entirely of chasing things (or being chased) around a maze of some kind. The classic maze game is Pac-Man, but newer 3D action-adventure games like Marathon and Doom have a close affinity with maze games as their levels are usually designed very much like mazes, with forking paths, dead ends, and monsters that must be chased down and killed.

MUDS, or Multi-User Dungeons, are Internet role-playing games in which as many as several thousand players can simultaneously interact using pseudonyms. The earliest MUDs were purely

text-based games, but newer MUDs like Ultima Online, EverQuest, Lineage, and World of Warcraft have graphical interfaces. Most MUDs are action-adventure style games, but a variant of MUDs called MOOs are virtual environments used for social interaction and world building using the native programming language.

MULTIPLAYER GAMES: Game theorists distinguish between one-person, two-person, and n-person games. Solitaire is a one-person game; chess a two-person game; Monopoly an n-person game (it can be played by two, but it isn't for only two as chess is). Many games have an optimum number of players; it's difficult, for example, to play poker enjoyably with more than about six or seven people. The term multiplayer game is essentially a synonym for n-person games but is used almost exclusively with reference to computer games. In particular, it often refers to the kinds of networked computer games, such as Quake or EverQuest, that allow large and variable numbers of people to log in and play together over the net. Online role-playing games like EverQuest can have thousands of users who may spend hundreds of hours a month on the game, and for this reason the larger games are termed massively multiplayer role-playing games (MMPRPGs).

NURTURING GAMES or **VIRTUAL PETS** are games in which the player takes care of a virtual pet that may be anything from a chicken (Tamagotchi) to an alien species (Pokemon). The pet thrives or dies depending on how well the player manages its needs, which generally include such basic activities as eating, play, and sleep.

PUZZLE GAMES are those in which the chief activity is solving logical problems and puzzles, especially those that involve manipulating geometric shapes. The classic in this genre is probably Tetris, but adventure games ranging from the early Zork to the recent Myst and Riven are often structured around solving puzzles.

ROLE-PLAYING GAMES, or **RPGs**, are games in which the player controls and develops a pseudonymous character over a period of time in a persistent virtual world. Players pursue a range of activities, including keeping track of their character's 'stats' (such as age and strength), exploring, training in new skills, collecting weapons and treasure, and fighting non-player characters (often monsters of various kinds). In networked role-playing games, players can also socialize with other players, which they're normally supposed to do 'in character'. RPGs range from the Final Fantasy series of Japanese games to the networked multiplayer games Ultima Online and EverQuest. They often have exceptionally complex storylines, and some network RPGs (such as the text-based Gemstone III) are in a continuous state of development, with new terrain, treasures, and monsters constantly being added.

SHOOTERS are a type of fighting game in which the main activity is shooting down enemies (such as fighter planes or alien spaceships) and avoiding being shot down oneself. As one progresses from level to level in these games, the weapons on both sides usually get more elaborate and powerful. Space Invaders is usually considered the first shooter; more recent examples of the genre include Defender, Doom, and Crusader.

SIMULATION or **SIM GAMES** are terms used for any kind of game in which real-world activities are modeled as convincingly as possible, typically with a wealth of specialized detail. Many of these are action games that put the player in the driver's seat of some vehicle like a ship, car, or fighter jet; these vehicles can be those familiar from the real world (as in Falcon) or wholly imaginary (Wing Commander). However, the term also covers games in which other kinds of real-life activities are simulated, such as deer hunting (Deer Hunter), running a war (The Perfect General), or evolving life on earth (SimLife).

STRATEGY GAMES are games in which players attempt to beat other players or computer-generated characters with a combination of strategic action and problem-solving. Typically they are war games in which the players control forces of roughly equal strength and the goal is to conquer territory controlled by opponents by defeating their forces. They include such popular titles as Age of Empires and Starcraft.

WINNING AND LOSING: Gain and loss are a major feature of most games, and games are divided into different types according to how the gains and losses add up. So called zero-sum or constant-sum games are those in which the total that can be won stays constant. Poker, for example, is a zero-sum game because if one player wins, another one has to lose. Players benefit at each other's expense, making such games highly competitive. In nonzero-sum games, however, all the players can be winners (or losers). In role-playing games like Gemstone III, for example, players can gain almost as much experience and wealth by sharing the task of killing a monster as they would by doing so alone, and greatly reduce their risk of being killed.