

“Applied Game Theory”: Innovation, Diversity, Experimentation in Contemporary Game Design

By Henry Jenkins and Kurt Squire

Since April 2003, we have written a monthly column, “Applied Game Theory,” for *Computer Games Magazine*. Our goal was to try to make some of the core insights of games scholarship more widely accessible to the people who design and play games. Perhaps the hardest challenge of producing this column has not been the issue of how to balance abstract speculation with concrete criticism or how to identify burning topics of interest to gamers; the biggest challenge we faced, as academics, was how to reduce our arguments to 800 words per month without over-simplifying.

During that time, the column has provided us a platform to address some of the core issues impacting the games industries (debates about censorship and media violence, intellectual property, user-generated content, online communities, the serious games movement, the educational potentials of games, racism, sexism, and homophobia). Columns have focused on top-selling commercial games (*Animal Crossing*, *Civilization 3*, *The Sims*, *Half Life*, *Grand Theft Auto 3*, etc.), on independent and experimental games (such as the work produced by Game Lab), and on research prototypes being developed by major universities and media centers around the world.

The following chapter represents a selection of columns focused around issues of experimentation, innovation, and diversity in game design. (Many of our efforts on games and education can be accessed at <http://www.educationarcade.org>.) From our very first efforts, we felt that game critics have an important role to play in educating consumers about cutting edge work within the medium and challenging the industry to take seriously the potentials of games as a form of artistic expression. Our approach mixed comparisons between games and other media (including in the selection here, film, television, comics, and popular music) with efforts to identify properties distinctive to this emerging artform (including a focus on modes of interactivity and participation and on spatiality). We have respected the challenges facing designers working within the games industry (with its relentless focus on the bottom line) but we have also sought to identify ways emerging products (commercial and otherwise) helped to expand the vocabulary of game design.

"Sensory Overload" (July 2003)

In early June, the Interactive Digital Software Association will host its annual Electronic Entertainment Exposition (E3) in Los Angeles. Perhaps you have already started to read advanced publicity for such hot new games as *Star Wars Galaxies*, *Pitfall Harry*, *Silent Hill 3*, *Aliens vs. Predator*, *Wallace and Grommit*, and *Republic: The Revolution* which will debut in the E3 showroom.

Perhaps you are at the convention now, reading this column over the thundering

noise and flashing lights which turn that same showroom into something akin to the streets of Hong Kong at midnight. Scantly-clad floor babes beckon to you with promises of easy access and cheap loot. Dancers in leotards demonstrate the wonders of motion capture technology. Highly skilled game girls are challenging all comers. The noise you are hearing is the sound of a thousand computer games all being played at the same time. Most people stagger out after only a few minutes, so overwhelmed that they can no longer focus on any one screen. We've seen people passed out in the corner, their friends trying to coax them back to consciousness by upping their caffeine intake. Everyone should see E3 once to experience the adrenaline rush.

E3's economic function is well understood by anyone who has spent more than a few minutes thinking about the games industry. This is where buyers from Walmart, Electronic Boutique, and the other chain stores first encounter the coming year's product. The major game companies are hyping their hottest new titles, smaller companies are trying to break into the market. Both are involved in a life and death struggle for the attention of the middlemen who will determine how much shelf space a title will get and how long it remains there. In E3 2001 for example, the disappointing Xbox showing sent the Microsoft PR machine scrambling for months to convince retailers that platform was ready to ship.

Yet, the consequences of E3 on the look and feel of contemporary games have been less often discussed. For starters, many game designers talk about the importance of designing memorable moments into their new releases -- features which leave vivid impressions after the bulk of what we saw on the floor has blurred together in our sleep-deprived, alcohol-addled, and sensorily-overloaded minds. Producers push designers to come up with a preview reel which grabs attention on the huge monitors which dot the display room and often, the result is an over-emphasis on cinematics over game play. The disparity between those massive screens, which would not seem out of place at your average multiplex, and the much smaller monitors on which most of us play games tells us why so many games look like bad action movies rather than exploring the interactive potentials of this medium or why game soundtracks so often emphasize noisy explosions rather than emotionally enhancing music. What would happen if every movie to be release next year got shown all at the same time in the same auditorium? Which films would stand out? Which films would get buried? For those of us who want to promote greater innovation and diversity in game design, the E3 floor may be the biggest obstacle in our path.

Smaller scale games get little or no floor space. *The Sims*, for example, got swallowed up by the chaos of the E3 showroom. Games like *Rez* or *Majestic* which really stretch the limits of our understanding of what the medium can do are more often displayed in private rooms off the main floor. Some of the most interesting games are literally relegated to the basement, the Kentia Hall, where foreign and independent game developers fight over the cheap space

with discount distributors and peripheral manufacturers. You might find an interesting title squeezed between the new video game glove and an online Korean dating game, but these quirky titles have little chance at being heard above the marketing din upstairs.

After even a few minutes on the floor, all of the games start to look the same. Is it any wonder that distributors and retailers are drawn towards recognizable franchises in such an hyperbolic environment? Is it any surprise that retailers make decisions based on eye candy and glitz?

There's nothing wrong with the industry throwing itself a party at an E3. Wouldn't it be great, though, if like film and music, we had other outlets as well: independent gatherings, grassroots festivals, a real awards show. As the games industry matures, it may not be able to contain all of its economic and social functions within one or two gatherings. The Indie Games Jam at the Game Developer's Conference is one approach, we hope that other similar efforts will emerge in the upcoming years as well. Consider, by comparison, how important the Sundance Film Festival has been for creating visibility and providing economic opportunities for independent filmmakers.

"Refreshing" (October 2003)

Being a game reviewer seems like a dream job: advance copies of games months before they ship, and most importantly, all the free games that you have time to play. Listen to most game critics, though, and you hear that reviewing games for a living can almost take the joy out of gaming. There are only so many dungeons that one can clear or look-alike real-time strategy games you can play before they all, well, start to look alike. Your senses literally become deadened by the repetition of game characters, themes, and mechanics.

Even the good games, which can take over 40 hours to finish, will often throw level after level of monsters at the player with little novelty. How many times do you get a few hours into a game and already know that you've seen it all before and that finishing is more a matter of endurance than excitement?

Fortunately, there are a few gems that suggest ways out of these gaming doldrums. In *Half-Life*, memorable moments are carefully doled out throughout. At first the game surprises the player with its interactive environment; it is not until much later that the player experiences some of the game's other most remarkable features, such as NPC guards that protect the player, marines which redefined state-of-the-art artificial intelligence for the time, or the dramatic desert and surrealist landscapes which come after hours of being locked in the dark cave-like spaces of the Black Mesa Compound.

Eye-catching graphics or unnervingly-good Artificial Intelligence are sure-fire ways to surprise the player, but games such as *Pokemon Ruby / Sapphire* for the Game Boy Advance show that good design can also create novelty and surprise. New Pokemon with colorful skills are peppered throughout the game and players delight in "collecting them all." Pokemon randomly evolve or gain new skills.

And, like *Half-Life*, *Pokemon* introduces new game play elements such as contests or Pokemon breeding hours into the game, creating the feeling that the game could turn in new direction at any point.

Even a simple game like *Pokemon Sapphire* reminds us how games can break our expectations, teaching us new ways to think about games as a medium or about the worlds they represent. Media studies scholars call this process defamiliarization. Our normal perceptions get deadened, much like the poor critic who has to play through the same formulaic games again and again. Art reawakens refreshes and revitalizes them and encourages us to rethink our assumptions. This is as true for popular art -- like computer and video games -- as it is for the so-called fine arts. A game like *The Sims* can invite us to rethink our relations with family members or roommates, while a game like *Half-Life* breaks our expectations about how the first-person shooter genre operates. Knowing what expectations players have is part of the craft of game design; creatively challenging those expectations without frustrating the player is part of the art.

In both cases, part of what makes these games interesting is how they transport players into entirely new worlds. All media are interactive in one sense -- we interpret information from our senses, relate what we're experiencing to what we already know and then build expectations about what will come next. Games are unique in that we act on our assumptions about how the world will operate, putting them to the test. The best designers shatter those expectations without leaving us feeling cheated or lost.

Genres in games, as in other arts, are enabling mechanisms which enhance the communication between artist and consumer, helping us to know what to expect and what we need to do to maximize our pleasure from the experience. The best artist knows when to break with those genres so that they offer us something novel and engaging. In a mature art, we come to read the breaks against the continuities to develop new understandings of the basic thematic building blocks of the medium. The risk is that genres become straight jackets which stifle innovation among artists and deaden the perceptions of consumers. Many game designers protest that the rigid application of genre formulas in the production process, in deciding what games to greenlight, in shaping their marketing, in determining how they get reviewed, and in producing a fairly conservative audience response, is what crushes innovation within the medium. These genre rules are often as enforced as powerfully by consumers who are outraged if a first person shooter doesn't include x feature. If the medium is to grow, however, both designers and players need to learn when and how they can defamiliarize those formulas to create fresh experiences and to keep us on our toes throughout the duration of gameplay.den"

"A Game That Will Make You Cry" (February 2006)

Want to design a game to make us cry? Study melodrama.

Don't snicker, o ye hardcore gamers. Although we associate melodrama with the soap opera -- that is, "girly stuff", melodrama has historically appealed as much to men as to women. Sports films like *The Natural* or *Seabiscuit* are classic examples of this, and in fact, most action-oriented genres are rooted in traditions from 19th century melodrama.

The best contemporary directors of melodrama might include James Cameron, Peter Jackson, Steven Spielberg, and John Woo, directors who combine action elements with character moments to generate a constantly high-level of emotional engagement. Consider this passage from Cameron's *The Abyss* during which the male and female protagonist find themselves trapped in a rapidly flooding compartment with only one helmet and oxygen tank. Games include puzzles like this all the time, but few have achieved the emotional impact of this sequence.

Cameron deepens the emotional impact of this basic situation through a series of melodramatic devices: Playing with gender roles (the woman allows herself to go into hyperthermia in hopes that her ex-husband, the stronger swimmer can pull her to safety and revive her), dramatic gestures (the look of panic in her face as she starts to drown and the slow plummet of her hand as she gasps her last breath), emotionally amplifying secondary characters (the crew back on the ship who are upset about the woman's choice and work hard to revive her), abrupt shifts of fortune (a last minute recovery just as we are convinced she is good and truly dead), performance cues (the rasping of the husband's throat as he screams for help), and an overarching emotional logic (she is brought back to life not by scientific equipment, but by human passion as her ex-husband slaps her, demanding that she not accept death). When the scene ends, absorbed audiences gasp because they forgot to breathe. Classic melodrama depends upon "dynamism", always sustaining the action at the moment of maximum emotional impact.

Critics might argue that these conventions are unique to film, but most melodramatic techniques are within reach of today's game designer. The intensity and scriptedness of a scene like this couldn't be sustained for 40 hours, but it could be a key sequence driving other events. Classic melodrama understood the need to alternate between down time and emotional crisis points, using abrupt shifts between emotional tones and tempos to further agitating the spectator. And, we often associate melodrama with impassioned and frenzied speech, yet it could also work purely in pantomime, relying on dramatic gestures and atmospheric design a technique platform games do well for fun or whimsy (think *Psychonauts*), but few games use for melodramatic effect.

Some most emotionally compelling games are beginning to embrace the melodramatic. Take, for example, the now classic game, *Ico*. The opening

sequences work to build sympathy towards the central protagonists and use other elements of the mise-en-scene to amplify what they are feeling at any given moment. The designers exploit the contrasting scales of the characters' small physical builds with the vast expanses of the castles they travel through. The game also relies on highly iconic gestures to communicate the protagonists' vulnerability and concern for each other's well being.

One lesson that game designers could take from classic melodrama is to recognize the vital roles that third party characters play in reflecting back and amplifying the underlying emotions of a sequence. Imagine a scene from television drama where a mother and father fight in front of their child. Some of the emotions will be carried by the active characters as they hurl words at each other which express tension and antagonism. But much more is carried by the response of the child, cowering in the corner with fear as the fight intensifies, perhaps giving a hopeful look for reconciliation. Classic melodrama contrasted the actions of the protagonists and antagonists with their impact on more passive characters, helping us to feel a greater stake in what is occurring. Games, historically, have remained so focused on the core conflict that they spend little time developing these kinds of reactive third party characters with most NPC seemingly oblivious to what's happening around them.

Finally, the term melodrama originally referred to drama with music, and we often associate melodrama with swelling orchestration. Yet, melodrama also depends on the quality of performer's voices (especially the inarticulate squeaks, grunts, and rasps which show the human body pushed beyond endurance) and by other expressive aspects of the soundscape (the howling wind, the clanking shutters, and so forth) -- elements that survival horror games use to convey fear, but are rarely used for other emotions. Game designers can not expect to achieve melodramatic impact if they continue to shortchange the audiotrack.

Want to design a game that will make players cry? Study melodrama.

Polyrhythm (January 2004)

If *Arcadia* didn't exist, a game theorist might have to invent it. Come to think of it – one did!

When *Arcadia* premiered at the GDC's Indie Games Fest several years ago, it provoked excited response from media scholars, retro-gamers, and minimalist game designers. Produced by GameLab, the independent games group headed by designer/theorist Eric Zimmerman, co-author of the recently released MIT Press book, *Rules of Play, Arcadia* allows players to tackle four games at once – an exploration of the aesthetic and ludic consequences of multitasking. If this weren't enough, the games are based on "classic" Atari-style games, a paen to what many people see as a golden age in game design, an

area of experimentation, aesthetic distinction, and eloquent game play.

You can see that the folks at GameLab want us to use *Arcadia* to examine how far we have come as a gameplaying culture over the past few decades and to think about some of the core elements of game design. But, push that intellectual pretension aside and *Arcadia* is a darned good little game. If all experimental art were this fun, you'd see people lining up outside the Guggenheim with their pockets full of tokens.

Arcadia confronts players with a random selection of eight games: *Over Drive* (think *Pole Position*), *Tut-Bricks* (*Tetris*), *Scrollius* (*Defender*), *Jumpy-McJump* (*Pitfall*), *Fullclip* (target shooting), *ElectronicTennis* (*Pong*), "Rocky" Shapiro's *Video Baseball* (*Realsports Baseball*), and *Strathreego* (*Connect Four*). Each game is simplified to be playable in only one-fourth of the screen and through a single mouse movement and click. But each still feels like its ancestor. The baseball and jumping games are about timing. The *Tetris* and *Connect Four* games are about patterns and strategy. *Pong* still feels like, well, *Pong*.

The design is crystal clear and yet still evocative. The artists / designers promise to take you back to 1977 and they do, exploiting retro chic for all its worth. The boldly colored splash screen could have been taken straight from a 70s luxury van. The pixelated graphics capture the lovable blockiness of Atari-era characters. The cap-gun sounds of the first-person shooter or the canned crowd cheers after a home run in baseball take the player back to the days of 4 bit gaming.

Gamelab creates an entirely new play experience by mixing and matching these familiar materials. *Arcadia* is one part action game. The pace of each game constantly quickens until things fly at you from all directions so quickly that you lose control. *Arcadia* captures what Mihaly Csikszentmihalyi calls "flow," the idea that we are in a special state of consciousness when all of our senses are engaged in a problem. If you think about what you are doing, you quickly fail, but if you can get into the zone, you do better than you might otherwise imagine.

Arcadia is one part resource management game. The game ends when all lives are lost in any one game, so a challenge becomes, "How do I divide my attention across all four screens to keep them going at once?" Because the final score is the result of multiplying all four scores, different strategies emerge for hanging on a few seconds longer and scoring evenly in all four games can lead to big pay-offs.

The most surprising, and instructive aspect of *Arcadia* may be its play with rhythm. *Arcadia* strips each game down to its essential elements - whether it be timing, dodging, pattern matching, or aiming. The player starts by settling into the groove of each individual game. As each new game is added, layer upon layer of rhythm is added to the experience. Here the game becomes truly polyrhythmic. In music, polyrhythm is different rhythms played simultaneously. Unlike, say, a standard rock drumbeat, which might use a snare, kick drum, and high hat toward creating a relatively unified beat, in polyrhythm, underlying rhythms are relatively prime to each other; if picked apart, their basic beats

and patterns and do not match up at all. Polyrhythm, common in many tribal drumming forms, takes distinct rhythms that cannot be subdivided into matching beats, and layers them on top of one another creating unique sounds.

What makes *Arcadia* so interesting is the way that it blends the feel of different genre games into one coherent experience. Lots of recent games have played around with rhythm explicitly – from *Dance Dance Revolution* to *Rez* and *Frequency*. In most of those cases, the rhythm is matched to the audio track. Listen to the audio track of someone playing *Arcadia* and you hear something quite different -- multi-rhythmic patterns of play from four games, sometimes dischordant, other times creating sublime unity.

Arcadia shows how an experimental games industry could exist within the games industry. Released as a Shockwave game, *Arcadia* takes the simple idea of playing four games at once and teaches us some much more powerful lessons about the role of rhythm in game design. We would not be surprised to see these design tricks flow into more traditional commercial games, such as console platform games. To avoid stagnating, the games industry needs to find a way to sustain experiments that push the boundaries of the medium.

"Realism (doesn't equal) reality" (December 2004)

Arguments about video games and violence almost inevitably hit on the question of whether, as video game graphics become ever more realistic, we will reach a point where games are indistinguishable from reality. This is basically the old undergraduate trap of confusing realism and reality.

Realism refers to a goal in the arts to capture some significant aspect of our everyday experiences. No artwork achieves absolute fidelity to the real, and it is pretty extreme to imagine anyone anywhere at anytime confusing art with reality. Realism in the arts, in fact, gets judged as much in terms of its break with existing artistic conventions as it does in terms of how it captures the real. Realism is a moving target not simply because technologies change but also because techniques shift.

As a result, nothing dates faster than yesterday's realism. For example, the Italian Neorealist films (*Open City*, *The Bicycle Thief*) were acclaimed in their own era for their use of non-actors, improvised dialogue, location shooting, and episodic structures, all of which were read as creating an unprecedented relationship between cinema and reality, but today, viewers groan over their swelling music tracks and reliance on melodramatic cliches. The Method Acting associated with Marlon Brando in the 1950s was celebrated for its realistic depiction of normal speech, yet again, today, such performances can seem extraordinarily mannered.

What does this suggest about realism in games? In part, it tells us just where artists are pushing contemporary conventions. Innovations in artificial intelligence might create more natural-seeming non-player characters; "immersive" interfaces try to situate the interface within the fiction of the world; expansive worlds (such as *Grand Theft Auto*) sell us on the feeling of a setting; accuracy in detail in *Medal of Honor* creates a more realistic depiction of war; realistic physics cause the world to behave in a consistent manner, and photorealistic graphics allow for less-cartoonish games.

Almost never does a game design team focus on all of these elements of realism at the same time. They make choices about where realism will achieve the desired aesthetic effect and what needs to be stylized in order to ensure the intensity and immersiveness of the play experience.

In fact, history tells us that most people don't want absolute realism. The Italian neorealist Caesar Zavattini once proposed making a movie which showed 24 hours in the life of characters who did absolutely nothing. If Zavattini were to make a game around that pitch, nobody would buy it. We want games to break with everyday experience. Otherwise, what's the point? Games that embrace a realism aesthetic aspire to create the feeling of playing a role.

People also fear that role playing in realistic worlds will somehow poison them. But, we've been "role playing" in the real world for a long time without obvious detriment. If this were really true, the most dangerous person on the street would be a Shakespearean actor.

In many cases, the realist style may represent a move away from absolute fidelity to the real world: for example, many people read black and white and grainy images in film as more realistic than crystal-clear color images, even though most of us experience the world in color. Photorealism depends on the representation of camera flair lines which are a property of camera optics, rather than reality.

Because we read realism against existing artistic conventions, breakthroughs in realism call attention to themselves -- they are spectacular accomplishments. When the marines behaved "realistically" in *Half Life*, it was so compelling precisely because it was in a game. As long as the artistic devices are foregrounded, we are unlikely to forget that we are playing a game. Realism isn't about creating confusion in the mind of the consumer; it is about using the medium to call attention to some aspect of the world around us. And more often than not, the best way to help us see the world from a fresh perspective is through exaggeration or stylization.

Game reformers are not the only people who confuse realism for reality.

Game designers seem relentless in their push for more realistic graphics, often failing to explore other potentials within the medium. There is no reason why games should embrace photorealistic graphics just because they can. Design teams confront realism as a technical challenge, a set of limitations on what they can achieve as opposed to a creative challenge. In other arts, realism is understood as an aesthetic option, one thing the medium can do. In cinema or painting, say, the push towards realism is held in check by a push towards expression or abstraction. The absence of such a counterbalance in games means a gradual narrowing of the visual styles present in games. We would personally welcome games which embraced stylization and exaggeration, which offered us radically different experiences.

"Spacing Out" (November 2004)

Critics often attack games for a perceived lack of good stories. Most games, they argue, boil down to "save the princess" or "shoot the demons".

Leave aside for a moment that there are great games with great plots, from the days of Infocom up to *Knights of the Old Republic*. Anyone who reduces a game to its plot doesn't appreciate the distinctive ways games tell stories through the creation of emotionally compelling spaces.

There is a reason that game guides are called "walk-throughs." Walk through the shadowing corridors of *Doom3* or the spritely island landscapes of *Super Mario Sunshine* – space's emotional impact on game experience is obvious. The best designers couple atmospheric design with the challenges and goals which shape our ability to move through these spaces to create mood, rhythm, and just plain fun. Great game design owes as much to architecture or dance as to literature.

Recall the feeling of oppression, claustrophobia, and chill that accompanied the experience of traversing the underground of the Black Mesa in *Half Life*. Now, recall that feeling when, after hours of underground seclusion, you first lifted your head into the desert air. Remember the blinding sunlight and hopeful blue skies (too bad that they soon gave way to the desolation of the desert).

As game developers master the building blocks of their medium, we have seen even more subtle uses of space to achieve emotional affect. Take, for example, *Eternal Darkness* for Gamecube. The player is Alexandra Roivas, a young woman returning to her family mansion in Rhode Island to investigate her grandfather's gruesome death.

Gramps was involved in something pretty big, involving "the Ancients'" plot to use him

(and others) to gain power and presumably, reign over the Earth and control Universe. The player uses his Tome of Eternal Darkness to travel through time to Persian and Cambodian tombs, a French cathedral, and the haunted family mansion. Each locale makes an excellent game space full of awe-inspiring vistas, beautiful light, twisty corridors and secret passageways.

Each time you return to these locations as a different character, one has a different experience and comes away with vivid new impressions. Consider the cathedral in Amiens, France, which you visit as Anthony, a 9th century paige to Charlemagne, as Paul Luther, a 15th century monk, and again as Peter Jacob, a reporter in World War I. In the five centuries that pass between each level, the space is transformed as rooms are closed off, added, and otherwise transformed. Players use their knowledge from each previous level to find hidden rooms, locate objects, or anticipate obstacles.

The result is an intellectually interesting and emotionally compelling game experience. You first visit the cathedral as Charlemagne's paige who is trying to save the Holy Roman Empire from being possessed by the Ancients (you fail). When you return as Luther, your goal is to uncover a conspiracy (someone -- presumably the Ancients-- has framed you for murder). As you try to save your Soul and uncover the evil plot, you encounter Anthony's decaying body and possessed spirit. The game taps our memories of Anthony, the cathedral, and Ancients heightening our fear and loathing.

Last, you revisit as the reporter, investigating mysterious disappearances of soldiers who are being treated in the cathedral, now a field hospital. Having already established the Cathedral's terrifying history of the cathedral, the game surrounds the player with fallen and recovering soldiers who are being tortured by the Ancients. Holiness and evil are juxtaposed within the cathedral creating emotional tension within each era; each successive level plays off the previous one.

Our ability to move through or control game spaces shapes our perception of our characters. In the MMO *Lineage II* for example, players start the game in unique parts of the world, each tailored to that race's backstory and myth. So, orcs are born in a fiery temple, emerging into a stark, isolated land of steep cliffs and dark colors. By the time you reach level 20 you have become a hardened orc. When players finally do leave the orc island, initial encounters with sunlight, different races, and even trees and grass are bewildering. By carefully sculpting the environment, Lineage designers gently nudge players toward thinking as orc -- mistrustful and suspicious of the outside world.

The emotional work being done by games cannot be reduced to plot lines, anymore than a plot outline of an opera would do justice to the work. *Eternal Darkness* is about more than creepy cults; it's also the story of a cathedral and of the characters who met their fates there. And Lineage II show us that good spatial design can shape define how each character relates to their surroundings. Until we understand how spatial design shapes our emotional experience, we won't grasp the distinctive aesthetic potential of this medium.