

Pacific University

CommonKnowledge

Volume 5 (2005)

Interface: The Journal of Education, Community
and Values

4-1-2005

The Problem With Reality

Chris Pruett

Recommended Citation

Pruett, C. (2005). The Problem With Reality. *Interface: The Journal of Education, Community and Values* 5(3). Available <http://bcis.pacificu.edu/journal/2005/03/pruett.php>

This Article is brought to you for free and open access by the Interface: The Journal of Education, Community and Values at CommonKnowledge. It has been accepted for inclusion in Volume 5 (2005) by an authorized administrator of CommonKnowledge. For more information, please contact CommonKnowledge@pacificu.edu.

The Problem With Reality

Rights

Terms of use for work posted in CommonKnowledge.

The Problem With Reality

Posted on **April 1, 2005** by **Editor**



By **Chris Pruett** <c_pruett@efn.org>

The latest and greatest video games are often described as “photo-realistic,” “highly detailed,” and “utterly convincing” by game journalists. Realism is a valuable commodity in the game industry, as highly-realistic games tend to sell very well. The quest for ultra realistic game characters and environments has resulted in incredible innovations in real-time computer graphics over the last ten years, and graphics continue to be the primary selling point for many games and game systems. This year, Microsoft, Sony, and Nintendo are expected to formally announce new video game consoles that will provide the computational power necessary to create the most realistic real-time graphics the games industry has ever seen. Realism is a quality that almost every game developer strives for, and as technology progresses video games are becoming more and more capable of convincingly emulating the real world.

Realism is a valuable quality to game developers because games rely heavily on the player suspending their disbelief. In order to “get into” a game, the player must feel connected to the events occurring on the screen, and immersiveness is often measured in degrees of realism. Though many games build convincing worlds without being realistic (such as games that employ cartoony art styles [1]), many developers see realism as the gateway to highly immersive experiences; the more readily the player accepts the game world as real, the more engaging the game should become.

Realism is also valued because it is very difficult to achieve. Realistic graphics alone require talented artists and graphic designers, not to mention programmers capable of producing advanced real-time graphics software. Since most game teams create all of their software from scratch, developing a high fidelity visual system can represent a huge amount of work. But games are interactive experiences, and consequently realism must extend beyond convincing visuals; a truly realistic game must employ convincing characteristics of reality, such as believable physics and sounds. Once a game developer decides to invest in a highly realistic game, he finds himself responsible for producing a convincing model of the world. The dilemma that such developers then face is this: the more convincing their game world becomes, the more obvious is every flaw. After all, if Bugs Bunny’s voice is slightly desynchronized with his lips, nobody really

minds. If a photorealistic character suffers from the same problem, however, the effect is jarring. Simply put, the more effort that is put into suspending the player's disbelief through realism, the harder maintaining that suspension becomes.

This concept is known as *The Uncanny Valley*. Coined by Japanese roboticist Masahiro Mori in the 1970s, the Uncanny Valley is a concept that describes human reaction to increasingly realistic robots. According to Mori's theory, the degree of empathy that people will feel towards robots increases as the robots become more and more human-looking. However, at a point on the anthropomorphic scale just before robots become indistinguishable from humans, people will suddenly find them creepy and disconcerting. The Uncanny Valley is the point at which robots appear almost human, but are flawed just enough to produce a negative reaction from people. Thus, says Mori, until fully human robots are a possibility, humans will have an easier time accepting humanoid machines that are not particularly realistic-looking [2].

Mori's Valley is applicable to mediums other than robots. Video games in particular suffer from being almost-but-not-quite-real, for both in-game characters and environments, because the player is often in control of the point of view. When a scene can be viewed from any angle, every aspect of the scene must be equally convincing. While film makers are able to manipulate camera angles to hide incomplete sets, game developers are often not afforded the same luxury.



A scene from Valve Software's *Half-Life 2*.

Difficult as creating highly realistic games may seem, some developers have accepted the challenge. Valve Software's recent hit *Half-Life 2* is notable not only for its realistic graphics, but also for the convincing way that the game reacts to the player. Characters in the game follow the player with their eyes and move their lips realistically when they speak. Wood splinters and cracks when shot with a pistol, and objects bounce and roll naturally when thrown. Solving the

complex physics equations necessary for modeling real-world dynamics has only recently become practical, and even now the most advanced physics simulations in games are a vast simplification of the real world. Still, games like *Half-Life 2* have shown that realistic physics simulation and detailed characters can go a long way toward convincing the player that what they are experiencing is real.

Despite the praise it has received for its realistic world, *Half-Life 2* also suffers from Mori's Uncanny Valley. The simulated physics, while believable, cause the player expect much more interactivity out of the game world. However, the simulation is necessarily limited; not all objects may be manipulated realistically, which breaks the suspension of disbelief. *Half-Life 2* also employs state-of-the-art real-time facial animation technology, but even so its characters stand right at the lip of the Uncanny Valley, teetering between stylistic caricatures and disconcertingly realistic people. The computational complexity of *Half-Life 2*'s various reality-modeling systems is high: Valve recommends a 2.4 Ghz PC with 512mb of RAM and a good graphics card just to run the game. These requirements will undoubtedly seem quaint in a few short months, but as of *Half-Life 2*'s November 2004 release, they higher than most other games on the market, particularly when compared to games made for TV console systems.

Realistic games are difficult to produce for other reasons as well. If a developer conquers the technical and artistic barriers to creating a realistic world, he still must find ways to make his universe an enjoyable place for a video game. Traditionally, games have been choreographed by game designers using collections of deterministic systems, Rube Goldberg-like machines that just manage to produce the desired results. But realistic-looking systems such as physics are often non-deterministic [3], which makes the game designer's job much more difficult. For example, if a game designer gives the player the ability to knock over a table and push it around, there is nothing to prevent the player from pushing the table against the door and blocking his own exit. Even worse, the door might become inadvertently blocked by the player during a brawl with an enemy. Of course, such an event might be realistic, but in this case it would not be fun; nobody wants to play a game that allows them to accidentally lock themselves in a room. By moving toward a realistic model of the world, game designers are giving up a degree of control, and will need to find new ways of ensuring that the game experience is fun despite the unpredictable influence of real world dynamics.

Ultimately, the problem with reality is that it is not the realm of the fantastic. Video games typically attempt to transport the player to a setting far different than their daily lives, fantasy worlds where princesses may be saved and anybody can do skateboard tricks. Creating a realistic game world is a double-edged sword: if done well, realistic worlds can serve to heighten the player's belief in the game experience, but at the same time each innovation in realism brings the player a little closer to his or her everyday life, and provides less and less of an escape. Realism serves to amplify flaws in a game as well, as people can easily spot deviations from reality. Though the ceaseless march of technology will no doubt eventually render the logistical challenges of creating realistic worlds moot, the implications for game design are vast.

Games are quickly approaching Mori's Uncanny Valley, and until they surpass the empathy dip, many developers will struggle with the implications of realism. Only recently have we begun to understand that realism is not only expensive to produce, it also serves to compound the difficulty of other aspects of game development. The next few years will likely be a tumultuous period for game developers experimenting with increasingly accurate simulations of reality for the first time .

Footnotes

[1] There are also a few games that purposely "break the fourth wall" by referring to themselves as games. The *Metal Gear Solid* series by Konami is a notable example; in this game characters will often refer to the game or game system explicitly without breaking out of character. *Metal Gear Solid 2* has been hailed as a post-modern metacognitive experience because the story line is filled with direct references to the medium. Tim Rogers' *Dreaming in an Empty Room* is an excellent exploration of this title: <http://www.insertcredit.com/features/dreaming2/>

[2] Wikipedia has an excellent article on the The Uncanny Valley here:
http://en.wikipedia.org/wiki/Uncanny_valley

[3] Or rather, they are deterministic but effectively unpredictable due to the number of complex factors upon which the results of such systems are based.

This entry was posted in Uncategorized by **Editor**. Bookmark the **permalink** [<http://bcis.pacificu.edu/interface/?p=3111>] .

ONE THOUGHT ON "THE PROBLEM WITH REALITY"

cork board ideas

on **February 5, 2014 at 1:41 PM** said:

Good site you have here.. It