Cinematic Camera as Videogame Cliché

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ABSTRACT

Because the videogame camera is not an optical camera, it can be programmed to represent a potentially infinite number of perspectives beyond the classic, representational linear perspective. However, an ongoing collusion of the optical camera and the videogame camera leads videogame designs to favor cinematic visual patterns. Classic videogames show a strong tradition of non-optical, non-cinematic perspectives and prove the potential for the videogame medium to expand beyond optically-true perspectives. In fact, this paper argues the development of videogames as an expressive medium depends on an understanding of cinematic perspective as a form of visual cliché'.

Keywords
Videogame, camera, perspective, game design, cinema

"Only with effort can the camera be forced to lie: basically it is an honest medium: so the photographer is much more likely to approach nature in a spirit of inquiry, of communion, instead of with the saucy swagger of self-dubbed 'artists'"
-- Edward Weston [1]

Of all the fictions presented in the videogame medium, perhaps none is more prevalent and less recognized that the notion of the camera. The central lie told to the videogame player by the camera is that it exists at all [2].

Although referred to widely in the critical and game development literature, the peculiar nature of the videogame camera is that it is not there, at least not as an optical camera. If a camera can be described as "an optical system for recording light," then a videogame camera is properly described as "a computational system for producing light."

Because the videogame camera is, in no real sense, a camera, it is not bound to produce

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images according to the physical, optical properties of light cast by objects and recorded through a lens or aperture. Nor does the videogame camera have an obligation to mimic the popular conventions for light recording, namely cinema and photography. The scientific, or linear, perspective invented to accurately represent the optical properties of light traveling through a lens is only one possible perspective producible by a videogame camera.

In this sense, a videogame camera shares a relationship much closer to painting than the photographic arts. As Man Ray declared: "I photograph what I do not wish to paint and I paint what I cannot photograph." [3]

The difference between an optical camera and a videogame camera is apparent and self-evident. One records a specific scene; the other can generate any scene. However, the ongoing collusion of the optical and videogame cameras has resulted in a number of unique, and perhaps avoidable, conceptual and methodological moves. Confusions arise as the conceptualization of the videogame camera merges with the optical camera, forcing a reading of videogames as form of photography or, more often, as cinema.

Two significant consequences arise from this confusion. First, the rich tradition of non-optical perspectives in videogames has steadily been marginalized into "classic games" genre classifications. Second, the reliance of contemporary game design on the optical camera perspectives blurs useful conceptual boundaries between cinema and videogames. In both cases, the confusion unnecessarily limits and clouds the conceptual space of videogame design and analysis.

To understand the full thrust of these consequences we must briefly consider the place of representation in art and the evolution of the optical camera as a primary computer interface.

A PERSPECTIVE ON PERSPECTIVE

The history of representation in art follows a rising arc of fascination with creating realistic paintings followed by a rejection of the approach and the invention of new techniques. Emerging from the incomplete perspectival systems of antiquity, representation found its most complete form with the discovery of scientific perspective in the Renaissance. Aided by the use of the camera obscura, early pioneers such as Brunelleschi invented techniques for drawing and painting optically. That is, they developed representational technologies for drawing patterns on canvases that were scientifically valid as representations of how light travels from objects and is received through the lens of the eye.

The pursuit of representation in art through the use of scientific perspective collided 400 years later with the new reality of the photographic camera and the machinations of the industrial age.

"At the epicenter of these enormous transformations was the debate about representation

versus abstraction. In art, there was a strong countermovement to the figuration and perspective that had held center stage ever since the Renaissance," wrote Arthur Miller. [4]

Nowhere was the attack on representation more obvious than in the Cubist work of Pablo Picasso and Georges Braque, an approach that, in addition to many other things, was willing to represent all sides of a subject simultaneously—something that is optically impossible.

Or, as Miller noted, "Just as relativity theory overthrew the absolute status of space and time, the cubism of Georges Braque and Picasso dethroned perspective in art."[5]

A hundred years later, videogame fans and critics still praise, "realistic graphics" without a hint of irony or a whiff of history.

THE CINEMATIC BIAS

In *The Language of New Media*, Lev Manovich discusses how linear perspective, via cinema, has become a primary cultural interface and *the* primary human-computer interface. In his analysis, early decisions to model 3D computer spaces using the optical principles of scientific perspective have merged the language and cultural interface of cinema with the computer interface. Or, as he sums:

"In short, what was cinema is now the human-computer interface." [6]

Manovich does not argue that the computer interface *should* replicate the "kino-eye" rather he accepts this as a pronounced feature of new media. To support his assertion he sagely points to the evolution of the interface from convention to unquestioned reality.

> "The fact that computer games and virtual worlds continue to encode, step by step, the grammar of a kino-eye in software and in hardware is not an accident, but rather is consistent with the overall trajectory of the computerization of culture since the 1940s—the automation of all cultural operations…..A side effect of this automation is that once particular cultural codes are implemented in low-level software and hardware, they are no longer seen as choices but as unquestionable defaults." [7]

Linear perspective is now built into game engine code, video card software drivers and even computer hardware. The fact that all perspectival systems start as one of many possible software decisions is being lost in the flow of convenience. The optical perspective has risen from possible instance in multiplicity to singular reality.

And while Manovich's observation remains valuable, when held up to the evolution of representation and perspective in painting, we can see that the convention is under

pressure. Because videogames lack a real camera or lens, they are not subject to the conventions of the kino-eye. Videogames can follow their own prescriptions for representation creating non-optical worlds. In fact, they always have.

WRAP AROUND UNIVERSES AND PARALLAX WORLDS

"We have obliquely noted already that videogame spatiality is not bound by contiguity and that tempo-spatial mutations are commonplace," wrote James Newman in his reference text, *Videogames* [8]. Or put another way, videogames can mimic cinematic language if they like, but they don't have to. Because they do not rely on an optical perspective, videogames can represent their onscreen space using any perspectival system imaginable and, certainly, even those not yet imagined.

When looking for examples, it is initially temping to hold up game/art experiments such as Nulpointer's *QQQ* as specimens of non-optical perspective in gaming. [9] And certainly, by distressing 3D game environments the way *QQQ* does, with inserted code and unpredictable input, a project such as this shows the potential for games which leaves behind the simple scientific perspective of the lens.

However, we need go no further than the "classic" arcade games to find ample examples of interesting, non-optical perspectives.

Steven Poole provides an illuminating example in his monumental work, *Trigger Happy*:

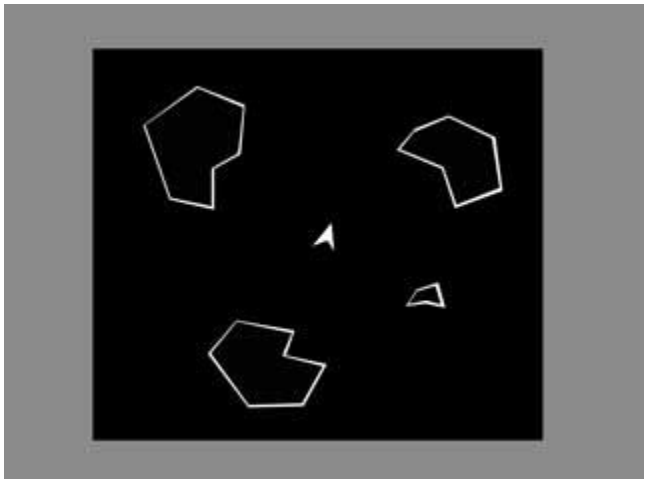

Figure 1: The world of *Asteroids* as seen by the player (images by Brett Martin)

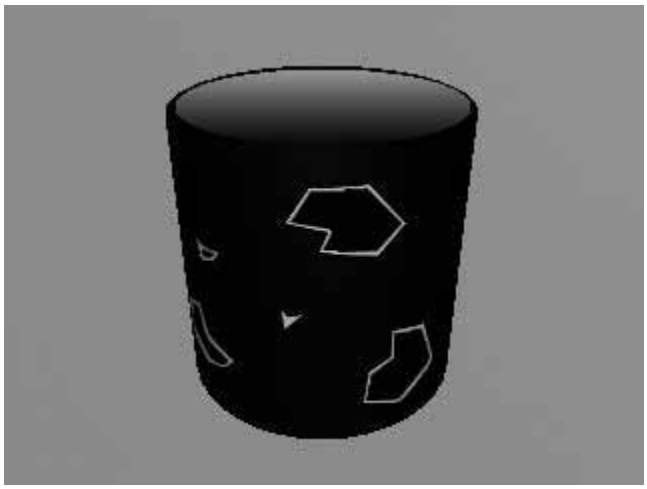

Figure 2: Possible *Asteroids* world layout

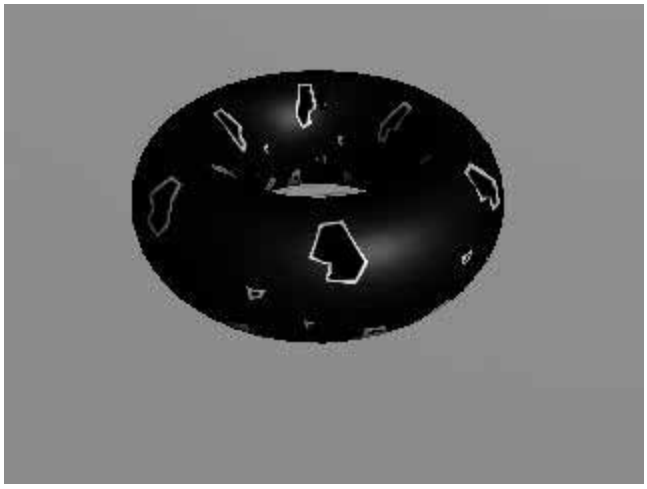

Figure 3: Actual *Asteroids* world

When you consider the notion of camera in the game *Asteroids*, your first instinct is to assume the camera position is at a fixed point, hovering high above in space, looking down on the scene (figure 1). But further inspection reveals something peculiar. The ship can travel off one side of the screen only to return instantaneously on the opposite side. This means, at a minimum, the world in front of you is a cylinder (figure 2). How else to explain the wrapping of the ship's trajectory from one side of the screen to the other? Noticing also that the ship may travel from the top of the screen to the bottom, we are once again forced to remap our notion of the onscreen space. We conclude the only possible shape of the *Asteroids* playfield shape is a torus—a donut world where the ship is free to travel across the surface (figure 3).

Asking again, "Where is the camera?" instinct tells you that the camera must still be fixed, hovering above the world, since the scene stays still while the objects in the game move. But how can this be? A torus has hidden surfaces. How can the camera show the hidden backside of the donut without moving?

Of course, the answer is that the "camera" in *Asteroids* is, at best, a sort of non-Euclidian space-warping camera that can peel a torus and spread it flat. More simply, the *Asteroids*

camera is everything but an optical camera system. Trying to find the optical camera perspective in a game of *Asteroids* is as futile as postulating the camera perspective in Picasso's Cubist masterpieces.

The lack of real 3D technology in early computer games forced game designers to think about the presentation of game space in ways that led them away from linear perspective. Even games which feigned the kind of optical perspective so familiar in cinema and photographs created distinctive, rather than derivative visual perspectives. *Super Mario Bros.*, for example, used parallax scrolling of different visual layers, with the background moving more slowly across the screen that foreground. This simulated a sense of a background sitting further away than the foreground, an optical perspective.

The result, as anyone who as played these kinds of games can tell you, is not so much a sense of cinema, a sense of space recorded optically, but a special sort of "videogameness" that is tied to this decidedly non-scientific perspective. *Super Mario Bros.* does not look like a movie. Rather, it is iconic videogame idiom on screen.

Even a contemporary game such as *SimCity 4* forgoes possible optical (and therefore cinematic) perspectives to present the word in an impossible isometric perspective. Although it appears that *SimCity*'s isometric perspective is an optical projection—after all, doesn't each little city look like a scene viewed from an airplane?—it turns out it is not.

The isometric projection, by definition, maintains an equal proportion between the *x*, *y* and *z* dimensions in space. This balance of proportion prevents objects from growing smaller as they recede from the viewer. The isometric perspective does not have a vanishing point at all and is therefore impossible to reproduce through an optical lens.[1]

CONSEQUENCES

Despite a tradition of non-optical perspectives, contemporary development of 3D technologies and hardware have meshed with and fueled the aesthetic recapitulation of Renaissance impulses toward realism in art. This impulse has led game development efforts away from classic, non-optical perspectives and toward the scientific perspective of the cinematic, optical camera in an effort to create realistic representations.

To illustrate how far the pendulum has swung toward optical, cinematic camera perspectives, consider that out of the 10 best selling console games in 2004, only one, *Pokemon Fire Red*, does not use a form of the default optical camera. [10]

This collusion of scientific perspective with the videogame camera has unnecessarily disadvantaged "classic" game designs and winnowed the design vocabulary for contemporary game developers. In short, we have more *Doom* and less *Asteroids*. This

[1]Poole does note that objects close to our field of vision do appear isometric because there is not enough distance for us to adequately perceive the convergence of parallel lines toward a vanishing point.

consequence can be described as “the cinematic camera as videogame cliché”.

Or, as Mark J.P. Wolf has remarked:

> “Except for a few torchbearers like *Rez* and *Frequency*, games have gone the way of increasingly representational graphics and gameplay, often trying to achieve the look and feel of movies or cartoons….But it would be quite a shame to limit game design to representational graphics and gameplay and to ignore everything else that the medium is capable of producing.” [11]

The real consequence of thinking of the videogame camera as an optical system is the retardation of the gaming experience and a contraction of the medium’s possibilities. Newman sumed this situation perfectly:

> “At least part of the pleasure to be derived from engagement with the cyberspace of virtual reality, according to Benedikt, apparently comes from the ability to play with and within these elsewhere spaces replete with their uncommon, perhaps even unpredictable, spatial rules.” [12]

Not only does the reliance on optical perspectives limit game design, it encourages a theoretical misunderstanding that games can be read as cinema. Moving beyond a strict reading of the videogame camera as an optical camera provides a platform for recontextualizing film theory vis-à-vis games and establishes a theoretical platform for considering games as *sui generis* and not simply an extension of other modern media.

CAMERA TRICKS

What does a 3D game that does not rely on optical perspectives look like? Certainly it may look like *Asteroids* or *SimCity*. But it may also look like something else entirely.

The Bug Eye project [13] was established to explore the possibilities of non-optical camera systems in 3D gaming. To date the project has explored 3D-isometric hybrid models, multi-camera scene mapping and selective object manipulation. Each of these camera perspectives attempts to illustrate how games can use non-optical camera perspectives to present new forms of game play.

Challenges to the project include working around the assumed linear perspective built deeply inside current 3D game technologies and showing the usefulness of non-optical perspectives to game design. To date, the Bug Eye project has confirmed the enormous amount of inertia generated by current 3D designs and experienced the difficulty in demonstrating the applicability of non-optical videogame camera systems to contemporary game designs.

CONCLUSIONS

As the cinematic perspective is just one of many, even infinite, visual perspectives available to videogames, there is no particularly good reason to privilege it over others.

But there are perfectly solid reasons not to.

"The spatial aesthetics of videogames are still stuck in the conservative line of the eighteenth century, because geometrically, it seems, truth is easier than interesting fiction," declared Poole in his analysis of the hopeful future of the videogame medium. [14].

Like Wolf, Poole finds the reliance on representation as a stagnating force in videogames. Continued reliance on the optical camera remains the underlying cause of this stagnation. Poole recognizes this when he playfully suggest a game world based on "the baffling perspectival contradictions" of Escher's drawings.

To limit videogames to optical camera perspectives artificially limits the expressive possibilities of the medium.

Despite attempts to place videogames in a context of cinematic media based largely on contemporary visual similarities, keeping games separate from cinema should remain a goal of designers, developers and researchers. If not, we simply extend the cinematic metaphor into a plastic medium all too willing to reproduce this imprint, but also one capable of much more. Why should games pretend to be movies when they are so good at being games? Why limit their gameness to a media form from another era? Why not release games to attain more, to become the refined expression of the digital world? [2]

Vice versa, reducing the importance of the cinematic perspective does not mean that videogames should drop optical perspective entirely. Working in the multi-medium of videogames, designers may, at times, need to re-create the experience of cinema or simply borrow from its vocabulary. In these cases, a cinema-similar perspective remains appropriate.

However, as the title of this paper suggests, unquestioning reliance on the cinematic perspective or assumptions about its position as an aesthetic goal, does nothing more than offer a rationale for cliché.

Artistic expression ultimately demands the greatest range allowed by the medium. Painters may choose to paint in black and white, but should not be limited to this palette. Musicians might prefer the Western scales but may explore other intonations. Poets may aspire to the iambic pentameter, but may also write free verse. Videogame creators should use the cinematic perspective when appropriate, but discard or embellish when expressive judgment dictates.

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[2] This would parallel the development of cinema as the expressive, aesthetic face of the industrial age.

In this way, videogames have much to gain (visually) from the painting traditions. Painting offers a wide variety of critical and aesthetic contexts for interpreting images. We do not assume that an abstract Pollack is somehow less meaningful that a realistic tromp ‘l oeil.

As Michael Polanyi observed in the introduction to “Optics, Painting & Photography”:

> “At the turn of the last century, writers wishing to emphasize that a painting possesses value irrespective of its imitative powers, have declared that a painting has an independent reality. We can appreciate this point by imagining the transformation of a painting into a tromp l’oeil. We realize instantly the abysmal triviality to which a still life by Cézanne would be reduced were it somehow made to convey the illusion of real fruits and vegetables placed in a recess in the exhibition’s wall. It is as well that the integration of brush-strokes and canvas lends to all paintings a distinctive artificial quality which isolates them from all natural sights. This secures the artistic reality of a picture and thus guard its distinctive power from dissolving in the surrounds of factual reality.” [15]

In turns out that videogame theory and design’s reliance on the optically correct, linear perspective may be one of the field’s biggest, and, unfortunately, self-imposed constraints.

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