

LUDIC LISTENING: SOUND ART IN VIDEO GAME DESIGN

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This paper will briefly discuss the history of sonic experimentation in digital game design, and describe one of a series of games the author is in the process of creating that directly address ideas in sound art theory. These projects focus on the world of audio with the intention of distancing video games from the rational and concrete. Video games in turn facilitate the exploration of relatively new paths in sound art.

This paper describes several experiments in audio-based game design that attempt to expand the expressive vocabulary of games, briefly discussing the histories and theories of sound art and video game design while outlining their potential to merge. These experiments probe what appears to be under-explored territory in audio games: although music-based play has been popular for some time, dating as far back as Mozart's musical dice game, [3] other forms of sound are relatively under-explored as the basis of game mechanics. This paper assesses the history of audio-based digital games, particularly the genre of music games, examining their limitations while drawing attention to areas of current and future experimentation. The author is in the process of creating a series of short games that explore new forms of audio-based game design, and will discuss one that involves voice-activated visual echolocation in an evasive three-dimensional sonic landscape.

The majority of audio-based digital games are musical and are comprised of the following two major categories: those that build gameplay around pre-existing musical compositions and those that generate dynamic music as a result of player action. In many music video games, the challenge that players face is to hit specific buttons in time with the beat of pre-recorded music. By contrast, the shooting game *Rez* allows players to compose music indirectly, by playing notes that are generated by the player's firing pattern. [5] Much interactive music software falls outside of games and into the more general category of "toys," as they have no set goals or obstacles. Often the player's only given objective is to compose music through experiment and play. Game or interactive toy-based generative compositions are not without constraints, however, as designers often restrict players to a certain set of notes to prevent them from creating music that is too dissonant and in some cases even alter the player's feedback to fit a pre-conceived rhythm.

Broader definitions of music, such as those proposed by John Cage, have not been widely explored in music-based digital games. Independent and experimental game designers, however, have explored other forms of sound-based game design. Eddo Stern's "Darkgame" installation relies on visual sensory deprivation, focusing in part on the side-effect of heightening other senses such as hearing. In experimental game design competitions, it is a popular challenge to create non-visual gameplay that requires the player to navigate by sound. Although three-dimensional first-person shooters have always relied on audio cues to alert players to the offscreen presence of enemies, the aforementioned games explore new ways to use audio as a way to augment or replace visual navigation.

Sonic art theorist Seth Kim-Cohen argues for a conceptual sound art that is not based on what is heard, "but in the elsewhere/elsewhen engagement with ideas, conventions and preoccupations." [4] Just as

the visual arts have explored the verbal and written communication of ideas over the retinal, he believes that sonic arts can move beyond the sensory. "Hear, Hear," an artwork created by Papermen at Eye-beam, New York, in 2011, is a silent kinetic sculptural representation of the collecting of vibrations by the ear and processing by the brain. It is a silently moving sculpture that nonetheless sparks a cognitive engagement with the processes of hearing. Are there ways that games can represent sound without reproducing it? Games are simulations, or, as Salen & Zimmerman put it, "procedural representations of reality." [6] It is interesting to note that most representations in game worlds, whether they be of death, conflict, conversation, are all simulated, yet sound is almost always reproduced (like visuals). An important area to explore, it would seem, would be simulation of sound through gameplay: having the player perform actions that are representative of the physical and cognitive aspects of hearing, listening and sounding.

What aspects of audio hold potential for game-based simulation? Consider the following descriptions of sounds in the context of actions, environments and visual representations in video games. David Toop compares sound's properties to those of "perfume or smoke," stating that "sound's boundaries lack clarity, spreading in the air as they do or arriving from hidden places." [7] He points out that sound "implies some degree of insubstantiality and uncertainty, some potential for illusion or deception, some ambiguity of absence or presence," and that, "Through sound, the boundaries of the physical world are questioned, even threatened or undone by instability." [7] Sound also has the "ability to stretch across the cut, to meld continuously from one 'object' or entity to another." [2] Sound always arrives at our ears blended, like shadows. [1] Typical games, by contrast, are often about the manipulation of distinct objects with logical boundaries. Games are often, however, about discovering alternate universes, and so contain the potential to allow players to explore worlds with fluid boundaries and objects that blend or arrive with ambiguous origins, like sound.

Optic Echo is a game created for mobile devices with the intention of representing visuals as sound is heard. Walls in the 3D environment are represented not as solid points in space but as particles flying toward the player "from hidden places." Visualization of the player's environment and non-player characters is migratory, ephemeral, like sound. Gameplay references echolocation: the player makes a constant noise (for example, with his or her voice) into the microphone and the game uses the volume of this sound to visually render the walls of the 3D environment, as if the particles were noise echoing off of the walls. The location of solid objects, like the origin of sound, must be inferred from the "optic echo's" movement. The manner in which the visuals were created to resemble sound was inspired by a quote from Frances Dyson in *Sounding New Media*:

like the fire, sound is always coming into and going out of existence, evading the continuous presence that metaphysics requires; like the fire also, sound is heard and felt simultaneously, dissolving subject and object, interior and exterior. Like the river, sound cannot be called 'the same' since it changes at every point in its movement through a space; yet like 'Soul,' it does not strictly belong to the object. Nor can sound's source and ending be defined. [1]

This was an attempt to mimic audio through another sense, a step toward simulating audio through gameplay.

Humans cognitively approach sound in ways that we do not engage with our other senses. Could it be that in games, navigating a 3D spatial tactile world is not the best way to move? How about forward and backward through the time of a sound? What choices could the player make as they move, what obstacles overcome? Studying audio gives game designers new ways to construct (and deconstruct)

space and action. Conversely, the 3D spatio-centric worlds of video games give artists who work with audio a space where they can explore goal and conflict-based compositional techniques, giving their audiences the potential to engage and procedurally explore the processes of hearing and listening.

References and Notes:

1. Frances Dyson, *Sounding New Media : Immersion and Embodiment in the Arts and Culture* (Berkeley, CA: University of California Press, 2009), 121.
2. Douglas Kahn, *Noise, Water, Meat: A History of Sound in the Arts* (Cambridge, MA: The MIT Press, 2001), 148.
3. Fares Kayali and Martin Pichlmair, "Levels of Sound: On the Principles of Interactivity in Music Video Games," *Proceedings of DiGRA 2007 Conference, Tokyo, 2007*, <http://www.digra.org/db/07311.14286.pdf> (accessed June 11, 2012).
4. Seth Kim-Cohen, *In the Blink of an Ear : Toward a Non-cochlear Sonic Art*(New York: Continuum, 2009), 37.
5. *Rez* (video game) is designed and produced by Tetsuya Mizuguchi and directed by Jun Kobayashi (2002).
6. Katie Salen and Eric Zimmerman, *Rules of Play: Game Design Fundamentals*(Cambridge, MA: The MIT Press, 2003), 457.
7. David Toop, *Sinister Resonance: The Mediumship of the Listener* (New York: Continuum, 2010), 24, 36.