SENTIENT VR ENVIRONMENT DESIGN: THE MEMESIS PROJECT

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ABSTRACT

The purpose of the *Memesis* project is to design an interface and navigation system that "reads" input off the player/user (using technologies derived from systems used for polygraph and blood pressure testing, among others) in order to provide the user with a tailor-made experience based on sub-conscious as well as conscious input. The program will be designed first for use in CAVEs (computer automated virtual environments), and then for online and console playing. For the project prototype I intend to develop a "horror/thriller/suspense" experience.

Keywords

Memesis project, interactive narrative, horror/thriller/suspense genre, interface design, cave.

1. INTRODUCTION

The purpose of the *Memesis* project is to design an interface and navigation system that "reads" input off the player/user (using technologies derived from systems used for polygraph and blood pressure testing, among others) in order to provide the user with a tailor-made experience based on sub-conscious as well as conscious input. The program will be designed first for use in CAVEs (computer automated virtual environments), and then for online and console playing. For the project prototype I intend to develop a "horror/thriller/suspense" experience. I will apply the knowledge gained from years of teaching screenwriting and cinema studies to dissect the horror genre as we know it from the cinema and translate it into a modularized version that players can enjoy in a 3D environment. Enjoyment of the environment will come from the direct interaction between user and environment (the user makes conscious choices) and indirect interaction.

The plan is to develop the project in cooperation with the CAVE at SARA (part of the University of Amsterdam in the Netherlands), the Alterface Company in Brussels, and Jeffrey Shaw at the ZKM in Kalsruhe. The project has just been awarded the support of a Carnegie-Mellon Fellowship.

The first phase of the *Memesis Project* is to create a horror-genre experience in a fully immersive interactive environment. There are three elements to this task: a new approach to interface design; a new way of thinking about and designing the relationship between the user and the interactive fiction; a modularization approach to the horror/thriller genre as we have come to know it from cinema, television and theatre.

2. BASIC ASSUMPTIONS

The *Memesis Project* starts off with the basic assumption that users seek out immersive digital experiences because they are looking for experiences that go beyond spectacle. *Memesis* will apply Daniel Dayan's and Elihu Katz's distinction of 'ceremony', 'festival' from 'spectacle'. In contrast to spectacle, ceremony and festival involve interaction, although to different degrees: festival involves a strong interaction between audience and the event they experience (as at carnivals), whereas ceremonies involve a measured interaction, (such as shouting and applause). Film is firmly rooted within the society of the spectacle. Interactive digital media, by contrast, need to be conceived along the lines of festivals and ceremonies. We expect that the end-users will be attracted to the *Memesis Project* because it will allow them to explore their inner fears and anxieties and help them to learn more about themselves.

This requires a new approach to interface design. The *Memesis Project* aims for a greater degree of transparency and immediacy, goals of all new media technologies. However, we plan to achieve these goals in a different way. The relationship between input (how the user communicates with the computers system) and output (how the computer system responds to the user) is the first area that will change.

Part of this approach requires changing the relationship between diegetic (elements of the fiction in question that are perceptibly part of the story world) and non-diegetic content (elements of the fiction that are clearly not a part of the story world). The aim here is to make the *Memesis* experience as transparent as

possible, but also to shift away from the computer-game approach which takes the important presence of non-diegetic interaction for granted.

3. HUMAN COMPUTER INTERFACE DESIGN

The nature of the *Memesis* experience necessarily entails a way for the game software to get readings off the player without the player having to constantly make conscious choices within the game. This can be achieved in a variety of ways. First-phase research will focus on adapting polygraph device readers to the *Memesis* interface. Second-phase design will include galvanic skin readers and eye scanners as well pressure-sensitive floor mats. The key is to take these readings with the least amount of discomfort and annoyance to the user. In its initial phase the project is designed for use in CAVEs, but we hope to eventually develop PC and/or console versions. Ergonomic research into these devices will be done with this eventual goal in mind.

4. USER-PROGRAMME RELATIONSHIP

Barbara Becker has noted that people are driven to create new identities for themselves on-line, in MUDs (multi-user domains such as text-based adventures like *Genesis* or 2D graphic MUDs like *Ultima Online*) because they want to "explore new dimensions of identity by its virtual (re-) construction" and in order to become "the product of ones own tinkering."

In MUDs and MOOs users work towards such goals by creating avatars (textual or graphic representations of themselves that include a character designed to fit into the fictional environment in question, complete with a set of personality traits, skills, and health status). *Memesis* enables users to interact with the environment "as themselves", rather than through the use of an avatar. What this means in practice is that user is not assumed to be a "co-author", as most theorists of new media, including Barbara Becker and George Landow, believe. Even in MUDs and MOOs where a maximum degree of control has been provided to expert users who achieve the status of "wizards," these controls are non-diegetically based. In other words, such expert users then abandon their status as players almost completely and limit their participation to regulating the MUD or MOO environment "from above", i.e., from a non-player position. In fact, one of the requirements of wizard status in a MUD is that the player, in addition to having a relatively high degree of programming skills, must have completed all of the quests and adventures available in the MUD.

The design for *Memesis* starts with a different assumption: rather than assume that the user is a co-author, we believe that part of the appeal of interactive fictions is that they enable a different level of narratee engagement. (Here I am following Edward Branigan, and his use of these terms in *Narrative Comprehension and Film*). Historically, certain classes of readers have chafed under the limitations of narratee construction, such as the fans of long-term popular shows like *Star Trek* who engage in story-tree making. Interactive fiction enables users to tailor their position as narratee to suit their own interests, though this "tailoring" is still limited by the parameters of the program design. *Memesis* is designed to capitalize on this heretofore unrecognized aspect of interactive fiction. This aspect

of the design recognizes virtual reality environments as the ultimate development of televisuality. Of interest here is Elihu and Dayan's semiotic theory of ceremony, festival and carnival. Elihu and Dayan applied these concepts to televisual events such as Lady Diana's wedding, but these concepts can also be applied the altered relationship between narrator and narratee positions brought about by the modularization of the narrative, and it is one avenue we intend to explore in *Memesis*.

5. THE MODULAR HORROR EXPERIENCE

Memesis, in its first incarnation, will consist of a modularization approach to the horror/thriller genre as we have come to know it from cinema, television and theatre. The horror genre can be subdivided into various types, such as "shock horror", "body horror", "psychological horror" and "moral or psychic horror." Shock horror depends on certain effects that are based on our fear of being attacked. Most shock horror works by activating viewer's phobic responses. VR environments are often used by psychologists to help phobic patients (patients can learn how to cope with vertigo or agoraphobia in a VR environment, for example). *Memesis* builds on such experiments to incorporate shock horror into the fictional experience. Body horror works by activating the revulsion/repulsion response in viewers. Certain VR techniques have been developed for use in surgery, etc, and *Memesis* plans to take advantage of the special qualities of VR vision to elicit similar responses in users of the *Memesis* fictions. Psychological horror works by giving viewers a particular insight into a horrible situation or a horrible mind, such as the mind of a psychopath, and even allow us to identify with him. *Memesis* will work by enabling the user to explore the darker corners of their own mind. This is the most challenging design element for *Memesis*, as this type of horror depends on a high degree of control from the narrator position.

However, for precisely the same reason moral or emotional horror can be more effective in the VR environment, because the altered status of the narratee implicates the user morally and emotionally into the situation. The hypothesis we wish to test in *Memesis* is that by enabling the user to provide the computer with input at a subconscious level, the resulting interactive experience will be profoundly more effective at the moral and psychic level. This is why, of all the storytelling genres that would lend themselves to this experiment, the horror genre was chosen: because moral and psychic effect is precisely what the horror genre achieves best. Future versions of *Memesis* are planned for other genres, such as fairy tales and romantic comedy.

The first step towards creating a modular horror experience is to analyze the horror genre itself, as it has manifested so far in film, television and prose fiction. Once an initial survey of the literature is complete, typical horror experiences can be precisely defined and broken down into units or modules of experience that *Memesis* can recombine according to player input.

6. THE A.I. OF MEMESIS

This brings us to the role of artificial intelligence (AI) in *Memesis*. The AI in *Memesis* will manifest in two ways: in the

intelligence of the environment and in the intelligence of the bots (characters generated by the program).

As currently envisioned, *Memesis* will consist of a series of individual experiences, each about 15 minutes long (the average user cannot spend more time in a 3D environment). The first part of a typical 15 minute experience will consist of an entry experience designed to gather readings from the user while the user is entertained with instances of shock horror. Then there will be the introduction of a bot which will continue to gather readings from the user. This gathering will work primarily on the indirect level even though user and bot will also have a direct engagement.

The bots in *Memesis* will not be designed as synthespians, or synthetic actors, such as the bot ELIZA designed by Joseph Weizenbaum. The *Memeis* approach is closer to that of Stephen Grand, the creator of the computer game *Creatures*. Grand created Norns, the creatures that inhabit Albia, the virtual world of the Creatures series, first released in 1996. Players rear their norn and help it through various encounters. Grand programmed his norns with over 300 genes and simple drives to satisfy, such as the drives to eat, breed, and avoid pain. Most importantly, norns can learn by doing. Productive skills are reinforced, unused ones fade away. This kind of design characterizes most virtual pets, but Grand also designed a "biochemistry" for his norns that behave much as hormones and neurotansmitters do in the human body. Players can influence the norns' learning pattern by doling out rewards and punishments, and when norns breed, the "DNA" patterns are mixed, often with unexpected results.

The bots in *Memesis* will also learn from experience, by incorporating information gathered directly and indirectly from a series of players. This information-gathering mechanism will be based on psychological testing instruments that alert clinicians to phobias and deep seated fears. The *Memesis* bots will not simulate human adults. They will not, for example, in the first phase at least, be capable of synthetic speech. Instead they will follow the limited rules of their environment. Their ability to provide an impression of intelligence will be based on their ability to read the player and the way the current readings are added to and blended with experiences with past players. For example, interactions that feature a fear of insects in today's player will build on interactions with previous players that also had an insect phobia.

The main event in each visit to *Memesis* will be a singular interactive horror experience designed to evoke one of the emotions or moral reactions traditionally evoked by the horror genre, such as fear of abandonment, fear of betrayal, fear of loss, fear of humiliation, and concomittantly, the fear of being discovered at wrongdoing such as abandonment, betrayal, etc. For example, almost every adult is familiar with the fear that an infant put into their care comes to harm. The first *Memesis* experience to be built will be designed with this fear in mind.

After the main event there will be a brief "exit" experience designed to enable the user to adjust to the end of the visit to *Memesis*.

7. SUMMARY

The *Memesis* Project is an art project, still in the design phase, which will consist of an interactive horror experience with a unique human computer user interface, an interface that will read direct and indirect input from the user. These responses will then be used to provide the user with an interactive horror experience designed around the same limited number of phobias and deep-seated fears that are characteristic of the horror genre in other mediums, such as film. The overall goal is to entertain as well as to provide a space for self-reflection. What we learn from this experience can then be applied to developing other interactive VR experiences (using other genres), and as the basis for a new type of interactive fiction form.

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8. RELEVANT LITERATURE

Arseth, Espen, *Cybertexts: perspectives on Ergodic Literature*, Baltimore and London: The Johns Hopkins University Press, 1997.

Bal, Mieke, *Narratology*, Second Edition, Toronto, Buffalo, London: University of Toronto Press, 1997.

Branigan, Edward, *Narrative Comprehension and Film*, London and New York: Routledge, 1992.

Chatman, Seymour, *Story and Discourse: Narrative Structure in Fiction and Film,* Ithaca and London: Cornell University Press, 1978.

Coming to Terms: The Rhetoric of Narrative in Fiction and Film, Ithaca and London, Cornell University Press, 1990.

Clover, Carol, *Men, Women and Chainsaws: Gender in the Modern Horror Film*, Princeton, New Jersey: Princeton University Press, 1992

Damer, Bruce, *AVATARS!,* Berkeley, CA: Peachpit Press, 1998

Davidson, Clive, "Agents from Albia" *New Scientist*, 9 May 1998 No. 2133, pp. 38-44.

Dayan, Daniel, and Elihu Katz, "Electronic Ceremonies: Television Performs a Royal Wedding", in *On Signs*, edited by Marshall Blonsky, Baltimore, MD: The Johns Hopkins University Press, 1985, pp. 16-32.

Dennet, Daniel C., *Brainchildren: Essays on Designing Minds*, London: Penguin Books, 1998.

Duguet, Anne-Marie, and Heinrich Klotz and Peter Weibel, *Jeffrey Shaw: A User's Manual*, Cantz: Edition ZKM, 1997

Garrand, Timothy, "Scripting narrative for interactive multimedia" Journal of Film and Video, Vo. 49, No. 1-2, Spring-Summer 1997, p.66-79.

Haraway, Donna, *Simians, Cyborgs, and Women: The Reinvention of Nature*, New York: Routledge, 1991.

Haugeland, John, *Artificial Intelligence: The Very Idea,* Cambridge, Mass: MIT Press, 1989 (1985).

Hedges, Inez, *Breaking the Frame: Film Language and the Experience of Limits*, Boomington and Indianapolis: Indiana University Press, 1991.

Heudin, Jean-Claude, ed., *Virtual Worlds: Synthetic Universes, Digital Life, and Complexity,* New England Complex Systems Institute Series on Complexity, Reading, Mass: Perseus Books, 1999.

Landow, George P., *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology*, Baltimore and London: The Johns Hopkins University Press, 1997 (1992).

ed., *Hypertext Theory,* , Baltimore and London: The Johns Hopkins University Press, 1997.

Laurel, Brenda, ed., *The Art of Human-Computer Interface Design*, Reading, Mass.: Addison-Wesley Publishing Co., 1990

Com*puters as Theatre,* Reading, Mass. Etc.: Addison-Wesley Publishing Co., 1993.

Leonard, Andrew, *BOTS: The Origin of a New Species*, New York: Penguin Books, 1997

Levy, Steven, *Artificial Life: The Quest for a New Creation,* London: Penguin, 1992.

McMahan, Alison, "Spectator, Avatar, Golem, Bot: Interface and Subject Position in Interactive Fiction" paper given at the SCS 2000 in Chicago, USA.

"Social Stage, Simulacra, Civilzation™" paper on city-simulation games given at SCREEN studies conference, Glasgow, July 2000.

"Verbal-Visual-Virtual: A MUDdy History" *Gramma: Journal of Theory and Criticism,* Aristotle University of Thessaloniki, Volume 7, 1999, pp. 73-90.

"The Effect of Multiform Narrative on Subjectivity" *Screen*, 40:2 Summer 1999 pp. 146-157.

"Interactive Narrative and the Interstitial Interface" *Interactive Frictions Conference,* The University of Southern California, June 4-6, 1999.

"Welkom in de speelautomatenhal. Het compuerspel als symptoom van het post-postmoderne tijdperk" (Welcome to the Arcade), pp. 45-57 and "Starring Lara Croft", pp. 213-222, in *Hollywood op straat: Film en televisie in de hedendaagse mediacultuur*, Thomas Elsaesser and Pepita Hesselberth, eds., Amsterdam: Vossiuspers, (AUP), 2000.

"De CAVE bij SARA (The CAVE at SARA)", *Archis*, 1:1999, p. 79-80.

"Ruimte als evenement: IMAX (Space as Event: IMAX)" *Archis*, 3:1999.

"Interactive ruimten:screenspace (Interactive Space:screenspace)" *Archis*, 4:1999, p. 78-80.

"Verhalende ruimte (Narrativized Space)", *Archis*, 6:1999, p. 78-80.

"Architectuur van de geest: Werk van Jeffrey Shaw" (Architecture of the Mind: The Work of Jeffrey Shaw") Feature Article, *Archis*, 6, 2000, p. 38-43.

"Interactive Lexicon" *Millimeter*, Teleproduction section July 1989 (analog interactive technology).

"E-Motional Control" *Millimeter*, Industry Report November 1989 (motion-control cinematography).

"BTV's Sharper Image" *Millimeter,* Teleproduction section September 1989 (high band corporate projection systems).

Milano, Dominic, ed., *Interactivity in Action: Case Studies of Multimedia Mastwerworks, Innovative Games & Other Successful Interactive Products*, San Francisco: Miller Freeman Books, 1997.

Morris, Richard, *Artifical Worlds: Computers, Complexity, and the Riddle of Life,* New York and London: Plenum Trade, 1999.

Morse, Margaret, "*Nature Morte:* Landscape and Narrative in Virtual Environments," in *Immersed in Technology: Art and Virtual Environments*, edited by Dmary Anne Moser with Douglas MacLeod, Cambridge, Massachusetts: The MIT Press, 1996.

Murray, Janet, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, New York: The Free Press, 1997.

Propp, V. *Morphology of the Folktale* (Austin: University of Texas Press, 1968.

Rabinow, Paul, ed., *The Foucault Reader*, New York, Pantheon Books, 1984.

Rabinowitz, Lauren, "Introduction," pages 3-8, and

Rugero Eugeni, "*Myst*: Multimedia Hypertexts and Film Semiotics," pages 9-26, both in *Iris* 25 (Spring 1998).

Rimmon Kenan, Shlomith, *Narrative Fiction: Contemporary Poetics*, London and New York: Methuen, 1983

Ryan, Marie-Laure, *Possible Worlds, Artificial Intelligence, and Narrative Theory,* Bloomington and Indianapolis: Indiana University Press, 1991.

, ed., *Cyberspace Textuality: Computer Technology and Literary Theory*, Bloomington and Indianapolis: Indiana University Press, 1999.

"Interactive Drama: Narrativity in a Highly Interactive Environment", *Modern Fiction Studies*, Vol 43, no. 3, Fall 1997, p. 693-94.

Samsel, Jon & Darryl Wimberly, *Writing for Interactive Media: The Complete Guide*, New York: Allworth Press, 1998.

Sawyer, Brian & John Vourlis, "Screenwriting Structures for New Media", *Creative Screenwriting*, Summer 1995, pp. 95-103.

Thalmann, Nadia Magnenat and Daniel Thalman, *Artificial Life and Virtual Reality,* Chicester, New York, etc.,: John Wiley & Sons, 1994.

Turkle, Sherry, *Life on the Screen: Identity in the Age of the Internet,* London: Phoenix, 1997 (1996) (New York: Simon & Schuster, 1995).

Tomkins, Silvan S. and Samuel Messick, eds., *Computer Simulation of Personality: Frontier of Psychological Theory,* New York and London: John Wiley and Sons, Inc., 1963.

Darryl Wimberly & Jon Samsel, *Interactive Writer's Handbook*, Los Angeles: The Carronade Group, 1995.

Varchol, Douglas J., *The Multimedia Scriptwriting Workshop*, San Francisco, etc: Sybex, 1996.