How They Got Game:
The History and Culture of Interactive Simulations and Video Games

http://www.stanford.edu/dept/HPS/VideoGameProposal/

Principal Investigators
Tim Lenoir, History of Science, email: tlenoir@stanford.edu
Henry Lowood, Stanford University Libraries, email: lowood@stanford.edu

Research and Development Team
Carlos Seligo, ATS Freshman Sophomore Programs, email: moth@stanford.edu
Carlos co-designed the Word and the World sites. His Blade Runner site is one of the most innovative interactive educational sites on the web
Rosemary Rogers, Program Administrator, HPS, email: progers@stanford.edu
Rosemary has designed the Mousesite, the HPS sites, and the Sloan Science and Technology in the Making sites. She has won numerous awards for her website designs.

Undergraduate Interns
Zachary Pogue, sophomore, email: zpogue@Stanford.EDU
Zach is part of the DMZ design team that won the VPUE website design contract. He has extensive experience in interactive website design
John Eric Fu, senior, email: hapgood@stanford.edu
As a Presidential Scholar John has completed an outstanding research project comparing British and American video game products and culture. Since his early teens he has been a video game reviewer for Macworld.

Grad Students
Casey Alt, History of Science and Film Studies, email: caseyalt@stanford.edu
Casey has worked with Scott Bukatman, Pamela Lee, and Lenoir. He is working on Japanese Manga film and has extensive media experience.
Yorgos Pannaris, History of Science, email: yorgos@stanford.edu
Yorgos has a master's degree in educational technologies from the MIT MediaLab and has extensive experience with databases and online design. He has worked with Lenoir on several recent projects.
Robert Harris, Art History, History of Science, email: robdawgs@stanford.edu
Rob has been working on the documentary film with Lenoir on the military entertainment complex during 1999/2000. He will begin working at the Stanford MediaWorks in July, 2000 and continuing to work on completing documentary film we have in progress.

Industry Advisors/ Collaborators
Paul Saffo, Director, Institute for the Future, email: psaffo@iftf.org
Mary Flanagan, email: marydot@attglobal.net
An experimental media maker, multimedia designer, and professor of digital arts at the University at Buffalo (SUNY), where she teaches about gender and technology, cyberculture, interactive media, animation, and sound design. Before moving to academe she worked in the video game industry. With funding from the NSF she is currently producing an online educational game for girls ages 9-11.

Steve Anderson, Silicon Graphics, Mountain View, CA
Steve directed the Nintendo project at Silicon Graphics.

Co-founder and Chief Technology Officer at ArtX, Tim Van Hook is an industry pioneer with over 20 years experience in designing and commercializing 3D graphics and multimedia technologies for leading edge consumer, PC, and technical products. Tim has founded three companies, including ArtX, Trancept Systems (subsequently acquired by Sun Microsystems), and Computer Video Corporation. Prior to co-founding ArtX, Tim was a Principal Engineer at Silicon Graphics, where he was the architect of the revolutionary Nintendo 64 video game console graphics and multimedia subsystem developed for Nintendo. Tim co-authored the MIPS Visual Instruction Set and the SPARC VIS Visual Instruction Set, and was the architect of the graphics and multimedia subsystem of the SparcStation 10-SX.

Dag Spicer, Computer History Center, Moffett Field, email: spicer@computerhistory.org

Other Proposed Collaborators

- We intend to ask Mark Levoy or Pat Hanrahan to advise our project.
- We also hope to acquire expert assistance from AliasWavefront, the SGI subsidiary that produces videogame and film animation software.
- With the help of Paul Saffo and others we will identify additional local participants from the entertainment industry.

I. Rationale and Importance of the Proposed Research

A spectrum of theorists spanning the gamut from Ray Kurzweil and Hans Moravec to Bill Joy and Manuel Castells proclaim that we are on the verge of a new — albeit "post-human" — renaissance, an era in which the human being becomes seamlessly articulated with the intelligent machine, a condition in which there are no demarcations between bodily existence and computer simulation, between cybernetic mechanism and biological organism. If we consider that most celebrated Renaissance of the fourteenth and fifteenth centuries, frequently heralded as the birth of humanism, to have been deeply connected with a revolution in information technology, such prognostications may not be hype. The congeries of personal digital assistants, cell phones, and Palm Pilots™ (about to become wearable servers) accompanying large numbers of us throughout the day as well as technologies such as web-based personal shopping assistants that learn our preferences and then crawl the web in search of software upgrades, information, and commodities are becoming computer-based media for creating, versions of the world. In numerous areas drive toward fusion of digital and physical hyperreal — the obliteration of a referent origin or reality — as philosopher Jean ubiquitous computing in which wearable agent-artifacts, and material objects are all just a few of the daily reminders that we immersed in a growing collection of distributing and interacting with digitized of our daily activities, we are witnessing a reality: not the replacement of the real by a and its replacement by a model without Baudrillard predicted, but a new state of computers, independent computational part of the landscape. To paraphrase
Gibson's description in *Neuromancer*, data is being made flesh. These new media are reshaping the channels of our experience, transforming our conception of the "real," redefining what we mean by "community," and some would maintain, what we mean by our "selves."

The aim of this project is to explore the history and cultural impact of a crucial segment of contemporary new media: interactive simulations and video games. Once the late-night amusement of nerds and hackers who built "Space Wars" and the "Game of Life" in the 1950s and 1960s, video games and interactive media have shed their reputation of being merely the violence-inducing pastime of a generation of adolescent males to occupy center stage as the most vibrant elements of today's entertainment industry. Video games and interactive new media are a cultural phenomenon with a transformative potential on a par with cinema and the gramophone at the beginning of the 20th century. Numbers suggest the magnitude of the impact of this new medium: In 1999 the video game and online game industry posted revenues of $6.6 billion, which compared favorably to the $7.3 billion box office revenue generated by the US motion picture industry. This year (2000) the video game industry will surpass box office revenues. The audience for computer and video games are no longer adolescent males: A new survey by the nationally recognized polling firm of Peter D. Hart & Associates reveals that 60% of all Americans play computer and video games — this translates into 145 million Americans. The average age of these 145 million game players is not 13 years old, it’s not 17, and it’s not 21. It’s 28 years old. Thirty-seven percent are under 17, but 61% are 18 and over. Forty-three percent are female.

By 2001, four new video game consoles will be introduced. The much-anticipated Sony Playstation 2, which will sell for around $300, has already set game and military simulation designers scrambling to take advantage of its 10 megaflop processor rating—technically qualifying it as a supercomputer illegal to transport across national borders. The IBM X-Box will have an even faster processor. These machines represent more than just raw speed and power. They are multi-function devices offering access to games, DVD movies, audio CDs, the Internet, email, and more. The Playstation will be a mobile device capable of plugging into online game worlds supporting persistent virtual reality environments. They are the first true convergence machines, and they symbolize why many believe the video game industry will be the nerve center for entertainment of the future. Designers for this new generation of console hardware are already creating extremely realistic game worlds with synthetic characters capable of engaging our emotions, where music and sound are used not as background noise, but as devices to create tension or other effects, and where actions are controlled not by joysticks and mousses, but by our own words. In some new games characters already can remember your conversations and the tone you take with different people: if you are rude to someone you encounter in the game, that character might not give you information you need later. We’re even seeing game characters who talk to each other about you, the player. There are games where characters take on personalities based on your decisions as the player, and these decisions affect the outcome. The importance of coming to terms with these new culture-defining phenomena has been the subject of several symposia, such as our own "Special Effects" symposium in February this year, and to the creation of departments at major universities, such as MIT's Center for Comparative Media Studies, which hosted the first national conference in February 2000 bringing the academic community and the game development and publishing community together to explore the role of computer and video games in popular culture. The Institute for Creative Technology formed in September 1999 at USC, which brings together military simulation experts, computer scientists specializing in artificial intelligence and graphics, and special effects designers from Dreamworks, Lucas Films, and Disney Imagineering, may be the prototype of academic ventures in this domain.

**History of Computer Game Design**

Our collaboration will build on projects that we two have been engaged in for some time. Most recently Lenoir has published two studies, one on the history of computer graphics and virtual reality for the National Academy of Sciences, and another study, entitled "All But War is Simulation: The Military
Entertainment Complex,” on the historical relationships between designers of military simulation technology and the computer and video game industry. In addition Lenoir has most recently been creating a documentary film on the military entertainment complex with Robert Harris, a student filmmaker. Lenoir has collected a large digital archive of materials related to these projects, including texts, images, and more than 100 hours of video interview and simulation materials which would be part of the resources for the proposed project. As curator for the Silicon Valley Project Lowood has developed numerous collections relevant to the proposed collaboration, particularly the Cabrinety collection, which is undoubtedly the premier video game collection available as an academic resource anywhere.

The collaboration will concentrate during its first year on four tight clusters of game software design. In each case, we have chosen one software title or a small group of closely related software titles as a focus for intensive study, identification of source materials, video documentation, and website development. These software titles have been chosen from each of four general rubrics—“early roots,” “war as entertainment,” “simulation,” “networks and communities”—that are guiding our thinking about the general structure of our research. We have also chosen these software titles for their suitability for collaborative research by emphasizing multiple and interdisciplinary elements that they exemplify, ranging from the involvement of key designers and institutions to their role in the history of simulation, game-related military and academic research, the creation of new narrative structures, or the development of computer graphics.

**Early Roots**

This segment of the project will cover the early development of rich textual worlds through games based on the role-playing format and, in some cases, on research in artificial intelligence and text parsers. We will focus, in particular, on the games Adventure and Zork. Adventure originated in the artificial intelligence and computer laboratories at Stanford and MIT during the late 1960s and 1970s and a commercial version released in 1981 by Adventure International (Scott Adams) for several microcomputer platforms. Many of the Adventure International titles are held in the Cabrinety Collection in the Libraries. Zork was published in 1980 by Infocom (Marc Blank, et al.), a spin-off from MIT’s Laboratory of Computer Science. The focus on these titles will illuminate the connection of university-based research to early computer game design, the role of artificial intelligence, the early development of rich virtual (but text-based) worlds, and the genre of open-ended, game-based fiction.

A tangent in this segment of the project will explore the early development of computer graphics through games such as Spacewar/Asteroids (1981, Brad Stewart, Atari)

**War as Entertainment**

Here we will concentrate on two software games with strong connections to the entertainment industry: The LucasFilm WWII Air Combat Trilogy (Battlehawks 1942, Their Finest Hour: The Battle of Britain, Secret Weapons of the Luftwaffe) published by LucasFilm between 1988 and 1990 (lead designers: Lawrence Holland and Peter Lincroft); and MechWarrior I/II/III (Dynamix, Activision and Microsoft, 1989-2000). These titles provide an opportunity to investigate the development of simulation
technology, the “Hollywood-Silicon Valley” connection, and the development of graphics-intensive games as crossovers from other forms of entertainment (cinema, animé, fiction).

Likely tangents in this segment include titles such as: Eastern Front 1941 (Atari, Chris Crawford, 1981), Civilization (Sid Meier), Mech Brigade (SSI), or Command & Conquer (Westwood Studios).

**Simulation**

Here we focus on the development of “industrial-strength” simulations that illustrate connections between the priorities of the military, historical simulation, and commercial software development. We have chosen two titles from the development of tank simulators: Panzer PLATO/TANKTICS (Chris Crawford, et al., 1977) and Panzer Elite (Wings Simulations, 1999). The PLATO project at the University of Illinois is best known for work in the 1960s and 1970s on computer-based education, but a number of innovative games and designers such as Chris Crawford emerged from this project. In 1977, PLATO put online a multiplayer version of the first tank simulator, Panzer PLATO, for the U.S. Armor School at Fort Knox, which Crawford rewrote in 1978 for the Commodore Pet; it is considered the first microcomputer-based wargame. Panzer Elite expands our attention to the development of simulations in the very different European context of game design, as Wings Simulations is a German design house. We have chosen these titles to illustrate not only the multiple connections between military, academic, and commercial technology, but also to shift attention from the entertainment to reality-based simulation, with an emphasis on physical and historical models. We will also explore issues of game design focused on the career of Chris Crawford, who has written widely on the theory and practice of his discipline.

Likely tangents in this segment include titles such as: LIFE; SimCity (Will Wright, Maxis, 1987); Hellcat Ace (Sid Meier, Microprose, 1982); Falcon 4.0; Kampfgruppe (Gary Grigsby, SSI, 1985); Close Combat (Atomic Games); and Harpoon (360 Games).

**Networks and Communities**

This segment will bring together many of the themes explored in the earlier topics by focusing on contemporary massively networked, “persistent-world” games. We will choose one of the three established titles in this genre—Asheron’s Call, Ultima Online, or Everquest—each of which currently subscribes on the order of 100,000 subscribers. Our goal will be to study the evolution of technology that allows for networked simulation and interactive game-play in real-time, as well as issues relating to the content of these games, such as the evolution of open-ended fiction, the violence factor, and gender issues. Important themes will be extended from the first three segments of the project, such as the role of military simulations (SIMNET and 73 Easting) or the history of first-person networked games (DOOM, Quake).
II. Product and Schedule

Our project will have several layers of product:

- An online digital archive suitable for initiating and supporting research and teaching on the history and culture of video games and interactive media. This will make available the Stanford Cabrinety collection and a supporting base of primary and secondary documentation for work in the history of online culture.

- A course on the history of video games to be taught in the winter quarter 2000/2001 by Lowood and Lenoir

- A web-based documentary on interactive media and the military entertainment complex. A multi-layered documentary, with multiply threaded sets of narratives exploring themes, specific project developments (e.g. development of Silicon Graphics/Nintendo Playstation project, simulation of Battle of 73 Easting, violence in video games, non-violent alternatives, games for GRLZ, the military SIMNET, [STRICOM], Playstation2 and building the holodeck), organized as an interactive game. The documentary materials would be driven by a suitably modified freeware version of a major interactive game engine.

- Installation of the documentary in the Cantor Center for Visual Arts with seminar series bringing together artists, entertainment industry, and academics from various humanities, sciences engineering disciplines.

- A collaborative exhibit between Stanford University Libraries and the Computer History Center on the history of game machines and software.

We expect to deliver the archival database of materials consisting of video interviews, video game segments, simulations and supporting text documents by the end of the pilot year. The course will also be offered during the pilot year. During the second year we would complete the media design work and implementation of the interactive web documentary. During the pilot year we would begin collaboration with colleagues in the Cantor Center for Visual Arts to design an appropriate seminar series and accompanying installation. We would hope to acquire additional support for the design component of this work from staff at the Stanford MediaWorks, hopefully from Tamsin Orion and her team. Completion and implementation of this part of the project would be undertaken in collaboration with the staff at the Cantor Center for Visual Arts during year two of the project. A less demanding but important exhibition will be implemented in collaboration with the Computer History Center at Moffett Field during year two of the project.
## III. Support and Equipment needs

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Purpose</th>
<th>Est. Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dell Dimension R933</td>
<td>1</td>
<td>• Game stations</td>
<td>$3,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Editing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Database design</td>
<td></td>
</tr>
<tr>
<td>DELL Precision 620 with non-linear video capture card</td>
<td>1</td>
<td>• Video Design Workstation</td>
<td>$12,000</td>
</tr>
<tr>
<td>Sony VAIO PCV-R558DS Digital Studio Computer, plus Monitor</td>
<td>1</td>
<td>• Video editing</td>
<td>$3,500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Design work</td>
<td></td>
</tr>
<tr>
<td>Firewire Drives</td>
<td>3 @75 GB</td>
<td>storage</td>
<td>$2,250</td>
</tr>
<tr>
<td>Sony Playstation II</td>
<td>1</td>
<td></td>
<td>$350</td>
</tr>
<tr>
<td>Canon XL-1 Digital Video Camera</td>
<td>1</td>
<td></td>
<td>$3,800</td>
</tr>
<tr>
<td>Software:</td>
<td></td>
<td>Adobe Premiere, 3DSMAX, After Effects, Media Cleaner Pro, Photoshop, Dreamweaver, Director Pro, Fireworks, and Flash</td>
<td>$4,000</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td>• Interviews</td>
<td>$3,500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Material collection</td>
<td></td>
</tr>
<tr>
<td>2 undergrad interns</td>
<td></td>
<td></td>
<td>$10,400</td>
</tr>
<tr>
<td>2 grad student stipends</td>
<td></td>
<td></td>
<td>$17,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>$59,800</strong></td>
</tr>
</tbody>
</table>