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# Lumiere Ghosting & the New Media Classroom

David Gillette

"The power of modern literature [narrative] lies in its willingness to give a voice to what has remained unexpressed in the social or individual unconscious: this is the gauntlet it throws down time and again. The more enlightened our houses are, the more their walls ooze ghosts." Italo Calvino, *The Uses of Literature*.

## Introduction

In the Winter of 2003 I began updating the curriculum for my interactive media and information design courses. Like most of us who teach new media design and theory, I had many different ways to approach the material, but had no "standard" to fall back on since this area of pedagogy and research is so new and continues to evolve as we work. Like many of us, I have tried most of the popular approaches to teaching online development and writing in the past ten years. When the web first became popular, I taught my new media courses (then called hypertext courses) through the lens of classical rhetoric, focusing on Plato's conception of the dialectical exchange. As online design also started to become a vital tool of corporate promotion and training, I refocused my courses through the lenses of project management, industrial user-centered design and usability testing.

As online new media technology improved and allowed for the creation of web-based material that functioned like stand-alone software, I refocused my courses around the structure of narrative and how it uses theatrical forms of interaction in the presentation of complex online help and instructional systems. Never quite comfortable with any of these course designs nor with the overall reception of my course material, I have continually reedited my curriculum and project designs. I keep changing course approaches to adapt to changes in the field, and to keep pace with students' foreknowledge of the technologies we use in the classroom.

What I have essentially been looking for all this time is a poetic conceit, a solid story line, a narrative and theoretical blueprint that I can use to build a pedagogical home for a wide range of theoretical approaches, cultural and technological histories, and student-driven technology development work. Lev Manovich's recent important work on new media, *The Language of New Media,* and its focus on new media development as a form of interactive, multicultural cinema, recently provided me with the inspiration for a way to tie all my interests and pedagogical approaches together into a single curriculum.

Manovich's focus on the integration of film history and technique into new media theory provided me with a way to present my course material in an interactive manner that draws students directly into the central concerns of our field. Because I believe praxis is essential in engaging students by asking them to actually create a new technology or a new process from the inside (instead of learning to only critique the completed work of someone else), I decided to take Manovich's ideas a good deal further by asking my students to invent a new form of cinema. For the last year and a half I have asked students to bring film and new media technology development to the next level as we work to create a next generation theater, a holodeck of sorts, that now has students thinking of themselves as next generation film makers and as new media information designers.

The project students have been working on is called the ***Lumiere Ghosting Project,*** and the new media, immersive theater they are designing is called the *CompuObscura*. The poetic conceit that draws the entire work together is the human fascination with the unseen which has often been presented in theater, poetry, prose, photography, and film through the image of the ghost. In many ways, for a year and a half now, our students and faculty have been working on a sophisticated but deceptively simple haunted house.

This work is actually three separate essays combined online into one interconnected hypertext presentation, and collected here in a print-ready collection of sequentually-numbered pages.

The first essay in this print collection introduces readers to the histories (personal and social) that support this ongoing pedagogy project. I begin this section of the essay (Inspiration) by discussing what I learned about teaching by running a small English language and culture school in the countryside outside of Osaka, Japan. During my years in Japan teaching English as a second language, I discovered that telling ghost stories and discussing the idea of ghosts served as an effective method to initiate longer and more involved discussions about culture, visual metaphor, media image exchange, history, language, and narrative. In the following years, I have found many ways to weave similar discussions about ghosts into my university new media and communication courses, except now we connect ghosts with the concepts of cultural transmission and transformation begun by writers and critics such as Walter Benjamin, Barthes, Ong, and continued into current work by recent hypertext and new media scholars.

The second essay in this print collection gives readers an overview of how the technologies that we are inventing will eventually come together into a single creation, a new form of interactive theater that we call the CompuObscura. In his essay (Innovation) I briefly touch on some of the technical aspects of how the CompuObscura works, while also offering details on some of the common scenarios we imagine will eventually take place inside the device.

The third essay in this print collection (Illumination) provides a brief discussion of how all this theory and technology development work has been integrated into a series of new media courses. The third essay also shows how we have connected the Lumiere Ghosting Project and development work on the CompuObscura into a diverse range of courses from many different academic disciplines at Cal Poly.

Because so much of our project work revolves around visual interaction, the first group of students who worked on this project decided that we should use the human eye as our "icon" throughout our work (a semiotic conceit that plays well, of course, with the cinematic fascination with the eye) and also the letter "I" which we use for:

- Inspiration (Personal and Social History)
- Innovation (Technology Development)
- Illumination (Pedagogy and Curriculum Design)

I have followed my student's advice in deciding how to structure the visual and prose divisions for this work. As with any piece of hypertext, you may read these pages in any order. I encourage you to explore, but I have also designed this print-ready version of my text to be read from beginning to end so reading in linear fashion might suit you the best when exploring this version of my work.

Because the Lumiere Ghosting Project is still very much a work in progress, and because *Kairos* is such an active nexus point in our community, we are eager to hear your responses to this article, to our work thus far, and to our plans for future collaborations with students and colleagues across the country. Please do write me at my email address (ddgillet@calpoly.edu) to let me know what you think as you read.

Like many new media instructors, I have had to look outside my academic "department" (English) in search of colleagues and students to collaborate with in this interdisciplinary pedagogy and technology development project. Therefore, while this article is my individual and quite personal statement about what we have created together, this project is truly a group collaboration that depends on the contributions of many thinkers, designers, and instructors.

# Inspiration

## My Life in Brush with Ghosts

I had been living in a small town outside of Osaka, Japan for over a year before someone finally told me the ground beneath my apartment was haunted. I suspected something was amiss with that part of town since my room's florescent bulb was the only light flickering in the area at night, and the apartment (which consisted of not much beyond my small room, a hot plate, a sink and a cabinet-sized bathroom) was perched atop a pipe-cutting factory and frequently used fertilizer storage shed. The nearest homes were a few blocks away.

Everyone in town apparently knew the history of the land beneath the factory, the parking lot, and the private school where I taught English classes across the street. No one except an ignorant foreigner would willingly agree to live anywhere near there. The land was haunted because it was layered with skeletons from battles fought in the nearby swamps and rice fields hundreds of years before. Everyone who dug a foundation eventually hit bone. The spirits of all the soldiers, villagers and bandits who lost their lives on that land were said to wander the shadows at night sending the chill of death scampering down the spine of anyone unlucky enough to encounter them.

It hadn't taken me long to discover that my adopted small town was alive with the idea of ghosts. My young students all knew and loved telling stories of local ghosts, zombies and spirits that haunted every part of town from the grape vineyards up in the hills down to the warehouses along the river. My middle-aged students told me about their disturbing and vivid dreams of ghostly ancestors choking them in their sleep every time they considered doing something unconventional. Then one night, in a small adult class, my oldest student quietly told the class, in nearly perfect English, that she had been haunted by the ghost of her young daughter for over thirty years. The five year old girl had been riding in the backseat of a car that was hit broadside by a truck, killing the little girl instantly. Ever since then, when the weather was hot and close as it was the night the girl died (and as it was the night we heard this story), the girl's ghost would briefly appear in the shadows of her neighborhood, drifting from doorstep to doorstep, as if the little girl was trying to find her way home. After the woman finished her story we sat in silence for quite a while with no idea what to say next.

Nearly every inch of Japan is marked by its past and its spirits, they seep up from the land into the culture and become part of the language itself. Most open patches of ground are mapped by shrines, temples, family headstones and historical markers of all size and description, and most commercial land has reserved space for spiritual, political and personal recognitions of the past (Addiss). The countryside is similarly spotted with markers of the history that has passed across it. The ghosts of a community's ancestors and past institutions drift through every conversation and influence nearly every personal interaction (Heinrich, Matsumoto).

Because the Japanese sense of place and sense of responsibility for personal and family history is so distinctly different from how modern American culture deals with its past and sense of place, ghosts stories and family history became the center of many of the discussions with my students; ghosts of all kinds floated through many of our classroom exchanges. Ghosts, and the stories that accompanied them, became the medium I used for teaching about English syntax and grammar. Ghosts were the starting point for many of my classes about English literature, and ghosts played a prominent role in our discussions about modern American culture.

It was during one of these ghost-inspired English classes that a student inadvertently revealed I was living and working on haunted ground. This student claimed that the fact I was living in the presence of so many ghosts is quite likely why my school didn't charge me for my room—a way of assuaging the school director's guilt should anything awful happen to me. After my students assured me nothing would happen since I was a foreigner and was therefore essentially invisible to local spirits, we returned to exploring the differences between American and Japanese ghosts.

The oldest student in the room, a woman in her early 70s said that Japanese ghosts were part of the earth and existed in all the natural elements around us. She asked me where American ghosts lived. With the movie *Poltergeist* in mind, I said, with what I thought was obvious deadpan humor, that because America was obsessed with technology and because Americans kept moving and were always tearing down buildings and putting up new ones, American ghosts were no longer rooted to a specific house or piece of land, and had instead begun to haunt the one "place" that all Americans visited every day, the electronic airwaves; I said that American ghosts lived in the blank channels between television stations. My students nodded as they seriously considered what I had told them, then the youngest student in the room, a secretary in her early

20s said, "They live in the TV here too, and in my purse." She pulled a tomogachi toy from her purse and proceeded to show us how she had been keeping alive a small electronic ghost of a child she called Anne-chan who lived in the pager-sized device in her hand.

## Ghosts Adrift in Japan

*Alice in Wonderland* and *Anne of Green Gables* are just two of the more prominent Western stories that have become fully integrated into Japanese popular culture. In the 1980s some reference to Anne or Alice appeared daily on television, in print media, or in practically any conversation with a teenaged girl (Craig). Since the eighties, those stories have been supplanted by other Western or "foreign" narratives, but these new narratives are similarly pervasive and similarly imbedded deep into the culture (Martinez). But when I was first living and working in Japan in the mid 80s, *Wonderland* and *Green Gables* were the bomb.

For my student's model of tomogachi, the narrative behind Anne-chan was that she had run away from Green Gables and stumbled into a Wonderland similar to the one dreamed up by Lewis Carroll. In this alternate Wonderland, Anne-chan is killed by a malevolent playing card spirit, leaving a ghost of her former self adrift in the world of everyday electronic Japan, shifting from device to device (television, phone line, rice cooker, video game) as she searches for someone to nurture her and keep her from vanishing altogether. The student's responsibility, as owner of this particular tomogachi, was to interact with Anne-chan throughout the day (by pushing a number of very, very small buttons clustered on the front of the case), ensuring that the little ghost continued to feel loved and cared for.

While the tomogachi fad quickly burned itself out in Asia and the West, the presence of virtual, ghostly "friends" (*tomodachi* is Japanese for friend, thus with slight alteration we arrive at the trade name *tomogachi*) informed by a vibrant mix of Western and Eastern visual and prose narratives is still quite popular in Japan (Morton). Now this exchange of media ghosts has gone wireless through Internet-driven cell phones that allow teenagers to trade tomogachi-like characters from one phone to the other as a companion to their continual stream of text messaging. These exchanges of ghost-like animated characters is a vital part of this youth-driven wireless culture (called *keitai culture* in Japan—*keitai* is the Japanese word for these specific kind of gaming/text-enabled cell phones) as these youthful cell phone owners take part in large-scale multi-player games while commuting to school or when filling dull moments at a part-time job.

The "real" world is now also added to these exchanges as the trading of characters can be accompanied by the trading of video and still images captured by one phone and shipped immediately to another—sometimes allowing virtual characters to inhabit worlds formed of images captured from the real world. The electronic characters that are traded back and forth often are quoted from Japanese anime narratives which in turn borrow liberally from the popular cannon of Western literature, film, music, and from components of international pop culture cults like those that surround Madonna, the Beatles, Bjork or Sailor Moon; the country is therefore alive with the ghostly presence of its own history intermixed with the histories, stories, symbols and images of many other cultures around the globe.

## Ghosts Merge in the Arcade

The eclectic, highly energized transmutation of diverse cultural images, narratives and ideologies merged into one seemingly consistent cultural identity (the well-known Japanese projection of cultural singularity) is what most outsiders comment on when first encountering Japanese culture on home ground (McCormack & Sugimoto). A short stroll through any of the labyrinth-like train stations/shopping arcades in Tokyo means being abruptly introduced first hand to an early 21st century manifestation of electronic, media-driven, cultural and commercial globalization (Baudrillard). Cultural markers and symbols that may at first appear to be lifted directly from one culture without alteration or commentary (elaborately decorated Christmas cakes on display everywhere in December or Mr. Doughnut shops on every urban street corner blasting a continual stream of classic American rock music from giant speakers perched raven-like above the entrances) quickly reveal themselves to be inherent parts of Japanese culture that by their wholesale adoption have been transformed into something truly "Japanese" while retaining essentially Western European or American surface associations (Park & Curran).


Very much in the spirit of the Parisian arcades that fascinated Walter Benjamin in the early 1900s, the postmodern train stations and shopping arcades of Tokyo, Yokohama, Kyoto, Osaka and Hiroshima allow the images and characters of many cultures and narratives to collide and create a media-inspired hybrid culture of intermixed narrative and myth, a physical manifestation of what Benjamin refers to as the subconscious desires and dreams of hybrid cultures made visible or "actual" in the media collages of early 20th century industrial culture. In *The Dialectics of Seeing*, Susan Buck-Morss refers to Benjamin's vision this way:

"Underneath the surface of increasing systemic rationalization, on an unconscious 'dream' level, the new urban-industrial world had become fully re-enchanted. In the modern city, as in the ur-forests of another era, the 'threatening and alluring face' of myth was alive and everywhere. It peered out of wall posters advertising 'toothpaste for giants,' and whispered its presence in the most rationalized urban plans that 'with their uniform streets and endless rows of buildings, have realized the dreamed-of architecture of the ancients: the labyrinth.' It appeared, prototypically, in the arcades, where 'the commodities are suspended and shoved together in such boundless confusion, that [they appear] like images out of the most incoherent dreams.'" (p. 254).

Benjamin's cultural subconscious-made-real is especially evident in Japanese video game arcades, cyber cafes (which also offer late-night broadband networked game play), and in the cell phone software and service shops where the dream ghosts of many different cultures are literally inserted directly into the technology of modern

Japanese society and placed snugly in the hands and pocketbooks of Japanese users (Derley). The shift with the cyber café and the cell phone network game, however, is that the arcade of cultural exchange has now become completely virtual, existing no where and everywhere simultaneously.

While these new physical and virtual Japanese mediums for expression, exploration and play remediate previous media and communication methods in the same way that Bolter and Grusin claim that hypertext and early new media forms remediate meaning, the spin that Japanese culture places on this process is that Japanese culture has always been a remediation machine that encourages a continual integration of outside cultural artifacts directly into the heart of the supposedly "unique" and/or "authentic" aspects of the Japanese cultural/historical experience (Napier). The walls between what is "actual" and what is "virtual" have also always been permeable in a culture that constructs gardens to recreate (remediate) actual landscapes in miniature, or that plants cherry trees on the hillsides in a pattern that makes it appear that clouds are drifting artfully amongst the foliage when the cherry blossoms bloom bright white among the layers of green. Because making large parts of an "outside" culture part of one's own culture is an authentically Japanese thing to do, and because there is a comfortable acceptance of integrating the virtual and the actual, it's easy to see why networked gaming, virtual reality, and pervasive computing would quickly become a key part of the culture, especially when connected to youth and popular culture.

Along with adapting the "markers" or cultural ghosts from other societies into their own cultural narratives, modern Japanese society has also connected this social integration process with the process of manipulating the mediating technologies as well (Craig). The interactive networked gaming technologies from Japanese cyber cafes and cell phone services have an open and easily accessible structure that places much of the narrative remediation and reformation process directly into the controlling hands of the user. For example, through a variety of commercial services, Japanese users can select the use of interactive characters that arise out of Western narratives (Mickey Mouse, Bugs Bunny, the Clint Eastwood manifestation of *Dirty Harry*, a zombie from *Night of the Living Dead*, a character from animated series of *The AniMatrix*), place their chosen characters in "themed" Japanese worlds that often were first imagined in manga books or anime films but now exist as full-scale online environments, and then dictate how they are going to interact with their chosen characters and environments through the use of hybrid cell phones or other various handheld, wireless devices. The users choose the characters for their stories, choose their gaming environments, choose their "real" cohorts for networked play, then choose the mediating technologies they will use as play tools. Because many Japanese internet users skipped the stage of home computing as it appeared in the West (especially as it appeared in the USA), many users went from having no use or knowledge of the Net to being quite comfortable with the idea of having the Net all around them, accessible through a wide range or portals, always on and always ready for interaction through technology that they hold in their hand or slip into their pocket (Lent).

## Haunting Technology into the Classroom

The direct connection between narrative reformation and technological manipulation of media is perhaps one of the reasons that spirit-enhanced cyber-world fiction is so popular in Japanese culture (Poitras). The Japanese fascination with ghosts inhabiting technology is apparent in nearly all Japanese science fiction and in the postmodern urban surrealism of writers like Haruki Murakami (*Hard-Boiled Wonderland and the End of the World, A Wild Sheep Chase*) to the imaginary worlds that Japanese artists and writers create for their *anime* and *manga* techno-narratives that range from the film-noir techno-spiritualism in older works like *Akira* to the pastoral *bildungsroman* Shinto-corporatism of narratives like *Spirited Away (Drazen). This obsession with the spirit world and technology is most clearly evident in the recent Japanese hit horror film, Ringu,* in which an evil spirit "lives" in a video tape and projects itself into our world through the television screen every time the video is played. But claiming this obsession with ghosts and technology as a particularly Japanese one would be improper however as nearly any examination of the narratives from a technology-dependent culture will often reveal a clear interest in how the use of technology interacts with the spirit world (Aitchison & Lewis).

When presenting this topic to American students I begin with Japanese culture mainly due to my personal history and because it helps students become aware of the effects of media ghosts in their own culture by first examining a distant culture. The more we discuss Japanese culture in class, the more students come to see that a good deal of modern culture is connected to our fascination with our communication technologies and the faces that those technologies present to us as we interact with them. At this point in our discussions, I introduce students to *Remediation* by Bolter and Grusin. After continuing discussion, many students see that Bolter and Grusin's remediations of narrative effect are not only central to the new media experience, but are present in nearly all technological forms of narrative mediation, therefore always connecting the construction and reception of narrative to the technologies used as a form of presentation.

Because many of the narrating technologies in modern industrial culture are complex technologies that often conceal the machinery of this process (in an attempt to make the mediation as "seamless" as possible), the average user often begins to imagine a certain degree of cognition is present in the mediating device, thereby inhabiting the storytelling "device" with a spirit or a sense of awareness (Carey, Norman). This effect can be traced back to tablets that "speak" to us with the voice of God, books endowed with evil spirits, and to the television in the movie *Poltergeist* that served as a technological medium to the spirit world. And we all know people who believe that their computers don't "like" them or have to take extra time to "think" their way through a particularly complex project (Gaggio).

In courses that deal with computing and communication, students are very aware of the cross-cultural fascination with technologies that contain spirits or ghosts, and we therefore spend some time tracing this obsession as it travels from culture to culture, from technology to technology, from medium to medium. For example, my students and I recently looked at a recent Japanese horror film, the movie *Ringu*, as a recent compendium of cross-cultural references to the idea of spirit-endowed technology (Lau). *Ringu* was made into an American horror film less than a year after its successful release in Japan and both versions of the film make obvious reference to the American film *Poltergeist*, which itself references low-rent zombie and cold-war-fear drive-in movies from the 1950s (Williams & Gledhill). These cold war and zombie movies often borrowed directly from early Asimovian-like concerns about "ghosts in the machine," (Gorman & McLean) combined with all the pop and subversive manifestations of Shelly's Frankenstein mythology and Caribbean voodoo doll narratives as well as similar Central European stories about animated "spirit" dolls. Many of these narrative concerns can then be traced back through cultural narratives about spirit-endowed technological constructions such as the stories of the avenging clay figure of the Golem in the Jewish diaspora of Eastern Europe and to similar stories of animated human figures that arise from the literatures of Central China and Southeastern Asia. By following this chain of associations we can find source material that rolls back into Japan where the folk literature from the 14th century is filled with stories of ghost-filled suits of armor acting as assassins for justice and stories about haunted swords with minds of their own that turn their bearers into killing machines, beginning yet one more run around the ring of culture-to-culture transmission and the fascination with connecting spirit and ghostly "presence" to technological invention.

This type of round-robin narrative and cultural semiotic tracing and detective work is playful and of course highly subjective (if you look for red cars, you'll see red cars), but it is also something many students enjoy taking part in and it helps me, as their instructor, illustrate some of the more complex ideas about media, mediation, and narrative transformation proffered by theorists and writers such as Benjamin, Barthes, Ong, Bolter and more current works on new media like those from Joyce, Grusin, Bolter, Landow and Manovich. Taking students on a journey through time and culture, driven by a connect-the-dots form of narrative association and technological remediation helps makes students more aware of the cross-cultural mediation process of language and communication, thereby also helping to strengthen their skills as readers, researchers, and ultimately making them better informed and culturally sensitive technology designers (Selfe). This round-robin narrative trip also help students begin to look with a more critical eye at the electronic media that supports the non-stop cross-cultural exchange of images and ideas that they see on their computer, cell phone, and television screens.

I once told my Japanese students that I thought American ghosts lived in the blank channels between television channels as a spur-of-the-moment joke, but the idea of ghosts in the television is an interesting and adaptive metaphor that helps us look at how we make use of our mediating technologies like television, film, and the web. As McLuhan predicted, we do indeed live in an electronic global village, a town that exists no where in particular and everywhere all at once (McLuhan). The one location that we all share, as we move from town to town, state to state, country to country, is the virtual meeting place of our electronic media, our electronic global village inside of which we appear (even if only for a Warholian fifteen minutes) as ghostly visions of ourselves. We have created a shared virtual reality of the world that none of us live in but that we also can't ignore.

When a culture becomes unstuck from a solid sense of place, when it frees itself from the confines of permanence, then that culture's ideas about persona (the ethos of spirit), about history, and about community become rootless, shifting, and open to renegotiation (Chen). Collage, recombination, and continual reinvention become the norm and the mediating technologies that these cultures use to talk to themselves adapt by creating a virtual place, an ephemeral location, a metaphorical home, that is equally shifting and continually open to renegotiation (Smith). This idea of an adaptive metaphorical home that is a commercial and social nexus point where the physical and virtual can interact is precisely what Benjamin noticed in the Parisian arcades at the turn of the century. What he saw in those arcades was a carnival of free association, of ongoing cultural recombination and collage that created a sense of coherence through the physicality of proximity—the architectural construct of the arcade, the alleyway, the thoroughfare, provided a channel along which participants could be led from one visual, textual, and textural non-sequitor to the next (Richter). The only consistency of the experience, the only cohesive narrative for what happened in that arcade was the reliability of the physical frame of the arcade itself, the knowledge that the walls around the participant were not going to suddenly expand, and that the alleyway itself did indeed have a terminus, the experience would eventually come to an end, the shops would close, the visitors would go home.

The web site, the television channel, the video game cartridge, the digital video disc, and the movie theater megaplex are entry ways into the current manifestation of Benjamin's Parisian arcade which now resides on the Net and in the open ended but ever present realm of worldwide electronic media (Hillis). The primary differences between the Parisian arcade and the twenty-first century worldwide electronic arcade is that, with a few exceptions (the movie theater, for one), the physical "spaces" that provide us entry into the electronic arcade are rarely shared, rarely public and focused mostly on the senses of sight and sound (the computer screen, the living room television screen for example), but the experiences that are publicly shared once we enter the electronic arcade are much more diverse and potentially more chaotic and powerful than those encountered on a trip through a real Paris location in the early 1900s (Thorburn & Jenkins). Our modern electronic arcade is continually open, continually expanding, and continually revising itself. We can travel though this arcade simply as viewers, remaining somewhat invisible, leaving very little trace of ourselves as we pass. Or we can linger, interact and become part of the arcade's edifice (Browne & Fishwick). We can

announce part of an event (be interviewed about storm damage for the TV news), we can engage in commerce (buy something on eBay), engage in play (be a team member for a networked game with partners in Tokyo, Chicago and Taipei), engage in discussion (post to a discussion list about teachers to avoid at a certain university), and thereby contribute to the expansion of the arcade since in this modern arcade, everything that we do is recorded and is then plastered on the walls (archived) to become part of the space, part of the overall experience. Engaging in the electronic arcade, even in a minimal fashion, allows us to haunt the arcade with ghost-like impressions of ourselves long after we are gone.

In this virtual arcade, in this ephemeral global village, the seductive persona of Monroe, the rampaging shadow of Godzilla, and the combative presence of the John Wayne cowboy float through the electronic ether as ghosts that we can observe, talk with, and update or recombine. In many ways, these ghostly personas interact with us with a certain degree of parity, the fact that they are actually dead, or never truly existed in the first place has no relevance in the virtual world (Heim). Reality and relevance (and the attendant sense of "fame") in the electronic arcade is achieved through persistence—the more often something occurs, the more pervasive its presence becomes, the more "real" that idea, that image, that persona then becomes in the alleyways of the electronic arcade (Crang & Crang & May). As new media designers and users, we are often quite aware of how we leave ghostly impressions of ourselves as we move through and create new additions to the electronic arcade, but learning how to build upon persistence and how to best shape our virtual, ghostly impressions for effective rhetorical or artistic purpose can be extremely difficult.

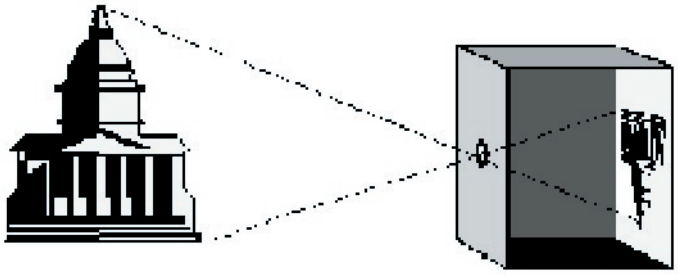
As I said in the introduction to this essay, I have long been looking for a narrative thread to tie together my various approaches to instructing new media theory and design. I have been trying to figure out how to make my classes more consistent and coherent, and to also help my students become better thinkers and designers. While most students expect new media courses to teach them about how to use certain software packages or various pieces of hardware, I have been reluctant to spend much time in my classes on "training." Teaching about the technologies themselves often seems to me to be too reductive and contains a certain degree of technological determinism that I find distasteful and inaccurate. Technology training tends to imply that the medias we use determine the messages we create (which I do believe is somewhat true) (Mantovani), but that those technologies then also determine how we actually think (which I believe is not true and is an assumption that leads to extremely poor design).

In my experience, students who focus too much on the the technologies they are using often create weak final designs. Technology-focused designers tend to design and create within the constraints of their technologies and often are poorly informed about how the world will put to use what they have created. Therefore, they tend to create devices for other technologists, not for novices. By focusing too much on the technology, they forget what they are trying to say through the creation itself; they lose track of their thesis (Gipson & Oviedo). Students who similarly focus too much on technology may produce work that appears functional, and that actually may look "nice," but that is, in the end, not really useful (Eisenstadt & Vincent). Like many of us in the field, I have been trying to find a way to teach about new media without teaching just the technology itself, but instead teaching about the process of new media design from the point of view of the artist, the storyteller, the narrator, from the point of view of the audience member and the non-technologist. The trick has been trying to figure out a way to combine the instruction of narrative and culture with the instruction of technological design in a way that makes sense to students and is also connected with the praxis of new media construction (Everett & Caldwell).

As I discovered when I first began teaching in Japan, people like telling or hearing ghost stories, and therefore this fondness for ghost tales was an effective narrative hook to use in the presentation of more complex subject matter. The ghost story not only is a simple narrative to construct, it is also cross-culturally pervasive since ghost stories always deal with the one thing we all share, mortality. I thought that using the metaphor of the ghost and the ideas associated with haunting a physical (or virtual) space could be an effective way to bridge the gaps between the cultures of technologists, designers, artists and users since we all share an interest and a set of preconceptions about ghosts and ghost stories.

By combining the ghost metaphor, Benjamin's ideas of the arcade, and some standard new media theories about persona and presence (and their attendant rhetorical effects on new media use and construction), and then combining all this with students' natural interest in cinema and the moving image, we established the outline for the pedagogy project that we now call the Lumiere Ghosting Project. My colleagues and I have then taken this approach one step further by immersing students into the process of inventing a next-generation new media technology (we call it the CompuObscura) that when used by its intended audience will demonstrate to participants how the electronic arcade actually works, and will also create a space where we can demonstrate some of our ideas about the electronic arcade through the actual projection and creation of interactive media ghosts and virtual persona.

## Integrating History of the Obscura Image



Because inventing something new often requires a return to fundamentals, I decided that as students and inventors, we should examine the early days of film technology itself, and then look even further back to some of the earliest presentations of the moving image. Therefore, in the lectures and discussions as part of the Lumiere Ghosting Project and in our design work for the CompuObscura, we have often looked to the early uses of camera obscura technology and to the first days of film as it developed with the Lumiere brothers and their simple, but powerful motion picture camera, the cinematograph.

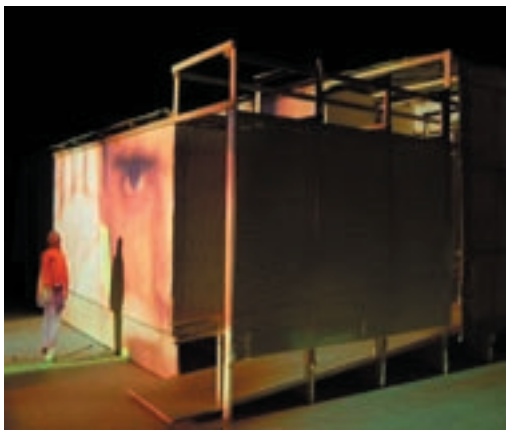
The idea of the camera obscura has been known since the time of Aristotle, and has been used in the arts in the East and the West for hundreds of years. As used in England and the United States in the 1800s, a camera obscura was a dark room inside of which viewers could gather to view a projected image of a selected view of the world outside (Wolf).

At first, just the phenomenon of seeing leaves blowing on trees, or of waves washing against the shore projected from outside and into the room, down onto a table or up against a wall, was enough to attract an audience.

Eventually camera obscura artists and operators created pantomime dramas that were performed outside the camera obscura and then were projected inside the device and displayed to a paying audience.

Because the popularity of the occult in the late 1800s in North America and Europe, a number of camera obscura artists and operators connected their "projected pantomime dramas" with séance-like activities inside their camera obscuras, thereby directly linking the display of a projected, narrative-based moving image with ghosts, and a visual projection of the invisible, the unknown, and of the parallel spirit world (Coleman).

To combine the idea of the media ghost and to find a way to look into the modern electronic arcade, we have



started an invention process to create a device that we call the CompuObscura. Similar to the camera obscura, the CompuObscura is a theater and a projector combined, and like early film cameras such as the Lumiere brothers' cinematograph, the CompuObscura is a camera and an image processing device.

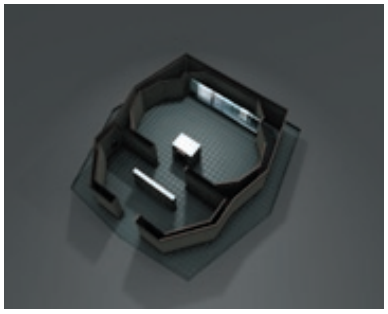
While the camera obscura simply looks out on the actual, physical environment that surrounds the device, the CompuObscura instead looks directly into the real, but also invisible and parallel world of moving images on the Net and in our other electronic media. The CompuObscura serves as a new entry point into the electronic arcade that allows participants to simply observe or to become active participants in the construction of the arcade itself.

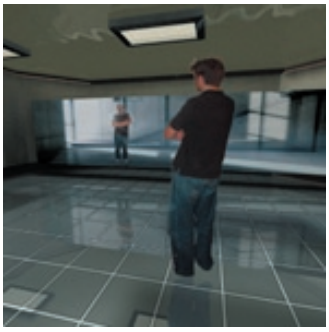
The CompuObscura device is directly connected to a high speed connection to the Internet that allows it to peer into the electronic arcade, the world of images, texts and sounds that is mostly confined to small, two dimensional spaces like the computer, television, cell phone, or movie screen.

Instead of having actors perform a pantomime drama in the environment outside the device, the CompuObscura borrows and then manipulates images from films, television shows, and web broadcasts as they flow through the Internet. When standing inside the CompuObscura, viewers can interact with other CompuObscura viewers in devices spread around the country (or across the globe) and can also interact with elements of the worldwide electronic arcade that appears inside the CompuObscura.

The CompuObscura device is designed to visually present the ideas of the modern electronic arcade. As I stated earlier, when we pass through the electronic arcade, we often leave impressions of ourselves behind, ghostly personas that become part of the arcade itself even long after we are gone. To represent this idea in the CompuObscura, we introduce ghostly screens into the environment on which are displayed images gathered at random from various sites around the world. Some of these images are captured from television, movies or web broadcasts, but some are also images captured in distant locations by other CompuObscura devices. Participants in the CompuObscura can then interact with these ghosts, and can also interact with the personas of other participants who appear as puppet-like figures in the environment.

To learn more about the particulars of the CompuObscura device, see the Innovation section of this essay.





## Our Technological Séance

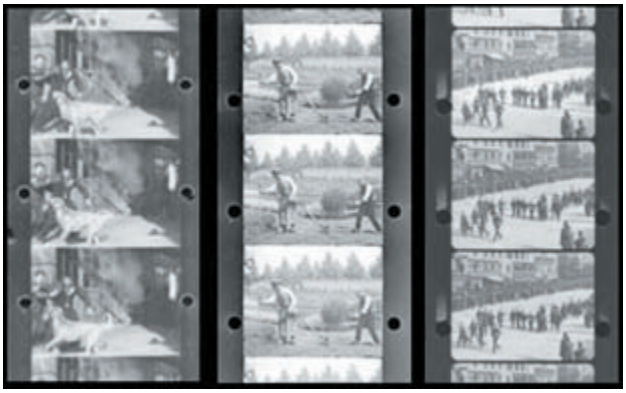
Ever since the introduction of the Lumiere brothers' cinematograph, the moving image has been a key part of shaping our cultural and personal narratives, especially as these images now freely move around the globe as part of the electronic arcade. For the purposes of our teaching and research, we refer to this complicated process of image-based cross-cultural transmission, interaction and transformation as *Lumiere Ghosting*. The images of ourselves and of others that comprise the structure of the electronic arcade we refer to as *Lumiere Ghosts*—ghost-like personas that we all leave behind us as we journey through the arcade. Lumiere Ghosts are also ghost-like personas that have been created over time through their persistence and repetition throughout the environment of the arcade.

Some Lumiere Ghosts began as images of real people (as with Monroe) but then quickly translated into iconic representations of a form that other people can inhabit over time (such as the image to the left of Monroe which is actually a drag performer reenacting a famous photograph as part of his representation of himself). Other Lumiere Ghosts were never real at all, such as the ghost of Superman which is continually represented and inhabited by a wide range of real and virtual personas for a wide range of reasons and to a wide diversity of effects.

This complex process of image creation, animation, transference, and reconfiguration is central to the modern cultural subconscious, and often influences our public and private lives in ways often too subtle to fully comprehend (Barthes). The Lumiere Ghosting Project is an attempt to explore this process as students and as researchers, and through the development of the CompuObscura, we hope to comment on the process through the creation and "physical" manipulation of Lumiere Ghosts inside the CompuObscura environment.

The Lumiere Ghosting Project and the CompuObscura is a reaction against many current video and new media art installations that often appear enraptured with the marvels and immediacy of the image technologies with which the artists are working (Packer & Jordan). Even if the stated "theme" of these works is to critique modern media, or the influence of corporate images on everyday life, we feel that many of these works tend to be fairly shallow or too simplistic in their critique and seem unaware or unconcerned with the histories that feed into the technologies in use. As we worked to develop the first manifestation of our moving image theater, the CompuObscura, we noted that many of the digital art and interactive new media works we reviewed seemed to deal with media use, and misuse "issues" that the artists often claimed to be quite recent developments, with a dip into a history spanning only ten or twenty years (Morley). The Lumiere Ghosting Project and the CompuObscura is a reaction against many current video and new media art installations that often appear enraptured with the marvels and immediacy of the image technologies with which the artists are working (Packer & Jordan). Even if the stated "theme" of these works is to critique modern media, or the influence of corporate images on everyday life, we feel that many of these works tend to be fairly shallow or too simplistic in their critique and seem unaware or unconcerned with the histories that feed into the technologies in use. As we worked to develop the first manifestation of our moving image theater, the CompuObscura, we noted that many of the digital art and interactive new media works we reviewed seemed to deal with media use, and misuse "issues" that the artists often claimed to be quite recent developments, with a dip into a history spanning only ten or twenty years (Morley).

As a new media instructor interested not just in image and communication technology, but in the rhetoric that informs the use of those technologies, I wanted to work directly with the history of film and moving image projection to examine our society's current obsession with the negative effects of globalization, mainly because my colleagues and I have come to believe that the "globalization issues" of the early 21st century (cultural confusion, loss of identity, exploitation, fear of the "other," the imposition of uniformity) have actually been around for a very long time (Kraus & Auer).



Ever since the introduction of literacy, illustrated texts and mass-production printing, cultures have shared stories, myths and technical innovations, integrating concepts that are useful, ignoring or actively rejecting others; this sharing has then manifested itself in positive and negative ways through various political, economic, social, and personal struggles (Essary). Therefore, as we define it in the scope of our project, globalization is nothing new, it is just moving faster than ever before while making use of elaborate, complex and widely distributed and interlinked visual and textual metaphor, therefore drawing more attention to the process through its persistent presence in nearly every world culture.

Film as we know it now essentially began as a documentary format and was often advertised for its scientific possibilities and its ability to "honestly" document real life. This promotion of film as a semi-scientific form for careful documentation was a concerted effort to separate the early medium from the peek-show, vaudeville-like entertainment and low-class venues where its visual progenitors had mostly been put on display. Promoting film as a serious component of science certainly made it easier to raise research and development funds from "respectable" sources and it has also endowed the medium with an element of "truth telling" that has never quite gone away no matter how fanciful and fantastic films have become (Mellencamp). The writings about film from many early film makers are often filled with the sense of mission toward truth telling. Film was at first considered as a new way to see the world, as a way of peering into places where the average viewer was unable to go. The use of the technology as a storytelling medium was, at first, of secondary concern.

It immediately became apparent to early film makers that much more money was to be made from attracting a large audience of viewers, many of whom were more than willing to pay to view the same presentation many times, as long as the images were compelling. While a large number of early film innovators clearly considered themselves men of science, with noble ideals for their technological inventions, or as artists interested in this new form of personal expression, the pressure of economics and the lure of quick wealth also encouraged them to be showmen. Therefore, the history of film is as much about the technology as the hype that surrounded the new technology (Abel).

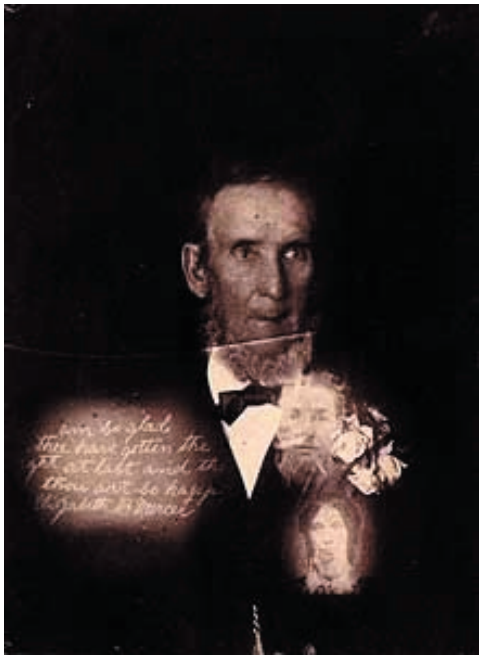
Early film cameras were small, able to film only a few minutes of action at a time, and relied upon a lot of available light to impress a viewable image onto the film. The first truly popular moving picture camera was the cinematograph, a hand-held motion picture camera invented by the Lumiere brothers in 1895. The primary "invention" of the Lumiere brothers was in making the mechanics of filmmaking economical and fairly

convenient. The Lumiere cinematograph allowed filmmakers to capture images during the day, develop film in the afternoon, then when the filmmaker turned the device around and illuminated it with a gas light or a small electric bulb, he could project the moving images he had captured just a few hours before.

To promote their new devices, the Lumiere brothers established a collection of franchise agents who took on the task of making hundreds of the first films, and showing the results as widely and as frequently as possible. Lumiere's nascent filmmakers traveled throughout Europe, then eventually over most of the globe, capturing moving images as they went. The most famous short film from this period—the one always displayed when presenting a history of film—is of workers leaving a factory (see a still frame from this film on the previous page). Many early filmmakers wanted to simply capture selected moments from the day, preferably moments filled with some type of action that could not be adequately represented through still photography or painting. The early motion picture camera was considered to be a device to help us look at life more closely, to help us slow motion down or speed it up, to help us see our bodies and the world around us in a new light. But it was also mainly seen as a way to present action itself just for the sake of showing action; this is perhaps why so many early films resemble footage captured from a surveillance camera.

By the start of the 20th century, cinematographs and other, more advanced motion picture film cameras, had spread around the world, capturing scenes of people engaged in the mundane details of their lives. These images of life in distant lands were brought back home and projected to audiences that integrated these early Lumiere Ghost images into their evolving visions of the world. Storytellers also quickly became interested in the fact that large, diverse audiences willingly paid to experience this new medium. The vaudeville and cheap-show nature of the medium flourished, more and more stories and narrative uses for the medium were created, and within a few years the film industry and the techniques of presenting persuasive, compelling and entertaining screened motion had fully taken shape.

As we explored the uses of the camera obscura, and explored early developments with still photography, we began to see a reoccurring social fascination with the occult and magic in connection to the use of captured and/or projected still or moving images. Any good look at the history of film and photography eventually reveals that the process of capturing a "realistic" image on film, either for stills or for the movies, has often been directly associated with the presence of ghosts (Cherchi). As I discussed earlier, camera obscura technology was used as a component of a formal séance, and early still photography was also associated with the attempt to "capture" the ghostly images of the deceased as they floated close to those who had recently lost a loved one. Early film was therefore similarly associated with aspects of the occult or of the world of ghosts and so the use of Lumiere Ghosts as a uniting metaphor for our work seems quite natural as a compliment to the history of the image technologies that precede us.



Therefore, as developers, as instructors, as students, and as artists working with the Lumiere Ghosting Project we are passionately interested in the idea of ghosts, both in the occult sense (haunting and foreboding), the spiritual sense (religious, historical, philosophical), and in the theatrical sense (as a narrative device, as a convenient distraction to cover a slight of hand, as a frightening and thrilling crowd pleaser). In the development of the technologies for our project, we are also interested in mating the ideas of theoretical interaction and critical dialectic with the actual, somewhat "physical" interaction with imagery itself. We are also interested in the idea of making the "subject" of an image a simultaneous "creator" of that image in the same way that Japanese keitai users can create and interact with their virtual tomogachi characters, and then eventually let them loose into the world to take on lives of their own.

We are, to be simplistic, interested in a high tech form of séance that works equally well as a form of theater, as a comment on history and as a metaphorical centerpiece for interdisciplinary collaboration and invention. One of the goals of this technology development and study process is to allow us as teachers, students and inventors (and then eventually the users of our inventions) to directly intervene in the electronic arcade and thereby learn more about how the arcade influences our everyday lives (Postman). By tapping directly into the texts, images and sounds being broadcast on the web and on television, we hope that our new media theater, the CompuObscura, will help to demonstrate how Lumiere Ghosts have been incorporated into our culture as they appear in newscasts and soap commercials, played again and again in Bollywood musicals and in late-night Russian satires, flashed on giant screens in a Tokyo entertainment district and flickered as a cell-phone background in a teenager's hand in Ulan Bator (Reiser).

The Lumiere Ghosting Project tries to make the cloaked, the internalized and the hidden visible, tangible, understandable and something we can individually control. The first step is to make this process visible. The second is to make the process small enough, specific enough, that we can grasp it in our hands. The third and vital step is to allow us to become active, informed participants in the process, to allow us to direct it from inside, to help us preserve and promote individuality, difference, differentiation, uniqueness, and the quirky everyday aspects of human culture (Collier).

## Questions of Shadow, Play, Ghosts & Transgression

When we collaborate with students in our Lumiere Ghosting discussions and in the development process for the CompuObscura, we often divide into small groups focused on some of the project's primary themes. These themes then serve as starting points for the questions that we ask each other throughout the term. These themes have also served as the basis for the development of different physical structures our architecture students created for the CompuObscura.

## *What four themes are central to the Lumiere Ghosting Project?*

**I. Shadow Play & Live Theater**—All modern moving-picture media are built upon the ideas and narratives developed for live theatrical presentation and shadow puppet play. The keys to these elements are the human voice, the motion of the human form, the abstraction of shadow and the shifting metaphors of interactive visual signs. Lumiere Ghosting wants to make specific reference to this history of live theater and shadow puppets in the design of the CompuObscura device.

**II. Film as Sideshow**—When film first began it was a documentary format. Filmmakers went into a community, shot footage, developed it, then showed it in the evening in make-shift theaters. Some of these "theaters" were nothing more than a tree with a sheet hanging from a branch as a screen. Other theaters were more like carnival sideshow tents that could be put up for the day, then taken down and moved to the next town in a bag. This early format was short, ephemeral, and often directly connected to the environment in which the images were shot. Lumiere Ghosting wants to make specific reference to this history of the temporary, side-show nature of early film in the design of the CompuObscura device.

**III. Camera Obscura & the Occult**—The idea of the camera obscura has been with us since the times of Plato (see the allegory of the cave from *The Republic* for an idea of this) and was often used as part of the visual arts. From the very beginning, the projection of moving images through a camera obscura format has been associated with the supernatural and has often been part of magic and sorcery. During the 1800s camera obscuras became a popular form of entertainment as people became more and more accustomed to attending "theaters."

After the novelty of going into a camera obscura just to see an image projected into the room from outside faded, camera obscura operators began connecting their camera obscuras with séances (to also adapt to the late 1800s fascination with the occult). Actors outside the device would perform as "ghosts," their images where then drawn into the camera obscura to be projected down onto a table top around which people were sitting, holding hands, trying to summon the dead. Mist or smoke was often introduced into the room, along with various scents, vibrations, and sounds to enhance the experience.

This was all quite fake by today's standards, and even many of the participants at the time were aware of the falseness of the experience, and yet, many still also believed (or wanted to believe) in what they were seeing and hearing. Lumiere Ghosting wants to make specific design reference to this history of the connection between the occult, ghosts, and the "beyond" with the modern manifestations of the projected moving image.

**IV. The Effects of Globalization**—Globalization has been with us as long as we have been able to travel. It has been limited in scope, however, by the mediums we used for travel and for cross-cultural communication. Global economic markets, the phone and television systems, satellites, and the Internet have vastly accelerated the process. Many cultures now fear they will be leveled into boring, meaningless uniformity by the press of corporate-state driven generic images, concepts, and technologies that seem to be all around us. The Lumire Ghosting Project is interested in this concept of cultural leveling, as well as cultural transmission and interaction through the medium of the moving image, and the effects of globalization are represented or referenced in the physical as well as virtual aspects of the CompuObscura.

## *What role does transgression play in the Lumiere Ghosting Project and in the CompuObscura?*

The desire to participate in an act of transgression, voyeurism, and magic, combined with the suspicion that what you are about to see might change your life is what draws us toward film and to the presentation of the moving image (Dalle). Early film often was shown at festivals or as part of a type of sideshow, and so was always surrounded by the mystique of transgression combined with an element of technological magic. As we have become more accustomed to the film viewing process and as it has become such an ever present part of our culture, modern theaters have become more like vending machines and less like "theaters," doing their best to

obliterate the sense of occasion and novelty from the cinematic experience. Many large budget Hollywood movies also drive out a lot of this novelty as they compete to present bigger and louder spectacle. And so, movies often no longer contain magic for many viewers (Helfand). Since televisions live in our homes, as an extra family member, they too have completely lost their sense of novelty and danger. The carnival mystique and the sideshow nature of the CompuObscura's external and internal design, therefore, is an attempt to reunite the image viewing process with transgression, suspicion and magic.

During the early days of the Internet, the sense of being allowed into areas that were previously forbidden was certainly an important lure of the environment and its attendant technologies for the average user (Hoveyda). Even today, people talk about places they have found on the Internet, or stumbled across and return to often, sometimes when they feel that no one is looking. The Internet is vast while also being intensely private; net technology allows millions to publicly view the supposedly private live actions of people living a dorm room which is continually on show through an open web cam, for example. The Internet also allows viewers, surfers and "participants" to continually play with the concepts of identity, secrecy, and transitive persona (on the Internet, no one knows you're a dog). Therefore, the act of viewing images and visiting hard-to-find web sites on the Internet still generates some of the same feelings of transgression and seduction that were a vital part of viewing early films which (like surveillance cameras and web cams of today) allowed viewers to view the events of the everyday without having to actually take part in those events and thereby "reveal" themselves (Levy).

The CompuObscura builds upon the sense of the "unknown" and the "forbidden" in how it captures sections of the hidden Internet and the media stream around us, and puts it on special display, only allowing a few people at a time to see the images inside the device and share the experience the same way camera obscura visitors interacted 100 years ago.

### *What does it feel like to "experience" the CompuObscura?*

The common response to this question is that audience members are not slowed down or interrupted by the technology of the room. Participants are free to move around without any wires or heavy technology attached to them. In tune with our interest in history and early film, the experience of interacting with images in the CompuObscura will be much like the process of viewing images in camera obscuras in the 1800s or like seeing some of the early Lumiere brothers' films when they were first shown—participants come together in a dark room, in a small group, to see something magical, something slightly surreal, they are there to experience something that will stay with them for days and weeks afterward. Audience members don't need to make any special preparation to be part of the event; they don't need to "make" it happen by bringing some technology with them, they just need to be present and have their eyes open. One of the important aspects of being a participant in a camera obscura in the 1800s, or being an audience member at the first showing of a new Lumiere film was the sense of doing something special, something out of the ordinary. In many ways, being at at an early film event was like taking part in a festival or being part of a carnival. Participating in the CompuObscura should make audience members feel that they are doing something a bit cheesy that is also, at the same time, slightly scary and transgressive.

In the final manifestation of the CompuObscura, audience members will slowly find themselves surrounded by darkness and shadows as they move through the device. At first they approach from the outside where the device should look pleasing, charming, festive—like a festival tent or a carnival ride. But as they get closer, they find there are slightly frightening elements in the design, elements in shadow that make visitors suspicious of what they will find if they get closer, but also interested to see what is inside. When participants enter the device they find themselves in a dimly lit pre-staging area, where they are told about the device itself and some of the ideas that go into it. This is similar to the pre-staging area where audience members in a carnival show interact with the Master of Ceremonies, who "sells" them on what they are about to see, gets them excited and eager to see what is just behind the curtain. Once the participants are "hooked" on the story of the device, then are then led into the interaction area which is darker than all the other areas encountered thus far.

Eventually they make out images on a wall and discover that one of those images they can see is a version of themselves, and that "virtual" versions of the participants are interacting with other images in a strange collage of different environments that look like real places, and yet, are also slightly displaced and distorted. The longer the participant stands there, the more she can see on the screen, and the more she is able to control the virtual version of herself in the room that she observes on the screen.

Eventually, the participants are encouraged to leave. One userful way to signal to participants that it is time to leave is to copy a standard motif from cinema—the "film" simply runs out. The CompuObscura therefore signals the end of the experience by simulating the projection of washed out film frames flickering across the screen, until the screen is filled with pure white light. As soon as the film runs out, all the lights in the room go up, the screen vanishes, and people find themselves just standing there, looking at each other, then an exit sign lights up and they leave.

# Innovation

## The Intention of Our Invention

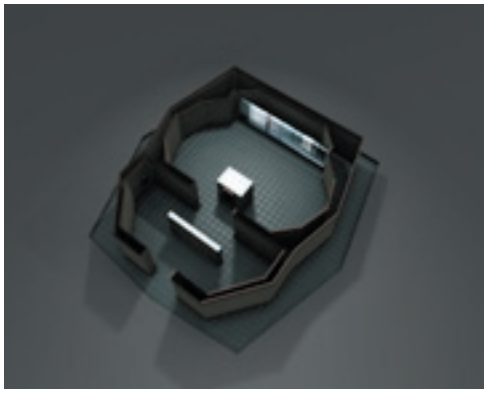
At the California Polytechnic State University (Cal Poly), San Luis Obispo, an interdisciplinary team of professors and their students from the departments of English, Art and Design, Architecture, Computer Science, and Graphic Arts and Communication have designed an interactive new media theater called the CompuObscura, a device that updates the concept of the camera obscura and connects it to other CompuObscuras around the globe through Internet II technology (Internet II is a faster version—twice the throughput—of the current Internet that is currently restricted for use by select research centers and major universities in the USA).To inform the development and design of the CompuObscura, the Cal Poly faculty and students have collected this technology invention, development and testing process into a research collective called the Lumiere Ghosting Project.

While the CompuObscura is a fairly complex technical device, and the Lumiere Ghosting Project is a complicated combination of research, pedagogy, usability testing, and program management, the ultimate goal for all these projects is fairly simple, and somewhat light-hearted—they both revolve around play and experimentation with emerging digital technologies.

The overall goal of the CompuObscura device is to encourage play between a viewer and a set of images. Like all truly good play the goal is to simply allow viewers to have fun, to explore, and to interact with images as freely and as seamlessly as possible. Good, open, free and expressive play often creates our deepest and most meaningful impressions and our most memorable narratives (Missac & Nicholsen). As instructors, students and researchers we are attempting to create an artistic play and exploration space for adults and children that allows them to create their own impressions and narratives through the facilitated process of interacting with a variety of projected moving images.

Through free-form, interactive play, the Lumiere Ghosting Project is designed to help people take a fresh look at how the projection and wide-spread distribution of moving images have complicated, and increased the speed of cultural change and cultural interaction (Nielsen). The Lumiere Ghosting Project is also designed to serve as a curriculum framework inside of which students and faculty can explore the theoretical and historical ramifications of this wide-spread social change and interaction. To help accomplish these goals, the Lumiere Ghosting Project makes use of the CompuObscura both as a device for creation, for technological development, and for study. Students and faculty connected with the Lumiere Ghosting Project help design,

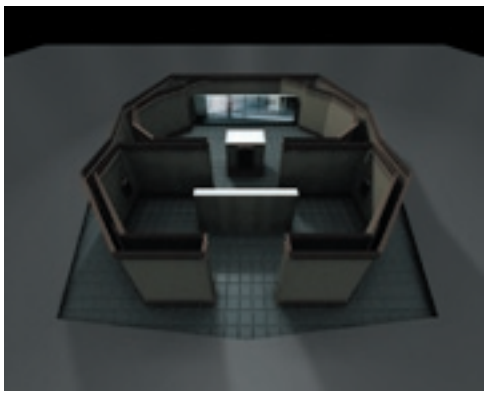
develop and refine different aspects of the CompuObscura, but at the same time they are all encouraged to explore (and add to) the histories that support the object's design, and to study and learn from the way viewers interact with the device.



## Alice's Mirror in the CompuObscura

The CompuObscura is an interactive new media art work that allows viewers to interact with images on display inside the device. The images displayed inside the CompuObscura are captured and manipulated, real time, from various siphon points around the world and from other CompuObscura devices scattered across the globe.

Because the CompuObscura is now being used as a research tool and as an interactive art work, there are currently no projected commercial applications for this device. The actual "content" of the CompuObscura will also evolve over time as it is used since it is also designed to "record" the actions of its participants and incorporate those actions into future manifestations of the CompuObscura environment.

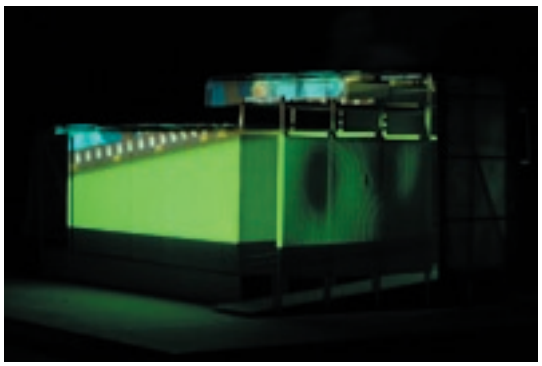


The way that the CompuObscura displays changing images is similar to how a mirror in a public space continually displays (with some distortion) the continually shifting environment that surrounds it. The CompuObscura is, in effect, a mirror of changing facade of the modern electronic arcade.The "mirror" of the CompuObscura "reflects" just one perspective of this collage of images, sounds, texts, and forms of electronic interaction.

Like the mirror in Lewis Carroll's *Through the Looking Glass*, a mirror which allowed Alice to slip into an interactive, fully immersive parallel world, the CompuObscura mirror not only provides a view of the electronic world of images that surrounds it, it also allows viewers to slip, seamlessly, past the membrane of the mirror and cross directly into one small corner of that parallel world of moving images.

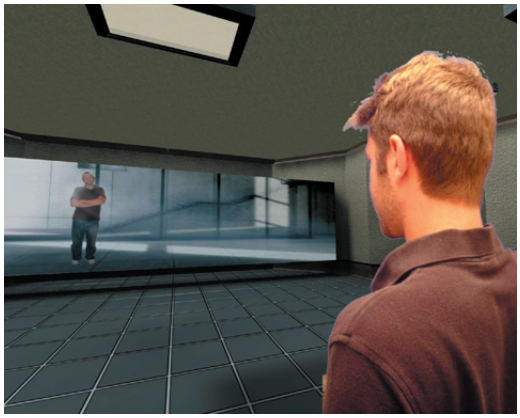
## Updating the Classic Obscura

The CompuObscura is a self-contained room-sized device modeled on the idea of the type of room-sized camera obscuras that were briefly popular around the end of the 1800s. Large manifestations of camera obscura technology used a room sealed off to all light, except for a pinhole-sized "window" in one wall that, over time, allowed an inverted image of whatever was outside the window to be projected on the opposite wall. Essentially, camera obscuras were large pinhole cameras, and were an early cross between a vaudeville hall, a movie theater, and a backroom séance.



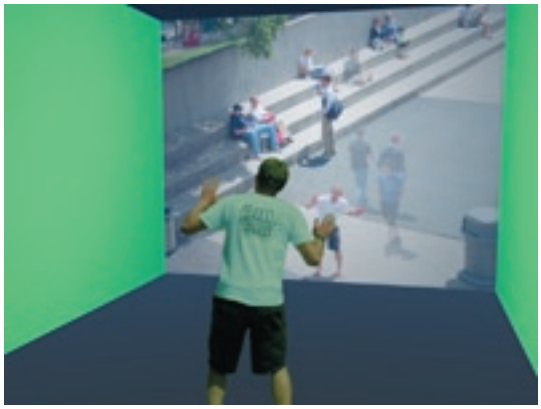
From the outside, we have designed our CompuObscura to appear similar to the ornate construction of a camera obscura. But inside, the device is a combination of a digital television studio (with green-screen capability) and an Internet-

channeled video projection and viewing facility.

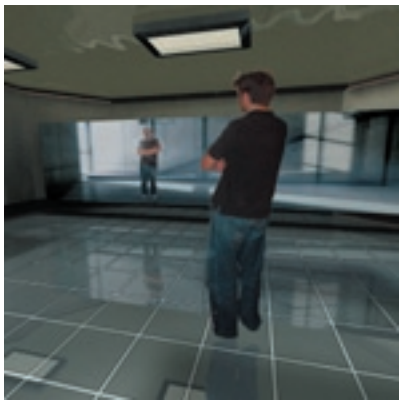


The CompuObscura holds approximately four participants at one time. Participants may either sit on the chairs provided along the walls, or move freely in the open area in the center of the room. The CompuObscura contains a high-resolution digital video projector, and a high-resolution digital video camera that captures the motion of the CompuObscura's participants. A space beneath the floor contains a small computer network connected with a high-speed connection to Internet II that in turn is connected to an advanced image processing center at California Polytechnic State University and with a number of other CompuObscura installations around the globe.

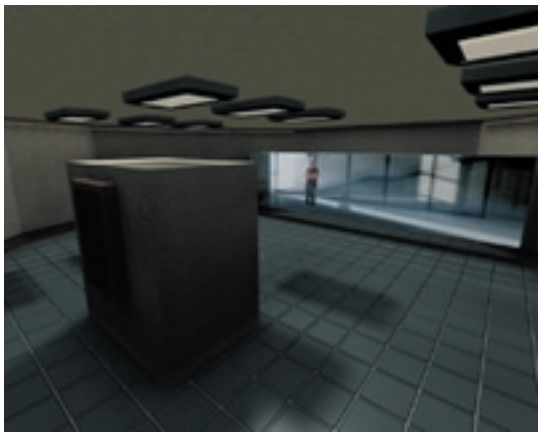
The CompuObscura captures and reprocesses high-resolution video images and high-quality audio on the fly, then uses the high-speed, massive bandwidth capabilities of Internet II technology to swap these composite images and remixed audio tracks from one CompuObscura installation to the next.



Against the largest wall in the CompuObscura, we display an image that fills the entire wall. This image shows the CompuObscura participants immersed in a virtual environment composed of architectural components lifted from an "actual" environment (a village plaza in Northern Italy, for example). This projected environment also contains live images of other CompuObscura participants (interacting in distant CompuObscura installations), and ghost-like images of other people captured from surveillance camera installations in public spaces around the globe.



Also inserted into this projected environment are a number of ghost-like wisps of smoke (roughtly the size of the participants) which display a wide variety of Lumiere Ghost images lifted from films, television shows, and moving images siphoned on the fly from Internet feeds around the country and from a number of countries in Europe and Asia. As CompuObscura participants move around the room, they can see that their movements influence the movement of the Lumiere Ghost images in the projected environment. CompuObscura participants can also interact with some of the ghost-like participants in the projected environment who may, in fact, be participants in other, distantly located CompuObscura installations.

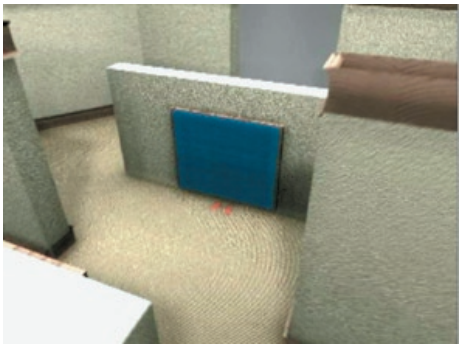


## Experiencing the CompuObscura

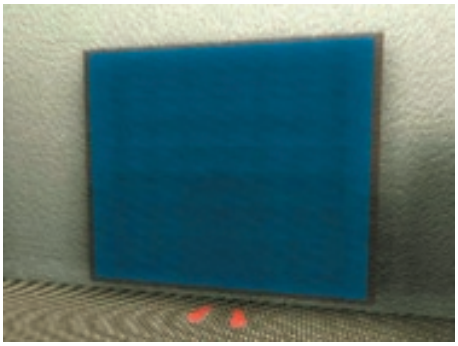
The most frequently asked questions about the CompuObscura are:

- What does it actually "feel" like to participate in the device?
- What happens after the participant has moved into the center of the device itself?

To answer these questions, I have written a brief scenario that explains this process from the point of view of a single female participant. We have also developed a short video demonstrating this process. The video can be viewed by following the link at the bottom of the images arranged to the right of this text.



A participant enters the CompuObscura, which is fairly dark, and she stands for a few moments to let her eyes adjust. She notices a few other people in the room with her, some standing still, some walking around. Projected against one wall is a large video image, showing that the participant and her fellow CompuObscura participants are standing in a corner of a plaza in Italy, taking up roughly the same amount of space in the plaza that they are taking up in the CompuObscura. The key thing that the participant will notice immediately is that the image of herself in the plaza is puppet-like, it is as if large photographs of parts of her body have been pieced together to form a large, somewhat two-dimensional puppet.



The effect of standing in the middle of the CompuObscura and looking at the video is similar to looking at a wall-sized mirror reflection of the CompuObsura room, except the reflection contains elements that are not present in the "actual" room. Scattered around the projected plaza environment are a few other puppet-like figures, but they are not representative of the people who are in the actual CompuObscura, at the same time as our subject--these puppets are clearly paired with participants "beamed in" from some distant location, probably from another CompuObscura device.

As the participant moves inside the CompuObscura, the projected image of herself also moves around the Italian plaza. After a few minutes, she notices that the projected plaza is starting to fill with large wisps of smoke (the Lumiere Ghosts) each one of which dimly displays a shifting collection of moving images as if they are projected onto the smoke itself. If she moves into or through one of these ghostly screens, she notices that the ghost screen (and the image it contains) wraps around her and then dissolves much as "real" smoke would react in a physical environment. Therefore, moving her arms up and down eventually causes ghosts to dissipate or separate, and moving quickly through them causes them to sweep in behind her.


She also notices that the other puppets in the plaza are aware of her presence, therefore if she waves at one of them they may wave back, and these other puppet people in the plaza are also interacting with the ghost screens that drift near them. The images



that are being displayed on the wisps of smoke, on the ghost screens, appear to be samples from old movies, and then also selections from television shows, still photos graphs, and other images gathered from a variety of cultures. If the participant watches these images long enough she will realize that they are being collected on the fly from Internet traffic from around the globe, with a collection point for an hour centered over Russia, for example, then for another hour centered over France, then Brazil, then South Africa, then Canada, and so on.

Finally, the participant notices that she can manipulate the wisps of smoke into somewhat stable shapes that linger in the virtual air, allowing her to sculpt the smoke into a design that is continually displaying a stream of images, as if she is building a three dimensional screen of Internet imagery. The more time that the participant spends in the CompuObscura, the more accustomed she will become to how different forms of interaction take place, and how different gestures of hers can actually be "read" by the software of the room to execute certain effects, such as storing the smoke or ghost shapes that she creates so they can later be released into the environment for other people to encounter. Eventually, the design of the environments inside the CompuObcura would begin to reflect the interactions of those who pass through it, capturing their "statements" about the interaction and making it part of the experience for all future visitors.

Much like the holodeck device from the *Star Trek* television series, we envision the CompuObscura as a type of interactive, holographic theater in which the images, the "stories" projected and created inside the device continually change and shift with the interests and interactions of the participants. Therefore, the images and the forms of interaction available inside the device will continue to shift over time as we are able to integrate more sophisticated image capture, display, and interaction technologies into the environment. But the overall goal remains the same--teaching about image manipulation, image distribution, and the cultural impact of that image manipulation through the playful and creative uses of the CompuObscura device, and through the concentrated, insider's appreciation of technology required in the development of the CompuObscura device (Hocks & Kendrick).

The whole CompuObscura experience is broken into a series of four stages:

**One**—Approaching the device from a distance. As participants approach the device, they will begin to make guesses about what is inside, using clues from the design and their experience with similar architectural constructions to foretell what is going to happen to them when they pass through the entrance. As we have worked on the interior and exterior design of the device, we have decided that the element of play, carnival, and transgression (manifested through the act of voyeurism) can be incorporated into the "shell" of the device itself. Students have become attached to the idea of the screen, and I am attached to the idea of the circus tent, and so when working with a group of architecture students on the design we decided to connect the idea of the circus tent with the practicalities of a projection screen. Many of the designs that students created used light materials to make the structure easy to put up and take down, and also created screen-like surfaces on which images could be projected from the outside in, or from the inside out. The final manifestation of the device will likely be a combination of tent and screen, along the lines of the structures created by the architecture students in the spring of 2004.

**Two**—Pre-staging as participants first enter the device. The prestaging area is a small area where participants are encouraged to stand fairly still for a few minutes (no more than three minutes), while the software for the system captures the participants' images and processes them for display inside the device. The common way to manage this in many theme park rides is to introduce "riders" into the narrative of the ride while they are still standing in line. This introduction is provided through video screens that progressively reveal the back story for the ride as the line moves ahead, from waiting room to waiting room. While they wait in line the riders are also surrounded by the sounds, smells, and vibrations of the ride itself distracting them the fact that they have actually been doing nothing more than standing in line for 20-40 minutes, waiting for a ride that often only takes two or three minutes to complete. While we don't anticipate huge lines of people wanting to experience the inside of the CompuObscura, we can still adapt some of the techniques of providing back story and narrative diversion into the design of the pre-staging room of the CompuObscura. The most obvious element to include is a short video that gives the history of the Lumiere Ghosting Project and some of the back story of the CompuObscura device. While participants watch the video we capture their image (front and rear) for mapping onto their virtual, interactive puppet that awaits them in the next room.

**Three**—Interaction in the main room. Participants move here from the pre-staging area and find themselves in an empty room that is quite dark. They hear sounds coming from one wall, and discover they are looking at a dim screen that eventually lightens to allow them to progressively see more of what is going on. After capturing their attention through the use of the screen, we then move sound around the room using multiple speakers positioned high and low and in every corner of the device. Most camera obscuras were simply dark, empty rooms, with their views displayed on one wall. Or, they had a table in the center of the room that displayed the image projected from directly above. Because the images that will be on display in the CompuObscura are quite active and interactive, and because participants are encouraged to interact with the images of other participants, the space is free of clutter and is as open as possible, thereby diverting from the camera obscura and early film theaters in one central aspect—participants are encouraged to move openly around the space.

**Four**—An exit area. This can is a short hallway, leading away from the interaction room. After talking with architecture students and faculty about building design, we came to the conclusion that leading people out to a small hallway or room before dumping them completely outside was a good idea. This exit hallway is a space where participants are able to decompress, review the experience they have just had, and also give them time and space to formally leave their impressions of the experience, becoming part of a permanent record. A video journal is the mostly likely record that will be available in the exit hallway, contained in a kiosk that allows participants to pause on their way out of the device and quickly voice their impressions of the experience that are then recorded onto a hard drive for later replay as part of the audio track for the system itself.

## Development Phases

The primary development phase of the project is now well underway. We are working on capturing images on the fly then compositing those images for immediate, interactive insertion into a virtual space. We are also learning how to best transfer all this data through an Internet II connection, moving video images from camera, into the Internet, into a distant processing facility, then back for insertion into a virtual space with as much speed as possible.

During the 2004-2005 academic year, we hope to begin the construction on a working model of the CompuObscura. At this point, all the video projection and capture systems will be installed in the CompuObscura, then the entire structure will be connected to the network, and tested with a wide range of participants. After the system is somewhat stable we will then move into integrating video collected from distant CompuObscura device and other moving and still images that we siphon from a revolving collection of Internet locations scattered around the globe.

As the technology for the CompuObscura continues to develop, we envision a number of phases for the device's development and use.

**Phase One—**In this manifestation, the CompuObscura only has one participant in the device, looking at him/herself on a screen which shows the puppet version of the participant roaming around a virtual environment that we have created in advance. This environment would be someplace "foreign" or quite distant to the participant's location--for example, if the participant is in Los Angeles, the environment on display on the screen would be a plaza in Italy. This is the most basic manifestation of the CompuObscura environment and it is the one we are currently modeling and using as a testing environment. The environment needs to be simple at first so we can perfect a number of low tech methods to track the motion of the participant, then connect that motion tracking information on the fly with the puppet version of the participant. The simplicity of the design also allows us to experiment with various forms of interaction made possible between the motion-tracking-controlled puppet and the virtual environment that contains that puppet.

**Phase Two—**This phase builds upon phase one, but now allows a number of CompuObscura participants encounter each other in the virtual environment, using the Internet to connect them together. This includes two to three people at a time participating from one CompuObscura, and then two to three people at a time participating from another CompuObscura. All participants, however, are immersed in the same virtual environment in which they can interact with each other in a similar manner to the way that players interact in networked gaming environments. The virtual environment is comprised of real footage taken from a distant location immediately prior to the entrance of the participants into the device, or concurrent with their actual interaction with each other. For example, a camera (or set of cameras) will be set up to monitor a place like a real plaza in Spain and that imagery is then introduced into the CompuObscura environment so the CompuObscura participants can play in that virtual, but also "real" place.

This phase of the device introduces participants to the Lumiere Ghosting Project's ideas about globalization by allowing people from distant locations to "explore" a real environment in real time, with audiences participating from distant locations, using different CompuObscuras as their gateway into the system. The actual development of this manifestation of the technology is still a year or more away, but we are currently developing a number of video demos that show how this system will eventually work.

**Phase Three—**Once the technical aspects of phase two have been tested and proven reliable, CompuObscura devices will be connected to each other through high-speed Internet II connections, and will be located in different places across the globe. Participants can see each other and interact in a virtual environment (as in phase two above), but now the images and sounds that are used to create the virtual environment and the images that are displayed on the ghost-like screens floating in the central CompuObscura room are siphoned on the fly from live Internet traffic. The siphon points switch, occasionally, from one point on the globe to another. Therefore, for thirty minutes the environment that the CompuObscura participants see is constructed from images and sounds captured on the fly from a siphon connected to an Internet traffic point in St. Petersburg, then thirty minutes later all the images and sounds are siphoned from a collection point outside of Tokyo, then Sydney, then San Francisco, then Amsterdam, then Paris, and so on.

At this point, as designers, we lose a good deal of control over what happens inside these devices as the content continues to shift as the siphon points move around the globe, gathering fairly random images and sounds on the fly. Occasionally there would be convergence points between all the images—for example, if this kind of system had been running on September 11th 2001, most of the images at any siphon point in the world would keep coming back to the World Trade Center Towers as they burned and collapsed. This system would dynamically display the effects of globalization as they play out through media across the planet, in real time. This phase displays one of the major innovations of the CompuObscura device and the Lumiere Ghosting Project as it allows for the interactive viewing and manipulation of electronic imagery gathered, live, from all over the globe.

The design of this Internet siphon is a project that we wish to begin with cooperation from various computer science students and faculty with hopes that we will be able to test this siphon and integrate it into an image display and manipulation system within the next two years.

**Phase Four**—A final phase of the CompuObscura device depends upon technological innovations in image projection that will eventually happen, but which are far beyond our development capabilities as faculty and students; this phase involves moving the images off the physical screen mounted on the actual CompuObscura wall and moving them into the room itself as a kind of free-form hologram that allows participants, without the use of goggles or gloves, to interact with the images that actually float around them in the room. In this version of the device, participants don't see a puppet version of themselves interacting with other "puppets" on screen—participants are actually immersed in the environment itself just as they would be if they were inside a holodeck. Phase four is clearly many years away, but based on the trajectory projected from phase one through three, a holodeck-like environment is clearly where we're headed with this technology development, pedagogical collaboration, and artistic design process.

## Illumination

### Adapting to Change

From the very beginning of my teaching career, I have been very interested in introducing students to the visual and textual semiotics connected to cross-culture narrative sharing and cultural remediation. Examining the ghosts of media transmission has been a central part of what I present in my classrooms. Because I began my teaching career instructing English as a second language while also working in non-English speaking environments, making use of cross-culture study and cross-culture media influence makes obvious sense, and it is also why I eventually gravitated toward university-level instruction inside an English department framework.

When released from the narrow confines of reading, interpreting, and debating the fine points of Western canonical literature, English can be an eclectic, extremely interdisciplinary and flexible field of study that touches upon many divergent aspects of communication and language (Bolter). Also, the expertise that English scholarship applies to the creation, revision, and interpretation of narrative structure is vitally important to studying how audiences of all kinds respond to all mediated forms of communication. Finally, the instruction of writing at any level also calls for easy access to and comfort with a wide range of fields of study and therefore a good deal of innovative interdisciplinary work and cross-cultural study inside an English department usually arises from the composition, technical/professional communication, and writing across the curriculum programs (Landow). It is inside these kind of programs where many of us have begun to refine our discussions with students about technologically-enabled transmission of narrative ghosts and energized electronic semiotic exchanges from culture to culture, usually organized under the rubric of studying information architectures, human-computer interface design and the rhetorical aspects of online communication.

While it has been fairly easy and straight-forward to trace the most blatant and prosaic elements of this cross-cultural pollination process through film and prose (resulting in the widespread use of traditional and postmodern literary theory for the use of film critique), many of us (especially those of us with backgrounds in technical communication) have found that with the advent of pervasive computing, the intermixing of images and ideologies from far-flung cultures has become a central component of the practical usability for the operating systems and information structures of many modern communication mediums (Lunenfeld).

As I mention elsewhere in this essay, pervasive computing has now put the tools of technological communicative construction directly into the hands of technology and media users, allowing us to directly manipulate the shape, intention, and symbolic representation of our online and/or computer-enhanced computer interactions. Therefore, like many of us working with the new media or emergent media theory aspects of English and rhetorical study (Landow, Buckingham), I have moved away from exclusively helping students learn how to critique the media artifacts, narratives and cross-cultural symbols that surround them and have instead turned toward helping students learn the praxis of adapting their critiques into the invention and construction of the objects themselves. While teaching about cultural mediation and technological remediation is complicated enough as part of helping students learn methods of prose and visual critique, it can be devilishly complex to integrate into a cohesive pedagogy that makes invention, creation and technology development key components of the process (Goldfarb). Integrating project work directly into a new media rhetoric curriculum means that a number of important and persistent questions immediately arise:

• Can new media development work truly find a home as part of an English department when the course and the students deal with such a wide range of theoretical concerns and with such a wide range of technological practices?

• Do students always need to complete their work? And how does one define "completion" in an interactive, new media design process?

• How do you assess the quality and level of success or failure for the projects that students create, especially when you're asking students to create something completely new and highly experimental? What do you use as a guide for assessment that makes sense to you as instructor and to your students?

In this section of the essay I will briefly answer these questions in connection to the Lumiere Ghosting Project and the invention and construction process for the CompuObscura. While there are elements of this new media development project that are quite similar to many new media rhetoric, writing and critical theory projects currently underway around the country (Liestol, Hansen, Samsel & Wimberley), my colleagues and I feel that with the Lumiere Ghosting Project, we have stumbled on a useful pedagogy and technological development model that may help inform and possibly improve how a diverse range of new media theory and practice can be combined into one large scale, collaborative production.

## Problems of Interdisciplinary Design

### *Can new media development work truly find a home as part of an English department when the course and the students deal with such a wide range of theoretical concerns and with such a wide range of technological practices?*

Yes, if English is open to the special needs and requirements of true interdisciplinary teaching and course design. This can be asking a lot, however, from any specific field of study since interdisciplinary teaching can be quite difficult to successfully integrate into any curriculum.

The concern at the heart of any interdisciplinary, media-centered approach to teaching new media is how much foreknowledge of media study and practice instructors can expect from their students. Interdisciplinary study is, by nature, fairly anarchic, drawing students from all parts of a university, bringing with them a wide range of academic, social, and technological backgrounds.The wider the range of courses offered by the university and the more fields of study offered, the more diverse the student make-up will often be for a new and/or experimental interdisciplinary course. Therefore, this leaves instructors with a quandary—should they teach to a simple level that all students will be able to understand, or move ahead quickly into advanced work that may well leave many of the students behind when it diverges from their prior academic training and

experience?

As someone who is continually experimenting with my course designs and with my approaches toward teaching about emerging media technologies and theories, I face these questions anew at the start of every new academic year. The key to successful instruction in these kind of courses is to find a common element that not only joins the many disciplines under review and in class use, but that also supports the expertise of the instructor and is something with which most of the students will be familiar.

Like many of us struggling to create this new form of teaching based on hypertext composition and mixed-media-informed rhetorical theory, I found that one single approach to the material, or the use of one theoretical school of thought was always insufficient to keep up with changes in the field, and often lagged behind the leaps in creativity and understanding the students were making on their own, through their own form of synthesis and recombination of theories, techniques, and communication technologies that they brought with them from their divergent academic and practical backgrounds (Selber).

Along the way I have followed many of the precepts for this type of mixed-media, rhetoric-based pedagogy that we all now are familiar with from the articles in *Computers and Composition*, *Technical Communication Journal*, *Technical Communication Quarterly*, the early research work of Selfe and her colleagues at Michigan Tech, the works and theories developed by Robert Coover and his students at Brown University, and the theoretical work of Bolter, Landow, Liestol, Moultrhop, and some of the later collections assembled by Lunefeld for MIT Press. While many of the ideas about hypertextuality, interconnection, interaction and the design of "experience" mentioned by all these works have been useful, I have also come to the conclusion that our field will always continue to be, as Lunefeld mentions in his introduction to a *Digital Dialectic*, a work in progress, a continually uncompleted, unfinished and unresolved form of teaching, study, and creation—an ongoing, never ending dialectical exchange between creator and audience, designer and user, instructor and student.

### *Do students always need to complete their work? And how does one define "completion" in an interactive, new media design process?*

Yes, students need to reach a point with their work that they can feel is indeed a completion point. While I always tell students that the Lumiere Ghosting Project and the construction of the CompuObscura are long-term collaborations that may well never have a satisfying, verifiable "end," the individual work that they create for class does, indeed, have deadlines and end points. Following some of the precepts put forward by those who use contract grading structures in their composition courses, I work out a contract with each student, early in the term, stating exactly what will be completed and also stating what terms will be used to determine the relative success and/or failure of that completion. But beyond this simple and somewhat reductive process necessary for grading and record keeping, I feel that focusing too much on completion takes away time that needs to be centered on collaboration, debate, discussion and exploration—focusing on what students and faculty can learn together by working through an open-ended technology development process.

Focusing on process over product in a pedagogical construction like the Lumiere Ghosting Project helps instructors who are interested in rhetoric return to our roots as Western rhetoricians. The continual questioning and reevaluations of prior assumptions that is part and parcel of our work with Lumiere Ghosting Project has allowed us as instructors and as students to use the unfinished nature of the development process as a way of looking for truth, or a truth, while also moving the teaching situation closer to the social sense of what the Greeks referred to as *paideia* (the design to form and to educate).

By centering our concerns on the particulars of process, and by acknowledging that this process may have no clear end point, we make what we do in the classroom and in our theoretical work less of a "study" and less about "instruction" and more about "conversation," "approach," and "invention" as it was envisioned in the original Academy. Through work with Lumiere Ghosting and the CompuObscura, we have often found our

course discussions and the "products" that we created taking on the shape of the dialectic as Pierre Hadot discusses Plato's approach to philosophy in *What is Ancient Philosophy?*:

"Such was the deepest intention of Plato's philosophy. He did not aim to construct a theoretical system of reality, and then "inform" his readers of it by writing a series of dialogues which methodically set forth this system. Instead, his work consisted in "forming" people—that is to say, in transforming individuals by making them experience, through the example of a dialogue which the reader has the illusion of overhearing, the demands of reason, and eventually the norm of the good." (Hadot, p.73)

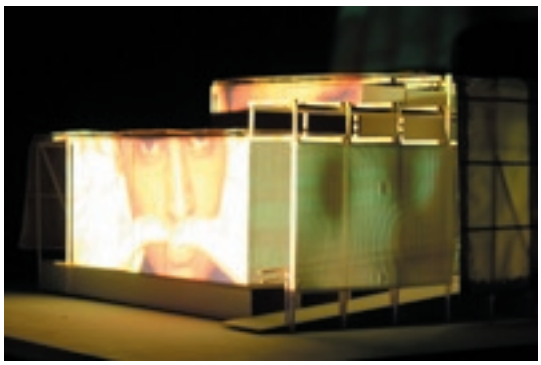
*How do you assess the quality and level of success or failure for the projects that students create, especially when you're asking students to create something completely new and highly experimental? What do you use as a guide for assessment that makes sense to you as instructor and to your students?*

Assessment of student success and failure often depends, first, on students understanding of how to develop and then follow a good development contract. The contract that I work up with students for their projects is built upon their clear understanding of how they are going to use prior knowledge in the construction of their new media work. Success is therefore defined as moving beyond already understood skills and theories into new territory. For students with considerable background with the material, finding new areas to explore can take time and requires the students to do some preliminary research into the field in conjunction with me. For beginning students, mapping out areas for them to discover requires me to have a solid understanding, based on past experience with other beginning students, what is reasonable to achieve (in terms of technical skills and in theoretical grasp) in a given period of study and also how to best integrate this new student with ongoing project development.

When judging each other's rough draft and "final" works, I have been asking students to turn to Manovich's text, *The Language of New Media*, for guidance and for a number of rubrics that can then be applied directly to their projects. Much like the advice that Sorapure provides in her *Kairos* article, "Five Principles of New Media: Or, Playing Lev Manovich."

## Integrating with Courses

In Fall 2002 I, and a colleague, Enrica Lovaglio from the Art and Design Department, received an internal university grant from California Polytechnic State University (Cal Poly) to fund development of new ways to use the high bandwidth available from the university's new Internet II connection. We used this funding to purchase some video equipment and to help us coordinate our efforts to start creating a working model of the CompuObscura.

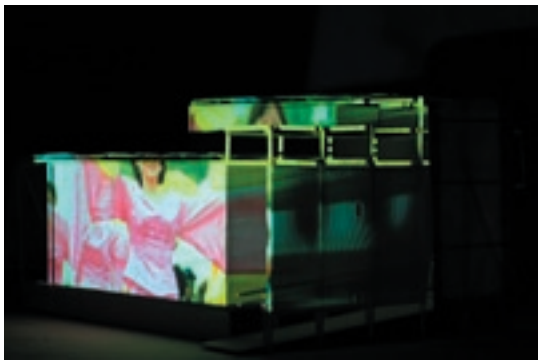


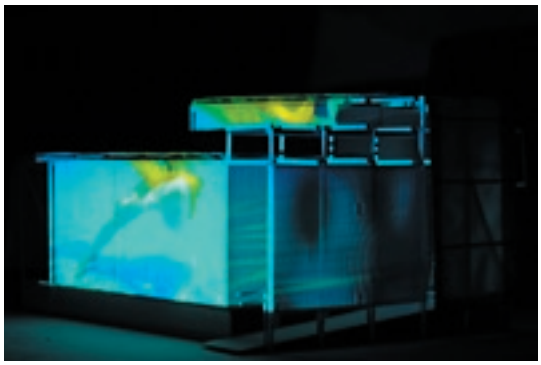
Starting in Spring 2003, we began experimenting with a basic team-teaching structure to set up the student base for the Lumiere Ghosting Project by combining two already-existing courses: *Interactive Document Design* offered from the English Department and taught by me, and *Collaborative Studio--Rendering, Animation and Modeling* offered from the Art and Design department and taught by Enrica Lovaglio. We shared lectures for our courses, and then worked together to select a number of students to develop

the basic research, online design and technical development that served as the foundation for Lumiere Ghosting Project development and for creating early models of the CompuObscura.

In Spring 2004, we invited two Architecture professors (Thomas Fowler & Tom DiSanto) and their students to join our project. The architecture students, working in four different groups (each group choosing a primary design theme to define their work), proposed a number of architectural models for the CompuObscura. We worked with the students to select the best elements of each design, which were then incorporated into the final design and the physical model of the CompuObscura. We asked the students to work within a number of financial and construction constraints. The final design costs roughly $18,000 in material, and can be put up or taken down in an afternoon with small group of non-technical assistants.

Arranged to the right of this text, you see a selection from the images of the final project model, onto which various Lumiere Ghosts are projected to simulate how the device will appear when in use. I have also scattered a few of these images throughout this essay.





In the coming terms we hope to broaden the reach of our project to include colleagues and students from the Computer Science Department at Cal Poly and plan on working with a number of colleagues and students at other universities in the USA and abroad.

## Integrating Lumiere Ghosting into a New Media Arts Program

The Lumiere Ghosting Project also serves as the primary pedagogical development project for a still-developing new media arts program at Cal Poly. As this program expands and develops, it will serve as the focal point for the theoretical, pedagogical, and technological work that supports the Lumiere Ghosting Project. The program is currently defined by its three core courses:

- New Media I: *Narratives & Semiotics*
- New Media II: *Technologies & Construction*
- New Media Projects: *Synthesis and Performance*

During one year of study, students take these classes in order (*New Media I, II, and New Media Projects*). As they participate in these courses, students are required to produce their own new media development projects which range from commercial applications to entirely artistic works. By the end of the series of courses, students are also asked to contribute, even if in a small way, to the ongoing development of the CompuObscura and the Lumiere Ghosting Project. At the end of the academic year, all the student works produced during that year are presented in a variety of public forums, and the best student work produced

for the Lumiere Ghosting Project is added to a work-in-progress presentation for a national technology forum, such as the SIGGRAPH conference.

**New Media I:** *Narratives & Semiotics* introduces students to the foundations of narrative and the study of signs (visual, linguistic, social) that support solid, persuasive, and innovative new media construction. The course is primarily based on reading, viewing, discussion and applied textual and visual critique. The course is equally divided between the study of linguistic or text-based theory and the study of visual design theory. Students must submit a fully revised seminar-length visual and textual essay examining the narrative and semiotic structure of a complex new media work and a complex "canonical" literary, theoretical, or visual text. Students must also complete a fully revised proposal for a small new media project they will build and display in New Media II.

**New Media II:** *Technologies & Construction* introduces students to the primary technologies currently at use in the professional creation of new media works. Students work directly with a wide range of new media technologies in a studio situation. The course is equally divided between working with text-centered software and working with image-centered software. Each student completes the course with a working knowledge of at least two or three new media production programs, and is required to create one fully functional demonstration of the project they proposed in New Media I. Some of the student projects will be directly related to the CompuObscura or the Lumiere Ghosting Project, but students are also allowed to develop completely individual projects that follow that student's interests and research. Some past individual student projects have included work such as developing a working kiosk design (software interface and physical container design) for traveler's aid stations to be located in airports around the globe, an interactive personal essay about family and identity presented through web and film technology, and a stand-alone software program designed to teach middle school children about penguins. Mid-way through the quarter, students will pause in their project development, document their work to date, and then convert that documentation into a submission for entry in a prominent national technology forum. At the end of the course all students in the class display their work in a local technology forum, an activity that is then later repeated in various places around the country by those students who have had their work selected for national presentation.

**New Media Projects**: *Synthesis and Performance* is a full studio and group-work course in which the entire class (students and instructors) works together on improving and integrating various smaller projects into the latest manifestation of the Lumiere Ghosting Project and for inclusion as part of what is displayed inside the CompuObscura. The primary focus of the course is in the practical synthesis of the theories and technologies students have worked with in New Media I & II. While the class focus is on developing work for the Lumiere Ghosting Project and the CompuObscura, students are also still encouraged to continue refinement work on their individual projects. In this course, students learn how to manage high-level group production projects, practice professional presentation techniques, and also investigate some of the commercial and professional aspects of new media production through site visits and guest lectures that cover work produced for the marketplace and for the fine arts. The student work (both individual and group) is critiqued and refined throughout the quarter by in-class participation from a rotating board of evaluators gathered from academia and industry.

## Student Creation, Design & Invention

Students have been involved with every aspect of this project. As they participate in the development, invention and research work for the Lumiere Ghosting Project and for the CompuObscura device, students learn about the history of film, photography, television, and narrative design along with the practical concerns of visual and textual rhetoric. Students also learn about project management, cooperation, invention, and testing procedures as they actually build the CompuObscura and develop some of the smaller technology elements that we use for lectures or group work in other parts of the Lumiere Ghosting Project.

The range of student contributions have been so tightly connected to collaborative course development and

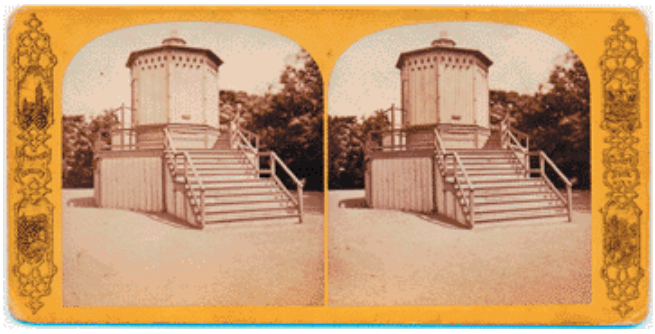
discussion that it is nearly impossible to accurately attribute specific developments to this or that specific student. However, a few students have created stand-out work for the Lumiere Ghosting Project and have made essential contributions in the design of the CompuObscura device. I would like to use this space to highlight a few of these contributions.

## Key Student Contributions

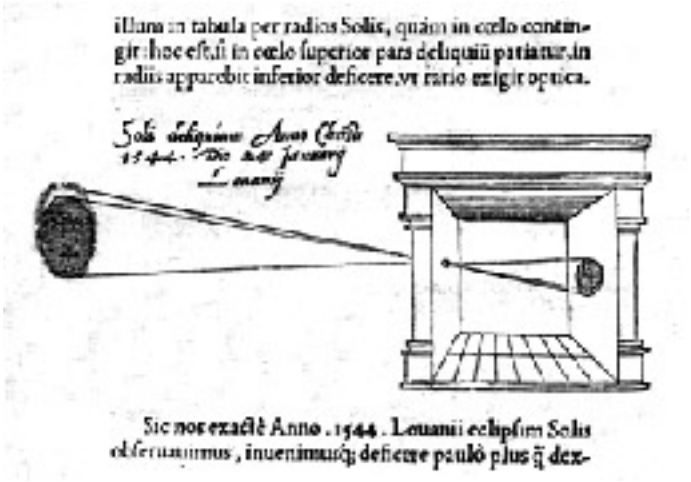
Jon Elsdon (jon@eefx.com) recently completed his MA in Art and Design from Cal Poly. His contribution to our work has been invaluable. We hope to fund Jon Elsdon in the near future as a full-time professional collaborator and developer both for the Lumiere Ghosting Project and as one of the central team members in the development of the CompuObscura.

Jon developed all the motion tracking models we use to track participants in the CompuObscura, employing very low tech solutions that are brilliant and cunning uses of very limited technical resources. Jon has also created all of the 3D-modeled demonstrations of the projected environment inside the CompuObscura. You have already seen many of Jon's images scattered throughout this article, but you may like to see this work in motion. In the online version of this article, I have attached a link to a short video which contains a sequence Jon produced to demonstrate the process of capturing the image of a CompuObscura participant, mapping that image data to a digital puppet and then dropping that puppet into a virtual environment created from real-world images.

Juliana de Freitas-Draper (design_jdfd@yahoo.com) and Ilsa Brink (ilsa@charter.net), working in conjunction with Professor Lovaglio in the Art and Design Department at Cal Poly, developed the first comprehensive web presentation of the ideas and histories that comprised the early stages of our work with the Lumiere Ghosting Project. The work these two brilliant design students created is beautiful and is also highly reflective of the spirit of the project itself. Please take some time to explore their site, presented as part of the online version of this article. We used components of this site for a number of academic presentations in 2004 (including a presentation at the SIGGRAPH conference in August 2004), and we will continue to use the bulk of the imagery of this site for our future work with the project.



# Text Citations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