



2006

# Public: An Exploration of Community, Environment, and Technology

Christopher John Malven  
*Virginia Commonwealth University*

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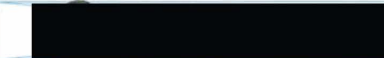
AN EXPLORATION OF COMMUNITY, ENVIRONMENT,  
AND TECHNOLOGY



  
  
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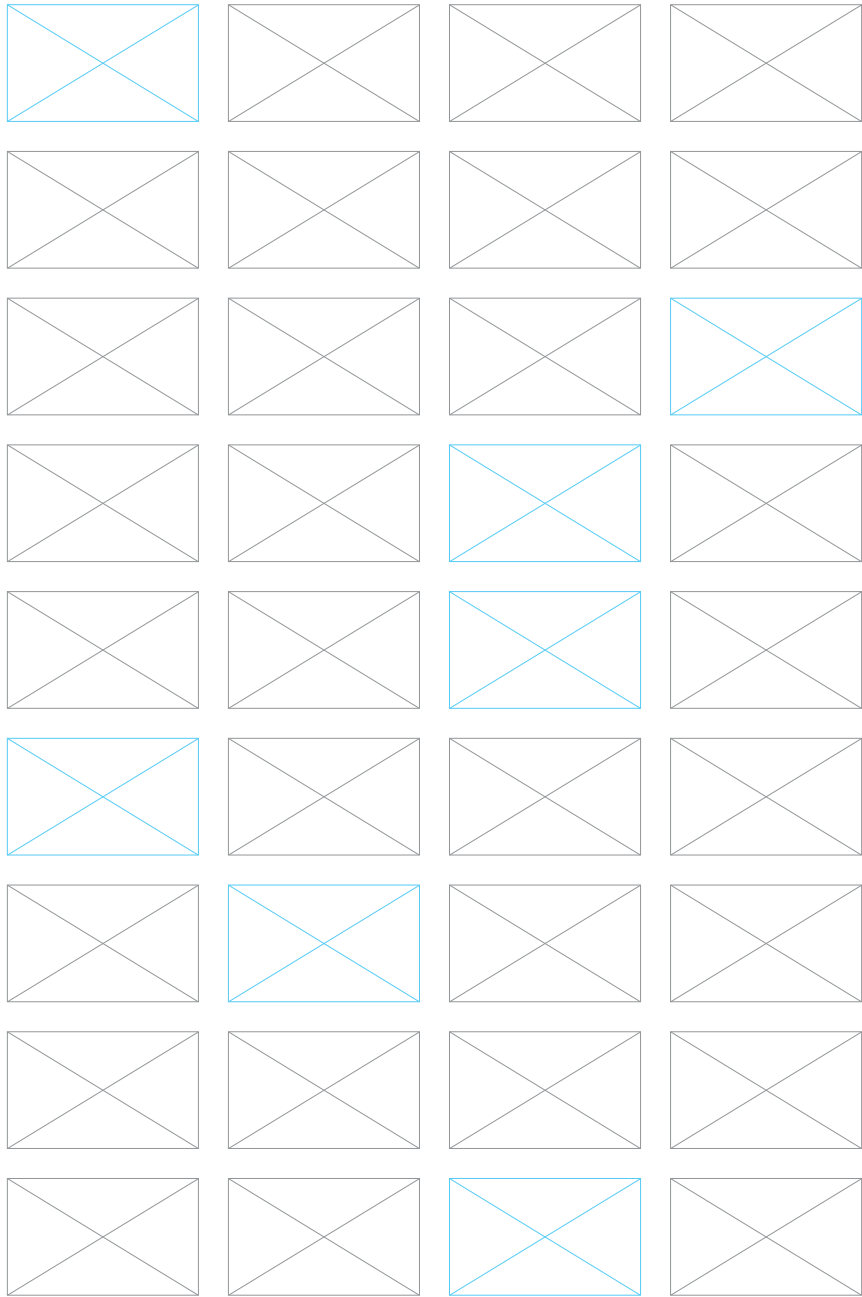
  
  
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*Public: An exploration of Community, Environment, and Technology*

Submitted to the faculty of the School of the Arts at Virginia Commonwealth University in partial fulfillment of the requirements for the degree, Master of Fine Arts in Visual Communications.

Christopher John Malven  
Bachelor of Fine Arts in Graphic Design  
Iowa State University 2004

Virginia Commonwealth University  
Richmond, Virginia 2006



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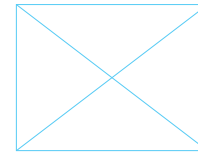
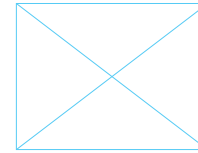
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## ABSTRACT



This project examines the potential of computer technology to enhance navigation within, and incorporate information-sharing into, the public urban environment.

## INTRODUCTION



We are living in the midst of a technological revolution. As much as the computer has changed contemporary life, we have only begun to explore its possible uses. A computer is a device unlike any other: its function and form are not inherently predetermined, but result from the intent of its programmer and designer. Looking back at the computer's evolution, its future uses have rarely been accurately predicted. For example, IBM's President Thomas Watson, Jr. stated in 1943 that he believed the maximum worldwide market for computers would be no more than five machines.

Growing up during the personal computer revolution, I have seen the uses and views of computing technology change many times. When it seemed that the Apple Macintosh, with its desktop-based graphic interface, would remain a tool only for the creative and curious, the business computing revolution adapted it creating an easy-to-use environment for the technically uneducated. When the Internet was created to provide a communication tool for academics and government officials, the World Wide Web delivered connectivity to the masses.



These developments seem enormous and unpredictable in hindsight, but they may pale in comparison to the uses for computing technology to be yet developed. As a designer I am extremely interested in how new innovations will open doors for human-computer-interaction. As a technology with no required form and no specific function, there is essentially no limit to the ways computers can introduce information and interactivity into our lives.

I believe the term 'computer' has expired, and can no longer accurately describe the many interactions, interfaces, and communication potentials that the technology facilitates. The American Heritage Dictionary® defines a computer as "a device that computes, especially a programmable electronic machine that performs high-speed mathematical or logical operations or that assembles, stores, correlates, or otherwise processes information." This definition is indicative of a current inability to describe a computer with respect to its range of possible functions, and is similar to describing an automobile as "a device that uses an internal combustion engine combined with human control to change the speed and direction of humans." Such definitions are accurate, but do little to describe the actual use of the technologies.

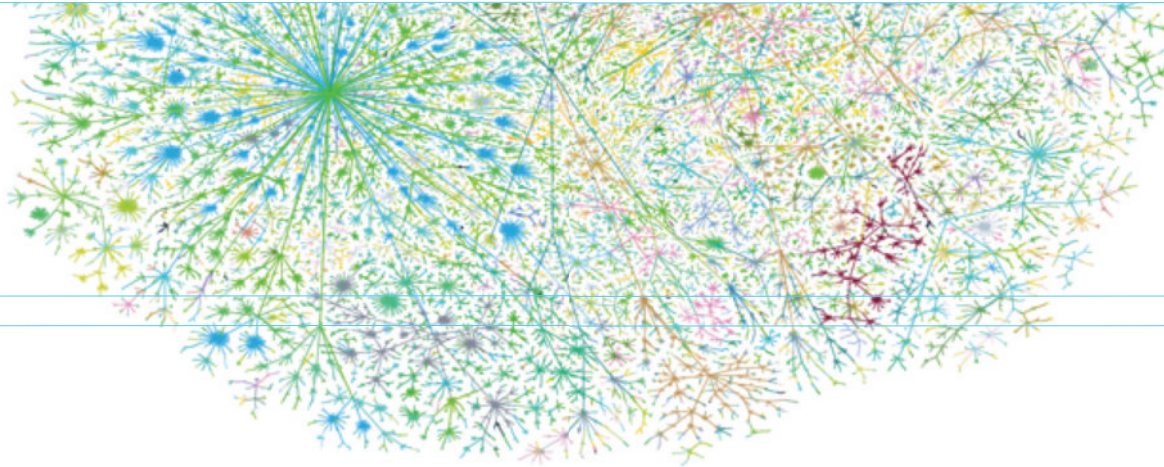
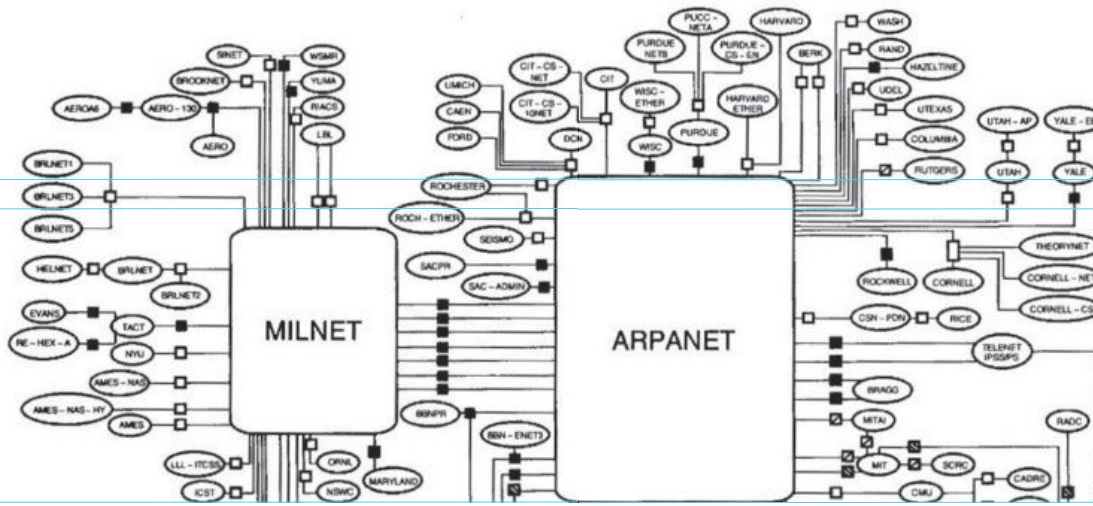
Designers are responsible for deciding how tomorrow's computers will look, act, and improve (or complicate) our lives. I've used this project as a way to consider how computers can be a positive part of human interaction, and to ask myself how technology effects the way people receive and share information in their every day lives.

## PROBLEM STATEMENT

The definition of a computer as "a programmable electronic machine that calculates, stores, and otherwise processes information" is quite appropriate for describing the origins of the technology. The first electronic computers were hulking machines the size of rooms, with the sole function of performing mathematical calculations; they were, in a sense, the first electronic calculators. All of these early machines were controlled by the government or large educational institutions and cost hundreds of thousands of dollars apiece.

In 1969, the Advanced Research Projects Agency Network (ARPANET) connected a machine at UCLA with a similar machine at the technology research firm, Bolt, Beranek, and Newman, and the Internet was born. Over the next decade dozens of universities and government computers were added to the network, but access was still quite limited. Nonetheless, the Internet's ability to provide instant information sharing across a continent was unprecedented. This new potential for collaboration and inquiry made the computer one of the most significant tools of the 20th century.

In 1972, the first person-to-person Internet technology was introduced. Email could be used to send simple textual messages to a specific individual on the network. As ARPANET continued to mature and increase its user-base in the following decades, email became its most widely used application.



It wasn't until Tim Berners-Lee invented the World Wide Web (WWW) that the Internet as the public knows it came into being. The functionality of the Web was made possible by several key technologies such as the File Transfer Protocol (FTP) and HTML (HyperText Markup Language), which allowed individuals to create online documents, link them to other documents, and upload them for the world to access. These technologies, and the development of Web Browser applications eventually allowed anyone with a computer and a dial-up Internet connection to communicate and share information with each other.

TOP: Diagram showing the connections that made up the early NSFNet  
 BOTTOM: Hal Burch and Bill Cheswick's *Internet Mapping Project* in August of 1998

The computer had originally been used as a tool for creating and managing information, but its potentials as a medium of communication and information sharing gave it new life and expanded its influence. We now associate the personal computer as much with Internet use as we do with its capabilities for information creation and storage. For example, I have found almost every activity in my life transformed by the computer. I do just as much shopping online as I do in physical space. I get almost all of my news through websites. I coordinate my daily activities and meetings via e-mail. I use the computer for research, to find movie times, to check on the weather. The list goes on and on.

As often as I use the World Wide Web as an alternative to telephone directories or newspaper weather reports, this isn't what makes the technology unique. These tools are often more convenient than the real-world services and documents they replace, but they don't represent a significant change in the way we live. It is the Web's ability to allow individuals to easily form networks and share information that has the capacity to all together change the way we obtain and use information.

Individuals working together can build collections of information that might never have otherwise been considered feasible. Network applications that facilitate these types of collaborations are known as *Social Software*, a term popularized by web critic Clay Shirky. Social Software approaches have been applied to mapping, image sharing, encyclopedias, news gathering, reporting and commentary, creating a variety of new web applications.

In the future, as increased wireless Internet access and diminishing size make the computer more portable and ubiquitous, information collaboration will make its way from the desktop (and laptop) into the physical world. As this technology matures, the variety of ways and places for people to create and access information will grow. As we increasingly interact with information through embedded, hand-held, or even wearable devices, it is important that designers work to make access to information fun, intuitive, and effective. My creative project is an examination of how technology can be used to navigate and share information in the spaces around us, and the role that design can play in representing and facilitating these exchanges.

This project is not, and cannot be, a tightly focused examination of any one particular design application. Instead, it's an attempt to explore the intersections of several different key themes through research and conceptualization. I've applied this thinking to an environment with which I have become familiar over the past two years of my graduate studies – the VCU campus. The result is not a single compact project, but a collection of possibilities that will influence my work as a designer for years to come.

Following are a few of the questions that drive this project:

- ☒ *How can collaborative technology enhance the functionality of an existing physical space?*
- ☒ *What effect does the integration of technology and physical spaces have, and how can this effect be minimally intrusive and useful?*
- ☒ *How can access to computer technology be made a part of an environment? How does this type of access differ from personal computer access?*
- ☒ *How can metaphors drawn from urban environments influence interactivity and information representation?*



## SETTING

I practically grew up on the Iowa State University campus. As a son of a professor, I spent quite a bit of my youth exploring the campus environment. Iowa State is integrated into the surrounding city of Ames, but also has its own socio-ecosystem complete with student residences, dining establishments, and an outdoor landscape designed by Olmsted Brothers, the same firm responsible for the design of New York City's Central Park.

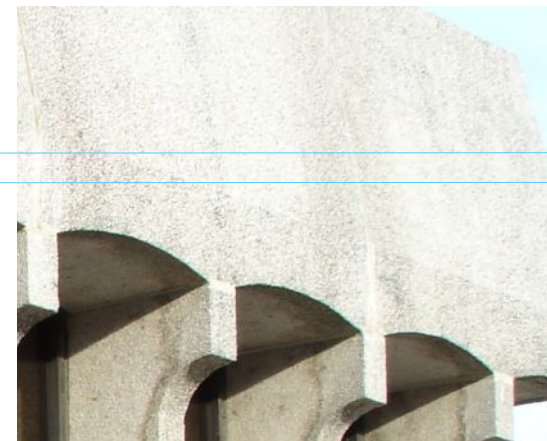
The campus provides students with everything they need within a short walking distance, and students routinely spend eight-hour days there without leaving its boundaries. As a result, connections between faculty, students, and the campus itself are allowed to flourish. Interpersonal communication comes quite naturally as the entire population exists within a small area.

The Monroe Park Campus of VCU is similar in some ways and yet different. The VCU campus is not so much a separate ecosystem as it is an addition to the varied urban environment in which it exists. Nestled into the surrounding residential and business communities, students more often than not live "off campus," and as such, return home during the day frequently and for long periods of time. A large portion of the students at VCU commute, and many of them engage in part-time work. As a general consequence, VCU's campus population is not as connected to campus life (activities, learning environments, groups) as students of a traditional campus might be.



As a graduate student, I arrived at VCU unaware of any kind of information network that would help me find out more about the university and its events and organizations. Most of what I learned about VCU and the surrounding city of Richmond was by word-of-mouth. Very few written or digital resources were available to help me get more involved. What I discovered in the nearly two years I've been here is that the Monroe Park Campus is teeming with organizations, events, and interesting locations. Unfortunately, many of these events and organizations are unlikely to be discovered by those who aren't actively seeking them out.

This campus could therefore serve as a fertile testing ground for exploring how technology might be used to increase access to communication and information in urban environments. How might design and technology change the decisions students make about time spent on the campus? If communication between students and faculty isn't as likely to take place in physical space as it should be, what might be an effective substitute? If students are spending less time on campus, how can that time be used to increase awareness of campus life?





RELATED GRADUATE WORK

*During my time as a graduate student, I've worked on many projects that have influenced my creative project. Some of these projects deal with issues of technology in creative problem-solving, and others address issues of communication in constructed environments. Some of them deal with both of these areas simultaneously.*



Homeless Vote — Fall 2004 / Susan Roth



In the first project of the Fall, 2004 Workshop, Professor Susan Roth asked the students to envision a project that would spread democracy in Richmond. Given the looming 2004 election and the problematic election process of 2000, I began looking at the various types of disenfranchised voters in the Richmond area.

I discovered that while homeless individuals are allowed to vote, many of them are unaware of this or have difficulty finding the resources necessary to register. These individuals, who often walk from one end of downtown Richmond to the other on a daily basis, spend the majority of their time outdoors.

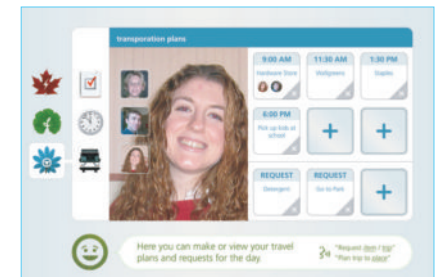
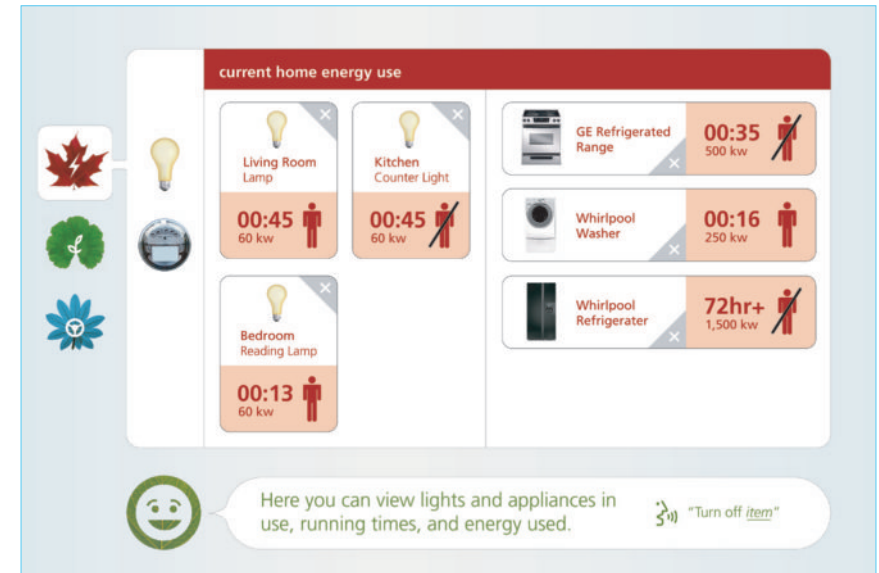
My solution was to use the downtown urban landscape as a canvas. A brick wall covered with stickers spelled out "No Home"—with each individual sticker containing provocative statements about homelessness and the power of voting. When peeled away, the back of each sticker provided voter registration information and the location of the nearest registration precinct. As stickers are removed from the wall, the "No Home" message slowly transforms to another message: "Go Vote." The project aimed to promote community involvement and the power of groups. The stickers, and their messages about the importance of voting, would spread organically throughout the city and leave behind a residual map of those who participated.

**Gaea** Fall 2004 / John Malinoski

During the same semester as the Homeless Voting Project, Professor John Malinoski presented us with the challenge of shifting public attitudes toward more environmentally responsible behavior. He encouraged us to envision a solution using media or technology that did not yet exist, but which was reasonably imminent. The importance of accountability to human behavior emerged from my research. Several studies<sup>1</sup> showed that people exhibit an increase in responsible behavior if they are held accountable for their actions by those whom they respect.

From this simple premise I developed the model of *Ecommunities* (pronounced "echo-munities") – small 3-4 household communities of the future that would share responsibility for energy use, transportation, and food production. To coordinate the efforts of such a community, I proposed a ubiquitous electronic system known as *Gaea*. *Gaea*'s minimal, friendly interface simplifies the tasks of monitoring energy use, arranging for shared transportation, and maintaining community gardens.

*Gaea* attempts to strengthen a community by fostering mutual respect, and at the same time changing behavior by increasing access to important information. While *Gaea* was treated as a practical exercise in interface design, I envisioned it existing in a future where the use of such interfaces would be necessary for survival of the planet and its inhabitants.



As the first interactive system I have ever designed, *Gaea* represents a big leap for me toward finding my goals as a designer. It helped me realize the potential for design to connect and assist people. It also raised many questions regarding the impact of technology on the human condition.

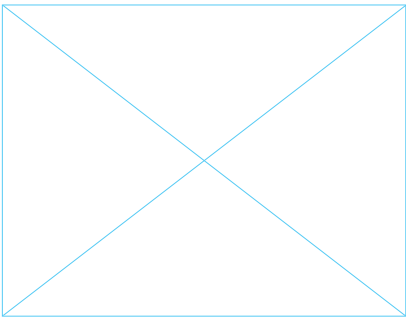




**Keychain** Spring 2005 / Laura Chessin

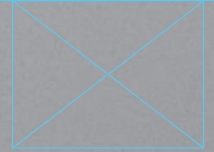
Keychain is an Internet-based community environment to be used by prisoners in their rehabilitation. The system provides users with a way of communicating with each other in a positive way, and connects them with valuable resources to help them deal with the stress of living in a prison environment. A significant problem of prison life is that negative relationships and behavior are more likely to flourish than positive ones. Keychain's tools are intended to help prisoners break out of that cycle by connecting those who really want to improve their lives.

Community forums give users a place to seek positive discussion and advice, and a specialized search tool encourages proactive learning and exploration. The tools create a community within prison walls that is free of the environmental and social constraints imposed by such a negative space.

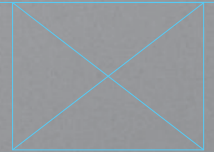


PROCESS + METHODOLOGY

I entered graduate school with the understanding that I had a lot to learn as a designer. My undergraduate education allowed me to develop a visual vocabulary and a basic problem-solving ability, but gave me little time to develop specific research interests and methodologies. It is within these areas that I've seen the most growth during my graduate education and much of this growth has taken place during my last two semesters working on my creative project.



The development of this project has in no way followed a straight path. The initial areas of exploration opened the way for more refined research directions, which in turn led to continuing experimentation. This cycle led me to reconsider the scope and goals of the project, and occasionally to re-structure my entire way of thinking about it.



As part of my process, I adopted various methods of working and employed them at different points. Many of these methods were borrowed and adapted from examples uncovered in my research. Others were developed to help meet specific goals.



The observer himself should play an active role in perceiving the world and should have a creative part in developing his image. He should have the power to change that image to fit changing needs. An environment which is ordered in precise and final detail may inhibit new patterns of activity. A landscape whose every rock tells a story may make difficult the creation of new stories. “

Kevin Lynch, *Image of the City*

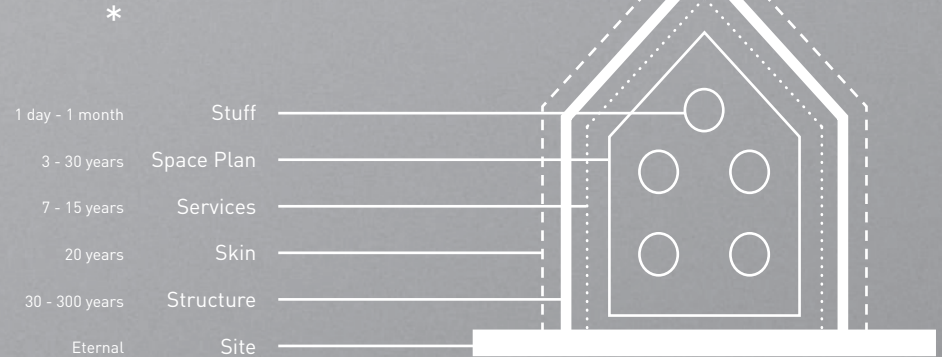


## THE BEGINNING: ENVIRONMENT, COMMUNICATION, AND INTERACTION

My project began with an interest in the human ability to continuously redefine the spaces they inhabit. Due to the solidity and imposing physical stature of urban environments, it is easy to view them as permanent, unchanging structures, neither requiring or affording much individual human intervention once they have been built and occupied. Stewart Brand addresses the scale of urban change in two of his books, *How Buildings Learn* and *The Clock of the Long Now*.<sup>\*</sup> He describes buildings and the urban environment as a series of layers. The most stable layers—the earth, building foundations, and external structures – change very slowly. The innermost layers of this environment – relating to the arrangement of spaces and the stuff that occupy them – change more frequently and are more directly under human control. As a result, urban dwellers feel intimately connected with the contents of these inner layers but separated from the more slowly changing environment defined by urban structures.

Most of the visual communication we encounter in the urban environment is situated outdoors. For example, as I walk down Broad Street, a major corridor in the city of Richmond, I find myself a captive of hundreds of visual messages. Few of these messages reflect the voice of individuals, and most of them provide only the most rudimentary information. I like to refer to the source of these messages as entities: organizations or corporations that have the resources and desire to use the urban environment as a medium to communicate with the populace.

These urban messages are almost always intended to provoke an action or response – to provide instruction in the case of wayfinding signs; or to inspire purchasing and influence consumers in the case of advertising. Readers interpret these messages individually in relation to their communicative power and the relevance of their content, but it isn't very often that they get to respond to these communications with anything other than acceptance or disregard.



Environmental communication exists in many forms and varying degrees of importance.

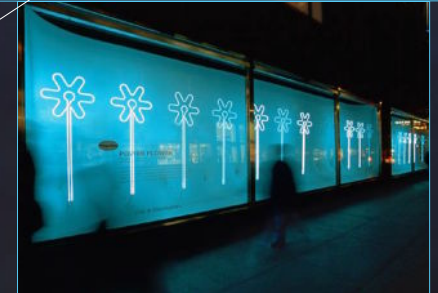
Visual chaos in *City, Signs, and Lights*, a 1971 policy study conducted by the Boston Redevelopment Authority.



In considering the static, *entity-controlled* environments that humans live in, I became particularly interested in the potential of integrating interactive technology into them. Computers have existed in a consumer form for only a slightly longer time than I have been alive, but there has been a dramatic change in the scope of their use. A large reason for this change has been a steady increase in the number of integrated circuits producible for a given cost. This was originally predicted by Gordon E. Moore in his paper titled "Cramming More Components Onto Integrated Circuits." Moore's Law, which states that the transistor density of semiconductor chips would double roughly every 18 months, has proven accurate through the decades, and has resulted in modern hand-held devices with the power that super-computers had in the 1980s. A similar but less dramatic reduction in cost-per-complexity has been observed in display and storage technology as well. All of these factors have allowed designers and engineers to integrate digital technology and interaction into the environment in ways that were previously impossible.

An example of this type of integration is an interactive exhibition from Germany called *Project Blinkenlights*. Project Blinkenlights made use of hundreds of computer-controlled lights to turn several building facades into massive bitmap displays. These giant displays were originally used to show simple animations, but later iterations of the project added interaction through the use of cellular phones. Passers-by were able to transmit their own messages and animations to the displays, and even use them to play classic arcade games against each other. The project succeeded in giving true communication capacity to the individual at a massive urban scale, albeit in a form more focused on entertaining than informing.

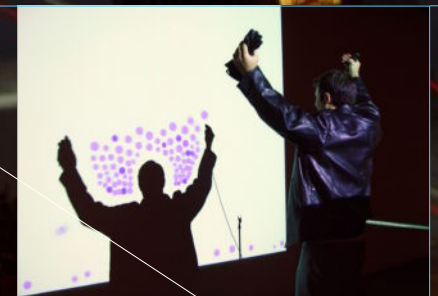
This and similar projects created by Ben Fry, Antenna Design, Golin Levin, IDEO, Ryota Kuwakubo, ART + COM\* and others made me interested in exploring other ways digital technology could be used to give the individual a voice in their surrounding environments.



Power Flower by Antenna Design



Composing by ART + COM



Mesa di Voce by Golan Levin and Zach Lieberman

Project Blinkenlights

## WAYFINDING AND THE ENVIRONMENT

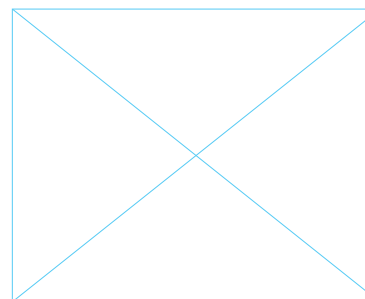
My creative project exploration began in earnest at the beginning of my second year in the graduate program. Having been encouraged to sharpen the focus of my thesis topic the previous spring, I began to search for an area of design in which I could examine connections between technology and the environment without too greatly limiting my creative freedom.

During my time as an undergraduate student, I had become interested in the top of Wayfinding for a number of reasons. Wayfinding incorporates the science of psychology, the physicality of environmental design, and the objectivity of information design. It is a rich and varied field with much potential for technological innovation and exploration.

I realized from the beginning that I couldn't become an expert in the science of wayfinding by the time I left graduate school. Instead, I would use the field of Wayfinding Design as a way of focusing my explorations of environment and technology.

My initial research led me to several important researchers in the areas of environmental design and urban planning. My initiation into the field began with reading Romedi Passini's works, *Wayfinding: People, Signs, and Architecture* and *Wayfinding in Architecture*. In these works, Passini, and his co-author Paul Arthur, formalize the principles of wayfinding psychology and discuss real-world concerns such as the role of language and accessibility.

While reading these texts, I also looked at texts on interaction design and human-computer use theory, including Donald Norman's *Design of Everyday Things*, Steven Johnson's *Interface Culture*, and Lucy Suchman's *Plans and Situation Actions*. I found numerous similarities between the human interaction and decision-making principles described in these texts and the behavioral wayfinding principles outlined by Romedi Passini and Paul Arthur.



LEFT: Paula Scher's work for the New 42nd Street Studios/Duke Theater in 2000.

Both fields include core concepts that involve the related models of optimizing and satisficing; the importance of cognitive maps or cognitive models; and associated problems of memorization and information referencing. A central problem in both interaction design and wayfinding design is how to make information available at the precise moment it is needed by users who need to make decisions and act upon them. Donald Norman describes this necessary information as "information in the world" – information that does not require memorization because it can easily be found when it is needed.

Wayfinding practitioners provide this information in the world by predicting usage needs and strategically placing information where they believe it will most likely be required. In many scenarios, such as in shopping malls, this method can work well due to the ease in which user needs can be predicted. In more complex environments, such as on a college campus, it is much more difficult to predict all possible patterns of use, leading to wayfinding signage that is either extremely limited in function or much too complex to be easily interpreted.

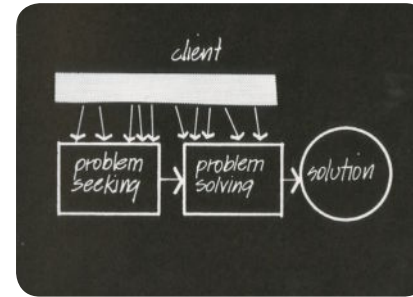
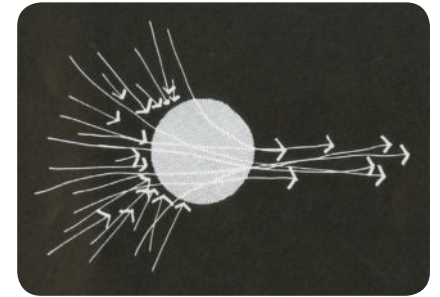
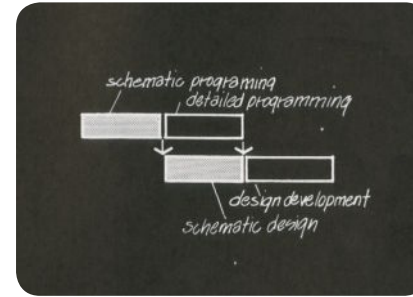




My introduction to the spatial and cognitive theories outlined by Romedi Passini left me with an intensified desire to look at other theories of environmental design and urban planning. Many sources I had read referenced *Images of the City*, by Kevin Lynch as an important contribution to urban design theory.

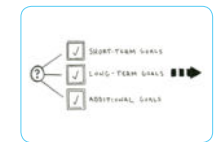
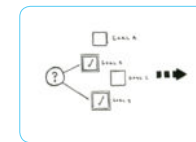
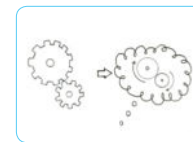
Primarily an urban design text, *Image of the City* seeks to understand the cognitive maps that people create through their experience of urban environments. By interviewing people living in large urban areas like Boston, Lynch arrives at the conclusion that our cognitive maps of cities are based on five distinct features: *nodes, landmarks, paths, edges* and *districts*. All of our perceptions of space, distance, and proximity are based on a cognitive map formed from our experience with these features. His theory also helps to clarify the methods that lead to memorable and enjoyable urban environments. The process by which Lynch dissects our experience of cities shifted my perspective from a holistic view to one focused on detail.

Christopher Alexander also views the city as a collection of intricately woven parts, all of which are based on the usage patterns. In *A Pattern Language*, Alexander describes the nature of cities, from their place within the whole of the planet, down to the most intimate details of their sidewalk markets and private sanctuaries. Alexander's writings reinforced the importance of cohesion, and encouraged me to examine the spaces I've created for myself and my reasons for doing so.

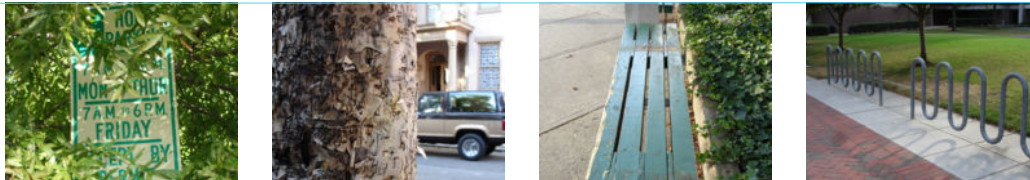


ABOVE:  
A sampling of Caudill Rowlett Scott's Analysis Cards.

BELOW:  
A sampling of Analysis Cards I developed during my Wayfinding and interaction design research.



Throughout my research I explored various methods of note taking and struggled to process all of the new information I was coming across. I discovered a conceptual representation method developed by William M. Peña of the architecture firm, Caudill Rowlett Scott, and described in his document, *Problem Seeking: New Directions in Architectural Programming*. Peña called his representational tools *Analysis Cards*, and says of them, "think about the essence of the message and put it to paper economically, using very few elements, using color for emphasis." A collection of analysis cards can be used by a designer to remember important concepts, or to help explain complex concepts to a client. I found this method to be very useful in my research, and it remained a significant tool throughout the remainder of the project.

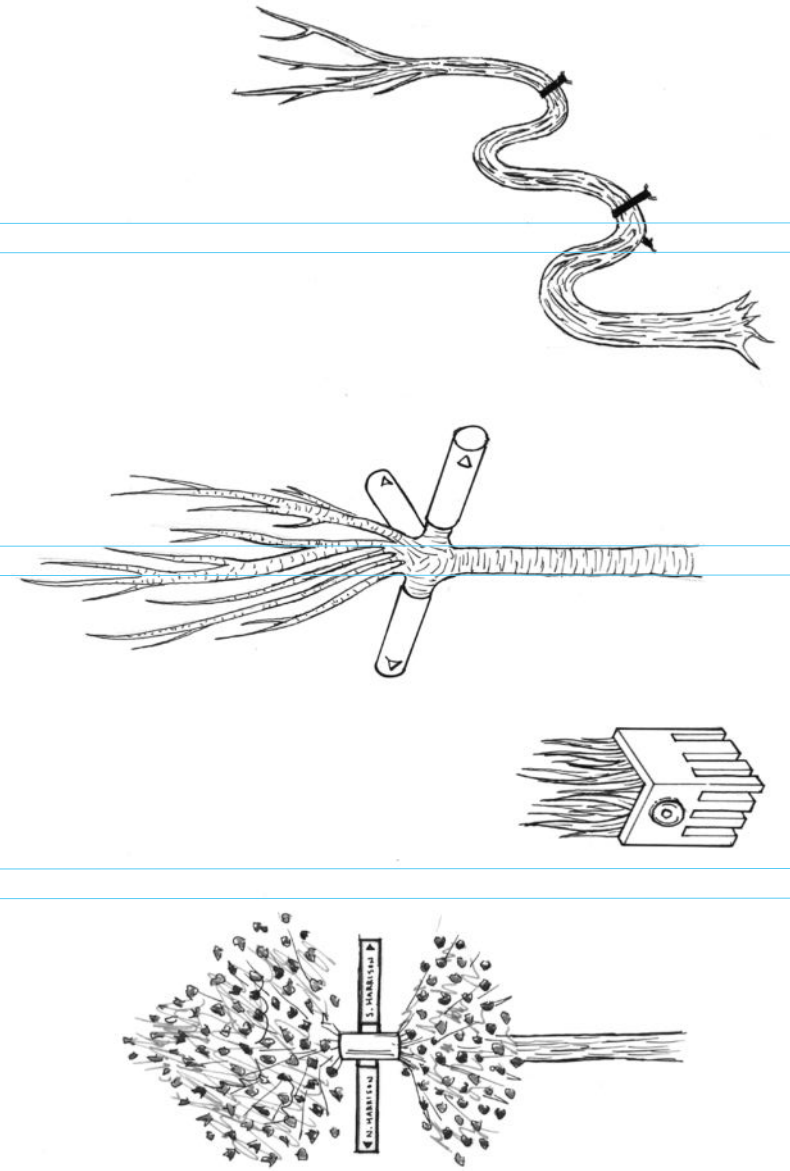
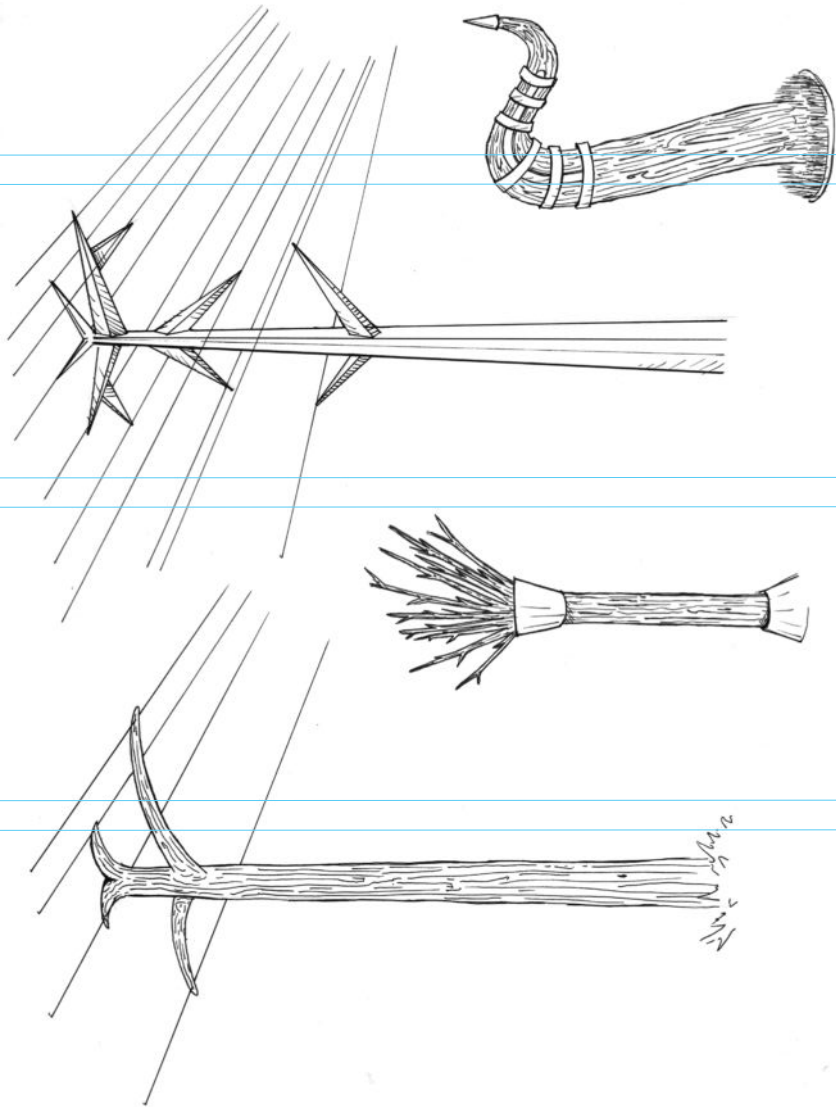


Photographic investigations of artificial and natural collisions in the Fan.

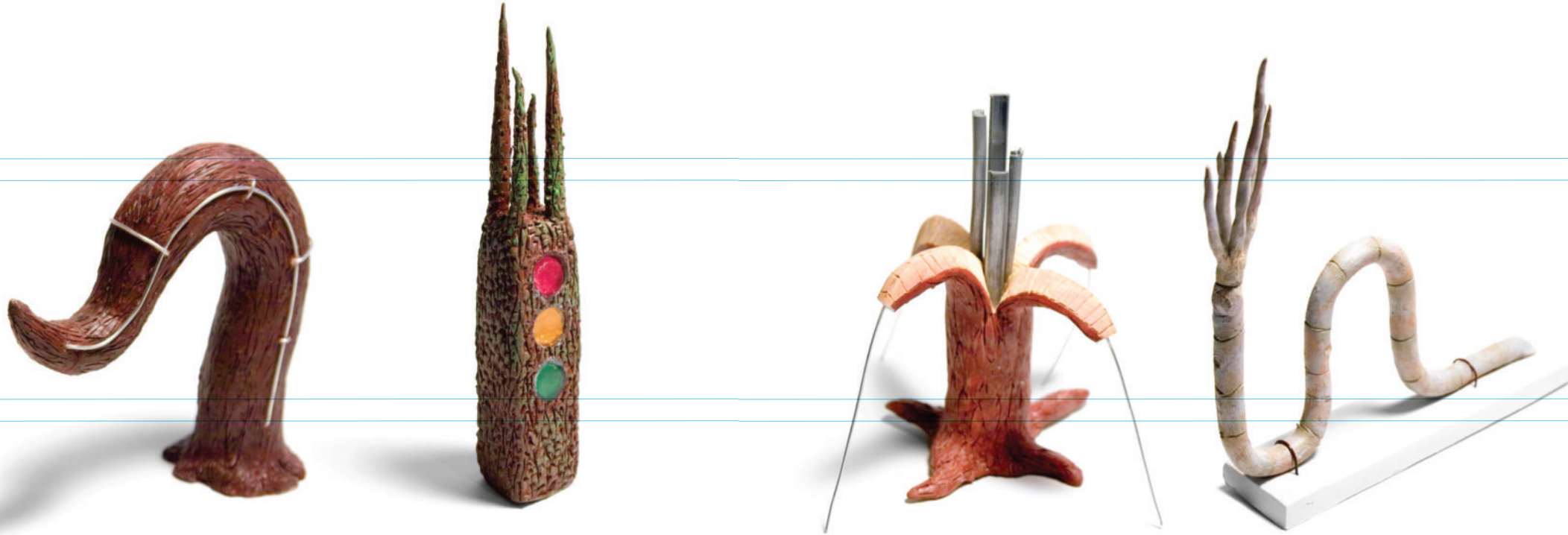
## EXPLORING MY ENVIRONMENT

I am a person especially prone to tangential thinking. Having been inspired by the writings of Passini, Lynch, and Alexander, I spent a good portion of my fall semester experimenting with the intersection of environment and design. Specifically, I was interested in several interconnected concepts: multi-functionality, the artificial versus the natural, and environmental integration.

The Fan area of Richmond, where I've lived for the past two years, is a lush, dense, urban environment where nature and construction are forced to live in harmony. This relationship stands in stark contrast to the carefully constructed (and often bland) suburban landscapes springing up all over my home state of Iowa and other areas around the country. In studying the Fan, I was fascinated by the intentional and accidental methods used to blend the natural organic qualities of plant-life with the required utilities of an urban environment. There are trees at street corners with stop signs nailed to them, street signage poles standing bare like dying plants, and telephone poles reaching up into the outstretched branches of nearby trees. I enjoy thinking about the circumstances that bring about these accidents and how the environment could have been designed with these inevitable outcomes in mind.

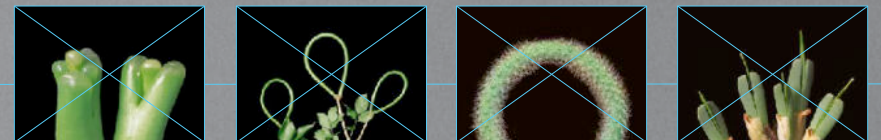






In my Fall 2005 workshop with Professor Wheeler, I looked at the relationship between “artificial” and “natural” elements of the urban environment. In an attempt to push the relationship to its extreme, I created a series of highly modified plants, disfigured or reconstructed into functional replacements for environmental objects that many would define as “unnatural” or “artificial”. Through these experiments I began to understand “natural” and “artificial” as interpretations of form or material, and not the result of origin.

KLONES, a computer-aided photographic series by Dieter Huber explores a similar connection between the natural and artificial. In a time when genetic modification is hotly debated, KLONES questions the unexpected beauty made possible through artificial processes and challenges the boundaries where this perception exists.

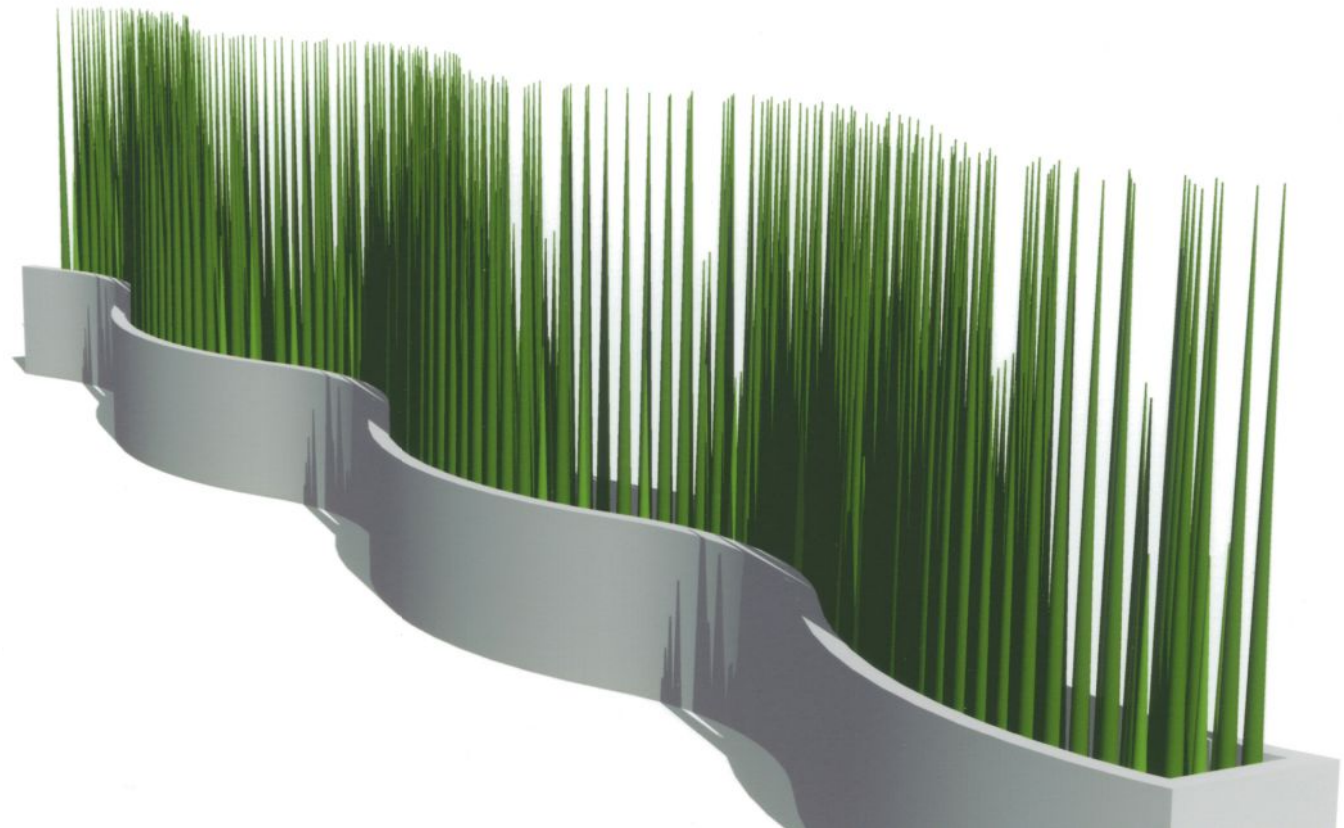
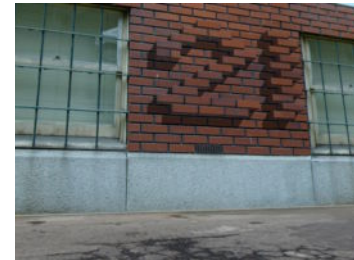
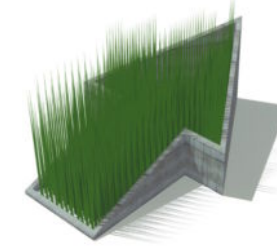






Richmond is full of objects with no overt visual purpose (telephone poles, power lines, iron fences) and others whose purposes have long ago become forgotten. Observing such objects scattered around my environment led me to consider alternate purposes for them and to think about the larger question of multi-functionality in environmental design. Additional functions for these found objects might include communicative capacity, diagrammatic utility, or anything else that could increase their useful lifespan or give additional functionality to their physical appearance.

I addressed these concepts through the environment of Richmond, turning fences into information graphics, power lines into path-finding tools, and sidewalks into communication tools. I also considered the use of landscaping as a subtle wayfinding tool and how plant-life can be integrated into existing environmental design.



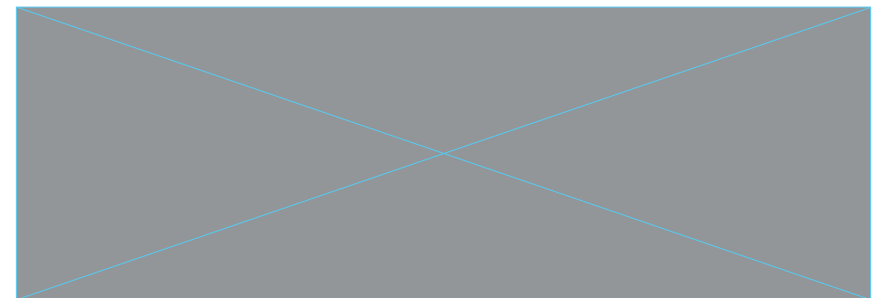
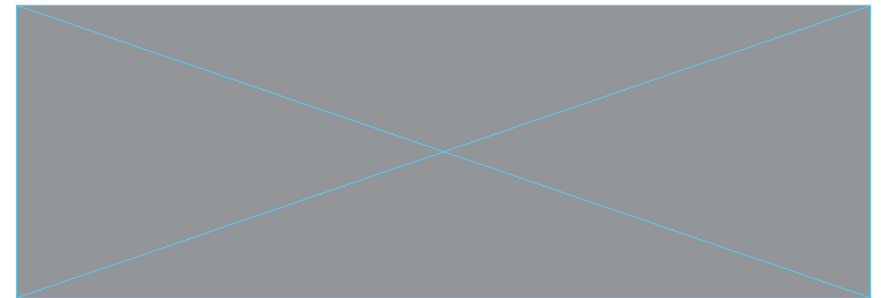
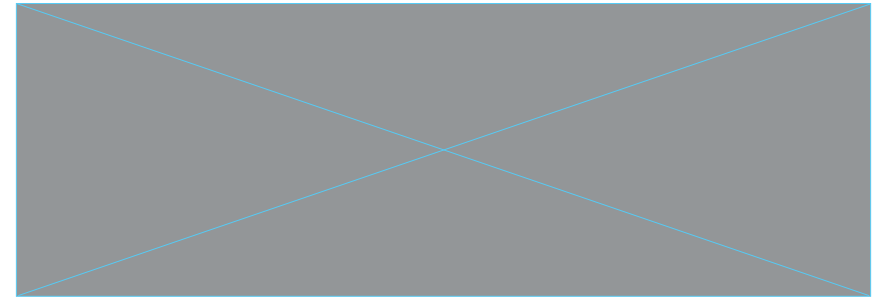
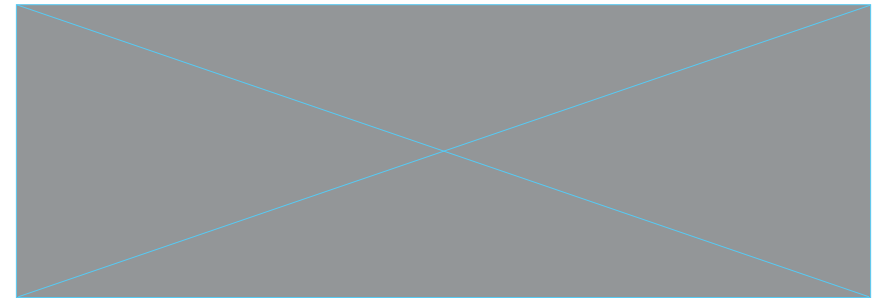
## INTRODUCING TECHNOLOGY

After spending time experimenting with environmental design concepts, I considered their relationship to my original project statement. My proposal had been to explore the potential of technology to influence our interaction with and within the environment. Technology, of course, could mean a large variety of things. The field of urban planning is based on the integration of technology with the natural environment to suit the needs of a large, centralized population. My concerns were not with the automobile, skyscraper, or paved road, however. My interests lied primarily in the use of digital technologies that enable electronic visual representation and communication to provide interaction between people, their surroundings, and the technology itself.

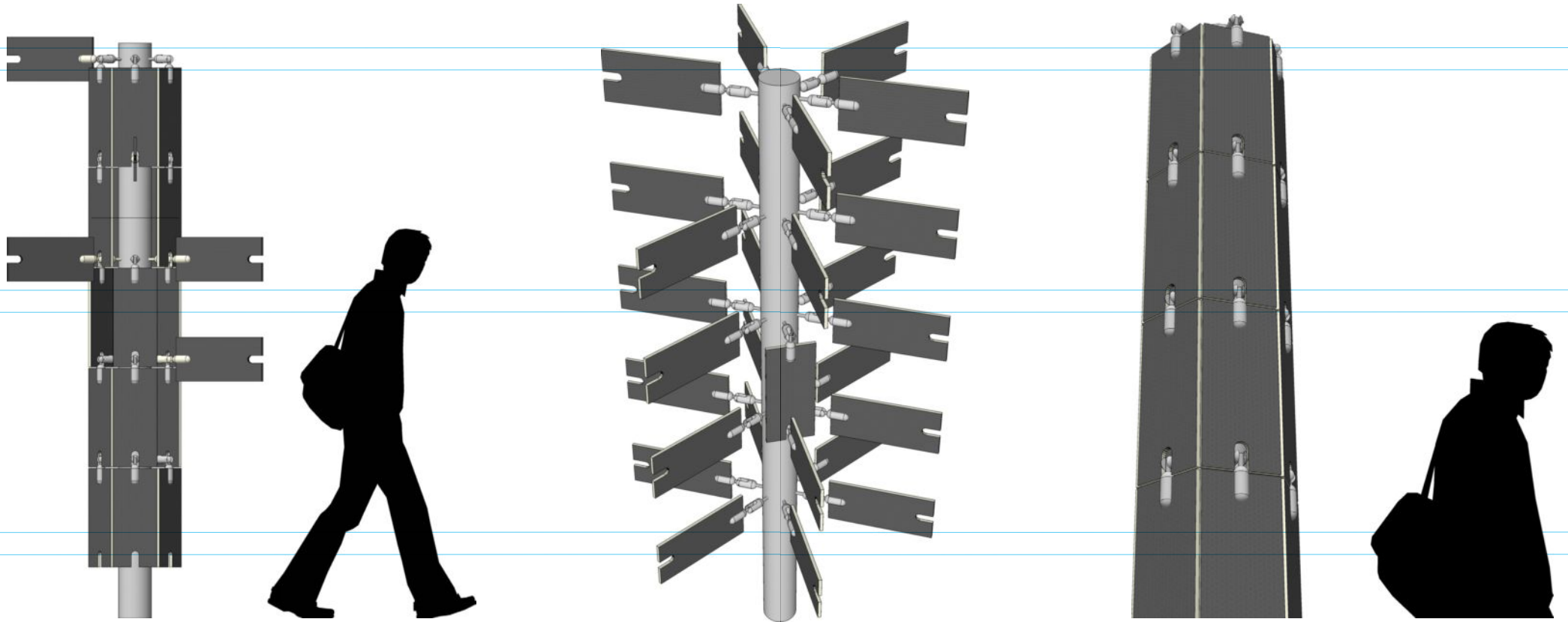
To these ends, I began exploring the integration of digital technology into the environment, using the language of signage and environmental design. I decided to use the VCU Monroe Park campus as a hypothetical testing ground, and to consider the needs of its inhabitants. Focusing on the campus environment provided me with a unique set of limits. The audience would be a diverse set of students and faculty with varying routines and interests. I would need

to create a system that would allow for a diversity of functions that would be simple and easy to use.

Setting the project in the campus challenged my ideas of what wayfinding in such environments is intended to achieve. While students can be significantly confused at the beginning of their freshman year and the beginning of each semester about the organization of their environment, primary campus locations are quickly internalized and the need to find new locations diminishes quickly as a routine is established. For this reason, it was important that I looked for a solution that addressed my previously defined concepts of "multiple-functionality" and "evolving purpose." The project would need to be designed so that new uses could be developed throughout the lifecycle of the system, and that multiple uses would be possible as the needs of individual users shifted.



## DIGITAL SIGNAGE

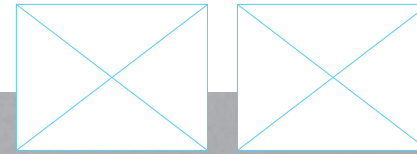
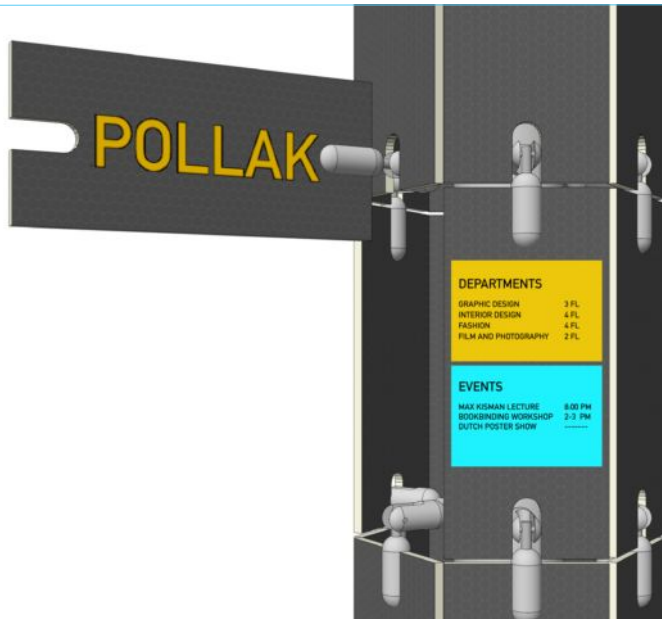
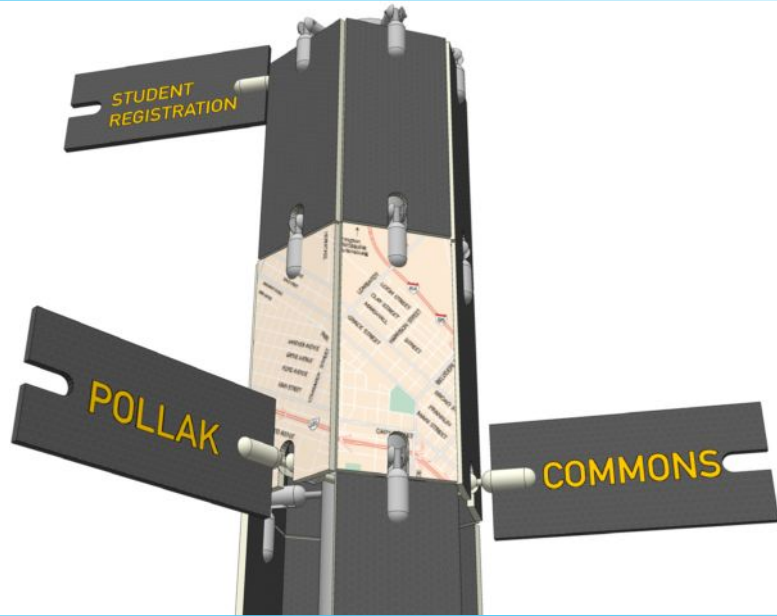


Early digital sketches of a Digital Signage system.

My first solution to the problem of integrating wayfinding and digital information technology was an interactive signage system, called *DigiSign*, that was both sculptural and mechanical. The system consisted of several components working in harmony, and was designed to serve as a wayfinding and communication tool as well as providing convenient access to useful information.

The primary components are digital pillars holding an array of uniformly sized LCD panels. Each display panel can be rotated on an actuating arm allowing it to project outward directionally, or lie flat in concert with the other displays. This arrangement allows for a wide variety of functional combinations. Each individual panel can be rotated outward to simulate the function of directional signage, or the entire network of panels can transform the pillar into one large display.



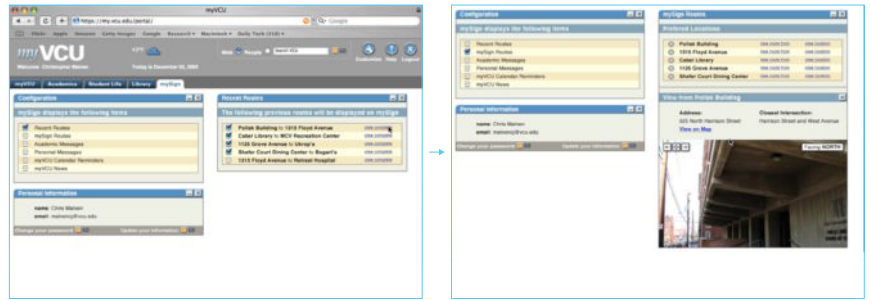


The decision to use digital displays allowed for an improved quality and increased range of functions over traditional signage. In an environment where the purposes of buildings are constantly changing, such a setup would allow the system to be used to guide users to events and locations currently taking place, or to locations specifically requested by them. A wireless network connection to the system would allow the content of the signs to be changed remotely as needed, or for information to be sent to and retrieved from the system by users in other locations.

I became most interested in the ability of such a system to connect directly to users. As I've described earlier, any fixed information system in the environment is only as useful as its ability to predict what information a user will need at the time they encounter it. Giving users the ability to tailor environmental information to suit their needs would enhance the functionality of the system.

Another key component of DigiSign is the interface that allows users to interact directly with it. I had considered integrating DigiSign with various hand-held devices such as mobile phones and PDAs. I decided, however, that I did not want interaction with the system to require ownership of any specific technology for fear that this would reinforce economic status as a defining characteristic of the user population. Students in the Monroe Park campus all have access to computers however, and presumably most are familiar with web-based interaction. This led me to focus on the internet as a way for individuals to interact with the system.

All students in the university have access to a Web-based information portal provided by the University called "myVCU." This system is intended to serve as a repository for all of the information students will need during their time spent at VCU such as personal and university calendars, email, instant messaging, and library access. The system seemed like an ideal place to integrate an additional component related to my digital signage system that would allow users to manage the various types of information they might like to access from the physical signage system itself.



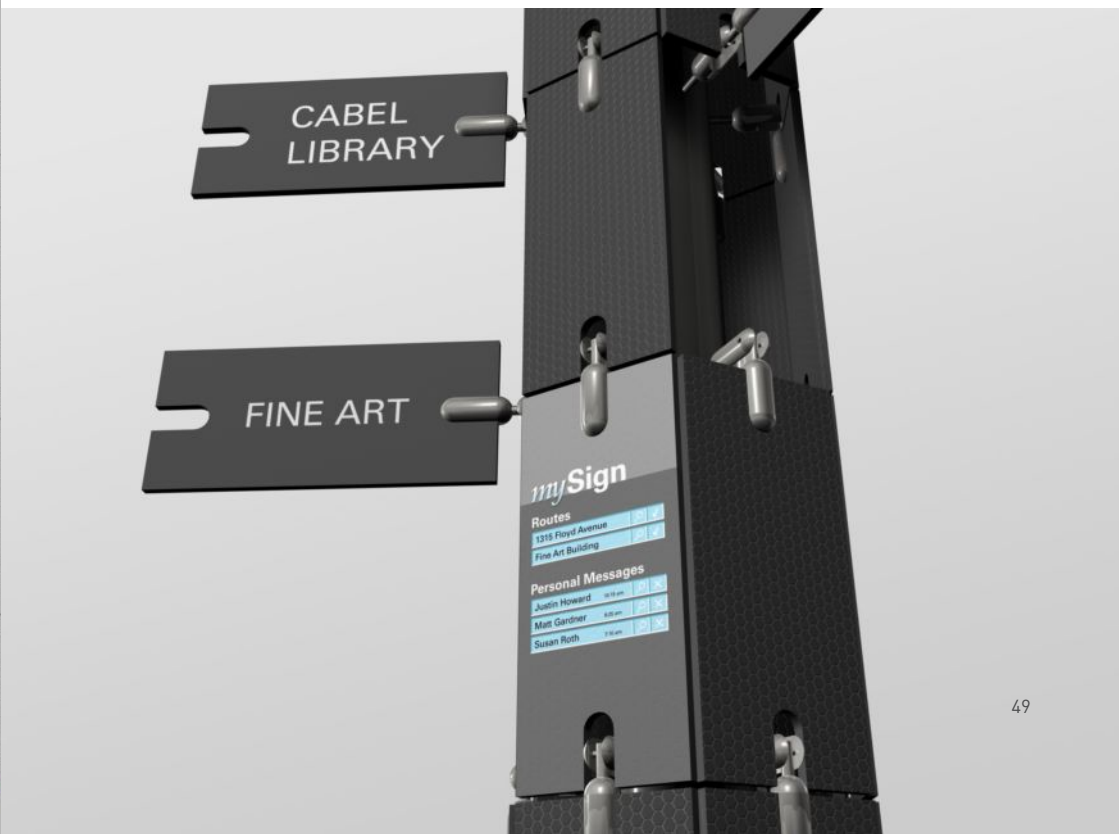
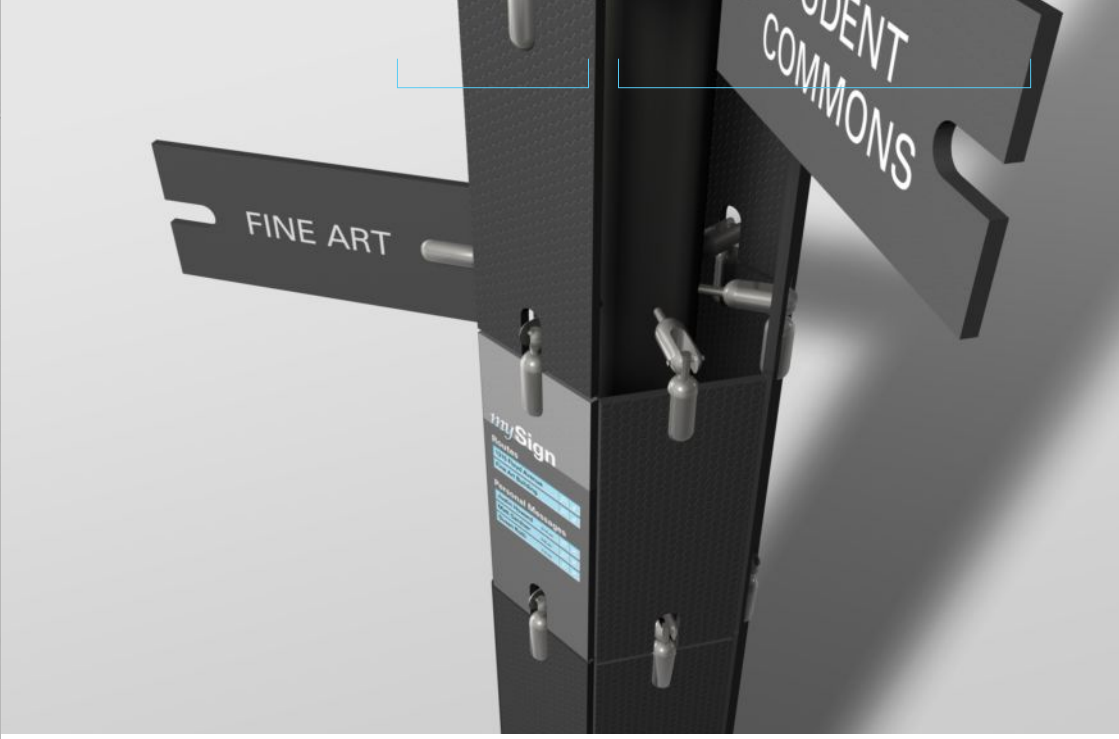
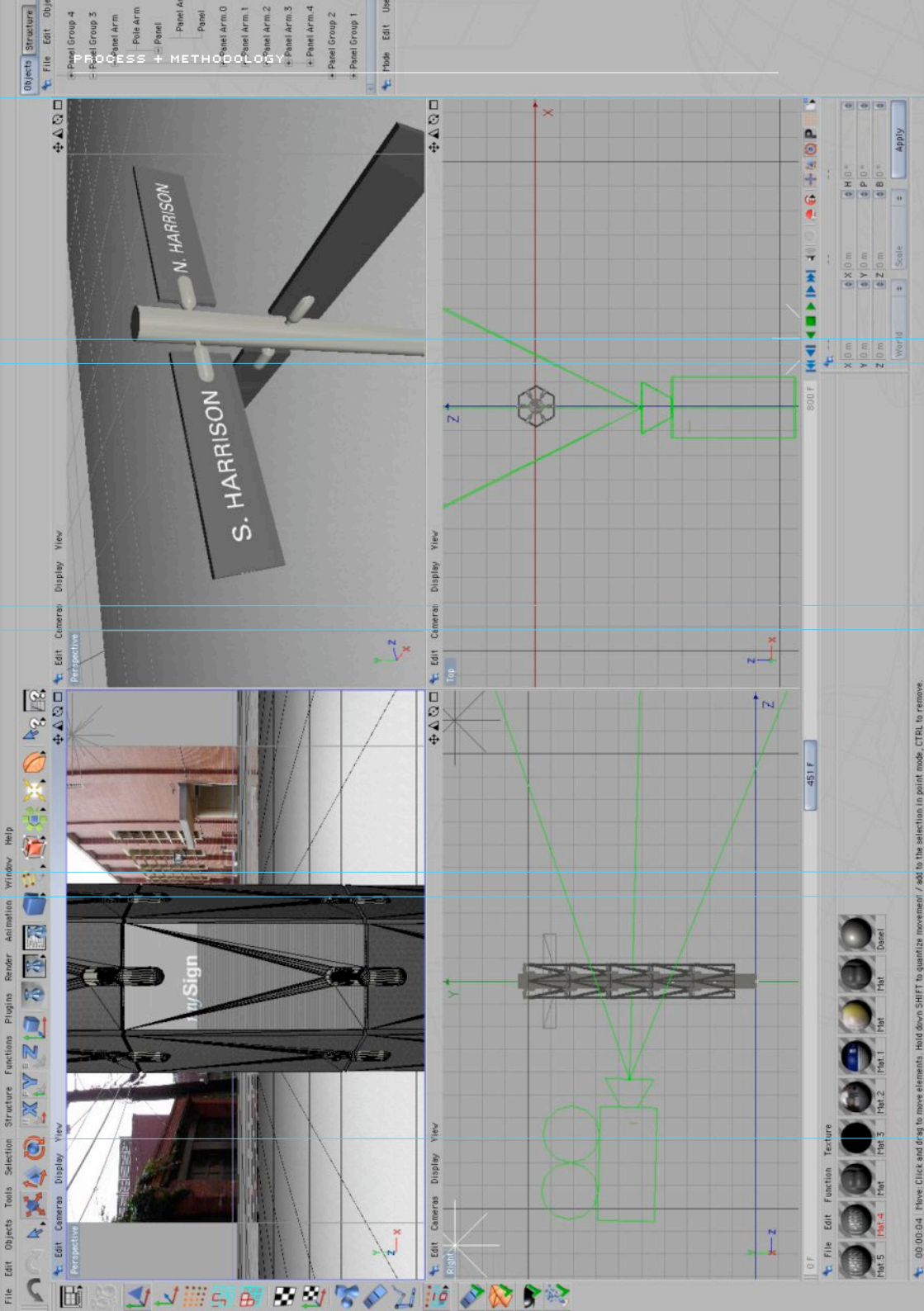
After using this web component, which I named *mySign*, users could access a variety of information simply by approaching the signage system. The system would recognize individuals as they neared, possibly through the use of a Radio Frequency Identification (RFID) tag embedded in each student's VCU card, and bring up a welcome screen for that user. After entering their PIN number, the user would be given access to all of the information entered into *mySign* via the Web, such as messages from students and faculty, or information on the location of events that may be of interest to them.

## REPRESENTATION

Designing this system was quite a challenging and exciting process, but deciding how to visually represent and simulate the interactions with the system presented an additional problem. Although I had worked with some basic three-dimensional modeling programs before, I wanted this project to be visualized in a way that would be as realistic as possible. I wanted to be able to see the animated quality of the signage system in action and to illustrate its use in a way that would truly bring the system to life. I also worried that the technological projections of the project would lead it to be dismissed by many as a fantasy. I didn't know how far into the future such a system would become possible, nor did I work on it with immediate feasibility in mind, but I felt that a realistic presentation of the idea would increase the likelihood of its acceptance.

Toward the middle of the project I began experimenting with various 3D animation software packages, carefully judging their capacities and learning curves. Many popular 3D software programs are only available for Windows (*3DStudioMax*) or are expensive and difficult to learn (*Maya*). I eventually settled on *Cinema4D*, a deep and capable program with a learning curve that I felt I could tackle in addition to the creative work of my thesis.

Three-dimensional animation proved to be much more time-consuming than I had originally anticipated, but rewarding enough that I felt it was worth pursuing. My representation of the digital signage system followed an approach similar to that used in the final presentation of my Gaea system; a brief series of animations that described the project in limited detail, but enough to inform the viewer of the key concepts and overall spirit of the project.





## WHO AM I WORKING WITH?

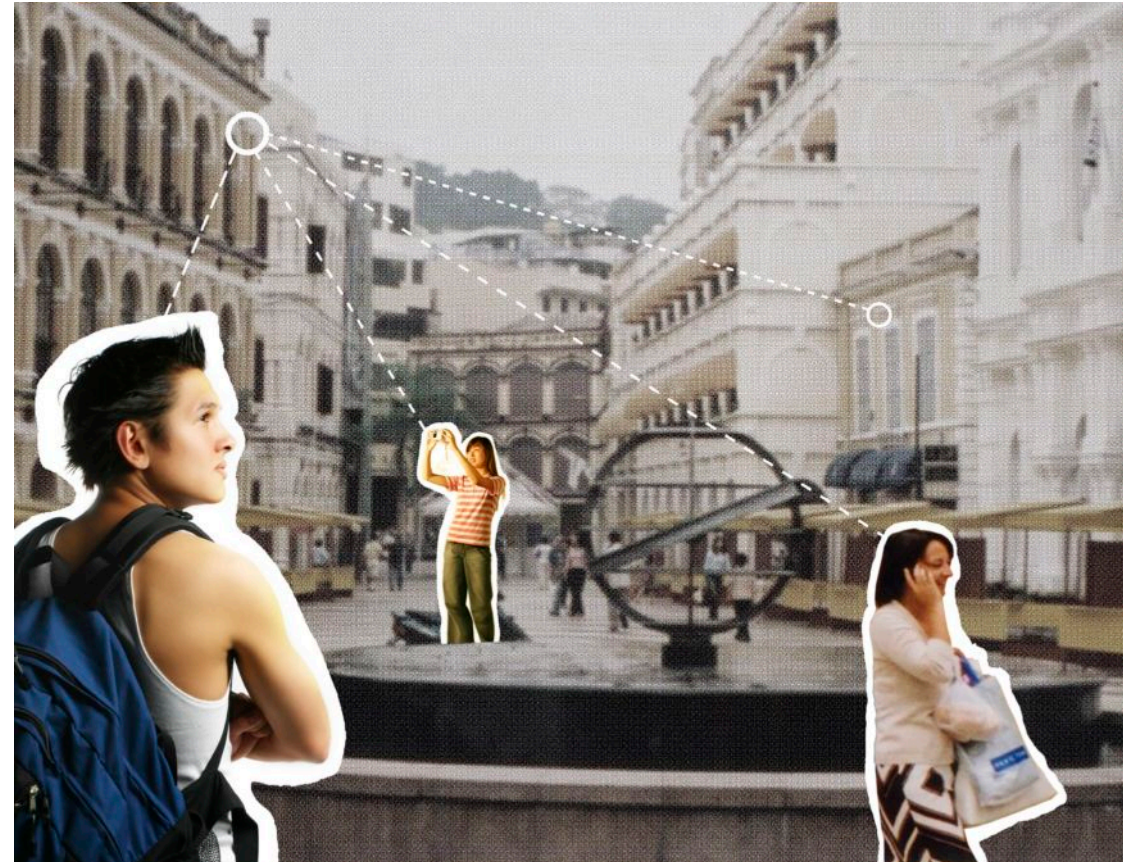
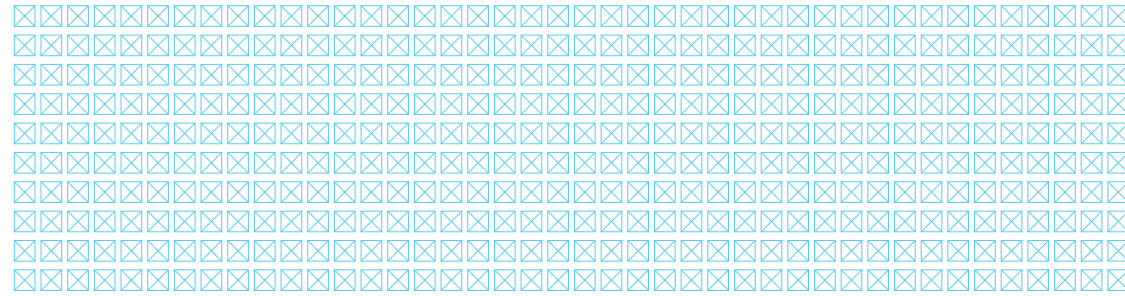
The DigiSign project brought my focus back to the importance of the user. Building interactivity into physical spaces is only purposeful if it brings something new and important to the users of those spaces. I realized that if I continued to focus solely on wayfinding issues, I would be forced to ignore other important needs of campus users. Unfortunately, at this time I didn't know what the needs of on-campus users were, although I'd come to discover some of them during my time spent working on the digital signage system.

Virginia Commonwealth University is host to roughly twenty seven thousand students from a variety of backgrounds. The university offers degrees in 127 different programs. Many of the students enrolled in the university live off campus, and many work part-time or full-time in addition to their course load.

The activities of campus users change depending on their department, social network, and personal interests. There are also distinct differences between the needs of faculty, staff and students. To limit the scope of the project I decided to target students as my primary audience.

Campus-related activities can be broken down into several categories: academics, social life, interests, and administration. Academic information includes anything relating to classes, projects, or educational requirements. Social life refers to personal communication and interaction with others on campus. Interests include hobbies, events, or any other activities that are in addition to a student's educational requirements. Administration encompasses any of the maintenance tasks that need to be performed by students such as registering for classes, paying student bills, or visiting the student health center.

For students, these spheres of information frequently overlap as academic life and personal life become indistinguishable over time. Many tasks within these categories revolve around either information access or personal communication. Deciding where to meet your friends, knowing what to study for a test, finding a good place to get Chinese food, choosing a new roommate, or making an appointment with a physician are all activities that revolve around these basic concepts.





In my research into behavioral observation techniques I was particularly impressed by the work of IDEO. IDEO is an internationally recognized design firm that is well known for its user-centered design approach and its ability to integrate observational data into real-world design solutions.

I had previously attended two IDEO lectures, once when I was an undergraduate student at Iowa State University, and once at the Tasmeen Design Conference in Doha, Qatar. As a result, I was familiar with their core design philosophy and some of their better-known projects. IDEO aims to “keep people at the center of the design process” through a dedication to observation, inquiry, participation, and communication with potential users.


IDEO also makes efforts to inform the design community about the importance of their user-centered design process. They have published numerous reports and books documenting their methods, and have recently published a set of “Method Cards” for use by aspiring and practicing designers who want to incorporate IDEO’s methods in their own work. I selected a handful of methods from these cards that I believed would be useful in my research.

Ideally, research methods similar to those used by IDEO should involve the participation and observation of strangers, ensuring a diverse population from which to obtain information. This would be especially important when analyzing a group as varied as a campus population. Unfortunately, guidelines imposed by VCU’s Office of Research Subjects Protection prohibit this type of research without a lengthy review process. Without time for such a review, I decided to collect information from openly available sources, personal recordings, and a small survey given to acquaintances and “friends-of-friends.”



**Instructions**

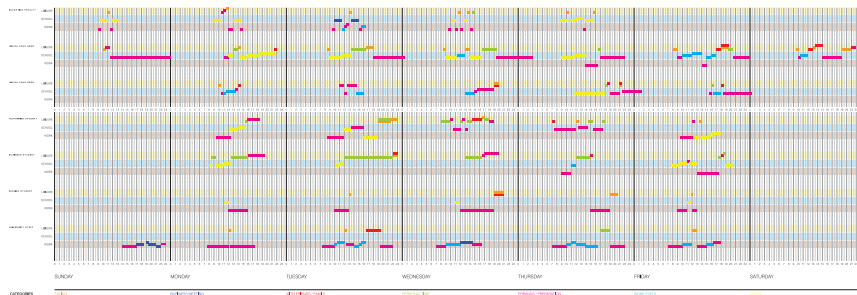
- Begin participating on any day of the week after you receive these materials. Please continue for a 7 day period.
- Each day, start with a clean form. One has been provided and labeled for every day you are to participate.
- Every time you change location or activity, please make a record of it. Even if you stay in the same building, but change your activity, it should be recorded.
- If you are moving from one campus building to another, please indicate the names of the building. When you move to or from a business outside of campus, please record the name of the business.
- Personal addresses or locations off campus do not need to be specified. Please indicate "Personal Address" when moving to or from the residence of yourself or an acquaintance. Please list indicate "Off campus" when your destination is outside of the area of the provided map.



- 1 These large letters indicate a change in activity or location. Every time you change locations or change activity, make a new entry by the next letter.
- 2 Enter your new location in this space.
- 3 Enter your new activity in this space. Be as specific as you like.
- 4 Enter the time you change location/activity here.
- 5 If the new activity is something you have not planned on doing all day, check "Yes". If it is something you did not anticipate doing, check "No".

**EXAMPLE FORM**

<b>A</b>	World Cup cafe coffee and breakfast before class	TIME 8:30 am
<b>B</b>	Pollak building Class	TIME 9:40 am
<b>C</b>	Pollak Building Printing flyers in the Pollak Graphics Lab	TIME 11:30 am
<b>D</b>	Student Commons Meeting a friend for lunch	TIME 12:10 pm
<b>E</b>	Personal address forgot books for next class	TIME 12:45 pm
<b>F</b>	Temple building Math class	TIME 1:00 pm
<b>G</b>	Off campus	TIME 1:50 pm
<b>H</b>	Pollak Building Class	TIME 3:00 pm
<b>I</b>	Cabell Library Studying and reading magazines	TIME 4:30 pm
<b>J</b>	Anderson gallery exhibition opening	TIME 5:00 pm
<b>K</b>	7-11 getting a snack	TIME 5:45 pm
<b>L</b>		TIME



TOP: Pages from the Campus Use Survey.

BOTTOM: Information Graphic mapping survey results.

## CAMPUS USAGE SURVEY

I distributed a survey that was intended to obtain information on the ways people use their time on campus. Participants included undergraduate and graduate students from various majors, as well as a few VCU employees. Each member of the survey group was provided with a packet containing instructions and the forms they would need. For one week, they were asked to record all of their campus activities, and to indicate whether or not each activity was planned in advance.

I broke down the results of the survey by type of activity and plotted them chronologically. The resulting graphic made it easy to compare, contrast and classify different types of behavior. The level of participation was so small that I couldn't assume the data reflected the campus population as a whole, but the study indicated a wide range of usage characteristics. For example, some individuals spent the majority of their time on campus, while others were there only for scheduled classes or work. The level of non-academic activity also varied greatly between individuals, and very little of it took place on campus.

A few buildings, as expected, revealed themselves to be especially popular with the survey group. Cabell Library saw more on-campus activity than any other location, followed by the Student Commons. No other buildings saw notably large traffic. I wasn't surprised by this result since the Library and Commons are designed for all-hours use.

A larger and more diverse sample population might have made the survey more valuable. Asking participants to map the paths they used to get from one activity to another would have been useful, although this would have made the survey more complicated to complete. Despite these shortcomings, the organization, distribution, and analysis that the study required was valuable experience and will help with similar work in the future.



## MAPPING BUILDING USE

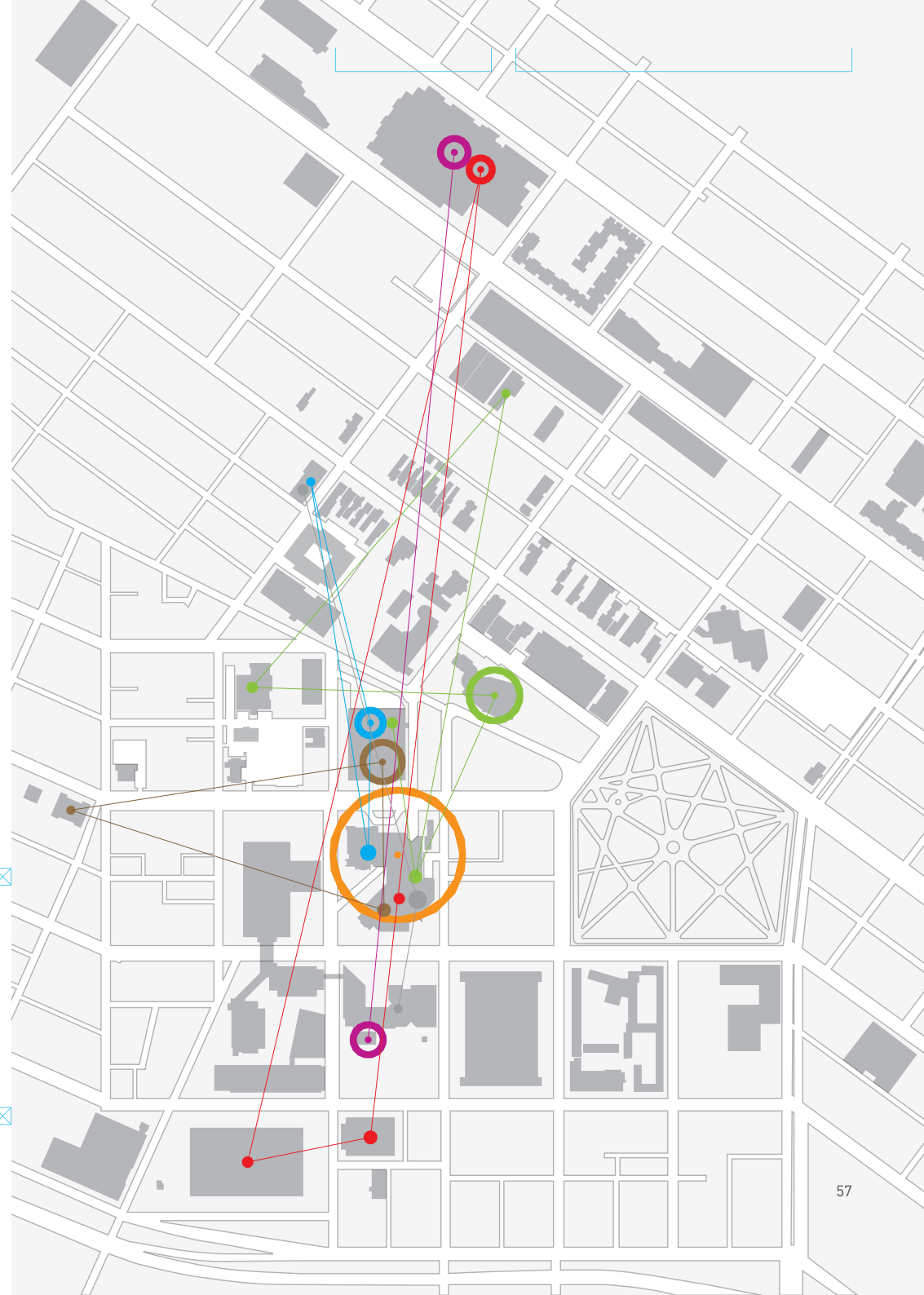
To find out more about which campus buildings are used most often and what they are used for, I looked to a readily available source: the VCU online calendar. I recorded the time of all events occurring for the past six months as well as their location and the type of activity that was involved. I superimposed my findings onto a map of the campus, placing a colored circle with a diameter that corresponded to the number of events of a given type that occurred at that location.

The resulting map shows the popularity of specific buildings for certain types of events. Most often these correlations are expected, such as the Student Commons being used most often for student events, or the Singleton Center for the Performing Arts being used most often for Arts and Music events.

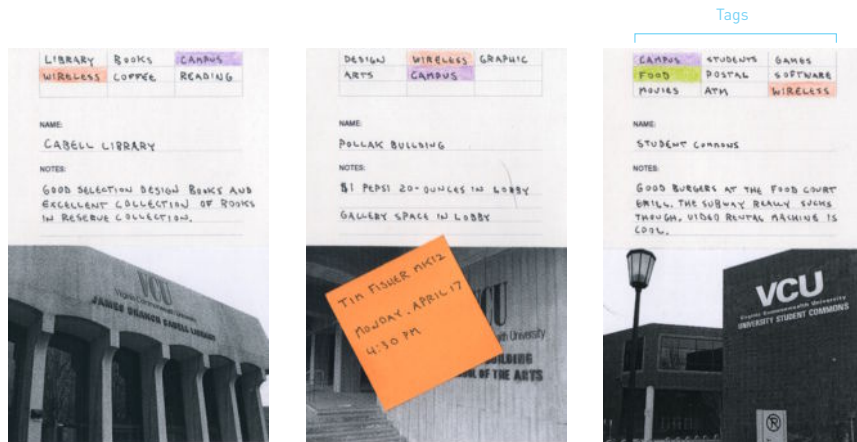
The results indicated additional useful information, such as what types of activity occur most frequently on campus and where those activities are held. It also demonstrated how little the VCU Online Calendar is utilized for advertising certain types of activities. For instance, the Music and Theatre departments have use the calendar a lot, while the other departments in the School of the Arts use it very little. Similarly, University departments use the calendar much more than student groups. I saw this as being an important indication that it is too difficult to obtain information about campus activities, and possibly a reason why students spend so little non-academic time on campus.



- student life
- academic + research
- recreational sports
- arts + culture
- staff life
- athletics
- other



## MAPPING PERSONAL LOCATIONS



As a final component of my research of campus use, I began to record information about every location I visited. To facilitate this process I created a template that could be printed onto 4" x 6" index cards with spaces for the name of the location name, personal notes, a photograph, and a special area reserved for tags. Tags are a concept borrowed from the world of social software, and made popular by websites like del.icio.us. Tags are user-created meta-data: words or phrases that are added to an object, website, or in this case, location, to make information about it easier to find and/or catalog.

The advantage of tags in social software is that, unlike formal taxonomies used in search engines such as Yahoo, or by the Dewey Decimal System, their use doesn't require prerequisite knowledge of the organizational system. Anyone can tag things by using words they find appropriate. This is also the disadvantage of tags; their use is so open that they can be approached in different ways, decreasing their usefulness for finding information. For example, I would tag Richmond's James River with the words beach, biking, and pollution. Another person might tag the same location with kayaking, fishing, and flooding.

Below is a tag cloud from del.icio.us

Size corresponds with popularity, and red indicates a tag that I have used.

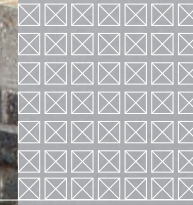
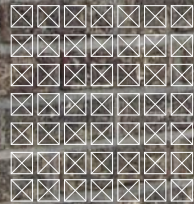
advertising ajax america **apple** **art** article articles audio beauty **blog** **blogs** books breast **business** california club clubs community **computer** cooking cool **css** culture daily **design** development diy download education email entertainment equipment finance firefox fishing fitness **flash** food **free** freeware fun funny games **google** graphics gyms hardware **health** home hosting **howto** humor illustration inspiration internet java **javascript** jobs lake library lifehacks **linux** **mac** magazine maps marketing media microsoft mobile money movies mp3 **music** network new **news** north online **opensource** **osx** people personal photo **photography** photos **php** podcast politics porn **programming** radio rails ranthealth.com read recipes **reference** religion research resources reviews rss ruby rubyonrails science **search** security **shopping** social **software** sports states storage teaching **tech** technology tips **tools** toread torrents **travel** **tutorial** tutorials tv united **video** walking **web** **web2.0** **webdesign** website wiki windows women wordpress

Clay Shirky best describes the reason tagging, or folksonomies, have been so successful:

“The advantage of folksonomies isn't that they're better than controlled vocabularies, it's that they're better than nothing, because controlled vocabularies are not extensive to the majority of cases where tagging is needed... This is something the 'well-designed meta-data' crowd has never understood... the cost of tagging large systems rigorously is crippling, so fantasies of using controlled meta-data in environments like Flickr are really fantasies of users suddenly deciding to become disciples of information architecture.”



This process led me to a new understanding of the campus environment: the importance and value of a campus is in its culture of learning and information sharing. One of my primary reasons for coming to graduate school was to be surrounded by curious, talented individuals and to immerse myself in a culture of discovery.



Everyone on a campus shares the need to discover, and the process of discovery changes from location to location. There is value in the ability for people to easily share information and discovery with others, and as social software has shown, networked technology can make information sharing a very powerful thing.



REALIZATION

To facilitate my exploration of design possibilities I developed an environmental interaction morphology. This tool allowed me to quickly consider combinations of form, input, and feedback in my sketch-book. Sometimes I would begin a sketch with an intended purpose in mind, and other times I would use the morphology to generate a form and then consider afterwards its functional implications.

Sketching allowed me to quickly visualize difficult concepts, and the brevity of each sketch forced me to describe only the basic functionality of each idea. I considered entire systems, ways of representing visual interaction, methods of mapping, and relationships between users. Some ideas clearly stood out, and many others showed promise for consideration at a later time.

REPRESENTATION 2.0

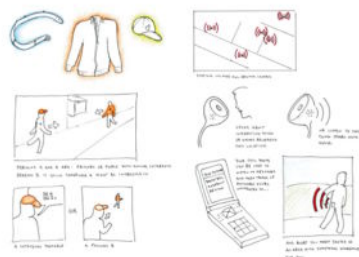
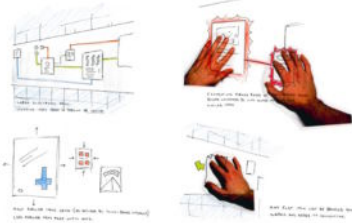
I knew that I couldn't explore many of these ideas fully within the time I had, since I had spent a significant portion of the previous semester developing the DigiSign system. Rather than select one idea to be refined into a full-realized solution, I decided to select several ideas that I would develop and show in simple conceptual form. I did not believe there was any one "correct" solution to the issues raised by the project; my goal was to raise issues and possibilities for consideration, and explore how positive relationships between information, technology, and environment could be formed.

The resulting representations were designed to be viewed in the Anderson Gallery during my MFA exhibition. This required them to be succinct, visually captivating, self-explanatory, and representative of the nature of the project.

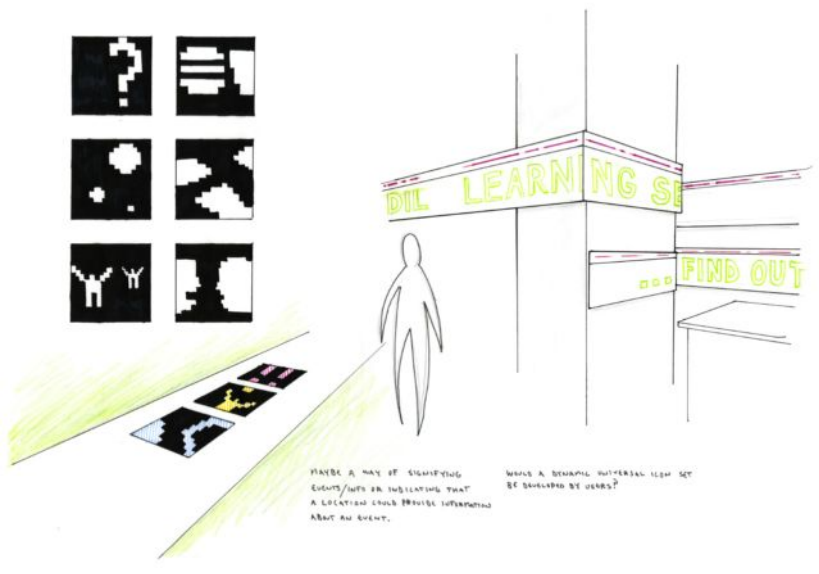
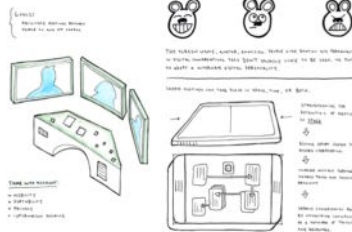
An interaction morphology to use in my sketching.

Interaction	Feedback	Material	Orientation	Form
voice	sound	concrete	above	panel
pushing	voice	glass	below	embedded
sliding	echo	plastic	under	distributed
lifting	electronic	stone	along-side	existing
turning	vibrational	metal	carried	animated
touching	touch	fabric	floating	graphic
holding	vibration	paper	suspended	architectural
gesture	force	composite		natural
movement	restriction	organic		enclosure
looking	movement	electric		
following	texture	digital		
taking	sight			
	light			
	color			
	movement			
	reconfiguration			

SPRING INFORMATION SPACES



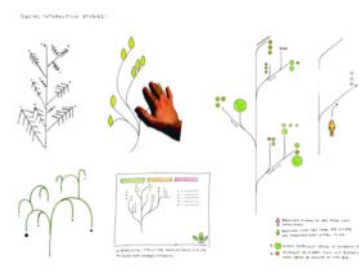
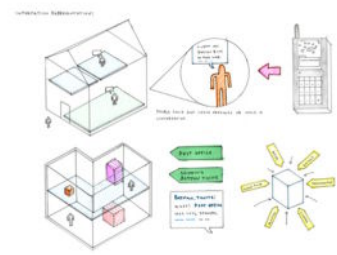
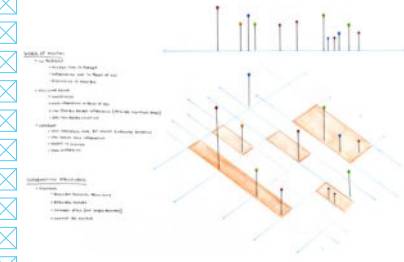
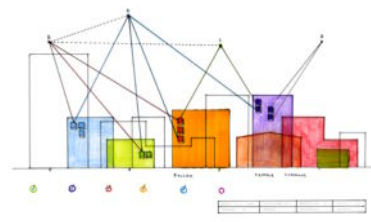
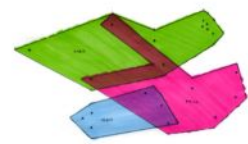
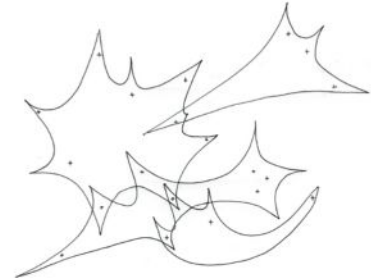
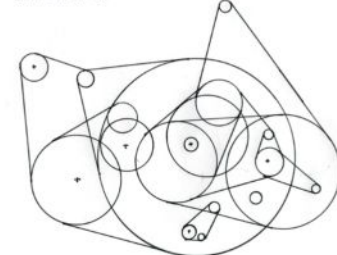
SPRING INFORMATION SPACES



PLANT A MAY OF SIGNIFYING  
CULTURE/INTO OR INDICATION THAT  
A SIGNIFIED THING THROUGH INFORMATION  
ABOUT AN OBJECT.

WHICH A DYNAMIC MULTIMEDIALE LEAR SET  
BE DEVELOPED BY USERS?

MAPPING:  
EXPERIENCE



META-ENVIRONMENT

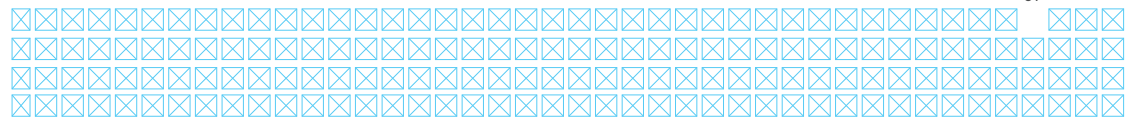
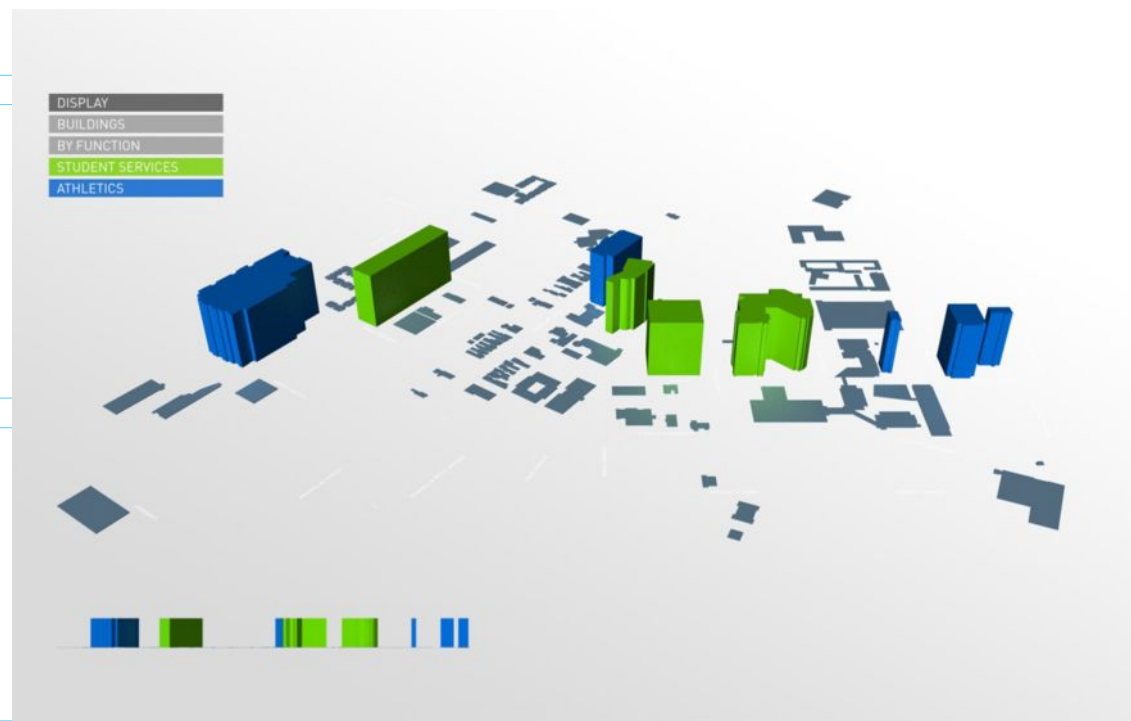
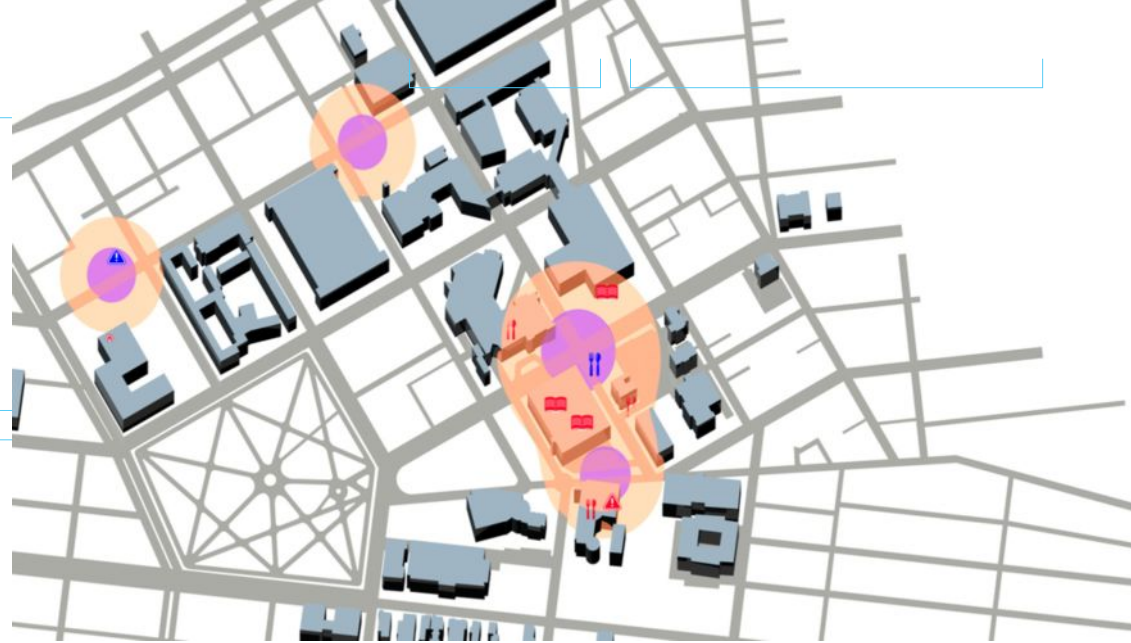
My first series of animations explored the idea of environmental meta-data. I took the concept of location tagging from my earlier research and imagined it being used by many individuals across a campus environment. Users would tag locations and events to help themselves recall them later, and to help other people discover this information. People would want to share only certain items with friends, keeping others private. Other items would be considered not too personal and would become accessible to anyone on the campus.

There are many ways to represent this kind of information. In one representation I considered each user to be within a bubble. As these users are observed navigating the campus, we can see locations and events that they have tagged within their bubble. As users get close to each other in physical space, their bubbles overlap and they are able to see the contents of each other's tags. The purpose of this approach is to encourage discovery of information and interaction between individuals. I can imagine such a system being used by friends to keep in touch and share interesting things, used as a tool related

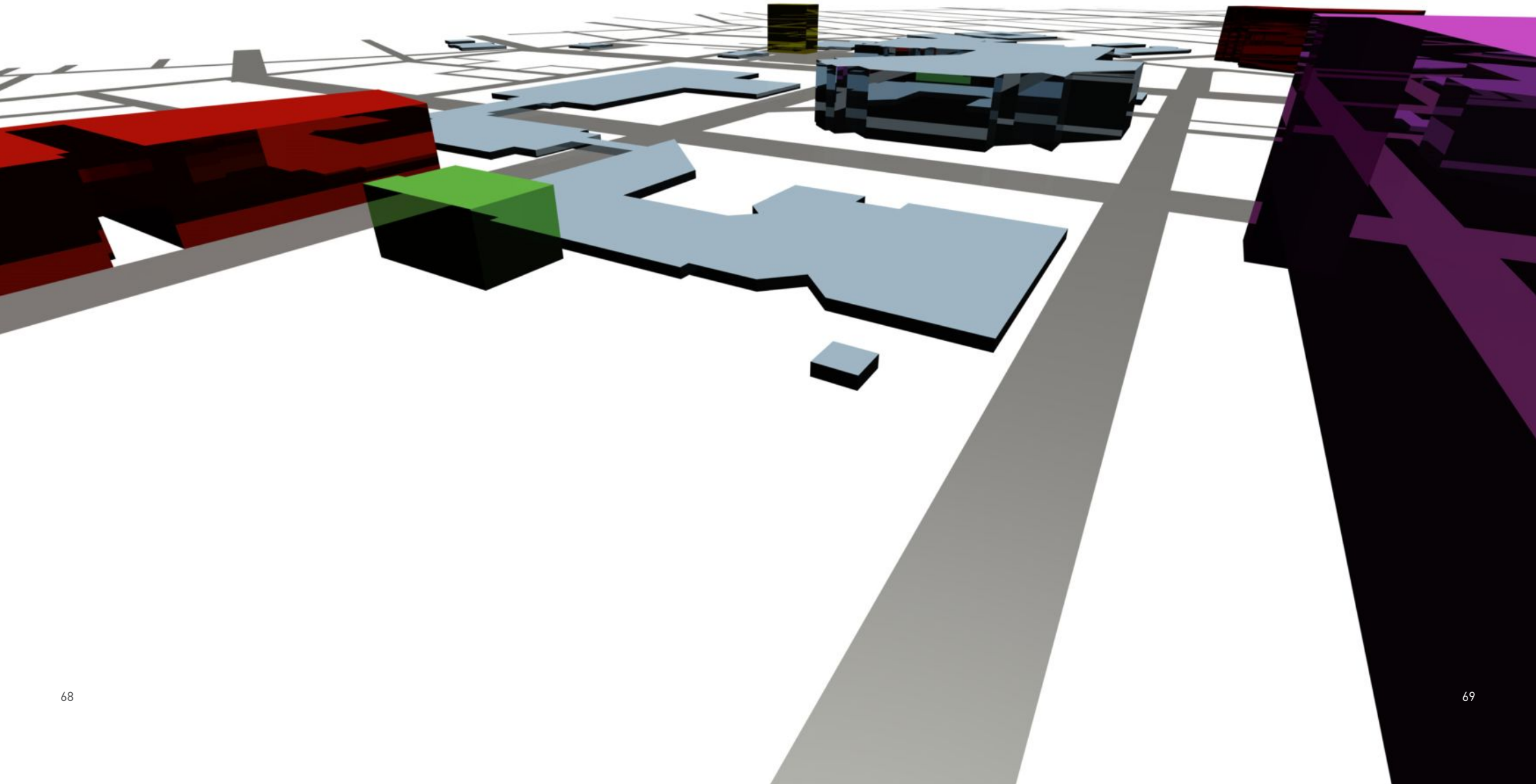
to an academic course, or something to be used by prospective students visiting the campus and looking for sites of interest.

Another way of representing an information-rich environment treats buildings themselves as containers for information. Buildings are a source of conversation, events, activities, and places of business. The broad concept of storing information in a container is perhaps easier to understand than that of marking arbitrary locations on a map, and it provides for interesting representational possibilities.

In my second simulation, I show a campus map shifting between several sets of tagged buildings, and then show how the same concept could be applied as an individual navigates the campus environment. Buildings might reveal relevant information only when a user is close to them, providing useful visual cues or reminders and calling attention to interesting information that others have created. All of this is already possible through the use of GPS technology, but work exploring the representation of GPS information is still in its infancy.







## BULLETIN BOARD

In another study I developed the concept of a digital bulletin board. Bulletin boards are very familiar to most inhabitants of a campus environment, and provide a rich visual metaphor for information sharing through a digital medium.

The hypothetical system that I explored replaces the usual pin-up surface with a large digital display. Pieces of paper would be replaced with digital representations that could be added by anyone. This could be done in person through a scanning device, or remotely by uploading a file. This eliminates the waste associated with traditional bulletin boards, allows for information to be posted to multiple boards instantly, and allows the contents to change and expire as desired by the poster.



Digital representation also allows the contents of the board to be grouped and tagged by users or downloaded for access at a later time. The appearance of individual items could become larger and more opaque depending on such factors as popularity – indicated by touch or frequency of downloading – or how recently the item was posted. Items could also be attached to additional meta-data like location or an Internet address.

Most importantly, richness and ease of use increase the likelihood of collaboration and information dispersion. The system could work at the most basic level of interactivity – viewing it the same way you'd view a traditional bulletin board – or it could be used in ways entirely unforeseen.







## HELP DESK

The campus library is a communal center of exploration, learning, and sharing. I decided to focus on the library for the final component of my project, and consider how environmental technology could add to the purpose and function of the space.

People enter the library with questions, and during their stay, may develop answers to those questions. Most consider the physical library itself – books, magazines, computers, and desks – to be the source of answers. Many people never even ask their question aloud, instead they go to a computer and type in keywords in hopes of stumbling across a valuable source.

Every individual in the library adds to the knowledge base of the space. Every time someone enters the library with a question, there are probably several others who have recently arrived and asked a similar question. Of course, there is no way to find these people, and social constraints make a connection unlikely. I used this idea as a basis for an environmental system.

Large digital displays would be mounted in the entryway of the Library and several other locations throughout the building. Anybody could submit questions to the system via the Web, a PDA, or cellular phone interface. The questions would immediately be displayed anonymously (or under a screen name) on the digital displays for anyone to see. Other library patrons could respond to these questions with an answer, suggest resources within the library or Internet, or respond with another question.

A log of recently asked questions and answers would be available via the library website, allowing for access anywhere in the library or campus. To add value to the system, library staff could submit their own answers and responses, or even submit questions that they had been asked by library help desk patrons.







April 17th  
the different types of

web/Music

4:16pm Wednesday, April 17th  
finding good classical music in  
Richmond

Official Website of VCU Music  
[www.pubinfo.vcu.edu/artweb/Music](http://www.pubinfo.vcu.edu/artweb/Music)

University of Richmond  
[www.richmond.edu](http://www.richmond.edu)

Richmond  
[www.richmond.edu](http://www.richmond.edu)

4:16pm Wednesday, April 17th  
any good resources on Virginia  
and the civil war?

Lee & Grant: profiles in leadership from  
the battlefields of Virginia  
E470.2 .B77 2005

Virginia's Civil War  
E534 .V46 2005

BUY COFFEE AT JAVA 90L AND HELP BUY BOOKS!  
VCU CATCHUP AND CONNECT @ CARRELL

The system attempts to make use of the untapped knowledge that exists in a library community. By openly asking questions, individuals are more likely to get useful immediate feedback than they would by relying on online searches. Interaction with the system might lead to the discovery of information that users didn't know they were interested in or hadn't considered.

The system is loosely structured to allow for a variety of uses, and could be moderated by library staff to prevent abuse. Most importantly, it would encourage constructive community participation and act as a valuable information resource for library users.

VCU Libraries  
Carrell Library Hours

THIS CAR UP

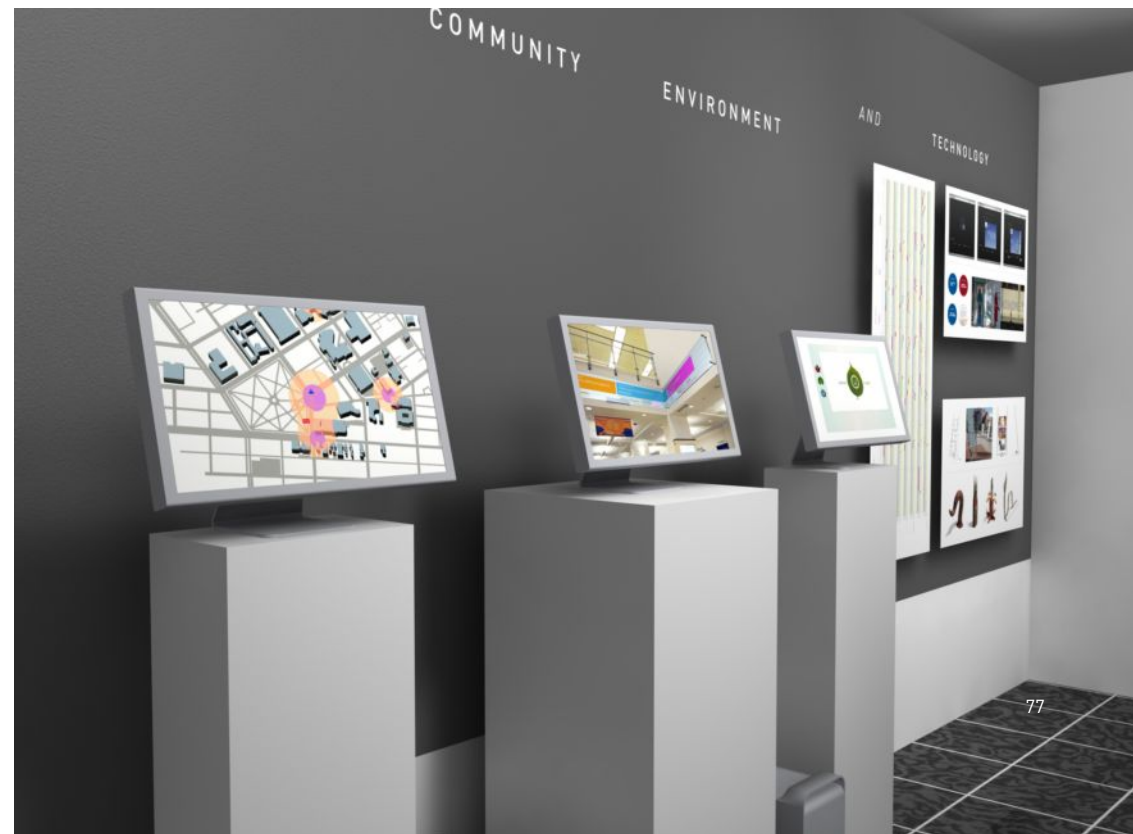
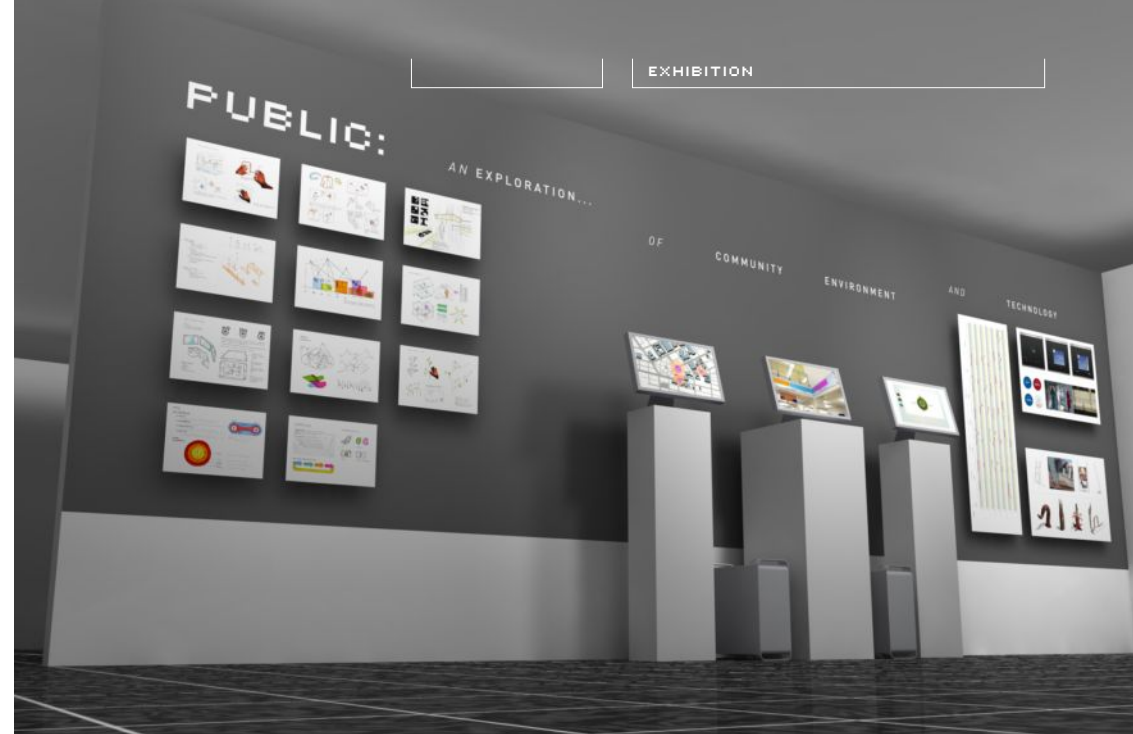
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## EXHIBITION

My MFA exhibition created a new set of challenges. Present too much information, and the project could seem overwhelming and beyond comprehension. Present too little, and it would lead to confusion and disregard. To solve these problems, I aimed for a balance in the presentation between the immediacy of artistic work like that which would be shown elsewhere in the gallery, and the descriptive precision required to orient visitors to in a project such as this.

I considered many names for the project, eventually arriving at *Public*. The word combines ideas of space, community, shared resources, and information. It is a term used commonly in the disciplines of urban planning and computer science. It connotes both power and promise. I used this name in my exhibition space with a descriptive tag line to create an immediate impression of the work and provide a starting point for the viewer.

The exhibition led the viewer through my process and presented connections between initial studies. Three flat panel screens centered on the final digital work of the project. A certain amount of confusion was expected of the audience, but I was confident that even those who did not fully understand the work would be inspired to consider and question its principle ideas.





# PUBLIC:

AN EXPLORATION...

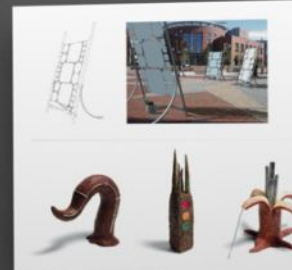
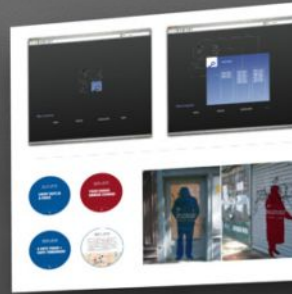
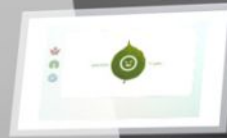
OF

COMMUNITY

ENVIRONMENT

AND

# TECHNOLOGY





## EVALUATION

It is difficult for me to judge the success of this project using criteria I've applied to past work. When I look at individual components in hindsight, I don't feel a sense of completion. There are just as many questions raised by the work as there are answers. Many of the questions I began with were too broad to be resolved by any one solution. However, the divergent nature of the project left me with exactly what I'd hoped to get out of graduate school – a greater understanding of my place as a designer, and an appreciation for the value of design methods, technological insight, and maturity.

I cannot say that I developed any entirely new concepts, but I challenged old ones and raised new issues. Designers need to push the limits of where technology should go and what it should do. I think that the value a computer offers is not to be found in our communications with it, but in how it facilitates different types of conversation between ourselves and others. These conversations can be based on image, text, and sound or other media types that don't yet exist. Regardless, we need to keep people at the center of the technology.

I learned a lot from the user-centered methods I used in this project. Many people see the design process as very personal. I believe that everyone brings a little bit of himself or herself to a project, but I prefer to center my process on the needs of society, of an organization, or of the individual. As my design career shifts from open-ended exploration to more restrained problem-solving tasks I hope I can keep the importance of the user in mind.

### What I'm happy with

I firmly believe that I addressed the core issues of the project as well as possible in the time allotted. I've significantly improved my ability to assess goals and direct my process toward meeting them.

I'm satisfied with the overall visual refinement of my design solutions. My representational abilities, particularly in the areas of environmental and product design, have come a long way since I entered the graduate program. The solutions I've developed are attractive and purposeful. They communicate to the designer as well as the artist. Everyone can draw their own unique conclusions from my work, and I can't ask for much more than that.

I'm happy with the presentation of my work in the MFA exhibition. The work was packaged in a way that was accessible, inspiring, and attractive. It gave me a way to take the project out of context as a personal exploration and place it in the realm of public consideration. By presenting the work in the three-dimensional space, it gave the body of ideas more weight than I believe they could have in any other form.

**What I'm not happy with**

None of my solutions are complete. Perhaps this is a result of the breadth of the project, or maybe it is simply a lack of focus on my part. Either way, it would have been nice to reach a solution that could entirely stand on its own.

I wasn't able to consider some of the most important issues of human-computer interaction, such as interface design and usability, in as much detail as I'd like. Again, this was a limit imposed by the scope of the project and the time constraints of a 2-year MFA program. I'm confident that I'll have ample time to think about these issues in my future work.

**How is this project valuable for the field of design?**

Every designer should ask themselves if what they are doing is valuable, and I'm no exception.

Immediately after selecting my thesis topic I was introduced to the work of Neil Postman, who has written several highly-influential books on technology. Postman suggests that we ask certain questions of any new technology, and I've saved some of these questions for the end of my study because I feel they are important in considering the long-term effects of any major design "solution."

**What is the problem to which this technology is a solution?**

I believe that increasing access to information is a good thing; it gives more power to the individual, allows people to make more informed decisions, and possibly even empowers democracy. I also believe that the amount of information available in the world is rapidly outpacing our ability to find it.

I'm not an information architect, and I cannot address issues of findability raised by this work. What I've attempted to do is focus on how technology can elevate a society's ability to communicate and interact. Technology can create the context for conversations that wouldn't otherwise be possible, or it can pool the efforts of hundreds of individuals with little effort. The problem I'm trying to solve is one that has existed since the dawn of man: how human beings can work together, share information with each other, and organize the information they receive.

**Who are the winners and losers of the technology?**

Most of the technology we use, websites we visit, and spaces we exist in are focused, at least in part, on the result of producing a profit. It is an unavoidable consequence of capitalism – profit drives innovation, sometimes at the cost of individual freedoms and well-being. Sometimes entirely well intended technologies create an economic or intellectual divide by denying information access to some and granting it to others.

People who can afford the tools of information access, which are quickly going digital, will have an economic and intellectual advantage over those who cannot. I've tried to address this issue throughout the project, and it is a major reason I became interested in environmental technology in the first place. I've tried to consider how information technology could be useful and available to all who wish to use it, and be as unobtrusive as possible for those who wish to ignore it. I haven't considered the financial incentive for VCU (or any other university) to implement any of these ideas, but I believe increased campus interaction and the resulting atmosphere of innovative thought would be incentive enough.



In the world of social software, the current debate over winners and losers is focused on issues of privacy. Many fledgling social software sites are being purchased by large corporations who want to cash in on their popularity. Because social software is based on providing information about individual interests and lifestyles, there is understandable concern over how trustworthy the Yahoos and Googles of the world really are.

I haven't addressed the issue of privacy in my work: not because I don't care, but because I don't think there is any real solution to this problem in the technologies themselves. Any technology can be used for good or evil, but that doesn't make technology a necessarily bad thing. Currently, we have no reason to believe that the organizations obtaining personal data from us will use it maliciously. The Internet is certainly changing the definition of "privacy", but the long term ramifications of this shift are unclear.

#### What new problems may result from the creation of the new technology?

Privacy is always a concern when you give your personal information to an organization which is driven by a profit motive. The work I've done this semester often deals with pooling information resources. This means giving up information about oneself in exchange for receiving information about others. This happens very often on the Web, but people are understandably concerned about it.

I have kept this in mind as I've been thinking and working, and I've tried to consider solutions that don't require public participation. In most of the work I've done, any information submitted about a user can be entirely anonymous. Many people would choose to limit knowledge of themselves to their close friends, while others might not care who knows about their activities.

I haven't stopped thinking about these issues, and I'm eager to address new ones as they develop. This project has challenged me far more than anything I've done in the past, and hopefully prepared me for even greater challenges in the future.



## BIBLIOGRAPHY

## Articles

Bush, Vannevar. "As We May Think." *Atlantic Monthly* July 1945. 23 July 2006 <<http://www.theatlantic.com/doc/194507/bush>>

Vannevar Bush discusses how developing technologies will change the way humans store and retrieve information. He introduces the concept of the *Memex*, a mechanical device which uses film as a storage mechanism, and allows its user to easily retrieve and associate various pieces of information.

Warwicker, John. "A Virtual City in a Global Square." *Eye* 34.9. 1999 : 38-44.

*Federation Square* is an architectural media project started in Melbourne, Australia in 1998. This article describes the purpose of the project, and questions the relationship between graphic design, architecture, the World Wide Web, and globalization.

## Books

Alexander, Christopher and Sara Ishikawa, Murray Silverstein. *A Pattern Language: Towns, Buildings, Construction*. New York : Oxford University Press, 1977.

A methodology for the design of spaces of all sizes. Christopher Alexander considers urban-planning on the micro-functional level, describing the purpose and ideal use of every element that forms the constructed environment.

Arthur, Paul, and Romedi Passini. *Wayfinding : People, Signs, and Architecture*. New York : McGraw-Hill Book Company, 1992.

The original text on Wayfinding, covering all aspects from cognitive navigation theory to accessibility standards. Outlines the Wayfinding roles of architects, urban planners, and graphic designers, and stresses the importance of considering Wayfinding early in the development of an architecture or city planning project.

Ashley / Myer / Smith and the Boston Redevelopment Authority. *City Signs and Lights*. Boston, MA : MIT Press, 1973.

Investigates urban-use needs in the city of Boston, and considers solutions to issues of visual complexity, Wayfinding, information access, and public safety. The focus is on the creation of "humane sources of information that do not overload the senses and overwhelm the destination seeker."

Hawkins, Jeff and Sandra Blakeslee. *On Intelligence*. New York : Times Books, 2004.

Jeff Hawkins outlines a new theory of intelligence based on the concepts of experience and expectation. He proposes that intelligence is developed from experiences derived from our human senses and our ability to relate these experiences to each other and to future events. He also discusses the implications of this theory on the field of Artificial Intelligence.

Johnson, Steven. *Interface Culture: how new technology transforms the way we create and communicate*. San Francisco : HarperEdge, 1997.

A look at how the new metaphors created by computer technology have had an impact on the language humans use, the way they think of information, and the way they view the world around them.

Lynch, Kevin. *The Image of the City*. Cambridge : M.I.T. Press, 1960.

Primarily an urban design text, *Image of the City* seeks to understand the cognitive maps that people create through their experience of urban environments. By interviewing people living in large urban areas like Boston, Lynch arrives at the conclusion that our cognitive maps are formed from our experience with several distinct types of environmental feature.

Morville, Peter. *Ambient Findability*. Sebastopol, California : O'Reilly Media, Inc. 2005.

*Ambient Findability* refers to a future in which information about everything is always available everywhere. In considering this possibility, Morville addresses developing technologies and concepts such as Radio-frequency Identification Tags, Global Positioning Systems, the Semantic Web, and Social Software.

Norman, Donald. *The Design of Everyday Things*. New York : Basic Books, 1988.

Norman addresses the age-old problem of human competence being blamed for shortcomings in product design through a discussion of human cognitive maps, information recall, and general design theory.

Peña, William M. *Problem Seeking*. Houston, TX : Caudill Rowlett Scott, 1969.

Caudill Rowlett Scott has developed a very refined program for informing and understanding clients during architectural design projects. Problem seeking describes their methods and outlines a program for using simplified concept representation to keep track of important design goals as well as communicating these goals to their clients.

Postman, Neil. *Technopoly: the Surrender of Culture to Technology*. New York, NY : Knopf, 1992.

*Technopoly* is a state of society in which all technological progression is seen as positive without any constructive examination of the true impact it will have. Postman describes why it is important to consider the true eventualities of any new technology, and what questions should be asked to help consider the possibilities.

Suchman, Lucy A. *Plans and Situated Actions: The Problem of Human Machine Communication*. New York : University of Cambridge, 1987.

Examines how computer interaction does not take into account the subtleties of real-world human communication, and introduces theories from the social sciences into the world of human-computer interaction and interface design.

Tufte, Edward. *Envisioning Information*. Cheshire, CT : Graphics Press, 1990.

A look at how simple visual and organizational concepts can improve understanding of information. Tufte focuses on a handful of these concepts, including the use of small multiple images to compare and contrast data sets, and the effective use of color in highlighting information.

Wurman, Richard Saul. *Information Anxiety*. New York : Doubleday, 1989.

Information anxiety refers to the current problem of information overload in everyday human life. Wurman states that everyday we are confronted with more information than we can possibly absorb, and that understanding any of this information has become a nightmare. The book goes on to help clarify effective methods for presenting information.

#### Web Resources

Antenna <http://www.antennadesign.com>

A design firm specializing in highly interactive environmental installations.

Clay Shirky's Internet Writings <http://www.shirky.com>

An internet critic whose commentary on *Social Software* and the *Semantic Web* has had a significant impact on the web design community.

Delicious <http://del.icio.us>

One of the original social-bookmarking sites, Delicious allows users to create internet bookmarks, and makes those bookmarks accessible to others through the use of *Tags*.

Digg <http://www.digg.com>

A social-bookmarking site that allows individuals to submit online articles from around the Web, and ranks the submissions based on the number of Diggs (votes) they receive.



Esono Connected Communities <http://www.esono.com/boris/projects/concom>

A project out of the Interaction Design Institute Ivrea that uses a specialized browser to show and explore relationships between individuals in a collaborative community.

Ben Fry <http://benfry.com>

A designer and computer scientist who explores the relationship between art and technology, and uses dynamic visualization and interaction to enhance the comprehension and impact of information.

IDEO <http://www.ideo.com>

A multi-disciplinary design firm focusing on user-centered methods. IDEO places strong emphasis on collaboration, getting users involved in the design process, and continuous prototyping.

Ryota Kuwakubo <http://www.vector-scan.com>

An artist and product designer who incorporates computer technology into toys and creative tools, redefining the expected appearance and function of technology.

Golan Levin <http://www.flong.com>

Explores the limits of how computer interaction can be used, through projects like the *Manual Input Sessions* and *Messa di Voce*, which both use sound and gesture as important components of computer input.

Visual Complexity <http://www.visualcomplexity.com/vc>

A repository for digital information-representation projects.

Wikipedia <http://www.wikipedia.org>

An online encyclopedia whose content is entirely submitted and moderated by its users.

## APPRECIATION

### Graduate school is a team effort.

Roy McKelvey

*Thank you for listening, asking questions, and pushing me.*

Matt Woolman

*Thank you for encouraging me to look beyond practicality.*

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*Thank you for keeping things fun.*

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*I'm a better person because of you. Thank you for your wisdom and guidance.*

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*You are all incredibly talented and wonderful people. Keep up the good work.*

Anne Graves

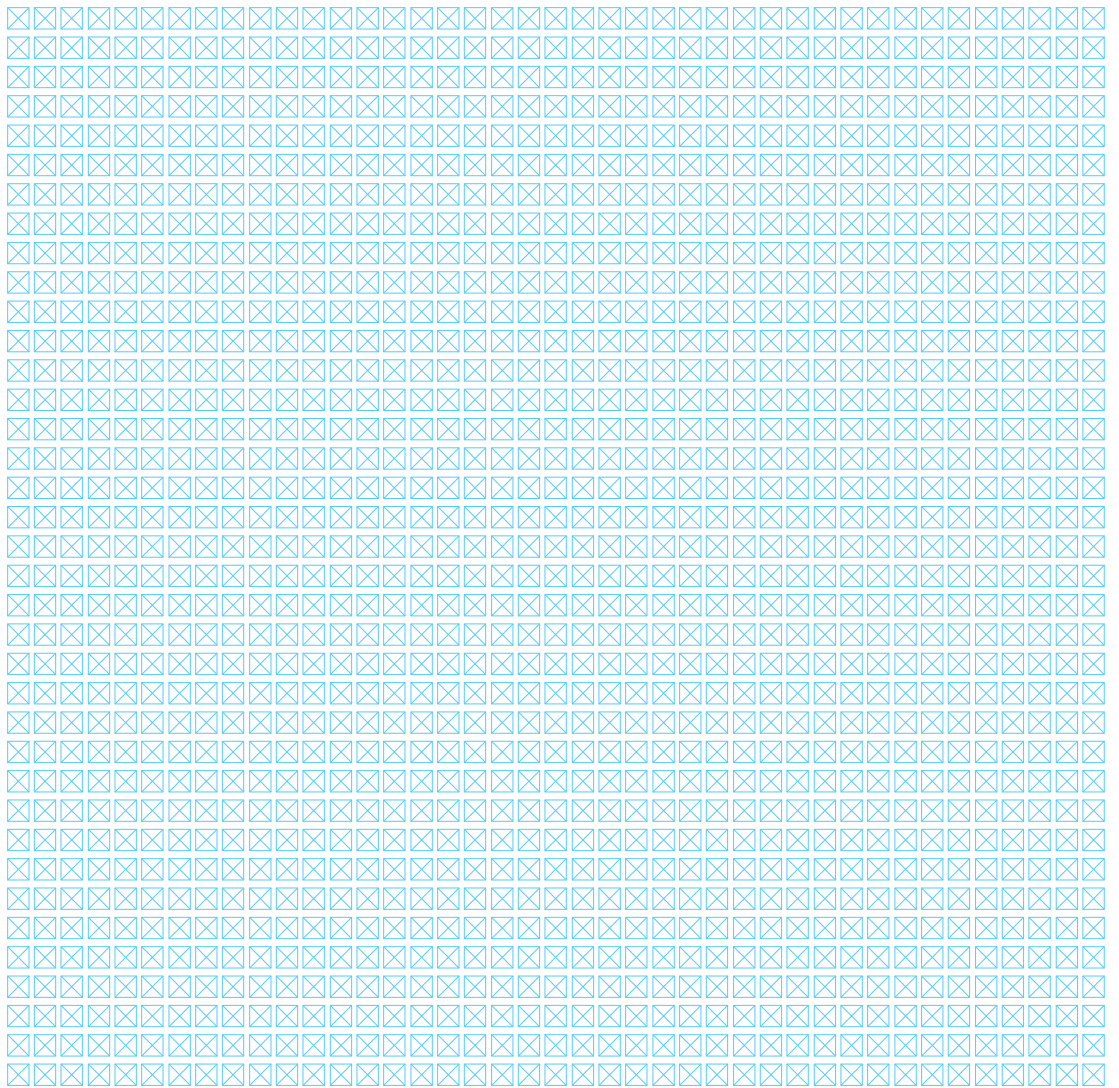
*Thank you for your sense of humor and making me take care of myself.*

Fred and Ann Malven

*Thank you for your encouragement and support.*

Emily Trevillyan

*Thank you for everything you do for me. I couldn't have done it without you.*



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