

**community**

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**University of Illinois at Chicago**

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"With each person we involved in this way, we tried to preserve the pleasure of original discovery."  
Myron Krueger, 1977.

## **Introduction**

My first experience with the web started as a Research Assistant for the webgroup at the Electronic Visualization Laboratory [EVL]. While studying virtual reality and computer graphics, web technologies were introduced. As time progressed, I realized that my interest was leading me to build art projects on the web.

The concept of emergent behavior was then introduced which led to ideas of using a social system to fuel visualizations over the Internet. The goal was to make a visualization that was organic and behaved as if it had a life of its own, but it was also important to engage the audience. Adopting the notion of the man behind the machine transferred the use of emergent behavior to using human interaction to compose the art.

## **interaction is the art**

Interactive art that uses the participant as the art producer promotes a different dynamic that I find stimulating because it adds an element of the unknown. Making an artwork dependant on the participants exposes the artist to a degree of uncertainty and allows for unexpected events to occur. The artist is completely reliant on the user to investigate, play, and interact, which cannot be determined beforehand. The

following artworks are participant dependant and have influenced my approach to my thesis project.



Fig1  
Text Rain, 1999  
Camille Utterback & Romy Achituv  
credit: Camille Utterback

One of the first interactive computer environments seen as being closest related to interactive art was Metaplay. Metaplay was developed by Myron Krueger in 1969, and is the first piece of a series of responsive environments that are widely regarded by both digital artists and critics as the prototypes of the later computer simulations and virtual reality (Stiles, 1996). The installation consisted a large rear-projected video screen that projected the live video image of the audience and the computer generated drawing by an artist in another building. The art was created by the play of the artist with the live audio feed and the reactions by the audience. According to Krueger, the computer was used to facilitate a unique real-time relationship between the artist and the participant in allowing the artist to induce people to play games or play with the act of drawing (Krueger, 1977). This early form of audience interaction opened-up the dialogue between the artist and the viewer and created an environment for the audience to play.

Text Rain by Camille Utterback & Romy Achituv is a video-projected installation that is dependant on the involvement of the audience (Fig.1). "Nowadays we are moving towards

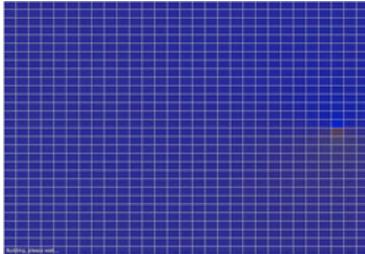


Fig. 2  
Bootstrap and the Blank Slate, 2003  
Jason Salavon  
*credit: screen grab from application*

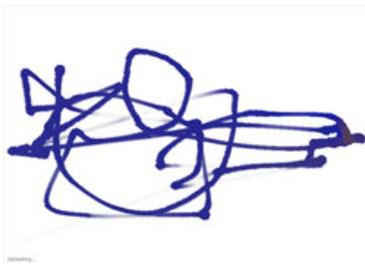


Fig. 3  
Bootstrap and the Blank Slate, 2003  
Jason Salavon  
*credit: screen grab from application*

state of play. While the general context of the art-experience is set by the artist, its evolution in any situation in which the game is never won but remains in a perpetually in a specific sense is unpredictable and dependant on the total involvement of the spectator” (Ascott, 1966-1967). The mirrored video projection allows the participants to see themselves as letters fall around them. The users are invited to play by catching the falling letters with their bodies. The letters can be caught, lifted, and then let fall again – without the users the letters just fall like rain. The letters seem to be random, but the participants actually catch words and phrases that spell out poems about bodies and language (Utterback, 2001).

A web-based application that requires the involvement of the user is Bootstrap and the Blank Slate by Jason Salavon.

Bootstrap and the Blank Slate presents the user with a grid overlaid on a dark blue background. There are no directions so the user begins to drag their cursor over the grid. Boxes begin to highlight which attracts the user to drag and click in that area (Fig. 2). Even though you’re not sure exactly what you are doing, you continue to participate with the hope that something is happening. After a few moments, your marks are revealed as a Japanese ink drawing (Fig. 3). The drawing is then submitted to a gallery where you have the choice to either browse through the submissions of others or continue to play.



Fig. 4  
**community** installation space  
*credit: Noel Ashby*

“The piece records, converts, and stores the collective actions of its participants into an ever-growing population of image-pairs—one genotypic, the other phenotypic.” It might also be seen as a collaborative mechanism for the saturation of a style-space. The project explores classic issues of color and form as well as an interactive system for reproducing two types of generated objects (Salavon, 2003).

### **social interaction**

The process began by exploring social networks and how they can fuel artistic practices. As the process went forward, it was transformed to exploring how social interaction can facilitate the making of art. Originally, the intention was to make a web-based piece viewed over the Internet, but it became more interesting to bring people together. The interaction of people both physically and non-physically adds another facet to the project that could not have been achieved otherwise. It creates an engaging, dynamic dialogue between strangers and friends working together to form a community of shared interests that transcends into the art (Fig. 4).

The shared environment let the users see the real-time gestures of the others to react and build upon. It also makes people somewhat responsible for how they contribute to the



Fig. 5  
Participants concentrating on creating  
a collective whole.  
*credit: Noel Ashby*

collaboration because you know that the marks are coming from one of the five participants. The awareness of others helps control their actions and directly affects the outcome of the artwork.

The hope is through social interaction, art will manifest into a physical art object that is a record of the events taking place, a slice of life. There are times in the collaboration that generate compelling art moments. Allowing the participants to print the collaborative activity captures the fleeting moments. The prints are the only evidence that the moments exist. It makes the audience cognizant of the effects of time and how quickly time can past.

The networked space requires users to be in the present and react only to what is in front of them (Fig. 5). The multi-user aspect of the application permits the participants' marks and actions to be more uninhibited than if it were a one-to-one application. It's not about what one person did, but about what was accomplished together. The objective is for the participants to walk away with the experience of being a part of a larger whole. What you do directly or indirectly affects others in this world and **community** provokes the participants to reflect on the impact of their actions.



Fig. 6  
Two participants drawing in real-time  
with the shared canvas projection.  
*credit: Stephanie Sides*



Fig. 7  
Two participants drawing in real-time.  
*credit: Noel Ashby*

## the application

**community** is a shared, multi-user, networked application encouraging interaction amongst users to produce artwork in real-time. It provides an unique experience through the integration of multimedia and programming to make dynamic content that is constantly changing. The application consists of a toolkit and digital canvas that is used by the participants to communicate and collaborate.

The participants draw and collage pre-made icons on their digital canvas as their marks are broadcast to the other users (Fig. 6). As time passes, the generated artwork slowly fades out allowing new marks to resonate—constantly transforming the image. The participants are able to print the artwork whenever they like capturing a moment in time. The prints serve as the history of the experience and as art objects.

**community** is a client application that is used by the participants to communicate with the each other on the local network. Each client is run on its own computer and displayed on its own monitor (Fig. 7). When the client is launched, it joins a specified room on the server and shares that room with the other clients that also connect. The actions of the user are sent as messages to the shared room and the updates the connected clients.



Fig. 8  
Example of printed artwork.

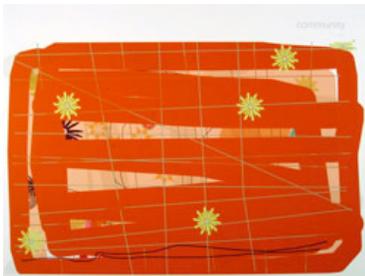


Fig. 9  
Example of printed artwork.



Fig. 10  
Example of printed artwork.

The provided client allows users to select, move, and collage pre-made icons to the digital canvas. It also provides a drawing tool that allows the user to choose a line color, width, and opacity. The icons are designed to influence the users to compose images that promote happiness and utopian scapes. By utilizing happy icons, the audience creates positive imagery and leaves the experience with a positive view of interacting with people. The participants' drawings suggest pretty cityscapes, peaceful countrysides, and flower gardens (Fig. 8, 9, 10). Each icon is assigned its own sound, a random size and a few animate. The combined sounds produce an ambient sound that also reinforced optimistic tone of the event.

The movement of the user's mouse and choices they make are recorded and sent as messages to the shared room. Once the room receives the message, it updates all the clients that are in the shared room and builds a digital image that is a combination of everyone's efforts. The collaborative artwork can be printed at any time and is returned to the ongoing application once the image has been sent to the printer.

**community** is developed in Flash MX with ActionScript and uses Unity 2 Multiuser Development Kit built by Colin Mook and Derek Clayton. "Unity 2 Multiuser Server is a server for managing multi-users Applications. Remote Clients, typically



Fig. 11  
Participants in the space collaborating  
and printing artwork.  
credit: Noel Ashby

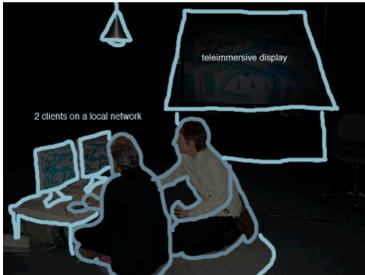


Fig 12  
Installation diagram.  
credit: Beth Cerny

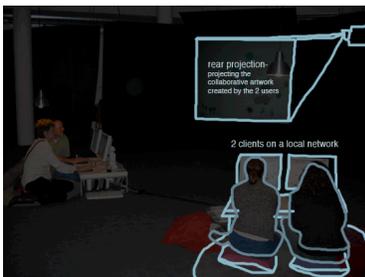


Fig 13  
Installation diagram.  
credit: Beth Cerny

written in Flash, make TCP Socket connections to the Serve.”  
(Moock) Unity is built to give developers a way to develop multi-user applications without knowing anything about socket server programming. It provides an easy-to-use environment with a library of classes to manage the multi-user application so that the developer can concentrate on the client-side development. All clients connect to the same room that receives and sends messages. The messages contain information about the clients’ attributes that are broadcast and updated to all the clients in the shared room.

### installation and exhibition

The show took place in the Center for Virtual Reality in the Arts [CVRA] located in the Art & Architecture Building. The installation space was inspired by the ElectroLobby at the 2001 Ars Electronica Festival in Linz, Austria. It was necessary for people to feel comfortable lounging around and sitting on the floor making art. In fact, the success of the piece was contingent upon people letting down their guard and opening up to have an experience with other users. It was crucial to get people interested in just playing and experimenting with the drawing tool.

To get the feel and establish dialogue between the participants, two low-to-the-ground tables with large round rugs and pillows



Fig. 14  
Audience engaging with the participation.  
*credit: Tom DeFanti*



Fig. 15  
Audience engaging with the participation.  
*credit: Stephanie Sides*

were used to add comfort. Pendant lights hung directly over the rugs and pillows to add ambiance and extra lighting (Fig. 11).

Each table provided enough space to set-up two workstations. A tele-immersion desk was used to add a fifth workstation and display. The addition of the tele-immersion desk allowed those that were not able to sit on the floor to also participate in the experience (Fig.12). The rear-projection acted like a large canvas displaying the collaborative painting to everyone in the room (Fig. 13). Large-format prints made with my application were hung on the walls to inspire the users. A printer was located nearby the workstations, which the users could use to print their work.

### **reflection and application improvements**

The event was successful and my concept played out as I had intended. Walking into the space was delightful and immediately engaged the audience to participate. People interacted, laughed, and teamed up to composed thoughtful artwork (Fig. 14, 15). It fostered the creative process because there were nuances that you couldn't control that led to many happy surprises. You were reminded that life moves at different speeds for everyone. Even the audience participated by encouraging the users to make certain marks or choose certain icons to react to someone else. One memorable

comment was that **community** made 2D interesting again.



Fig. 16  
Display delay.  
credit: Noel Ashby

However, not everything went as a plan due to an unexpected difficulty. Earlier in my development, some problems arose with a delay in the amount of time it took the client to display what the others had drawn (Fig.16). The use of the local network instead of the application server was done to circumvent the possibility of this problem. "Over DSL, a typical total round-trip time for a Unity message to be sent to the server from Flash, received by the server, returned to Flash, and parsed ready for use is about 100ms (ten messages per second). On fast machines with high bandwidth, the round-trip time will be faster; on slow machines and low bandwidth, the round-trip time will be slower. Locally, on a test machine running both the server and the client, the round-trip time is anywhere from 0 to 15ms (test machine is a Pentium4-2.6, with 1Gig ram)" (Moock).

The application was tested several times on a local network using my desktop as the application server and the application had no problem running smoothly without much delay. Through testing with a total of three users, it seemed that the problem was solved.

During the show, the longer the application ran, there was an



Fig. 17  
Photo of interaction.  
*credit: Stephanie Sides*



Fig. 18  
Photo of interaction.  
*credit: Stephanie Sides*

obvious delay between what the user did and when it was displayed. This delay was not a part of my original idea.

Most of the users didn't mind the delay and exactly preferred it. The delay forced them to be patient and to witness what others were doing. For them, it felt like a meditative act like playing with a Japanese Sand Garden (Fig. 17, 18). Another positive response was that the users felt like they were living in the past. One user actually preferred the slowness and refused to work on a faster computer because he enjoyed watching the past actions of the other users unfold. He was reacting to their actions that had happen moments before which created a unique experience within itself. However, for other users, this delay was frustrating.

After the show, research was done on the problem and it was discovered that the speed of the application is also contingent on the memory of the computer and speed of the computer. The computers borrowed from the lab were older models due to SC2005 taking place at the same time as my show. Another mistake was shortening the amount of time that the application displayed the drawing and icons. I thought it would help the application to speed-up because it was removing the elements from the client. This actually caused more problems by added strain on the computer to process the queue. I came to the

conclusion that I can only run three clients at a time on a Pentium 4 with high processing power.

### **conclusion**

Although there was an unexpected incident with the delay in the draw, I was very pleased with the overall installation and event. The success of my project was based on creating a compelling environment that encouraged and engaged the participants to play. This was accomplished by making a simple user interface, designing an ambiance, and providing the attendees with a take away original piece of art. This event has inspired further investigation of creating artwork that is dependant on the participant. Not only does it provide a rich, fun experience for the user, but gives me the extra challenge to funnel the interaction into something tangible.

## **hardware, software, and installation props**

### **hardware:**

6 computers

4 LCD monitors

4 mice

1 tele-immersion desk

rear-projection screen

projector

network hub

network cables

1 printer

### **software:**

Macromedia Flash MX

Unity 2

### **installation props:**

2 – white, high-glass tables 1.5 inches from the floor

2 – 4' round, charcoal gray, plush-pile rugs

1 – 2' round, pink, plush-pile rug

4 – solid color pillows

4 – hanging pendant lamps

1– printer

high-gloss 8.5 photo paper

## works cited

Moock, Colin. *Unity 2 Multiuser Development Kit*, <<http://moock.org/unity/u2mdk/>>

Randall Packer and Ken Jordan. *Multimedia from Wagner to Virtual Reality*, New York, NY: W. W. Norton & Company, Inc, 2001.

Ascott, Roy. "Behaviourist Art and the Cybernetic Vision", 95-103.

Krueger, Myron. "Responsive Environments", 104-120.

Salavon, Jason. *Bootstrap and the Blank Slate*, 2003  
<[http://www.moca.org/museum/dg\\_detail.php?dgDetail=jsalavon](http://www.moca.org/museum/dg_detail.php?dgDetail=jsalavon)>

Stiles, K. and Selz, P.H. *Theories and Documents of Contemporary Art. A Source Book of Artists' Writings*, Berkeley: University of California Press. 1996.

Utterback, Camille. *Text Rain*, 1999 <<http://www.camilleutterback.com/textrain.html>>

## other references

Grudin, Jonathan. CSCW: History and Focus,  
<<http://www.ics.uci.edu/~grudin/Papers/IEEE94/IEEEComplastsb.html>>

Manninen, Tony. Interaction Forms and Communicative Actions in Multiplayer Games, *Game Studies*, Vol. 3 Issue 1, May 1003,  
<<http://www.gamestudies.org/0301/manninen/>>

Manovich, Lev. *The Language of New Media*, Cambridge: MIT Press. 2001.

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

## other web sites

Ambient User Sound  
<<http://www.moock.org/unity/clients/ambientUserSound/index.html>>

Friendster <<http://www.friendster.com/>>

GeoTracker <<http://www.marumushi.com/apps/geotracker/>>

Golem <<http://www.salavon.com/Golem/Golem.shtml>>

Mr. Picassohead <<http://www.mrpicassohead.com/>>