Katherine Keane
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Nancy Hechinger

Looking Back

Abstract

Looking Back encompasses two types of reflection: a retrospective of my experience and projects at ITP; and a final project entitled *Breaking the Frame*, which provides a more literal look back in time through reflection of the self.

My ITP Experience

I arrived at ITP in August 2009 with a background in media and communications. For the preceding five years, I had worked in media relations where I had been focusing on how people and brands communicate and figuring out ways to improve these conversations. At ITP, I wanted to focus on creating more meaningful interactions between people, using technology as a vehicle for communication.

My work at ITP has focused on exploring the interaction potential of traditionally passive activities, and employing inputs that wouldn't usually be considered inputs, such as breathing, looking, and picking things up. The notion of play and the experience of physically affecting objects in unexpected ways have driven my projects, some of which include the following:

> ***SwigJig:*** Hidden behind the mirrored door of this Art Deco-era liquor cabinet was an interactive experience based on the observation that people tend to associate certain alcoholic beverages with specific atmospheres. *SwigJig* created a different atmosphere based on the bottle the user picked up: for example, if the user selected the bottle of Irish whiskey, the Pogues' *The Irish Rover* launched, accompanied by a green, white and gold light sequence, representing the colors of the Irish flag. When the user picked up the Pinot Noir, *SwigJig* provided soft jazz and mood lighting for a relaxed or romantic evening. *SwigJig* was a collaboration with Alex Vessels.
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> ***I.C.U.*:** An interactive installation and assistive technology project that enabled the user to make objects explode simply by looking at them. First, the user put on a pair of eye-tracking glasses. Then, a variety of objects such as bananas, strawberries, and Justin Bieber appeared on a screen, one by one. The user focused on these objects to make

them jiggle and eventually explode into smithereens all over the screen. I.C.U. was a collaboration with Scott Wayne Indiana and Zach Taylor.

> ***BREATHE*** was an LED light sculpture designed to curb the human stress response by encouraging deeper, more controlled breathing and by providing the user with visual feedback based on their own breathing rate. As the user inhaled, the lights on the sculpture turned on, one by one, all the way to the top of the piece until the entire sculpture was lit up in a warm white hue. As the user exhaled, the lights dimmed from the top down. The overall effect was a calming experience in a stressful world.

I often judge the success of my pieces by users' willingness to interact with them. I need the presence of viewers, their minds, their bodies and their actions to complete the piece. For my final project at ITP, I wanted to create a platform that would be fun to use while experimenting with ways of granting the user the control to create his or her own unique aesthetic experience.

Project Background

In many ways, my ITP experience has been similar to an experience I had as a child. This story, based on my personal experience with impaired eyesight is in many ways a metaphor for my ITP experience. It also led me to an exploration of vision that would ultimately lead to an exploration of vision shifted over time, which is my final project.

For the first seven years of my life, my visual experience was different to that of others. The only things I saw perfectly were the things immediately around me, and anything more than a few feet away was a blur; yet, knowing nothing of sharper vision, I was unaware that blurry vision was not the norm and less than adequate for daily life.

On my first trip to the optician, I learned that I had moderate myopia, or nearsightedness, and I was prescribed glasses to correct my vision. The world literally expanded when I slipped on my first pair of glasses. My field of vision was no longer limited solely to my immediate environment: while I had been fully aware that leaves grew on trees, and while I had been entirely familiar with what a leaf looked like, I had never seen multiple leaves attached to a tree except in photographs. My visual world had expanded in three-dimensionality; I could now see clearly all the way to the horizon.

What I find remarkable about my impaired eyesight is that I was entirely unaware of my inability to see. In school, for example, my teacher would write on the blackboard, and my fellow students and I would watch the board as she wrote and copy the words into our notebooks. All

along, I thought I was writing what I saw her write. Years later, however, I realized that I was writing the words not as I saw her write them, but rather as I heard her say them aloud as she wrote. My brain and other senses were compensating for my imperfect eyesight.

Before I wore glasses, my vision was not based on the sharpness of what my eyes were seeing. My brain was pulling together information and detail from past experiences to create a sense of "seeing" in the current moment.

The experience of "seeing" is about more than vision. It is a process that begins with focusing on and comprehending visual information and then interpreting that information to make assumptions and conclusions. Seeing is something that depends not only upon the current information we are viewing, but also on information from a greater context, some of which might not currently be available at a given moment.

My ITP experience, like that first pair of glasses, expanded my horizons. ITP has enabled me to see the world and notice new details that I might not previously have noticed. ITP has also helped enrich my perspective of the world through collaborating with others, and catching new glimpses of the world through the eyes of my collaborators.

Detail is always a subset of a larger picture. When I see a blur, as I did without glasses, I can see only the big picture, but not the details. My ITP experience has provided me with the ability to examine problems from a number of perspectives – from the big picture down to the intricate details, and the links between the physical perception and the psychological process – and create solutions through collaboration, technology and creative problem solving.

Breaking the Frame

Breaking the Frame is an art installation that explores the connection between visual perception and time by displacing the user's reflected image over time and space. The installation elevates the user's self-awareness in the present moment and challenges our traditional perception of a mirror image by incorporating not only our present reflection, but also our reflections from the immediate past.

The act of looking in a mirror is simple and familiar: the mirror traditionally reflects a real-time image of its beholder. *Breaking the Frame* shows the user's reflection as would any other

mirror; however, it also absorbs that reflection and re-presents it repeatedly via projections in new times and locations that show things as they were. Thus, the user experiences the current moment as it becomes the past – which is dead, but never gone – it is stored in memory, and will continue to affect us.

Eventually, the user learns to take these consecutive moments of past and present into account. *Breaking the Frame* thus becomes an experimental platform that enables the user to play with his/her reflection.

Breaking the Frame is another way of seeing: it provides us with the ability to see ourselves not only in the present, but also in the moments preceding it, and act upon the realization that our reflection is merely a representation of reality.

Research and Exploration of Vision

Intrigued by how people react to changes in their vision, I experimented by creating some unusual optical devices that would playfully alter my visual field. I popped the lenses out of six old pairs of sunglasses, cut various shapes out of construction paper and affixed them to the glasses, creating six different styles. I called this series Dotty Glasses, partly because some of them were embellished with construction paper dots, and also because the glasses were amusingly absurd.

The most interesting pair of Dotty Glasses had multiple red construction paper polka dots over each eye. The experience of having the dots placed within an inch of the eye created an odd sense of depth and an odd, halo-like blur effect around each red dot. These glasses made the wearer more aware of his or her eyes' ability to focus. Another pair of Dotty Glasses had a single large dot in front of each eye and forced the wearer to look left or right if they wanted anything sharper than peripheral vision. Another pair blacked out everything except for three small holes on each lens, rendering the wearer privy to viewing three small areas within their field of vision, without being able to see what was between them.

I enjoyed the playfulness of Dotty Glasses, and the way that they enabled the user to see differently. However, I felt that it would be worthwhile to explore different ways of altering a user's vision, and I decided to look at the effect of visual distortions that go beyond simple obstructions.

In *Eye and Brain*, R.L. Gregory discusses an experiment conducted by K.U. and W.M. Smith to examine how viewing position affects a subject's behavior at a given task. The subject was seated with his hand behind a screen while writing, and a television camera was pointed at the subject's hand to enable the subject to watch his hand on the monitor as he wrote. The image was distorted in various ways using lenses and camera distances, but it was found that the subject was able to "draw or write very well with large changes of view."[1] This experiment indicates that the brain successfully adapts to displacements of the retinal image in space, and led me to consider how people react to their vision being altered not just mechanically, but also temporally.

Gregory also recounts a modified version of the Smiths' experiment by creating a time delay between the camera recording and the image shown on the monitor so that the subject viewed his hand in the past. In this experiment, "a short delay (about 0.5 seconds) made movements jerky and ill co-ordinated, so that drawing became almost impossible and writing quite difficult. Practice gives little or no improvement."[2] This experiment indicates the declination of control skills with temporal image displacement.

The Delay Mirror, developed by the Interactive Institute in Stockholm, Sweden, is one example of artwork that appears to be related to the findings of the Smiths' time delay experiment. The Delay Mirror is a video mirror that displays a user's reflection delayed by three seconds.

> In the delay mirror you see yourself *per speculum in aenigmate* – in a mirror, darkly – but this mirror, because of (rather than in spite of) its distortions in time and space, gives you a new perspective on your own self image… You can spin around and see yourself from behind, or see yourself close your eyes. It is a mirror that shows you yourself as you see others.[3]

The Delay Mirror provides a new perspective on self-image based on how we perceive ourselves visually. Intrigued by the possibility of playing with images and temporal displacement, I created an experimental sketch in Processing that was based on the Delay Mirror concept and which displayed video of a user's actions delayed by between 0.5 and 5 seconds. I found

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[1]Gregory, R.L. *Eye and Brain: the psychology of seeing*. 3rd ed. New York: World University Library 1978), 214.
[2]Gregory 215.
[3]Smart Studio, Interactive Institute. Delay Mirror. <http://smart.tii.se/smart/projects/delaymirror/index_en.html> Web. March 28, 2011.

that watching video delayed by three seconds or less created confusion for users performing assigned tasks such as writing or moving to a given rhythm. However, if there was no specific task assigned, users began to experiment with their reflection in a more playful, experimental manner.

Breaking the Frame expands upon some of the notions explored in the Delay Mirror by presenting the user with a series of his or her reflection at multiple moments ranging from the recent past to the previous second, and placing them in motion at multiple points displaced on a physical timeline.

Visual perception may search past experiences to construct the current visual experience. According to Gregory, "the seeing of objects involves many sources of information beyond those meeting the eye when we look at an object. It generally involves knowledge of the object derived from previous experience, and this experience is not limited to vision but may include the other senses." This notion is underlined by my personal experience of looking at my environment while unaware of my inability to see.

In "Take Your Time: A Conversation," an interview with Robert Irwin, Olafur Eliasson states that the user is the "source of the artwork." He goes on to explain that the feelings that a user brings to the artwork help to complete the piece:

> The key issue is the role of the engaged spectator or user. The question is whether the activities or actions of that user in fact constitute the artwork. Let's say that without the participation of the user there is nothing. This is not a new idea, but we need to take it to the point of saying that the user is the source of the artwork. And the psychology—the memories, expectations, moods, and emotions—that a person brings to the work is an important part of it.[4]

A user's engagement with *Breaking the Frame* is initially a passive action, based on whether they happen to be in front of the mirror. However, when the user becomes engaged, they make the piece their own and change its aesthetic by interacting with the mirror and understanding the relationship between their current and past reflections.

Gregory asks us to consider a "double reality" in which there exist an object and a painting of

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[4]Eliasson, Olafur and Irwin, Robert. "Take Your Time: A Conversation," *Take Your Time: Olafur Eliasson*, (Thames and Hudson, 2007), 56.

that object. “The painting is in itself a physical object, and our eyes will see it as such, flat on the wall, but it can also evoke [other physical] objects, lying in space.”[5] The arrangement of the mirror, projections and subject of *Breaking the Frame* exemplify this idea by presenting and re-presenting an image; each representation of the image adds new detail and attaches further meaning to that image.

Through interactions at the ITP Show and while observing museum visitors for exhibit design classes, I have noticed that, when possible, users appreciate the opportunity to perceive a piece in their own unique way. Providing the user with a sense of control over their experience of my work is important to me. As Irwin puts it:

> I very much like the idea that you aren’t led through something or told where to go, but instead are given a continuous set of qualitative choices. The choices are not dictatorial in any way. You’re the one who has to make them. You’re put in this position of actually constructing the aesthetics of the experience as you go, because each time you make a choice you change the nature of the experience.[6]

Irwin continues by emphasizing that the “crucial” issue is “not having an ambition [...] some idea of correctness or meaningfulness”[7] for the user. Rather than pushing an agenda, the observer should have the freedom to perceive as they wish. In other words, the work of art should convince the user that the power to perceive lies within them, rather than in the art or in the hands of the artist. In *Breaking the Frame*, I wanted to give the user this sense of control, of a kind of ownership of the piece for the duration of their interaction with it.

Technical Details

Breaking the Frame employs a camera behind a two-way mirror. The camera sends video to a Processing sketch via a USB connection to a nearby computer, and the images created by that sketch are projected onto a screen.

The Processing sketch receives images from the camera and saves them to an image buffer, then recalling the images from the buffer at different times and displaying them arranged within the Processing display window. I created and tested the initial sketch using a laptop webcam, and

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[5]Gregory 170.
[6]Eliasson and Irwin 57.
[7]Eliasson and Irwin 57.

then selected an external camera for installation behind the mirror. I chose the Sony PlayStation 3 Eye, a camera that is currently popular for computer vision applications due to its ability to capture images in low light conditions, its simple USB connection, its high frame rates, and the availability of open-source Macam drivers for it that interface easily with Processing.

To create my mirrored capturing device, I built a wooden frame that could hold a 18" x 24" mirror and secured the mirror with wood blocks and foam to ensure a snug fit and avoid scratching its delicate surface. After a couple of experiments with putting the camera behind the mirror, I realized that there were two lighting issues to overcome: lens flare between the camera and the rear surface of the mirror and a slight ability to see the camera and frame through the two-way mirror. I resolved these issues by creating a black foam core backing for the mirror and cutting a small hole for the camera lens, just above the horizontal center of the mirror.

Once satisfied that the camera, the mirror and Processing were playing well together, I experimented with various configurations for the installation by varying the placement of the mirror and projector, as well as the number and sizes of projected images.

Initially it seemed that a linear, chronological configuration would make sense. At one point, my dream location for *Breaking the Frame* was Frank Lloyd Wright's Solomon R. Guggenheim Museum in New York City. The user would gaze into the mirror in the building's atrium, while the video footage of recent moments would travel upwards along the smooth white banister of the building's spiral ramp into the nautilus shell-shaped structure of the dome, and disappear into the void.

Given the realistic time and space limitations for the prototype, I decided that a linear setup at this scale lacked interest and began to explore other ways to set up the installation. I pulled the mirror away from the wall and set it up to face the projection surface, so that when a user stands in front of the mirror, her or she sees his or her reflection in the foreground and the projected images of his or her reflection in the immediate past in the background. With careful attention to lighting, this setup proved successful.

Conclusions

Breaking the Frame is an experiment in user interaction with a series of the user's own reflections displaced over time. In some ways, the results are still unclear, as I have only begun

to see people interact with the mirror. I am intrigued to see how viewers will react to the piece, and I am hopeful that they will play around with it and enjoy the experience of seeing themselves at once in the present and in the immediate past.

Although I'm still not sure of all of the ways that ITP has changed how I think about the world, some of its effects have already begun to make themselves clear. As I head on to whatever I do next, I know that how I see the objects around me and my ability to explore their potential for interaction has been expanded into a spectrum of new and exciting directions.

Sources and Influences

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