Cue

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Date of Exhibition:

Thursday, July 6, 2006

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MFA Thesis

July 2006

Submitted as partial fulfillment of the requirements for the degree of Master of Fine Arts in Electronic Visualization in the Graduate College of the University of Illinois at Chicago, 2006.

Acknowledgments

I've come a long way since all this started and I wouldn't be where I am right now without the guidance and support of so many people. First of all, my committee – Drew, Dana, Sabrina and Daria. I'm not sure how you all kept from laughing at some of my crazy ideas in the beginning like the Back To The Future-like static electricity proposal, or how you remained patient through so much of my nervous rambling but what I do know is that each of you came to every meeting ready to take me seriously.
Your dedication to helping me find my way with your passionate remarks, honest, constructive criticism, and genuine advice was remarkable and will always be remembered. Thank you all for mentoring me and especially for giving me so much of your valuable time.

Special thanks to Chris Clepper for taking the time out of his busy schedule to come by and talk tech with me. Having an extra pair of eyes on my application was so helpful and made a big difference in the end.

There are numerous people to thank from the infamous EVL. Pat, Lance, and Alan, without your help and assistance on tech issues this and many other of my projects would never have come to life. Allan Spale, you were my angel the first time around. If you hadn't helped me with my errors and stuck with me the evening of the event, I would have been lost. Thank you for that and

also for being so cool about letting me use DVL's equipment. Daniel Sauter, your informative emails and critiques spearheaded much of my research. Hearing about Retrievr from you was a major stepping stone. And many thanks for helping me setup at the last show and keeping my brother and I from arguing any more. Greg, Jonas, Laura, Javid, Kapil, AnnMarie, Melissa, Dubi, Bob, Cole, James, Milg, Arun, Raj, Venkat, Santi, and Mark, there are so many ways in which you all helped me out from helping me move equipment to documenting the show, and I truly appreciate it. And of course, Eleni, my partner in crime, without you these past four years would not have been possible. It has been a pleasure to collaborate with and learn from you but an even bigger pleasure having you as my friend.

Last but as always never the least, my family, my friends and my man. You all have been so understanding of my busy life this past year and have always provided me with some fun when I needed a break. The support I've seen from all of you is amazing to me, I really feel so special. Without all of you believing in me, I would have went to bed instead of staying up all night. Thank you for seeing more in me, for listening to me, and for always asking. I feel your love and hope you feel mine.

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Abstract

In all of us we have stored away memories and experiences that can be conjured up with the slightest trigger. A personal encounter of mine consists of frequent flashbacks to my native country, India. There are numerous occasions when I'll hear a car with a bad engine drive by and immediately recall my days in Gujarat riding in a rikshaw, or more specifically, when I see a certain shade of red on a woman's lips, I'm brought back to my cousin's wedding day and the lipstick she wore that matched so perfectly with her sari. In cognitive psychology terms, this type of auditory and visual processing contributes to a type of memory called Episodic, the recollection of events that include time, place, and associated emotions.

Cue is a systems-based artwork representing the visual processing experienced during moments of recollection. By designing an algorithm to track color relationships between my database of video diaries from India and images captured real time in the exhibition space, a unique perspective is created on visual stimuli that cue our past.

Conceptual Introduction

Sometimes I'll smell something in the air, not knowing exactly what it is; suddenly it takes me to a beautiful evening in Gujarat where I'm walking along a dirt road, joshing with my cousins. Often when staying up late, I'll hear the sound of birds chirping in the new morning outside of my bedroom window. I can't help but think back to mornings waking up in India to the sound of exotic birds as my alarm clock. Or when I see a little boy running aimlessly as his parents call on him to be careful, I smile at the thought of my cute little nephew making trouble for his mother back home.

Like many people, I experience these sorts of moments frequently. Something – a smell, sound, image – reminding you of something else. It's a normal yet somewhat magical process that all of us go through.

Personally, I have flashbacks to India on many occasions. Maybe it's because I was born there and we now visit our big family every five years. That's enough to forget, visit, get culture shocked, become used to things, then love it and have to leave and end up longing to go back. Or maybe it's because at one point growing up we actually moved back to India for what seemed like forever and then suddenly after just months, we came back to America for good. I've always wondered what life would have been like if we had stayed there instead of here.

Regardless of either of these or any other reasons, the memories of India constantly visit me. I remember the sounds, I remember the smells. But most of all, I remember the colors. Unlike many other countries, India boasts of an array of hues throughout its landscapes, architecture, food, people and much more.

Figure 1. Families strolling on the beach.

Colors are an integral part of the culture of my country and what makes it so unique. Immediately getting off the airplane in Bombay, one can see people wearing Indian clothes made up of every shade of the rainbow. When was the last time anyone walked on a Chicago street and could say they saw 10 people in a row wearing colors that were *not* black, gray, or blue? The people of India seem to thrive on the vibrant dyes of their clothing (Fig. 1). Even panhandlers, found everywhere in India can brighten a vision with their own worn but intensely saturated clothing.

Figure 2. Holi, The festival of colors.
Credit: Maneka Gokool

There are even events such as an annual festival in March called *Holi* that celebrate color. Indians all over the country create a spectacle throwing powdered color throughout the cities and at each other, an event full of fun that brings out the prismatic essence of India's people (Fig. 2).

Figure 3. Kids on a school bus.

Indians' apparel and their colorful-like personalities make up a majority of the various shades of my past, but there is still so much more like the landscapes that include a variety of blossoming gardens and foliage found all around in addition to the interesting pigments of bungalows, vehicles, and businesses lining up along the crowded streets (Fig. 3).

It is these pieces of India I miss, the pictures that come to mind and leave me with mixed feelings of nostalgia and joy, just as Proust's tea soaked cookie had surprisingly brought up his past to his delight (Proust, 1913-1927).

In their simplest form, my memories of India are visually just splotches of colors. *Cue* is based on this abstract perspective triggering stories from my video diaries shot in India. By using a hue detected in an exhibition space, an episode associated with that particular color is cued. Like the basic process of memory, *Cue's* system imitates the brain's recognition of shapes, smells, images, moments, etc., and specifically targets color in this case bringing to mind the moments that are connected. In this simple order my past is exposed and shared to create a new perspective on remembering while at the same time showing India through my eyes.

Memory

According to Wikipedia, Memory is the ability of the brain to store, retain, and subsequently recall information. Memory used to predominantly be associated with studies in philosophy but later joined the coupling of cognitive psychology and neuroscience, called cognitive neuroscience.

Memory is classified in many different ways based on duration, nature and retrieval of information. Of the various types of memories such as sensory, short-term, long-term, semantic, and many others, *Cue* represents the episodic classification defined as the recollection of events that include time, place and associated emotions, originating from a very personal experience.

The statement by Tulving, "Episodic memories can be likened to written stories" sets the tone to the encounter with *Cue* (Tulving, 1972). Each ten-second segment of videos shown has a story practically narrated visually to the viewer. A first person camera view on the episodes create a memoir-like experience for an audience to absorb.

Simulation, Reenactment and Visiting Memory Lane

Many underlying ideas disseminate from *Cue*. Readings on simulation and reenactment are constant influences in my theoretical understanding of artworks and have a big contribution in this work.

Jean Baudriallard's essay, *Simulacra and Simulation* often comes to mind when thinking of memories that are recalled again and again (Baudrillard, 1981). According to some researchers, episodic memories are refined into semantic memories over time. In this process, most of the episodic information about a particular event is generalized and the context of the specific events is lost. One modification of this view is that episodic memories which are recalled often are remembered as a kind of monologue. If you tell and re-tell a story repeatedly, you may feel that you no longer remember the event, but that what you're recalling is a kind of pre-written story.

In his essay, Baudrillard states that "Simulation is no longer that of a territory, a referential being or a substance. It is the generation by models of a real without origin or reality". He goes on to provide an example about the ideas around power explaining "it is no longer a question of the ideology of power, but of the scenario of power" (Baudrillard, 1981).

There is a potential that the video diaries repeatedly played in *Cue* could become a model of India to an audience unaware of my personal connections. Images that are flashed before them, especially in large scale, become the scenarios they imagine

when thinking of India, the ideal becoming just a sign that I am able to define to them without it having any original meaning.

My memories from India are played back once, twice, or many times. Not only do I have normal moments of recollection, but I have actually put forth the effort in capturing days past in India and archiving them to video files. According to reenactment theory, it is a type of obsession to constantly document the past. In Umberto Eco's *Travels in Hyperreality*, it is suggested that there is a constant in the average American imagination and taste, for which the past must be preserved and celebrated in full-scale authentic copy; a philosophy of immortality as duplication (Eco, 1983).

Obsession or not, my stories are played to strangers who then reenact an experience of mine through their eyes, reinterpreting something that was once private to me.

About a year ago while doing some reading on reenactment I began to think about stories my father has told me. A story I was especially fascinated by was about a day in his young life in Gujarat when he was walking home from school with a friend, and by a miracle, my father saved his friend from being hit by a truck with just the right feeling at the right time. I started imagining this narrative on my own terms. I saw my father as a handsome young hero and imagined India and the road they were walking on a bit older and less colorful than the India I know now. Soon, it was not enough for me to just have these images, recreations of my father's days in my head. I had to document this reenactment of a reenactment in the form of a video piece. (See Figure 4A & 4B).

Figure 4A. My Dad, an artwork on reenactment

Figure 4B. My Dad, an artwork on reenactment.

Research on simulation and reenactment theories have helped in developing the initial concept of *Cue* and is motivation to continue with the details of the different facets of these subjects to progress in further related artworks.

System of Cue

Cue is made possible by using Pure Data and the Graphics Environment for Multimedia library otherwise known as PD/GEM, an open source real-time audio and graphics processing system (Fig. 5).

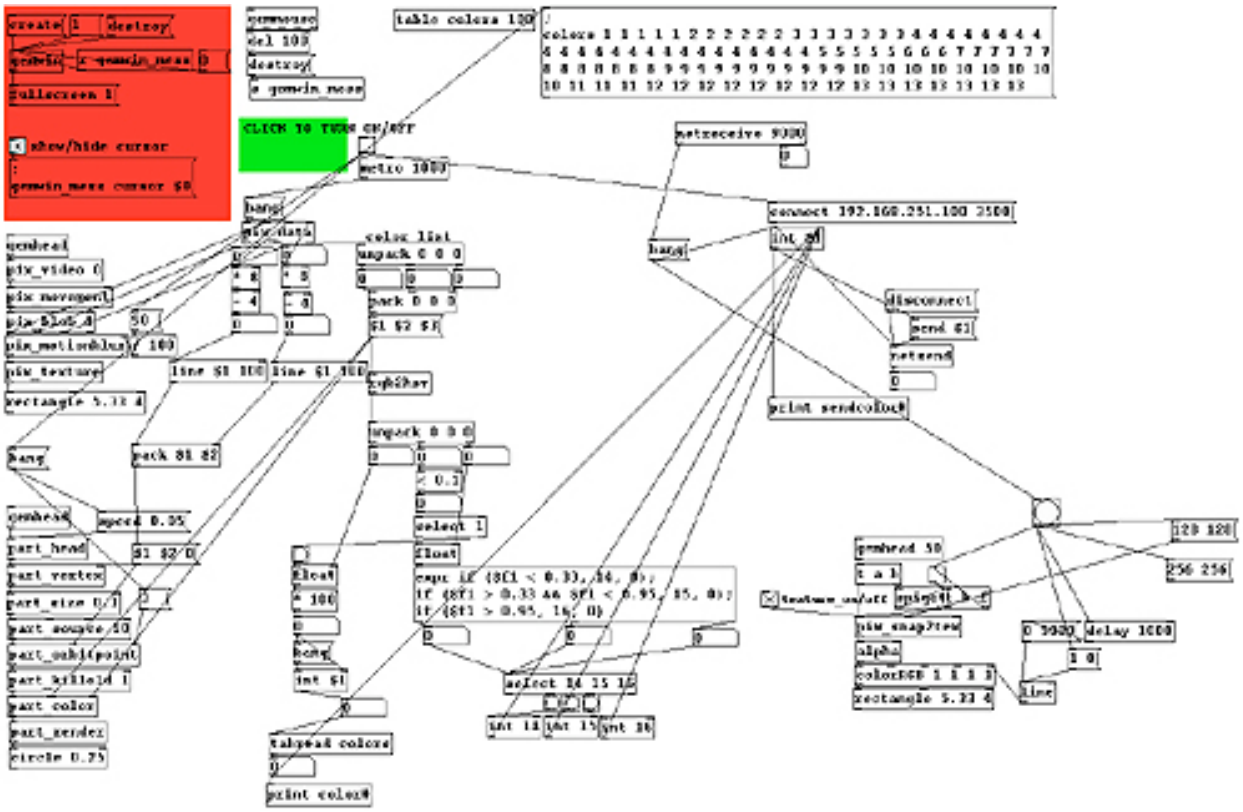

Figure 5. Screenshot of PD/GEM application

The system consists of three computers. Computer 1 runs an independent PD/GEM application that consists of stretched and scaled images that fade in and out infinitely

through time (Fig. 6). This visual provides for a colorful and serene backdrop to the other two more active screens creating a balance to the presentation as a whole.

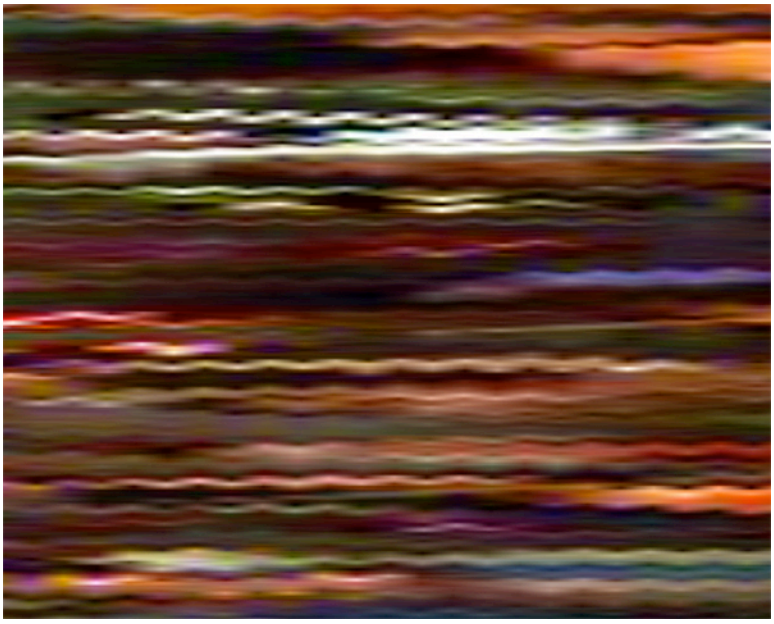

Figure 6. Screenshot from Computer 1.

Computer 2 is the catalyst to the whole process. Cue comes to life when a visitor walks into the exhibit space. A webcam captures images of the space and displays them through a blurred and trailing process. In addition to capturing video through the webcam, Computer 2 integrates a particle system connected to a motion and color tracker. Particles floating on the screen drift into areas where movement is found while also taking on the color of that specific x and y coordinate over one second intervals. This clues visitors in on the interactive aspect involved in contributing to the visuals seen originating from Computer 3 (Fig. 7).

Figure 7. Particles following movement

Computer 2 and 3 are communicating using a local network. Computer 2 first deciphers a color value from the specific coordinates. The color value comes in as a RGB value but then is converted to HSV for simpler color identification. The H, S, and V values are run into a detailed expression in PD that outputs one number representing a color within a range. This range has already been set in a predefined array, so when the PD algorithm outputs its answer, that number is located in the array which then provides the number corresponding to a color.

At this point, Computer 2 snaps an image from the video capture, displays it for seconds before it fades back to the webcam visuals. This sequence of events creates a photo-like quality of the actions and images in the space giving a viewer a memory of his own that has contributed to triggering my memory.

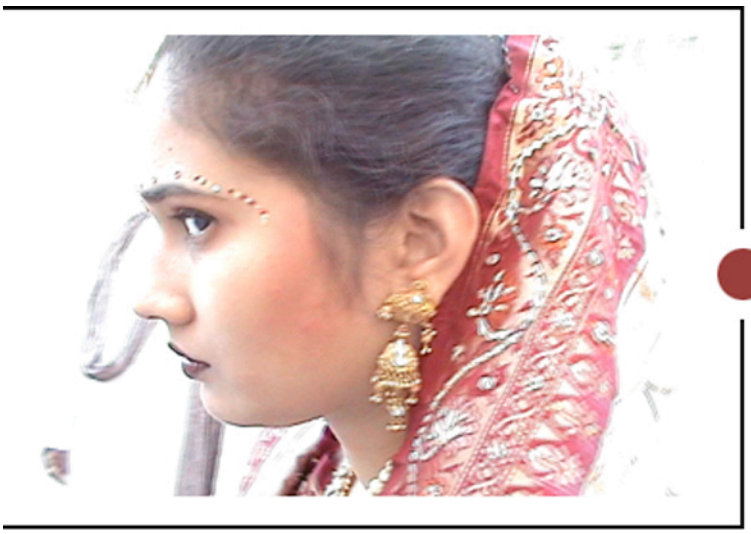

Figure 8. Color/memory association.

Also at this same instant, the color number is sent to Computer 3 via the network. Computer 3's application takes the number, puts it through an expression much like an if-else statement that finds the memory associated with that color (Fig. 8). There are always two movies to choose from for each color. This minimizes the chance of the

same video playing over and over. One is randomly picked and then played for ten seconds. Once the episode has reached its end, Computer 3 immediately receives another color and plays the next representative story.

Since there are millions of shades out there, I chose to simplify this process by choosing seventeen hues to have all the incoming color values round up to. This way, I am still able to accommodate an array of colors without there being room for error in this regard. Since each color has a choice of two videos, there are all together thirty-four memories.

In addition to the overall process, various image effects are applied to the visuals on all three computers to emulate characteristics of a memory or the act of remembering with its missing pieces, blurred recollection, chaotic sounds and slow, trailing motions.

Setup

As mentioned before, Cue was setup using three 10x10ft. surrounding rear projection screens. All three screens were projected on using Christie Digital Systems' Mirage 5000 projectors. The projections bounced off a large mirror onto the screens to create large scale images. The application itself was run by three Windows XP machines.

Figure 9. Lighting

A major challenge to the setup was lighting. Quantity and placement of studio lights had to be correct since the incoming video was being tracked especially for color. If the lighting was off, I would only get very dark values like grey, blue and black. Many hours of testing of placement and using filters took place since I also had to make sure the lights would not disturb the visuals. In the end a soft spotlight was created which worked well in regards to tracking and ambiance (Fig. 9).

In addition to the lighting, the video image itself had to be adjusted. Experimenting with the frames per second became a huge factor in the quality of the image as well as brightness, contrast, and gamma settings.

Another challenge was something that was unpredictable. In order to get the most out of Cue, it is essential the visitors are able to view a good amount of my memories. But if people only come wearing dark colors, I would run into a problem of showing only a few of the same videos. With my committee we discussed various solutions like changing the hue of the incoming image itself or providing props like Polaroids that people could wave around. Finally I opted to use the left wall, an extra wall at the time, as a backdrop that contained the stretched/scaled images which could help in triggering more colors. Also I did provide props in the form of Indian garments that people were able to experiment with if desired.

Of course, I did wear a colorful outfit and there was actually a good amount of color among the crowd so this did not appear to be a problem. Even though, I would like to find a more dependable solution that would ensure that an audience could see a variety of memories.

It should also be mentioned that the setup of Cue is flexible. There could be two screens, three or even four. There could be projections or monitors. The aesthetic changes with every setup though always pleasing.

The Exhibition

On July 6, 2006, I exhibited the final version of Cue. The event was part of a monthly schedule of meetings organized by the Open Node group. Open Node is a collective of Chicago based artists, teachers, students, curators, gallery owners, and overall art lovers who get together once or twice a month networking to bring our city to the latest art front. Each meeting typically consists of two presentations by members of the group or visiting artists. This way we are able to get to know each other and receive helpful feedback on our artwork and research.

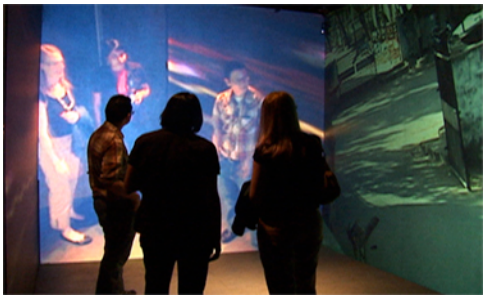

Figure 10. Thesis Exhibition
Credit: AnnMarie Cernoch

Cue was projected on three surrounding 10x10 ft. walls. The images, as one person said, were "mammoth-like" in size (Fig. 10). The space of the three walls seemed to provide a space within a space. It was immersive, yet almost seemed threatening at the same time as I observed that people were reluctant at first to go "inside" or preferred to watch as a spectator.

Figure 11. Thesis Exhibition
Credit: AnnMarie Cernoch

Nevertheless, eventually people did come in and encountered my memories and pursued to trigger new ones (Fig. 11). Many would linger in front of the central screen, noticing their mirrored selves looking back at them. Once this got their

attention, the particles would peak their curiosity which lead the gaze to the other screens. Some would then watch my stories, or watch themselves or watch the fading images on the third wall which came as a surprise to me as this was a last addition but of which I'm glad I made.

I had the opportunity to talk with many of the attendees that night about my project which was very enlightening. I was able to communicate my idea, and felt I was relating. Many comments and interesting suggestions were sparked by Cue. For example one visitor mentioned an essay he had been reading about the auras of people and how these invisible auras actually interact with each other creating another form of communication that is not just physical. He felt the particles seemed to demonstrate that idea, as the colors that people radiated floated around them. Another comment was made on the background music I played during the event. It was Indian music by DJ Cheb I Sabbah that provided more of a context to the visualizations since the visitor was unaware at the time that the memories were from India. A suggestion was also made about the possibility of processing the captured video, much like the image process happening on the left screen, making the video more abstract and perhaps more central to color. This and other feedback I received that night was very useful. I definitely plan to play around with some of the suggestions in the near future.

The Open-Node event was a great learning experience. It was the first time I had shown my final thesis project to the public, especially to a large group of artists, and

being able to stand by my piece and share in their experiences while getting valuable input was very rewarding.

Reflections

Looking back, there are a couple of things I'd like to change and/or add. The moment when an association occurs in Cue's application is something many visitors did not notice. The picture taken from the captured video fades out so quickly that it's almost invisible. I underestimated the importance of this moment and now realize my error since this is an important phase within the system. Drew Browning's suggestion to display that image on the left wall is a good one and would definitely get noticed by a visitor. The only conflict is with the visual of the fading images which though I did add last minute as a sort of filler to use a spare wall, is now almost integral. Thinking about this, since the presentation is portable, it could be shown as projections or on monitors and there are possibilities to have four outputs which could change the work a bit but could be interesting. There definitely are some options.

I'd also like to incorporate a process to the incoming video that is similar to the left screen's process – stretched and scaled images. Perhaps instead of using the particles, if I did change the incoming video I could use PD/GEM to somehow highlight the tracked area using another visual like extending it out or scaling it even more.

Overall, it would be worthwhile to explore these possibilities and continue learning PD/GEM.

Conclusion

Cue is really a project from my heart. As an artist, I feel the need to express my emotions which are my motivation. Even now, after seeing my video diaries from India so many times, I can't help but smile back at my cousin on her wedding day, or feel like a voyeur watching seconds of a woman's life I can hardly imagine. When watching my memories, I feel warm and happy since that is the way I felt while I was in India. I long to go back, to document more. Until then, I will just wait for the next cue.

The final execution was successful. People experienced my stories, got to know me, and were able to relate to the content on a personal level. The setup, the system, the presentation all worked well together but the concept is what pulled it all off.

Keywords

memory, india, color, hue, track, value, rgb, hsv, data, diary, association, relation, simulation, reenactment, story, nostalgia

Hardware/Software Specs

Hardware

- 3 Windows XP PCs
- 3 Flat screen monitors
- 3 Keyboards & mouse
- 3 Christie Digital Systems' Mirage 5000 projectors
- 3 Rear projection screens
- 1 Phillips webcam
- 2 Studio lights
- 1 Hub, 2 network cables
- 1 USB extension cord
- Extension cables, VGA cables

Software

- Pure Data - http://pd.iem.at/
- Graphics Environment for Multimedia Library - http://gem.iem.at/
- Quicktime Player - http://www.apple.com

Cited Literature & References

Baudrillard, J. (1981). The Precession of Simulacra. Simulacra and Simulation. Universtiy of Michigan Press. pp. 1-42.

Eco, Umberto. (1983). Travels in Hyperreality. Travels in Hyperreality. Harcourt Brace Jovanovitch. pp. 3-57.

Proust, M. (1913-27). Remembrance of Things Past. Volume 1: Swann's Way: Within a Budding Grove. The definitive French Pleiade edition translated by C.K. Scott Moncrieff and Terence Kilmartin. New York: Vintage. pp. 48-51.

Tulving, E. (1972). Episodic and semantic memory. In E. Tulving & W. Donaldson (Eds.), Organization of memory, (pp. 381-402). New York: Academic Press.

1. Wikipedia, http://en.wikipedia.org/wiki/Memory

2. Wikipedia, http://en.wikipedia.org/wiki/Episodic_memory

3. Pure Data - http://pd.iem.at/

4. Graphics Environment for Multimedia Library - http://gem.iem.at/

5. Quicktime Player - http://www.apple.com