the elements of

ENGAGING EXPERIENCES

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THANK YOU

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We are in a moment of transition; our culture is moving from physical real-world interactions to digital. The interfaces we interact with on a daily basis, for work, entertainment, and connection, should reflect our relationship to the real world and be engaging, immersive, and emotive.

I am interested in how designers create engaging experiences. What evokes empathy in a user? How can we connect with our users on a more personal level? Why do we want these experiences?

In response to these questions, I will explore and create engaging experiences by building interfaces that draw on our physical experiences. My goal is to find new ways to connect with users through emotion, simplicity, the five senses, memory, personality, play, and conventions.

INTRODUCTION
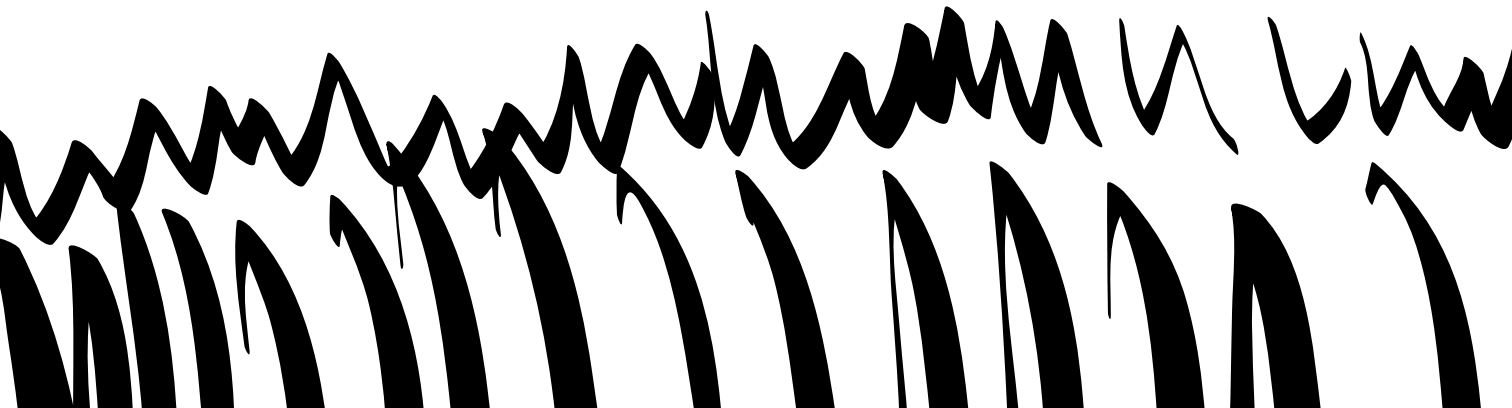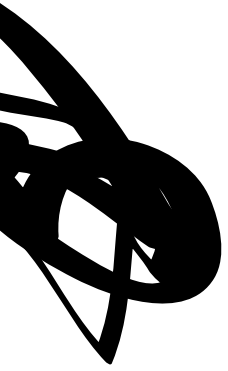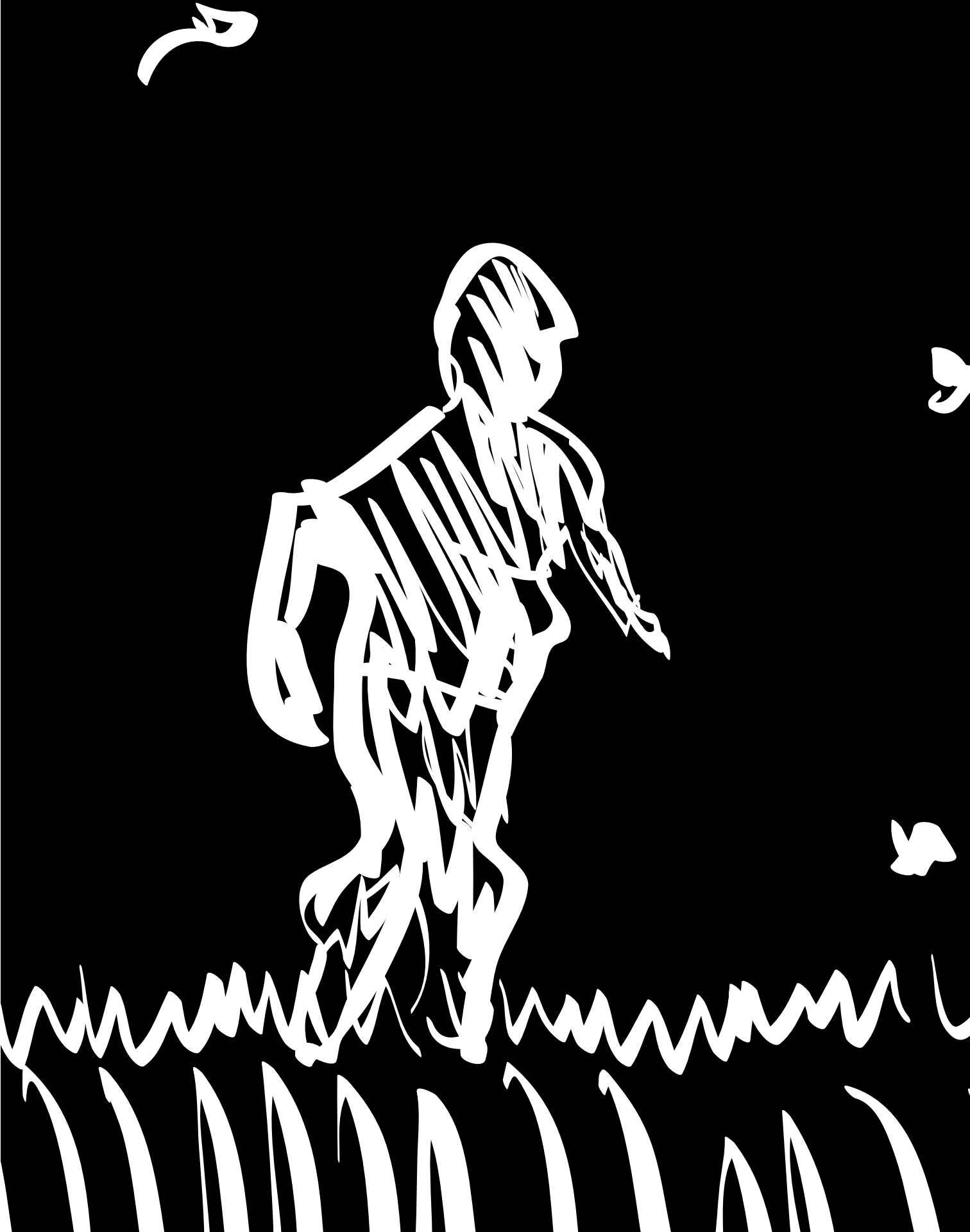
DO YOU EVER
catch
YOURSELF IN A
moment?

When time feels like it stops and the only thing that matters is what's in front of you.

Or perhaps there is an event you look back on and recall every sight, taste, smell, and sound. I obsess over these experiences, seeking them out wherever possible. As an interactive designer I have sought out ways to bring this level of engagement to my interfaces. Through research and prototyping I compiled a small set of elements crucial to my design process. In the following chapters I will guide you through the discovery and implementation of the elements of engaging experience.

stories of
EXPERIENCE

Books on Tape

I couldn't have been older than 4 or 5, sprawled out in the big bench seat of our Oldsmobile surrounded by books and crayons.

"Are we there yet?"

We were only five hours into our road trip and I was antsy. This wasn't our first family trek from Maine to New Jersey and I'd learned early on that sleeping got us there faster. But I wasn't tired and we had just entered the longest state in existence, Connecticut. My parents knew it was time, out came my shiny red Walkman and my small collection of books on tape. Each illustrated book housed a brightly colored cassette in its thick corrugated cover. My Walkman was a precious commodity. As the batteries wouldn't last through the entire collection of books, I had to be selective about the stories I wanted to hear.

We didn't have a VCR yet, and my parents rarely allowed me to watch the news on our tiny black-and-white TV. So my books and tapes had become the equivalent of a favorite movie, getting played over and over. It was a magical experience—I could have a story read to me whenever I wanted without waiting for an adult. I sat in my own little world with the big foamy headphones blocking out everything else around and lost myself in the stories. Unlike most adults, my Walkman would read me my favorite book as many times as I wanted.

This is one of my earliest memories of a truly engaging experience. The brightly illustrated pictures combined with the audible narrative made books come alive to me. They made me love books for the new experiences I found within them.

Postcards in Paris

"Votre attention s'il vous plaît..."

The garbled voice said something incoherent over the loud speaker. I was nineteen, arriving in Paris alone, and completely petrified. Managing to navigate myself through the Charles De Gaulle airport, I exchanged my money and eventually made my way to the Metro. I was beginning a four-month internship at a design firm in Paris. I didn't know a single person, my dorm room was in an area I didn't know, and the language I'd been studying for three years suddenly felt completely unknown.

That first week everything was unfamiliar and frightening. My dorm room was a small gray and white square, with cold tiled floors, an old white pedestal sink, and squeaky metal bed. While my internship was filled with friendly and welcoming people, I still felt like an outsider with no connections home.

Despite phone calls and emails from family and friends, I went to bed at night missing home. At the end of my first week a postcard arrived. It was from San Diego, where I'd been living with my boyfriend for the summer, he'd sent it before I'd even left the States. It only had "love you" scribbled illegibly on the back, but I suddenly felt less alone. He was leaving that week to travel around Western Europe for a semester with his brother so I thought that our communications would be few and far between, a phone call here, an email from an Internet cafe there. Soon more postcards arrived. Munich, Vienna, Zurich, Florence, Corsica, from every new place he visited I got a postcard. Some simply had a heart with his name, Pascal, scribbled below, a few were completely blank but for my name and address. Each postcard's arrival evoked a new set of feelings, some days a thrill of excitement to see where he was, others a twinge of sadness that we were apart. Though their imagery wasn't necessarily personal, they made me feel more connected, and stayed around long after a phone call would end.

These simple objects created a lasting memory of emotions and feelings. My time in Paris was amazing, I made many new friends, and ate more crepes and croissants than imaginable. But above everything else I think of those postcards first when recalling my time there. They evoke memories of love, longing, excitement, and even the smell of fresh bread from the bakery below.

Slide Binding

Alone in a dark, hot closet.

This was my first assignment as a work-study student in the Art History Department. I took the first job offered, and though I was grateful to have my finances worked out, I worried that I should have waited to find something better. And now here I was, in a tiny room void of any sound but the buzzing of the lightbox in front of me, re-binding slides. The art department still used slide projectors for presenting in class. At the beginning of each semester professors would order hundreds of new slides, each arriving encased in a plastic cartridge. It was my job to remove the film from its plastic case with a razor blade—a tedious task. I first discarded the old shell and took out a new Gepe glass slide-mount. I then snapped the mount apart, and carefully taped the film down on all four sides with special tape to prevent any light from sneaking through. I then snapped the slide back together and carefully checked it against a reference book to ensure that I hadn't accidentally inverted the image. Each slide then needed a tiny label typed and printed with the title, artist, and date of creation. If this description seems unnecessarily long, imagine the physical process.

I hated it. My roommate had waited and landed a job in the education department. She was photocopying reading packets and pre-sharpening pencils with two other work-study students and it sounded like heaven. I kept at it, 10 hours a week mostly spent in that dark room.

At the time, I happened to also be taking an Art History class. I liked art, I always had. Now I was experiencing it in a whole new light. Many of the slides we viewed in class I had physically prepared, hovering over the lightbox and peering down into a loop, labeling, and occasionally out of boredom reading about the pieces in the reference books. I soon found myself more engaged in class, drinking in all the new details about the classic works. Each painting was a historical story to be discovered. Back in my closet, I became more interested in my once boring job. I got to see ancient architecture, modern paintings, and amazing photography in detail - they were paying me to look at art!

WHY ENGAGING EXPERIENCES?

Engaging experiences have the power to evoke emotion and connect with users beyond the initial interaction. The most powerful ones allow a user to fully engage in an experience and have everything else fall away. Interactive media has the power to engage beyond the one-way interactions of a poster or movie. By building dynamic experiences, designers can begin exploring new venues for engaging users.

For the past 10 years I've designed logos, retail spaces, ad campaigns, applications, interfaces, and anything else a client needed. In each situation user engagement was measured in units sold, page views, and conversion rates. I never actively considered how to evoke engagement, instead I designed for specific user perceptions. Using color, type, scale, layout and whitespace I worked to engage users with pleasing aesthetics. These become "tricks" to make an advertisement feel energizing, retail space feel inviting, and websites feel secure. While these methods of engagement were successful on some levels, I strive to dig deeper. I want to go beyond merely engaging users. I want to create an engaging experience.

experience is defined by those situations and episodes that we spontaneously refer to as being 'real experiences'; those things of which we say in recalling them, "that was an experience"

John Dewey, *Art As Experience*

WHAT IS AN ENGAGING EXPERIENCE?

To help define this experience I found John Dewey. In his major work devoted to philosophical aesthetics, *Art as Experience*, he explains "experience…is defined by those situations and episodes that we spontaneously refer to as being 'real experiences'; those things of which we say in recalling them, 'that was an experience'" (Dewey 37).

Dewey's concepts of "recall" and "real experience" pinpoint the subconscious divide I make between "having an experience" and merely "experiencing". I have experienced many things in life, but the moments and places where I had "an experience" are distinct and unforgettable, they are also mainly analog. For example, I experienced completing a marathon, but the actual running of my first marathon was "an experience," one that brings with it many senses, memories, and emotions. I can still feel the heaviness of my legs at mile 18 and the numbness of my quadriceps by mile 22. I remember the dry steely taste in my mouth, the salty crust on my face and arms, and the smell of sweat and ocean. I don't remember hearing the crowd cheering or music playing, but instead my footsteps pounding in my ears. This is "an experience" by Dewey's terms. When I recall experiences they rely deeply on all the senses: touch, hear, taste, feel, and smell (Dewey 39).

Each of my explorations study user engagement in an experience beyond a simple interaction with an interface. My methods of exploration vary, from physically building a three-dimensional space to translating that space to a two-dimensional screen. Additionally, by analyzing my own experiences with dynamic objects and interfaces, I have developed patterns of engaging elements. In the next chapter I will analyze some of these experiences with technology.

designed for
EXPERIENCE

Cows vs Bubbles

How can this be so hard? I arrived my freshman year of college armed with a brand new Gateway computer. It seemed unbelievably cool, packed up tightly in its cow–patterned box. My roommate had a brand new iMac (the original), seemingly less cool in it's simple white box. My computer required an awkward multi-step setup, starting with us delicately prying the Styrofoam encased monitor from the box (imagine two smart young women sprawled on the floor playing tug-of-war with a box). What came next was an hour of cords, monitors, and indecipherable manuals. Eventually we moved to the iMac, prepared for our next battle. Instead, we found a process so simple it delighted us.

Open the box.

Grab the big blue handle built into the monitor/computer.

Watch it slide gracefully out of the box.

Plug in the computer. Done.

EXPERIENCE & TECHNOLOGY

DESIGNED FOR EXPERIENCE

When we talk about user experience, we often frame it in terms of technology. What new technologies are we using? How can we use them to further engage users? We consider the machines and code first and the experience second, often allowing the technology to get in the way of the human experience. Modern technologies are introduced at a rapid pace, as designers how can we stay focused on the humanness of our interfaces? How do we keep users engaged and emotive past the initial "aha" moment of a specific technology or interface?

In his book *Hamlet's BlackBerry*, William Powers surveys seven historically great thinkers and how they dealt with new technologies, then compares their process with our current constraints. Powers focuses largely on the lost opportunities we face in digital interfaces and the "potential for deeper impact and value... It's all those unrealized epiphanies, insights, and joys - journeys the mind and heart never get to take" (Powers 27). As designers we can take techniques we've learned in creating engaging experiences and bring them to new and existing technologies. We can allow users to experience technology beyond its specific technical capabilities.

As we examine our own history with developing technologies, we can pick out specific experiences that frustrate or confuse users. We can then analyze how designers successfully negotiate the code and device capabilities to engage and excite users. In his book, *Emotional Design*, Donald Norman explains, "There is much that can be done to enhance these technologies. We have already seen that lack of trust comes from lack of understanding, from situations where we feel out of control, unaware of what has happened, or why, or what we should do the next time" (Norman 157). While my first Gateway desktop computer was advertised as the affordable and approachable home computer, complete with the uber friendly cow-pattern packaging, ultimately the experience of unpacking and installing left me feeling incompetent and uncomfortable with my new technology. While in comparison the design of the iMac and its packaging sought to create a truly simple experience for the user. Apple simplified the steps needed to set up the computer. The tower was built into the monitor, eliminating the need to connect multiple cords. The physical obstacle of lifting the computer was removed by designing a large handle as part of the device.

VCRs from Hell

It was a simple deal. I would willingly attend my Saturday swim lessons if my father recorded my favorite cartoons. Our fancy new VCR, which could be programmed to record television shows at specific days and times, would take care of all the work. My father, a mechanically savvy man who took apart and repaired truck and tractor engines, tackled the situation like any good engineer. He sat and followed the instructions in the manual step-by-step. Several hours later a shout of triumph erupted as several red lights began blinking. I went off to my swim lessons without a complaint.

Upon returning, my sister and I cozied up onto the couch with TV-tray tables and our lunch. My father proudly rewound the VHS tape and hit play... gray lines of static ran across the black screen, he hit fast forward through thirty minutes of black screen until a flicker of color appeared the last few minutes of our favorite cartoon, we'd missed it. The machine recorded the next half-hour of an infomercial. This was not the last attempt we made at mastering the VCR, some ended successfully, some in failure. If you ask any 30+ person about programming VCRs you'll see a cringe emerge with the memories. It was not a good experience.
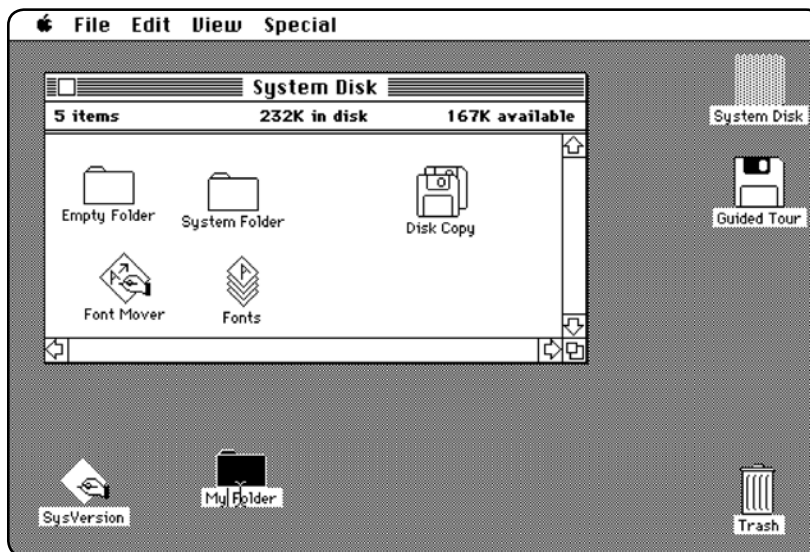
DESIGN & EXPERIENCE

Today's technologies often seem to flatten or hinder our experiences. As new devices emerge, often programmers are tasked with bringing the experience to users, and the focus of the experience can get caught on the specifics of the technology. Yes it was amazing that VCRs allowed us to record TV shows, and we were all thankful for the technology, but the experience of trying to use it left much to be desired. As designers it is our role to find ways to make these experiences accessible and more engaging, even enjoyable.

While VCRs became cold and confusing pieces of technology that only the super tech-savvy could use, the TiVo came onto the market with a completely user focused design. By examining the pitfalls of the VCR, the TiVo could eliminate previous friction and focus on creating an enjoyable experience. The TiVo plugs in just like the VCR, but instead of trying to select a show and set a time from a multitude of black buttons the user is presented with a simple screen interface. To record a show the user only needs to select the show name, the TiVo ensures that it records at the right day and time (and even updates if there is a delayed schedule). The simplified user focused interface removes the confusing and complication layer present in the VCR experience, allowing users to engage with their television naturally, without having to understand or "program" the technology behind it. The TiVo also presents itself as a friendly and happy device. Its logo, a goofy antennaed, anthropomorphized television, appears on every screen of the interface. The user is greeted with an upbeat "bee boop" and with "boop beep" noises when they successfully complete tasks. It's almost like this happy device is conversing with the user. The TiVo took a technology we all wanted, recording and watching TV shows anytime, and made it not only an easy experience but also an enjoyable one.

# USER INTERFACES

DESIGNED FOR EXPERIENCE

The same effort to design for user experience can be seen in early Mac operating systems. In 1984 Apple Inc. released Mac OS, the first consumer operating system that didn't use a command line interface. Until this time users could only control applications by giving commands to the program through lines of text. This was a technically challenging system to operate, users had to have a basic understanding of programming and computers. Mac OS was the introduction of a Graphical User Interface (GUI) to personal computers. It allowed users to interact with their devices using images instead of text commands. Replacing the need to type lines of text into a black screen, users held a mouse to move across a screen space called the desktop. On this desktop were actual images of folders, hard disks, files, and a trash can. Everything about this experience contrasted previous interfaces, but allowed the same control over the device. The visual representations (skeuomorphism) helped users understand a highly technical system by referencing real-world objects they already understood. Robert Markley, in his book *Virtual Realities and Their Discontents*, explains that "In the history of cybernetics, skeuomorphs acted as threshold devices, smoothing the transition between one conceptual constellation and another" (Markley 17). Users mimicked how they would complete tasks in a three dimensional space by freely moving around the desktop with a mouse and clicking on an image of a folder to use it. By designing an operating system focused on user experience, instead of just the technical aspects, Apple created an engaging and accessible experience for non-technical users.

THE BROWSER EXPERIENCE

Designers continue to push GUIs to new levels, finding ways to reengage users by taking established conventions and presenting them in new ways. Many of these explorations are happening within the Internet browser window. The pop-up window, a new browser window that appears over the current window when a specific button or link is clicked, began as a simple interface concept. To provide more information without disturbing a users flow, designers would pop-up a small window with more information. However, the windows quickly became popular with advertisers, leading to an abuse of the system. Websites began to open multiple pop-up advertisements behind the current viewing window (called pop-unders), which left users with a barrage of ads when they closed that website. Pop-up windows quickly became associated with pop-up ads and were considered a nuisance. Browsers eventually "killed" the pop-up ad by making it impossible to open a new window unless the user initiated the action (through a click of a button or link). Pop-up windows were considered bad interface design until designers like Aaron Koblin and Chris Milk began playing with the pop-up window from a new perspective. In the website, Wilderness Downtown, Aaron Koblin and Chris Milk use browser windows to create a personalized and immersive experience for the user. The user enters their address to initiate a music video where windows pop-up and move around the screen filled with videos and images from google maps, based on that user's address. This highly individual and customized experience used a familiar technology presented in new ways. By breaking user conventions, the designers create an experience of delight and surprise for users.
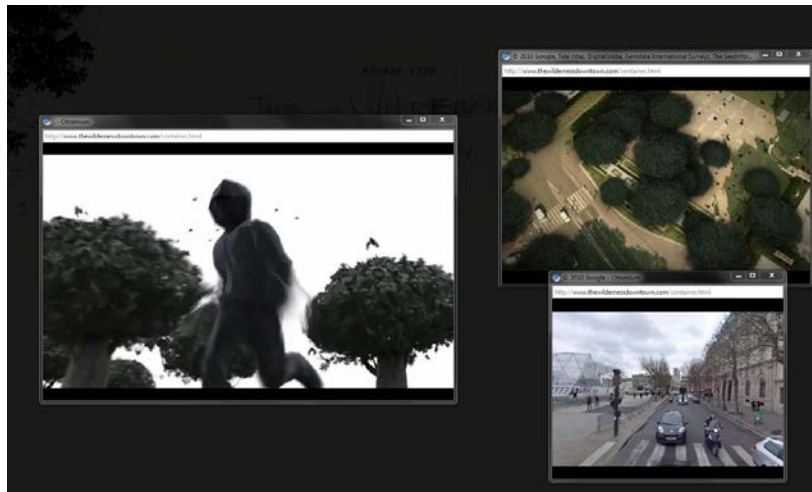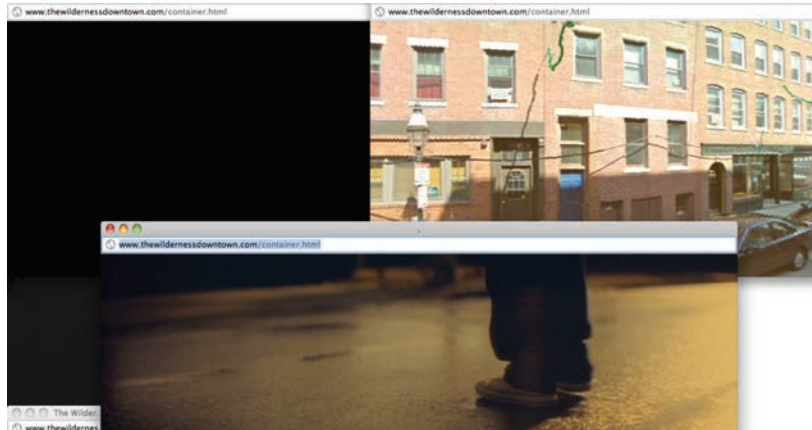
Similar to the conventions of pop-up windows, designers followed the print convention of "above the fold" in web design. All content of the site was displayed on the current screen. Scrolling was considered poor design for users so designers used pagination, asking users to click multiple times to read more content. Turning or clicking for new pages mimicked the book reading experience and was a familiar task for users. When sites like Twitter, Facebook, and Pinterest started abandoning pagination for the infinite scroll, users found themselves engaged in new levels, consuming content quickly. The infinite scroll requires no clicking for new content, as a user reaches the bottom of the page new content is loaded, allowing them to simply repeat a scrolling pattern over and over.

With users' ability to scroll established, designers began exploring ways to bring more movement to the page through scrolling. Parallax scrolling is a technique long used by the game industry, where background images move by the viewpoint slower than foreground images, creating an illusion of depth in a 2D space. When Nike launched their Better World website few other sites had tried to bring parallax scrolling to the web. The user lands on a normal looking homepage, but as they begin to scroll the content animates. Sneakers and balls zoom by as text scrolls slowly - at a readable pace, background clouds or textures add additional levels of dimension. The Better World site garnered much attention and praise, as users found themselves immersed in an unexpected way. Smashing Magazine described it as "An interactive storytelling experience... Perhaps one of the most talked about websites in the last 12 months has been Nike Better World. It's been featured in countless Web design galleries, and it still stands as an example of what a great idea and some clever design and development techniques can produce" (Shepard).

By adding depth and interaction to previously static content, Nike turned the conventional act of scrolling into an engaging experience.

NEW TECHNOLOGIES

Much as Nike's Better World used a technique, scrolling, that users were comfortable and familiar with to create a simple-to-use and engaging experience, Theo Watson and Emily Gobielle used the typical motions of child play to create an instantly engaging experience for children. Video games are normally rule-heavy affairs that require in-game tutorials and buttons to get started, but in Funky Forest, Watson and Gobielle remove that technology from the interface to allow children to directly manipulate the environment. In Funky Forest children interact with a world of trees and waterfalls projected on the walls and floors. In this installation they can create trees and help them grow with their bodies and create rivers of water to feed the trees on the floor with simple gestures mimicking that of creating a river in sand. The actions in this interface require no rules or explanation. Every interaction mimics how a child would play in the real world, creating an immersive and highly engaging experience for both adults and children.

TOUCH EXPERIENCE

I watch as my two and a half year old nephew, who has just recently begun stringing together words to form sentences, picks up my iPhone, slides open the lock and starts swiping through icons.

He might not understand why his favorite cookie-baking app isn't there - but he sure understands how to touch & swipe. If I put him in front of my computer and asked him to find his cookie app using a mouse, I guarantee the afternoon ends in tears.

As technology evolves we see the principles of direction manipulation exhibited in 3D spaces brought back into everyday 2D interfaces. The touch screen has transformed how we interact with a flat surface and how we design for it.

So what is it about touch devices like the iPad that makes them so accessible? Our basic understanding of the world is three-dimensional. We learn about space, depth, and touch from birth. We wave our hands hello and goodbye before we speak our first words. First steps are a negotiation between space and touch. We aren't biologically designed to use 2D spaces. In Designing *Gestural Interfaces*, Dan Saffer hypothesizes that "One could argue…that the current 'traditional' computing arrangement of keyboard, mouse, and monitor goes against thousands of years of biology"(Saffer 5). He goes on to cite a 1993 article by David Liddly in Wired, stating "Humans are born with a tool kit at least 15,000 years old. If the tool kit was designed for foraging and mammoth trapping, why not try to make the tasks we do with our machines today look like the task the body was designed for?" (Saffer 5). By bringing these 3D experiences into our 2D interfaces we can begin to bridge that gap.

Apple's Developer Guide outlines these principles.
"Direct manipulation means that people feel they are controlling something tangible, not abstract. The benefit of following the principle of direct manipulation is that users more readily understand the results of their actions when they can directly manipulate the objects involved. iOS users enjoy a heightened sense of direct manipulation because of the Multi-Touch interface. Using gestures, people feel a greater affinity for, and sense of control over, the objects they see on screen, because they do not use any intermediate device (such as a mouse) to manipulate them" (Apple).

By bringing the 3D physicality of touch and manipulation to the 2D space we can create an emotional connection with our users and engage them more deeply in our experiences. In addition, the form factor of these touch devices, either small or mid-size tablets, encourage a connection and intimacy from their use, often cradled in one or two hands, that is missing in the large, boxy, desk-situated computers of yesteryear.

the elements of
ENGAGING EXPERIENCES

*How can I add a human element
to my interfaces?*

*How can I find more meaningful ways to
navigate through information, or bring a
more intimate experience to the user?*

*Can I make information and connections
more relevant to people through
memories, emotions, & senses?*

My first year at DMI ended with these
three questions.

In subsequent semesters I actively
explored these concepts, but also
examined seemingly unrelated
interests, such as browser windows
and toy theaters. While these initial
questions needed some refining, they
flow through my work as a whole,
regardless of a project's intention.

RESEARCH

Emotion &
Intimacy

The mere site of a snake sends my heart racing, my palms sweating, and a lump to my throat (just writing about it has my mind in panic mode). The past few years around Christmas the SPCA runs a commercial overlaying a sad Sarah Mclachlan song with videos of impounded puppies and kittens – my husband and I both dash to change the channel to avoid my inevitable tears, as well as any attempts to adopt a fourth animal.

Why is emotion so important in creating engaging experiences?

As humans we are wired for emotion. It's a survival mechanism: run from frightening experiences, and care for the weak or injured. Emotions are biologically tied to our experiences. John Dewey further explains the connection between emotion and experience, "it is not possible to divide in a vital experience the practical, emotional, and intellectual from one another and to set the properties of one over the characteristics of the others. The emotional phase binds parts together into a single whole" (Dewey 56). Emotion is a part of experience.

Why do we need emotions in interface?

In *Brain Rules*, John Medina explains that "Emotionally charged events persist much longer in our memories and are recalled with greater accuracy than neutral memories". By evoking emotion in our users we engage with them on a deeper level, physically activating their "gray matter" (Medina 91).

Emotion also serves as universal language to converse with our users. It connects us all on the most basic level. In *Designing for Emotion*, Aarron Walter clarifies this argument, stating that "though we develop verbal language as we mature, emotion is our native tongue from the moment we enter this world. It is the lingua franca of humanity" (Walter 50). As designers we can use emotion to reach users across cultural divides.

Often when discussing my work I use the word "feel". How does it make me "feel"? Does it make me feel at all? When I use this term I do not mean general states of emotion like happy, sad, frustrated, or excited. Instead, I'm referring to feelings as an activation of emotions. In his book, *Emotional Design*, Donald Norman argues that while designers associate emotion with beauty, things that are attractive, cute, or colorful, beauty does not drive our emotions. We feel love and attachment for things that are ugly as well. It is the "feelings" that activate the emotion. Norman explains "Emotions reflect our personal experiences, associations, and memories" (Norman 47).

I explore this activation of emotion through feelings in several of my pieces. For example, in the *Perfect Human* Interface I use video footage of humans expressing emotion to evoke emotions in my users. By incorporating video of real people in relatable settings I can make the experience more personal and accessible.

THE PERFECT HUMAN INTERFACE

The Perfect Human is an interactive response to Jørgen Leth's 1967 film, The Perfect Human. Users re-interpret the film through a single knob that scrolls through footage of modern humans mimicking scenes from the film.

The original film is a black and white narrative describing the "perfect human" in very cold and sterile terms. The two characters of the film are tall, thin, and attractive, not my idea of "perfection". I broke the film into various sections that describe a human (hair, legs, face, nose) and then reshot the film using real people, of different heights, ages, and colors. I shot each of the different sections in specific locations that evoked more emotions, in a green and lush park, against a gritty-brick building, in a warm home, etc. I then built a minimal interface that allows the user to recreate the film by simply turning a knob to scroll through the different human interpretations. This project served as an exploration in the importance of simplicity and control when trying to evoke emotions. My first interfaces required too many decisions and actions by the user - detracting from the beauty of the footage. Once I limited the actions a user could take and placed the focus back on the importance of an individual's freckles, curls and wrinkles I found the emotional connection I was looking for.

ELEMENT 2
Simplicity

ELEMENTS OF PACKAGING EXPERIENCES
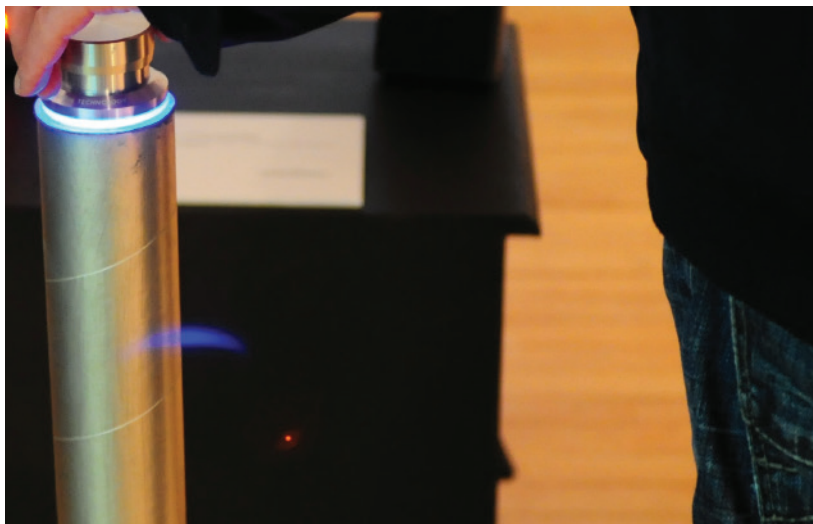
I'm paralyzed in the peanut butter aisle of Whole Foods. So many choices; chunky, smooth, natural, organic, roasted, salted, unsalted. With a smaller selection I usually grab a salted, chunky, natural jar and head on my way. But here I have 5 different types of nuts, and new flavors I've never considered. Do I want vanilla cinnamon almond? Or maple chocolate cashew? Why don't they make a maple almond? That's what I need! On more than a few occasions I've left the store empty handed to indecision. So what is the problem? How can I make a decision so easily with a smaller selection, but face such difficulty with more options?

Why simplicity succeeds

The problem is that our brains can only handle a set number of choices. We are forced to make decisions hundreds of times each day. The more choices our brains make, the closer we come to cognitive overload. Most designer guidelines cite Hick's Law, which states that with every additional choice you ask a user to make, the time it takes to make the choice increases. So the more options you give an interface, the more difficult it will be to use. Aarron Walter applies Hick's Law to websites, reasoning that "as you increase the number of high contrast elements on a page, you proportionally increase the time needed to perform a task, learn a system and remember pathways. Adding stuff pushes the human brain to its limits" (Walter 64). To create an engaging experience our brain needs to be active in the experience, not stuck making choices in the interface.

So how can we minimize cognitive overload?

Simplicity. By removing unnecessary choices we allow users to engage quickly and more effectively with our interfaces.

My *Weather Predictor* removes interaction, no clicking or logging in to access the weather, leaving only the observation of the current state of the weather.

WEATHER PREDICTOR

Weather Predictor is a physical interface that attempts to simplify weather related choices in the morning without "plugging-in". I have always found Ambient's light orb to be a beautifully simple example of interpreting data, I just never found it terribly useful as I couldn't remember what each shade of color represented (especially as I'm leaving the house in the morning before my first cup of coffee). I also love the concept behind umbrellatoday.com, a website that allows you to enter your zipcode and see if you need an umbrella. The drawback here (as with most other weather information services) is that I have to turn on my phone or computer to access the information, exposing me to my 50 unread emails, 20 Facebook updates and twitter messages — not what I want as I'm trying to leave the house. Instead I built a small LED-matrix that will pull the weather data and can be mounted next to my closet (no phones or computers). It only has three settings, umbrella (it might rain), sunglasses (it will be hot and sunny), and hat (it is below freezing - no need for sunglasses or an umbrella).
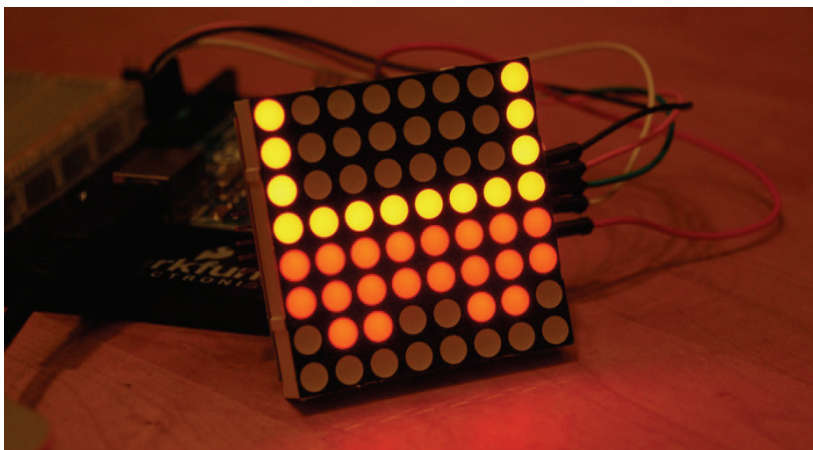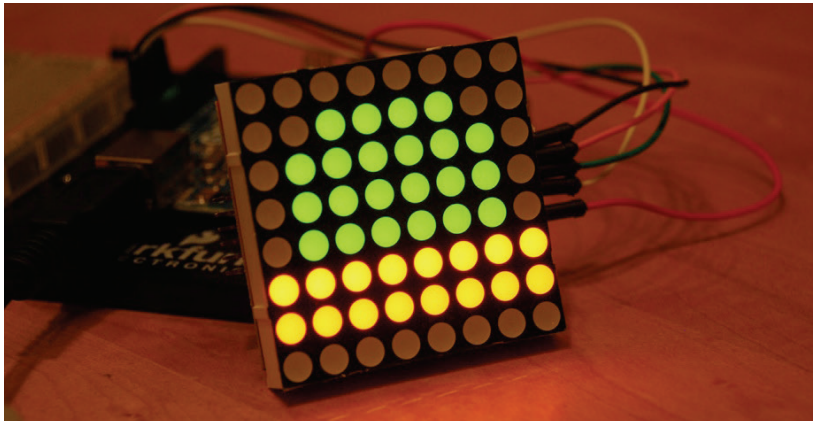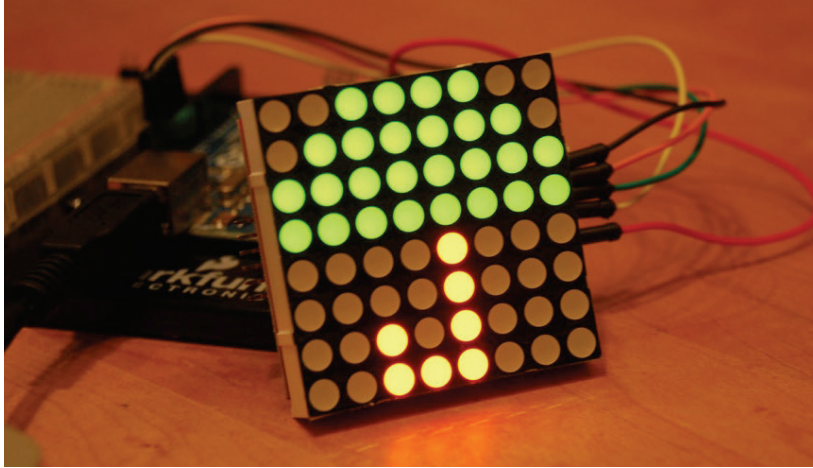
Firefly

I eased my way into the rickety wooden Adirondack chair. The tension in my shoulders relaxed, my breath deepened, and eyes softened. The fading sun silhouetted two small children chasing fireflies in a field. Crickets chirped loudly and a soft breeze swept the warm summer air across my face. Childhood memories came flooding back as my senses peaked. THIS was it, the intangible "experience" I'd spent six months trying to pinpoint. This was the "experience" as I understood it in John Dewey's Art As Experience. I'd found a glimmer of understanding and pushed to learn more. What led me to this experience? How could I translate this feeling to my work? I began sketching, writing, and envisioning Firefly.

I ended my first year at DMI deeply concerned how we, technology shackled humans, "feel." After months of studying our current state of connectedness I found a lack of intimacy and emotion in the interfaces we use to communicate. I wanted to consider user engagement in a more personal and emotive way.

interactive
fireflies
to
engage

led lights
user in.
inside the

The Experience

Firefly is an interactive installation exploring elements that trigger an emotional experience. Light, movement, and sound are used to engage users. Memory, perspective, and play provide a means to create a deeper connection. Using a Kinect to detect motion and depth, users chase and catch fireflies in a life-sized projected interface. Users enter a space filled with sounds of crickets and children laughing. One wall depicts tall blades of grass that sway and part as they move through space to indicate their position. Fireflies dance around the users, darting away if they get too close. Daylight slowly fades to complete darkness, hiding the grass and leaving the user without knowledge of their position. The user must catch fireflies in order to keep the daylight. The more fireflies the user catches the faster daylight will fade and more difficult the interface becomes. The difficulty level also increases with the number of users on the screen. *Firefly* attempts to engage users in a truly immersive experience.
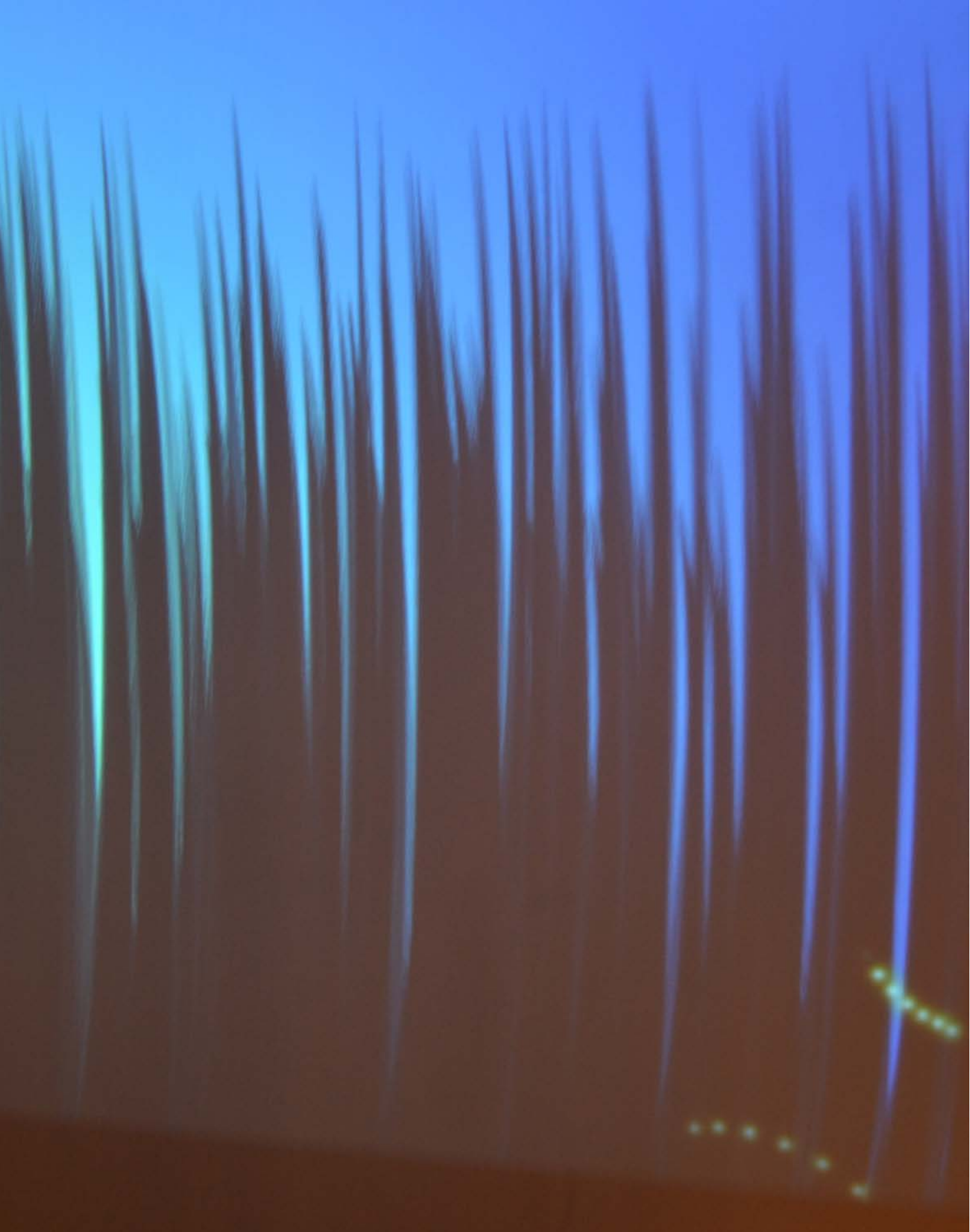
Early Experiments

My initial concept for *Firefly* recreated the scene I witnessed that summer. I found inspiration in Funky Forest, a project of Theo Watson and Emily Gobeille, as well as my recent experiments using the Kinect to create animated silhouettes. I envisioned a large field with trees at sunset, similar to the field in Maine from my childhood. I would layer the animated silhouettes of children chasing and catching fireflies on top of the scene. The user would enter the scene and interact with the children and fireflies.

The first prototype tested my concept with a simple animation and audio compilation. I created an audio track layered with crickets chirping, wind blowing, and children laughing. Instead of spending time animating the scene I drew a black silhouette of a tree next to a field of grass with two children playing. I set this static silhouette against an animated sky fading from orange-sunset to dark-night. For the first user test, I projected this scene onto a wall and presented it to a small group. The lights dimmed and my projection began. In sequence the tree appeared against a perfect sunset with crickets chirping lightly in the background. As the sunset faded into darkness the sound of laughter faded in, and two small children appeared. A pigtailed girl kneeled down to peer into the grass as a young boy reached up as if he were catching a butterfly. The sun faded completely into night as bright-yellow orbs of fireflies appeared throughout the scene. The crickets faded to silence, as did my small user group (not a good response in this case).

Users noted my highly detailed illustrations were attractive, and the children cute, but they didn't get it. The engagement was not there. Where did the experience go wrong? Questioning users revealed the highly detailed illustrations were too specific to resonate with most of the audience. While the girl with pigtails evoked strong memories of my little sister at that age, she remained a disconnected image to my audience. My users asked questions like: Why would I want to play with these children? Why would I want to be part of your memory? The experience was too specific to my own. Users should be able to step into my memory and make their own. How could I engage the user on a more universal level? What could I use to trigger my user's memory? Too much detail prevented people from inserting themselves into the experience.

Refining the Experience

I began exploring ways to add meaning for my users. Nathan Shedroff explains in *Experience Design 1.1,* "it's important to design experiences so that audiences or participants can connect meaning in them by making connections to their own lives and values" (Shedroff 125). My initial prototype asked users to connect with my memory preventing them from using their own. What if I made the experience more abstract? I didn't need the actual scenery in the field to convey a sense of place. Did I need the children as well? The feedback on the initial sounds was overwhelmingly positive. Users had a visceral response to the crickets, wind, and children. Could the sound alone replace the need for imagery of children?

To trigger memory experiences I examined perspective. Shedroff explains, "The perspective of the activity or content in an experience can affect how it is understood...the point of view of the experience itself can have an effect on how people interact and relate to it" (Shedroff 235). Could I make the perspective more relatable to my user? My first prototype asked the user to watch the scene, not actively be part of it. I considered how to integrate the user into the experience and change the perspective.

In *Firefly's* second prototype I went back to the drawing board for the visuals and made minor adjustments to the sound. To create a change of perspective the flat scenery was swapped for tall blades of grass that literally appear to grow from the floor up the side of the wall. Each blade sways slowly back and forth mirroring the wind the user hears. The grass appears higher than the user, reducing their size to a child's and reminding them of how childhood looked. Instead of images of children, silhouettes of the users followed their movements in the grass. Fireflies slowly floated above the blades of grass encouraging the user to jump and catch them. Once caught, a firefly will glow brighter, pulse, and then quickly fly off the screen.

```cpp
#
*/
#include <math.h>
#include "firefly.h"


Firefly::Firefly()
{
    dead = true;
}

void Firefly::appear(int width, int height) {
    grassWidth = width;
    grassHeight = height;
    x = ofRandomf() * grassWidth;
    y = (1.5 + ofRandomf()) * grassHeight / 3;
    vx = ofRandomf() * 4 - 2;
    vy = -ofRandomf() * 4 - 4;
    startLife = lifetime = 50 + ofRandom(100);
    offset = ofRandomf() * 6;
    dead = false;
    dir = 4 * ofRandomf() - 2;
    hit = false;
    size=36;
    alive=0;
}

bool Firefly::isDead() { return dead; }

void Firefly::draw(float dt, ofImage *fly) {
    if(dead) return;

    if(hit) {
        if(hit == 2) {
            vx = ofRandomf() * 15 - 7;
            vy = -ofRandomf() * 8 - 16;
            hit--;
        }
    }
    else if(closestDist < 2500 && closestDist > 0) {
        float dister = sqrt((closestX * closestX) + (closestY * closestY));
        float speed = 10.0;
        vx = speed * closestX / dister;
        vy = speed * closestY / dister;
    }
    x += vx;
    y += vy;
    offsetX = cos(dt * dir + offset) * 30;
```

```cpp
*/
#include "blade.h"

Blade::Blade(int level)
{
    x = ofRandomf() * ofGetWidth();
    y = ofGetHeight();
    width = 15 + ofRandomf() * 5;
    height = 450 + ofRandomf() * 120;
    sway = 10 + ofRandomf()*4;
    offset = level / 25 + ofRandomf()*1;
    trans = level;
}

void Blade::draw(float dt) {
    ofSetColor(0,0,0,trans);
    ofBeginShape();

    ofVertex(x,y);
    float swayX = sway * sin(dt/2 + offset);
    float diffX = width;
    float destX = x+width/2 + swayX;
    float destY = y - height;

    float upX1 = (diffX )*1.2 + x + swayX;
    float downX1 = (diffX )*1.8 + x + swayX;

    float upY1 = y - height/4;
    float upY2 = y - 3*height/4;


    ofBezierVertex(upX1,upY1,
                   upX1,upY2,
                   destX,destY);
    ofBezierVertex(downX1,upY2,
                   downX1,upY1,
                   x+width,y);
    ofEndShape();

}

void Blade::update() {
}
```

More in-depth coding was necessary for this prototype of *Firefly*. Using the Kinect and openFrameworks (an open-source C++ library) I developed a system that would detect a new user in the scene and draw their moving silhouette. With the help of my husband-programmer, Pascal, the blades of grass were drawn as OpenGL polygons with random patterns of motion to create a realistic feel. We also built a system to detect if the user touched "caught" a firefly.

User testing began weeks before the Fresh Media Show, resulting in many more iterations. The initial presentation involved three classmates. I dimmed the lights and started the program, as the tall grass appeared on the wall with the users silhouettes overlaid, my classmates first reaction was to wave their arms and jump. They moved back-and-forth across the wall a few times, jumping to catch the fireflies floating overhead, and watching their own mirrored silhouette. The initial engagement was strong, with bursts of laughter and energy, but faded quickly as they learned the system. One woman felt a deep connection with the interface as she had fond childhood memories of chasing fireflies. Another woman had never seen or chased fireflies. She still found the experience to be enchanting and immersive claiming it was like a memory she would have imagined. There was a clear level of engagement and emotion, though brief. For

a more realistic experience users asked for grass that moved with them and for smarter fireflies. The current fireflies had their own pattern and would often fly directly into a user. It was also difficult to identify when a firefly was caught, their flash of brightness too brief for the user to observe.

I took this feedback and presented a revision of Prototype 2 at final reviews that winter. The code was modified so the grass and fireflies detected a user. As a user moved through the space the grass parted and flowed around them. The fireflies avoided users. The feedback was overwhelmingly positive. Viewers felt an immediate connection to the piece. *Firefly* evoked emotions and memories in users in different ways. Some felt an immediate transportation through the sound alone, for others it was the magnified grass, and a few through the actual memory of chasing fireflies. Even though the response was enthusiastic, feedback included the suggestion to remove the silhouettes of users completely — the grass was enough.

Fresh Media Show

Firefly appeared as an installation in the Fresh Media Show in April of 2012. For this final piece I reconsidered what the experience would be like. I felt sure that I'd created some emotive interaction, but how could I keep the user engaged longer? I turned again to John Dewey who explains a need for effort as "an act of the going-out of energy in order to receive, not a withholding of energy…when we are only passive to a scene, it overwhelms us… We must summon energy and pitch it at a responsive key in order to take in" (Dewey 55). I hesitantly removed the silhouettes of users and increased the reaction of the grass to users. I also added levels of difficulty to the catching of fireflies, increasing the challenge the longer a user played.

Using a short throw projector (borrowed from the MIT Media Lab), a Kinect, and a laptop, I set up a wall in the show. Users entered the space to sounds of dusk in a field. Tall blades of grass, moving gently from side-to-side filled a large wall as fireflies danced through the scene. Most users were hesitant at first, uncertain of the space, taking small steps to see what would happen, then moving more quickly as they saw the grass parting for them. Some users ignored the fireflies all together and just waved their hand back and forth over the grass to watch it move. Others quickly began swatting at the light of the fireflies, the interaction instinctual.

I watched users frolic in an art gallery, jumping up-and-down, waving their arms wildly. They forgot the social norms of a public space, lost in the moment. Some users interacted for only a few seconds, but the majority stayed until they caught a firefly (or learned the system), and a handful stayed to play for an extended time. Users may not have been experiencing the same romantic moment that I did almost a year before, but I built an experience that allowed them to use my memory to create their own.

Reflections

My parents are decidedly low-tech people (in the age of the iPhone5 my mother still thinks her 3 year old flip-phone is the coolest thing). They traveled 3 hours south by train from their rural home in Maine to see Fresh Media. I have a hard time explaining to them what I do and I was certain they wouldn't understand any of the show much less be willing to participate. My mother walked into the space, took a few minutes to look around, and declared to everyone around her "I know which piece is Martha's! It's our backyard!" An experience can transcend age, location, and background. *Firefly* reminds me I am most successful at recreating experiences I know.

Firefly began as a small sketch exploring the translation of a specific memory. It grew to become a large-scale installation project researching how we elicit engaging experiences in interface design. After spending 10+ years creating screen based interfaces, moving into a new space allowed me to explore elements that could be used to reach users on new levels. In a three-dimensional space the transition from light to dark holds the power to create anticipation, silence, even fear. A memory can be evoked by a sound as simple as the wind, transporting a user to a different place. Movement leads to user participation, and as Nathan Shedroff argues, "Participation creates a sense of ownership, which is critical when you desire deep interaction from your audience. It is an essential ingredient, in fact, of creating community" (Shedroff 151).

RESEARCH

ELEMENT 3

Senses

We smell old take-out food from the fridge to see if it is good or bad. The glowing red light on the stove warns us that it will hurt if we touch it. We find comfort and warmth in the softness of a teddy bear. As babies the sound of our parents voice lulled us to sleep.

Why we rely on our senses

We rely on our senses to tell us about the world and what we are experiencing. Our brain associates these senses with specific memories and triggers an emotional response. For example, the first time we touched the red stove, or heard the soothing sound of our parent's voice. Nathan Shedroff explains that "because our whole body is involved in the activity, our kinetic, olfactory, and tactile memory is stimulated in addition to our visual and sonic memory. This creates a richer experience and binds our memories together, often in subconscious ways" (Shedroff 51). By evoking emotional responses in users we find deeper engagement in experiences.

How our senses effect experience

When I recall memorable experiences they rely deeply on all the senses: touch, hear, taste, feel, smell, sight, combined with the action of doing something. John Dewey explains that compelling experiences have "The sensory satisfaction of eye and ear, when esthetic, is so because it does not stand by itself but is linked to the activity of which it is the consequence" (Dewey 50). Engaging experiences involve much more than doing or watching something. Drawing on the human nature of our senses allows us to personalize a user's experience and connect it to their memories.

THROUGH THE WINDOW
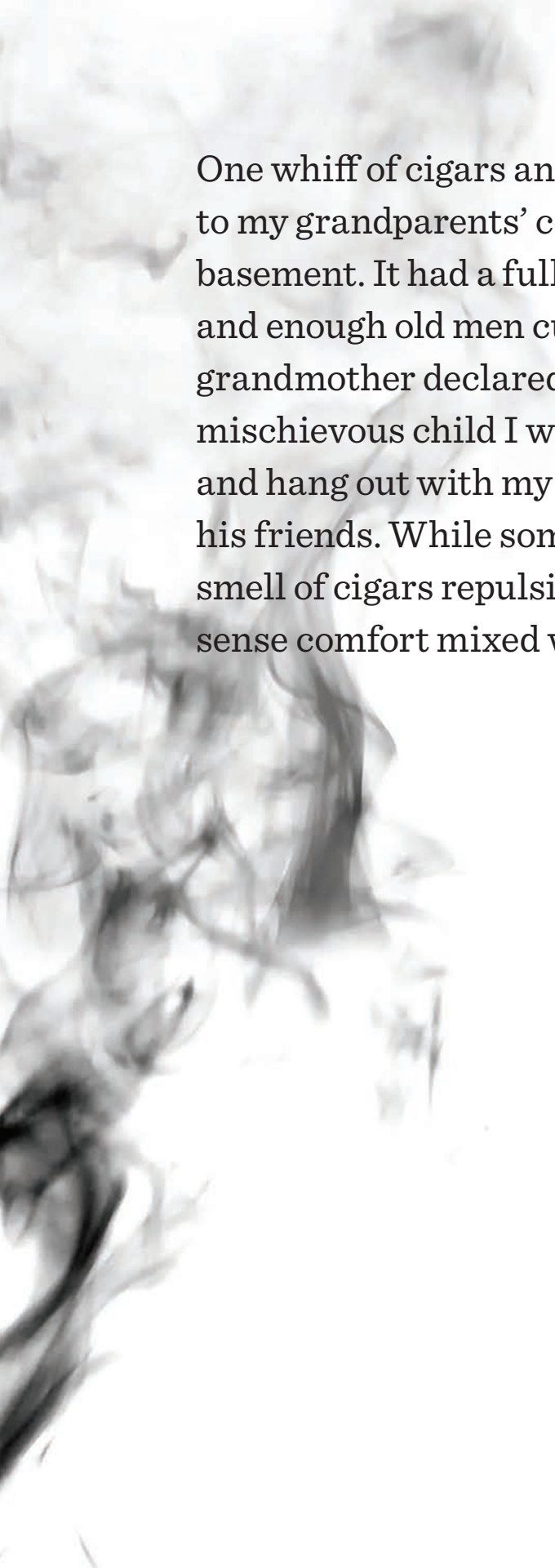
Through the Window is an interactive installation that uses touch, sound, and sight to evoke a memory experience in users. A weathered window is hung from the center of a room. Users can physically touch the worn wooden window and feel the cold glass and peeling paint. As users approach the window they will see their own silhouette moving in the scene projected on the other side. The scenes are curated to evoke a memory response in users. One of rain falling at night, with a projection of rain falling on the window pane accompanied by the sound of rain drops hitting the glass. Another of a snow storm, with snow accumulating on the window and the sound of wind blowing. A Kinect is used to detect and capture the user's silhouette and a projector to project the scene behind the window. *Through the Window* attempts to engage users more deeply in the experience by combining multiple senses and to evoke memories of similar experiences.

you look through the window

image see the yourself looking through window

RESEARCH

Memory

One whiff of cigars and I'm taken back to my grandparents' cool and damp basement. It had a full bar, a pool table, and enough old men cursing that my grandmother declared it off-limits. As a mischievous child I would sneak down and hang out with my grandfather and his friends. While some people find the smell of cigars repulsive, they give me a sense comfort mixed with excitement.

The power of memory

Memories have the ability to take us back to specific spaces and times. They engage our emotions and senses. Biologists, such as John Medina, have found intrinsic relationships between our emotions and memories, proving we remember highly emotional experiences with greater detail.

How memories affect experience

Donald Norman explains, "memories reflect our life experiences. They remind us of families and friends, of experiences and accomplishments. They also serve to reinforce how we view ourselves" (Norman 53). Memories enhance the connection we feel to an experience, and increase the level of engagement our brain commits.

John Johnson notes that, "activating a memory consists of reactivating the same pattern of neural activity that occurred when the memory was formed. Somehow the brain distinguishes initial activations of neural patterns from reactivations". So by physically introducing these memory triggers in users we can activate their brains to recall neural patterns.

How memories evoke experience

We can evoke memories with objects or imagery to draw on past experiences and emotions. Sherry Turkle, in her book *Alone Together*, studies the effects of our personal relationships and memories as they move online. She reflects that "A teddy bear may be irreplaceable because it has gone through life with a child. It calls up memories of one's younger self" (Turkle 59). By intentionally evoking memories in our interfaces we can strengthen the emotional engagement users experience.

In *Twidentify.me* I attempt to engage users by connecting their past tweets, by visualizing the memory of what they have experienced and said to real people on twitter and matching those experiences to other tweets.

TWIDENTIFY.ME

Twidentify.me is an online interface that generates a visual identity for Twitter users based on their similarity to other users. I compare individual user's tweets to people who are tweeting similar things and then generate a visualization of the overlapping data. The user is then presented with a new perspective of their identity within the larger framework. Using the Twitter API I pull all recent tweets of a user and then compile a list of their unique phrases, words, and hashtags. This list is then searched against the entire Twitter network to find matching tweets. I create set of 100 "matches" by finding which users have the most matching keywords. Each of the matches' profile images are then displayed in a grid and run through a filter to pull the dominant color from each. The result is a multi-color abstract grid unique to each user. I also create a random tweet using a markov chain from the matched keywords. This project was developed to research the known and unknown connections within the conversational space of Twitter and explore how the community shapes our identity. As a regular Twitter user I am acutely aware that my perception of the space is limited to the users I follow. I attempt to research my own curiosity to see whether people might be saying the same things or having the same experiences.

Do I know them? Do they live near me? What else might we have in common?

Twidentify.Me
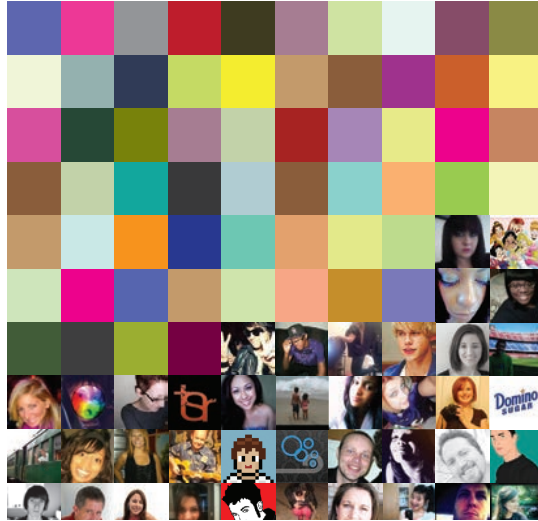
Twidentify.Me

@artimated

Your Bio

I am **ambassador** of **scuba**. I live to be a **fun loving**, **passion**, **innovator** who loves to **eat** with **addicted world kisses**.
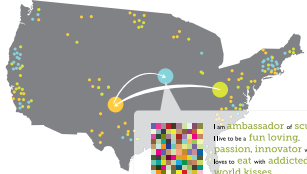

10/19/10

I am **ambassador** of **scuba**. I live to be a **fun loving**, **passion**, **innovator** who loves to **eat** with **addicted world kisses**.
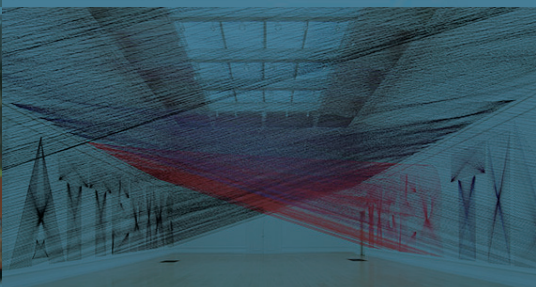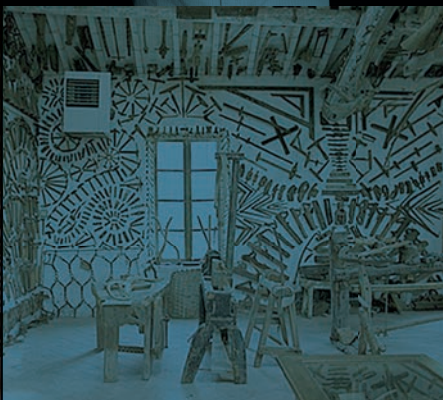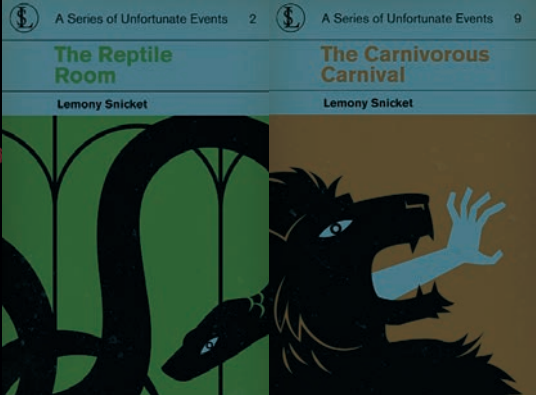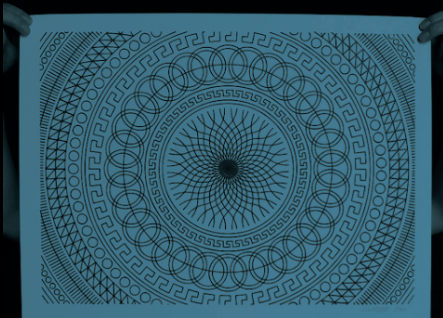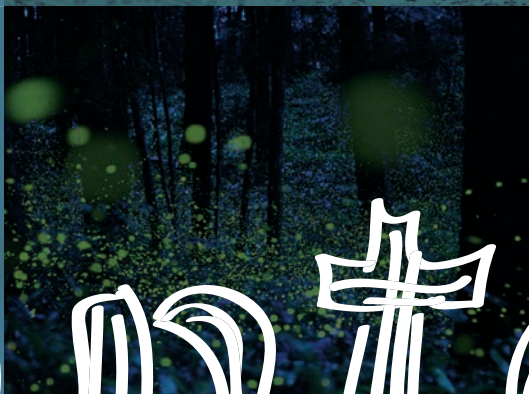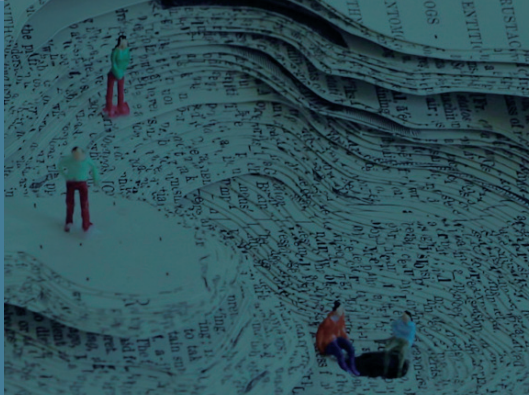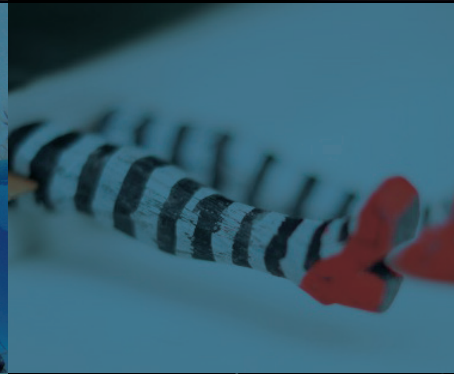
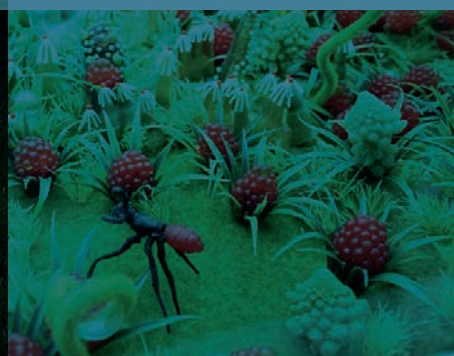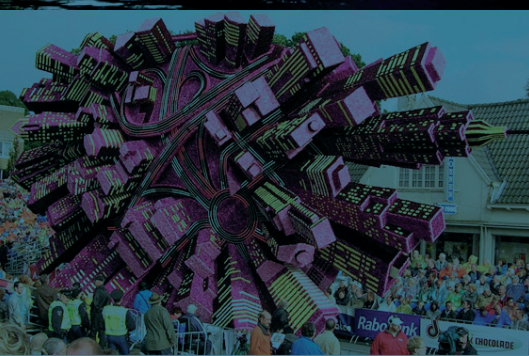## Twidentify.Me

@artimated's Timeline / **Map View**

PROJECT

eye

As a designer I look for inspiration all around me. In my daily activities: walking to work or making dinner, in the materials I consume: magazines or blogs, and in my free time: visiting museums or traveling to new cities. Most often in these activities I try to capture some part of the experience so I can experience it again later. I do this by taking photos, collecting postcards, saving ticket stubs to concerts. These mementos initially formed pages in a scrapbook or photo album, or often lived in a shoebox in the back of my closet waiting to be added to an album. As technology progressed I no longer have the physical remembrances of specific experiences. I take photos with a digital camera, so I don't have actual photographs in hand. Shared experiences from events occur on the pages of Facebook and feeds of Twitter and Instagram. Ticket stubs have turned into scannable bar code receipts on my iPhone, and today's form of the postcard looks more like a photo posted on Facebook with me in front of a palm tree, margarita in hand. As our means of collecting and archiving have moved from the analog to the digital how we engage with these experiences and remember them also changes.

ELEMENTS OF ENGAGING EXPERIENCES
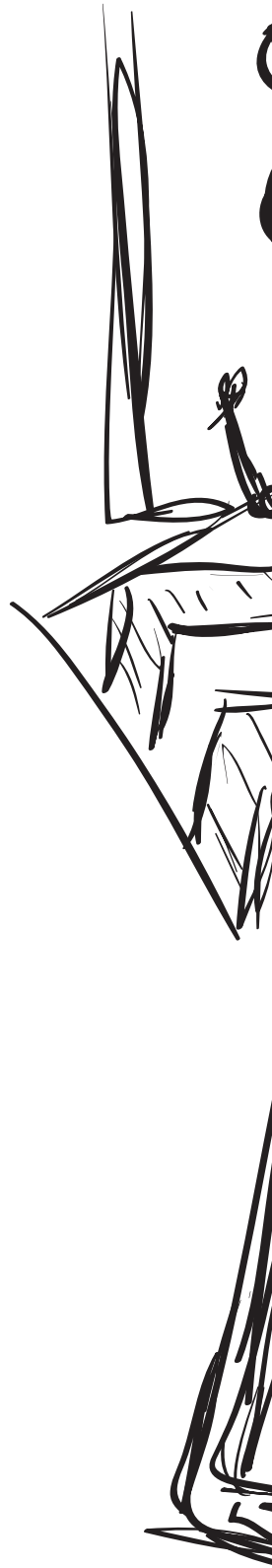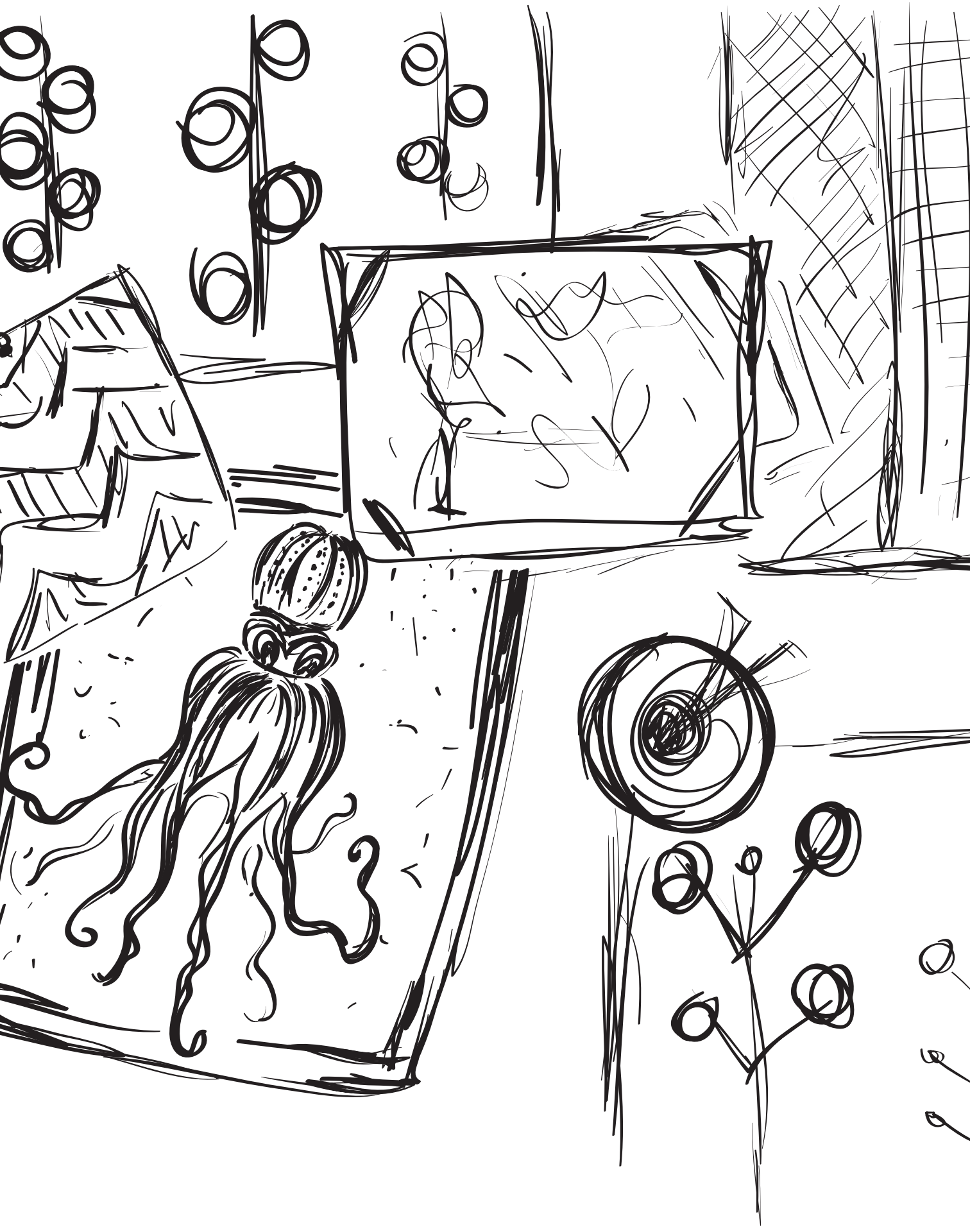
The Experience

EyeWanto.com is an online visual-browsing system built to aid in the collection and filtering of experiential images. It allows users to collect images, sites, and videos easily, tag them with meaningful categories, and then browse through them at anytime to find visual inspiration. *EyeWanto* explores elements to engage and immerse users by allowing them to filter through an emotional and personal taxonomy and then consume through compelling images that evoke the memories they initially found engaging. *EyeWanto* allows users to move visually meaningless folders of interesting links and images into an application meant for personal collecting and browsing of visual content.

Through this interface I seek to enhance the experience of current visual browsing systems like Pinterest and Tumblr. This public arena is not where I always want to collect and engage with inspiring works. When looking for inspiration I often want to sort through my own curated collection, which is personal and relevant to me specifically.

I WANT TO TASTE...

I WANT TO TOU

I WANT TO SMELL...

I WANT TO MAKE...

I WANT TO PLAY WITH...

...TOUCH...

I WANT TO VISIT...

I WANT TO HEAR...

I WANT TO SEE....

typekit

Early Explorations

In Designing with the *Mind in Mind*, Jeff Johnson explains that "the pattern of neural activity that corresponds to recognizing a letter, a word, a face, or any object includes input from neural activity stimulated by the context. This context includes other nearby perceived objects and events, and even reactivated memories of the previously perceived objects and events" (Johnson 5).

My ways of finding inspiration have also moved from analog to digital. When I first began designing, I collected images from magazines, swatches of paper or cloth textures, and interesting snapshots of the type on old signs. These physical reminders of a particular experience would get pinned onto a cork board above my desk or stuffed into a folder on my desktop, all categorized by what type of inspiration they might provide "places to visit", "things to buy", "things to eat", "logos I love". As the physical objects began to diminish so did my means of finding inspiration. My desktop took on a minimalist aesthetic, the client folders becoming digital folders and the inspirational findings becoming folders of bookmarks within bookmarks of websites I found interesting, or just links to images on websites. Over time these folders of bookmarks and images become inconvenient for most users trying to remember a specific experience.
I wanted to see what these links looked like, not just the letters of the url. Letters alone did not provide enough reference to our actual memory of the webpage or image we were saving. While I may have bookmarked a great new typeface from my favorite foundry, reading that foundry's name as part of the bookmark link only told me that it was from a foundry I liked. Not why I saved that particular typeface or what it looked like. Bookmarks and folders of images were missing an essential link to the experience users wanted to recall. The community answered this resounding need from users by creating sites like Pinterest, Polyvore, and Tumblr. Each site allowing users to easily store, label and share images, websites, and videos from their own personal collections and from other websites. As these sites began to gain traction the concept of "visual browsing" spread quickly. Now it is standard practice to present data links visually.

Johnson explains why users responded positively to visual browsing systems. He states "our goals filter our perceptions; things unrelated to our goals tend to be filtered out preconsciously, never registering in our conscious minds. ...For example, when people navigate through software or a Web site, seeking information or a specific function, they don't read carefully. They scan screens quickly and superficially for items that seem related to their goal. They don't simply ignore items unrated to their goals; they often don't even notice them" (Johnson 5).

Visual browsing systems solve one part of this problem by providing visual stimuli, but they fall into a second trap common to large collections: Taxonomy. Sites like Pinterest and Tumblr support free-tagging, which means you categorize elements into as many flat categories as you like, but that freedom often leads many similar, but non-identical tags, which hinder finding or browsing items in any useful way— (Did I put that chair under living room or furniture?). *EyeWanto* was created as a system to rein in that lack of structure in an experiential way.

typekit
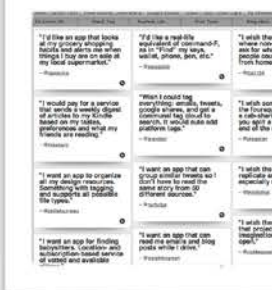
A Collection of images

Eyewanto began as an assignment to create an encyclopedia of creative works. I started by picking 10 pieces around which we would create a system. My first selection of creative works came directly from my folders of bookmarks, mostly under the names of "inspiration", "design", "visit". Some also came from Pinterest, under board names of "places to visit", "things to read", "things I want". As I created lists of shared characteristics and classifications of my collection of creative works it became clear the taxonomies that were important to me did not consist of subject matter, date of creation, or creator. These were images that I found inspiring in some way. I was initially drawn to this collection because they were things that I wanted to do, look at, visit, play with, or hold. They embodied this idea of capturing or remembering an experience. By continuing to examine what characteristics made these works compelling to me I started creating lists of more emotional descriptions. I wanted to caress, hold, manhandle, gaze, watch, interact, enjoy, taste, savor, sip, smell, inhale, these objects. I wanted to be transported to the very room in a museum where the classic painting hung, smell the aging paint and canvas, and see every crack and wrinkle on the surface. I wanted to feel the textured cover of the Penguin Classics Novel on my fingertips, the weight of the book in my hand, and the breeze of flipping through new pages.

Jeff Johnson explains my yearning to collect and store these experiences. He states that "since prehistoric times, people have invented technologies to help them remember things over long periods: notched sticks, knotted ropes, mnemonics, verbal stories and histories retold around campfires, writing, scrolls, books, number systems, shopping lists, checklists, phone directories, portable digital assistants, online shared calendars, etc...humankind has a need for technologies that augment memory." (Johnson 159)

It was more than just saving and displaying the imagery of these works that created an experience for me. It was the tactile elements of the experience that they evoked. My taxonomy evolved to include the five senses: touch, taste, hear, smell, and see.

Photos on walls

As I began to refine my taxonomy I built my first prototype. This was a barebones physical prototype. I printed images and created categories from post-it notes and taped them to an empty wall in my apartment. Another element I looked to enhance was the filtering and sorting process. Other interfaces allow many contributors, which added the complexity of endless tagging and categorizing options. The result was an interface that lacked a level of personalization and could be complicated to navigate through. I began sorting through my paper prototype system, manually exploring how I would categorize each image, first starting by placing each experience under a corresponding topic. What I discovered immediately was that every image had multiple categories it fell under (for example a museum was a place that I wanted to smell, see, and hear). So simply placing each experience into its own bucket under only one topic was limiting. I began creating a grid with each of the four categories sitting at one of the four corners of the grid. Each experience was plotted closest to how strongly each of the senses corresponded to it. This became complicated quickly, requiring me to make multiple decisions for each experience and exhausted me within rating the first few. It also limited me to how many topics I could have present. After several more explorations on filtering through this data in a meaningful and inspirational way, I landed on simply having an x and a y-axis and sorting either 1 or 2 topics at a time. This allowed me the freedom of more than 4 topics and limited the options I could take as a user. By narrowing the infinite options of the self-tagging process I attempt to simplify the system and highlight what made these experiences engaging. I eventually expanded to 9 categories (all sensory): "I want to touch…", "I want to taste…", "I want to smell…", "I want to see…", "I want to hear…", "I want to play…", "I want to make…", "I want to visit…". By minimizing my interface options and placing the focus on my collection of images I created a personal space for myself that is emotionally moving and inspirational.
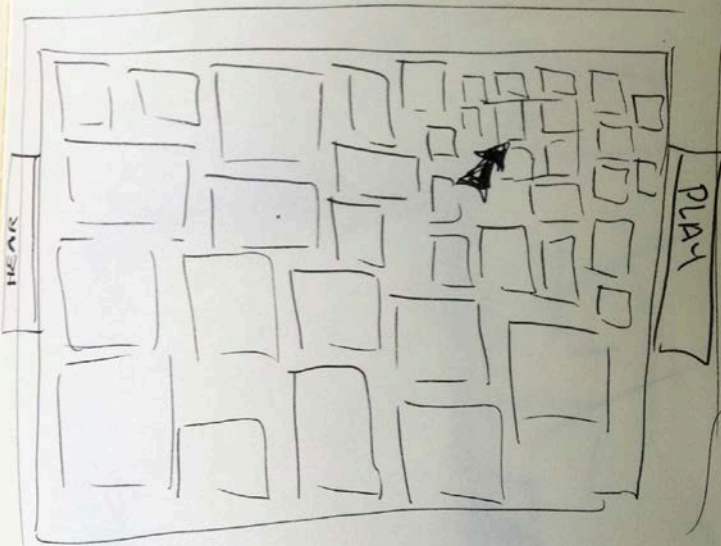
ZOOMING IN?
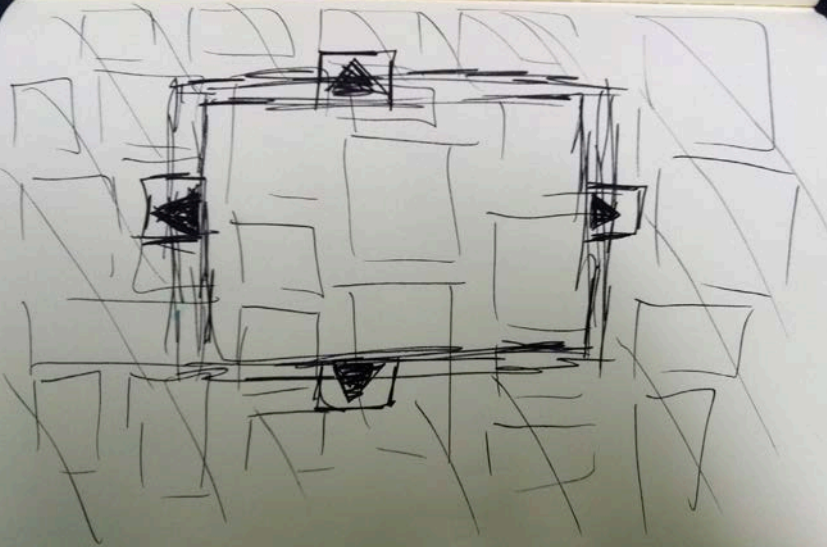
YOUR SCREEN AS A FRAME/CROPPING TOOL

DIGGING DEEPER

HEAR

PLAY

Moving online

Bringing the paper prototype online was less of a challenge than previous projects. I developed a simple HTML and CSS page and used a jQuery library for the drag and drop functionality. When I tested the online translation of my filtering system, users responded positively to the concept of limited categories and very naturally employed the drag and drop features. However, they all requested to see the image larger on-click. They also wanted to see additional tags the image might have, as these could lead to new threads of inspiration. I added the ability to click the thumbnail image and have a larger image appear over the grayed out background of the page. Around this image I displayed additional tags as well as a title. The user could also click on the enlarged image to view the original source. By allowing users to dig down into the details of an experience in the same screen and easily click off the image to close it I was able to maintain a level of simplicity while adding more detail to each piece in an interaction that mimicked the real world. When we don't want to see/use something we simply move away from it or go back to what we were previously doing.

The last integral addition to the site was the plugin to allow users to easily add images, videos or screenshots from any webpage they were on. By building a simple plugin in my browser of choice, Google Chrome, I was able to reduce the friction of getting items into my collection to a couple of clicks. From any page, you could click on the *EyeWanto* icon in the browser bar and it would give the option of either pulling one of the pictures on the page or taking a screenshot, and it would pull a title automatically. All that was left was to click the checkboxes that matched the sensory feeling that item evoked. Since there were a limited number (9), this proved to be an easy experience that required very little mental effort; much less than coming up with a consistent but descriptive free-tag for each item.

eyewanto

Chocolate and Strawberry Marshmallow Recipe ▸

typekit
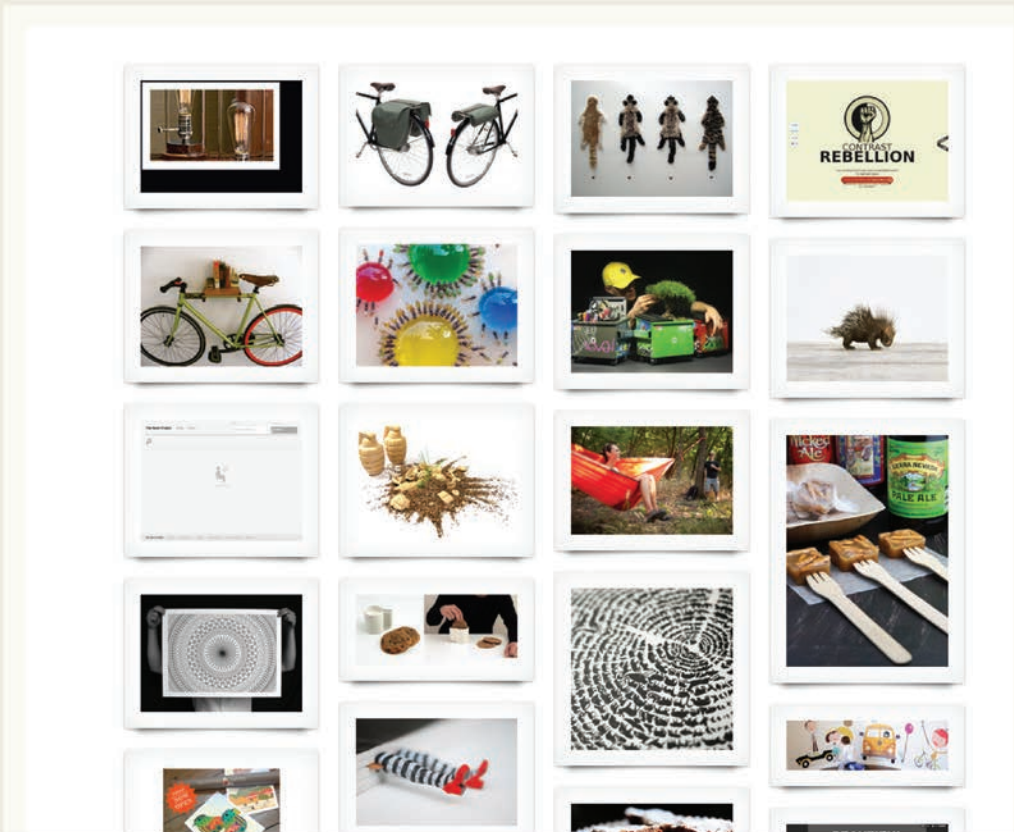
Reflections

Over 2 years later I still use this system. I pulled up the site today to write about it, and while I haven't actively added anything in 6+ months, I was astonished at how inspired I felt by the imagery I'd stored. I am now an avid pinner on Pinterest and poster on Tumblr, but I rarely use those boards to revisit experiences, and if I do I am often met with frustration at how many awkwardly named boards I have that are similar, making it impossible to search through all food related posts simultaneously. While *EyeWanto* never became the system I choose to use on a daily basis, I think there is something to be learned from this exploration in simplicity. By limiting tags to emotional terms and literal and tactile senses a system can be created that is easier to flow through and can hold more personal meaning without need the actual "personal tags" that I would write on my own. I also think that there is something about physically dragging and dropping these tags into a space to filter, it allows me to access this content through another memory pattern.

As much as I enjoy the filtering process and path in *EyeWanto* there is something missing without the "sharing" aspect. I don't want to share everything I'm saving, but a number of the experiences I find are of significant importance and want to share.

RESEARCH
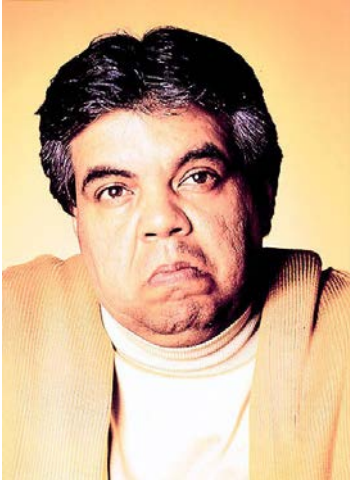
Humanness & Personality

There is a saying about dogs looking like their owners — or maybe owners looking like their dogs. I have been told that I resemble my dog. We both have mops of wavy hair and a happy bounce to our step. While my dog's tail is always wagging, I seem to have a permanent smile plastered on my face — it just worked out that way. Or did it?
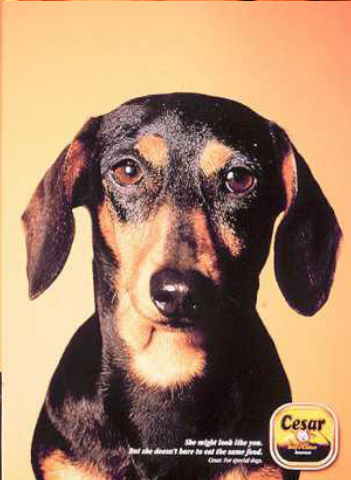
Why should we care about humanness in design?

As humans we are incredibly narcissistic, even those of us who claim not to be are genetically predisposed. Nature drives us to seek out and create our own reflections. That is how we evolved to survive as a species. We want the world to relate to us and seek to make those connections even when there are none. Donald Norman explains "our self-image plays a more important role in our lives than we like to admit" (Norman 53). In humanizing the world around us we find personalities in everything, our friends, our dogs, our cars, even our computers.

Personality and engagement

Aarron Walter suggests that "emotional design's primary goal is to facilitate human-to-human communication. If we're doing our job well, the computer recedes into the background, and personalities rise to the surface" (Walter 79). We spend most of our days working with interfaces, for business, play, and connection. These interfaces should be fast and easy-to-use without technical coldness. If I begin each morning by reading emails and news on my iPad, I want these interfaces to leave me feeling engaged and human. Walter argues that "personality is the platform for our broader emotional responses and the key to making a design more human...to achieve this goal, we must consider how we interact with one another in real life" (Walter 76).

Adding a level of human perspective to digital interfaces not only improves user experience, but also allows us to connect more deeply with the interaction.

The *Perfect Human Interface*, *ToyTheater*, and *Firefly* allow users to find reflections of their own image in the interface. *Red Riding Hood* and *Eyewanto* attempt to bring a human personality into a two-dimensional interface through hand drawn imagery. *Weather Predictor* speaks directly to the human condition; it's wet out so you need an umbrella today.

RED RIDING HOOD &
THE PARALLAX FOREST
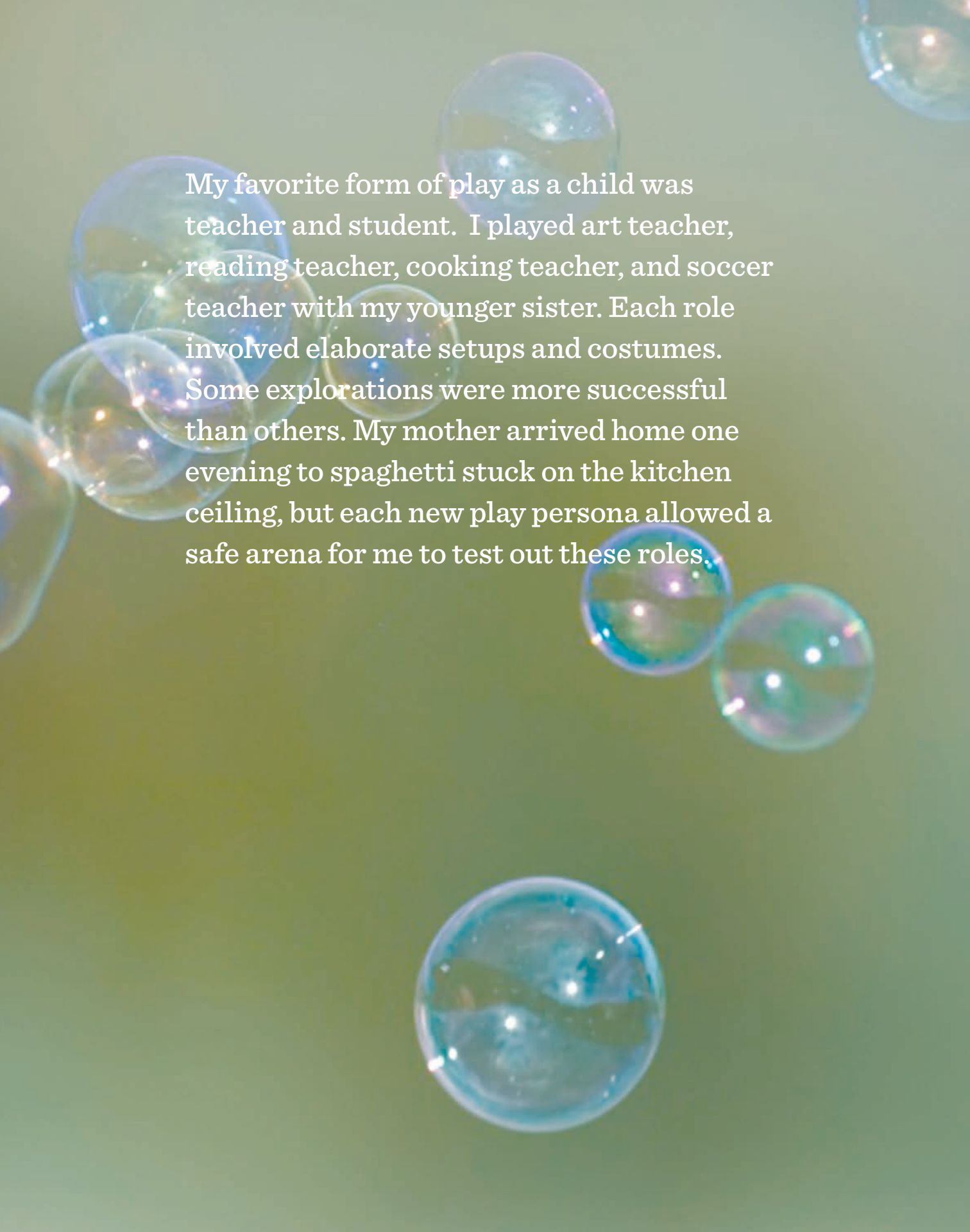
Little Red Riding Hood and *The Parallax Forest* are explorations of user engagement through movement and perspective within a browser. Users are presented with a still scene of Little Red Riding hood and a dark forest, when they begin scrolling down the page the characters and background become animated. Little Red Riding Hood's head and body wobble slightly as she wanders down a curving path. Animals pop in and out of the forest as she passes. As the user continues to scroll the day fades into night and the lively day-forest-creatures become night-creatures, eventually leading to the Big Bad Wolf. The use of scrolling, though common in modern browser interactions has not been a historically accepted user convention. Initial user guidelines instructed designers to follow print interactions and keep content "above the fold" leading to users becoming accustomed to paginating. By breaking conventions like scrolling and static (non-moving) content I attempt to engage users in new immersive experiences.

RESEARCH

ELEMENT 6

Play

My favorite form of play as a child was teacher and student. I played art teacher, reading teacher, cooking teacher, and soccer teacher with my younger sister. Each role involved elaborate setups and costumes. Some explorations were more successful than others. My mother arrived home one evening to spaghetti stuck on the kitchen ceiling, but each new play persona allowed a safe arena for me to test out these roles.

How play encourages engagement

As children we play to explore adult personas. By encouraging play we can encourage this same sense of safe exploration for our users. Play gives them freedom to try the unknown without fear of failure. Psychologists Barbara Fredrickson and Thomas Joiner state that "positive emotion broaden people's thought-action repertoires, encouraging them to discover novel lines of thought or action...Play, for instance, builds physical, socioemotional, and intellectual skills, and fuels brain development" (Norman 103). By allowing users to play we allow them to find new engagement in experiences.

Play also encourages users to physically interact with an experience. This interaction helps root experiences in users' memories. Nathan Shedroff explains, "actually performing an activity is almost always more memorable than simply watching" (Shedroff 51). Play is a useful technique to help connect users memories with their experience.

In *Red Riding Hood* and *Window StoryTelling* I use movement within the browser to engage users and explore the limit of the interface. *Firefly, Perfect Human Interface,* and *ToyTheatre* all employ the user to physically engage to explore the experience.
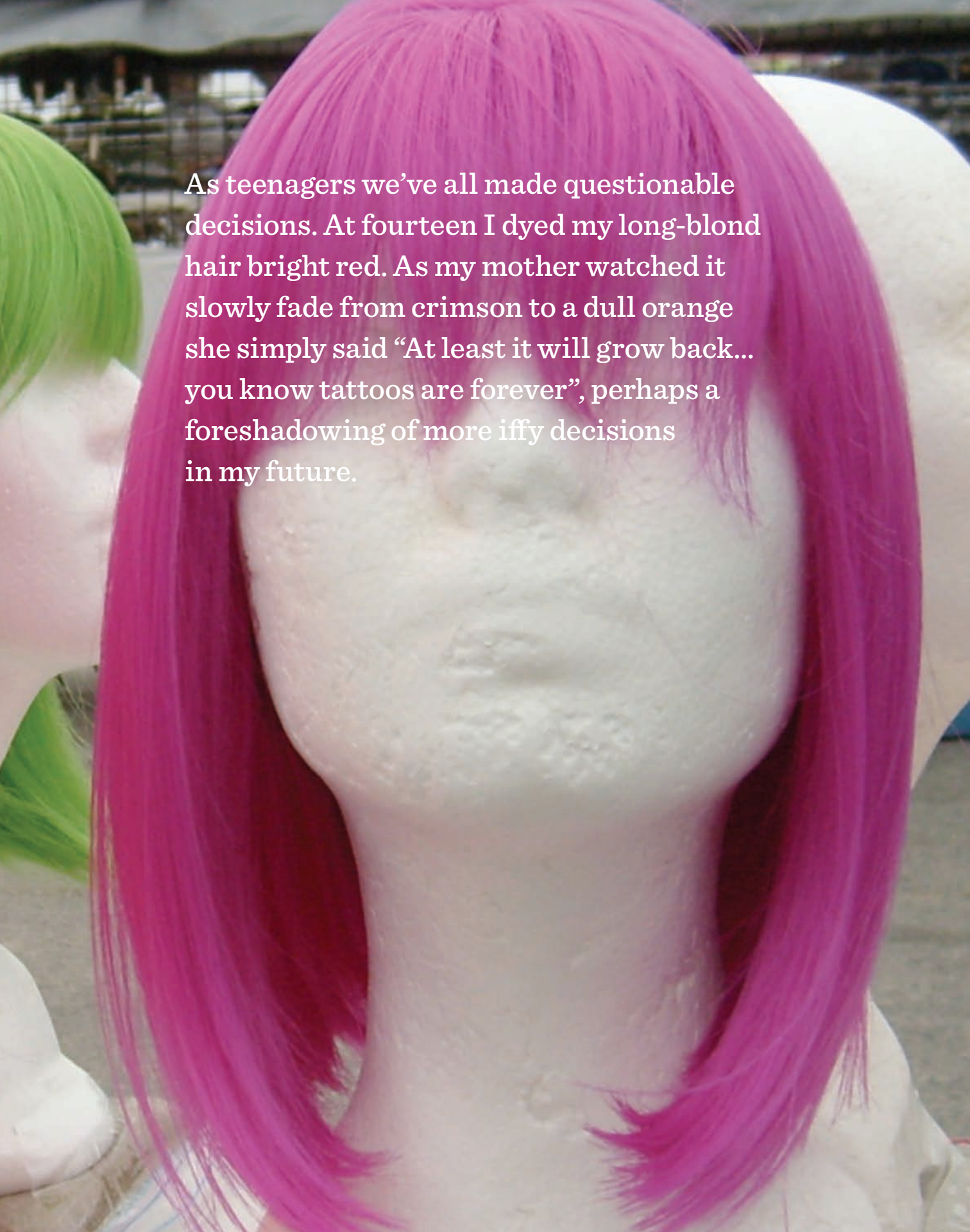
TOY THEATRE

Toy Theatre is an interactive three-dimensional miniature theatre. Users can engage with puppets to learn about theatre through play and physical interaction. Toy Theaters date back to the early 19th century. Often sold as paper kits at playhouses or opera houses, users would assemble the theatre kit at home and create their own performances using the accompanying scripts. *Toy Theatre* resembles the paper theaters of the past in its wooden stage and two-dimensional character construction, but is augmented by sound and video. Users are presented with a projector-lit stage. When they move a character onto the stage the images and sound change to reflect that character. To learn more about each character users can combine different characters on stage to produce different results.

While *Toy Theatre* is still in its prototype stage, watching users interact with the initial setup allows for closer examination of engagement.

RESEARCH

Conventions &
Breaking Rules

As teenagers we've all made questionable decisions. At fourteen I dyed my long-blond hair bright red. As my mother watched it slowly fade from crimson to a dull orange she simply said "At least it will grow back... you know tattoos are forever", perhaps a foreshadowing of more iffy decisions in my future.

Why conventions are good for users

Breaking rules can be fun, that's why we get tattoos and dye our hair startling colors as teenagers. However, as designers we love rules, they allow us to create a sense of familiarity translating to "easy" for our users. This happens because our users' brains quickly adapt to repeated experiences. But, as a result, they require less attention and decrease the designer's ability to engage. Donald Norman found that "people tend to pay less attention to familiar things, whether it's a possession or even a spouse. On the whole, this adaptive behavior is biologically useful, because it is usually the novel, unexpected things in life that require the most attention. The brain naturally adapts to repeated experiences" (Norman 108). So, if repeated experiences create user conventions, we can break those conventions to regain our users' attention and engage in new ways.

Why should we break rules

Designers often use shock, beauty or cuteness to capture viewer's attention. But, how can we engage users beyond this initial sense? Donald Norman found that "the unexpected transformation is the key [to discovering] what transforms an impression of shallow cuteness into one of deep long-lasting pleasure" (Norman 106). By taking a familiar experience and adding new or unexpected elements we can trigger new responses in users' brains.

ToyTheatre takes the theatre experience out of the physical theatre. Also, it allows users to participate in an experience they are accustomed to watching. *Red Riding Hood* and *Window StoryTelling* both take standard user conventions within a browser window and push them to new limits. The *Firefly* installation literally had people jumping up and down and running back and forth in an art gallery - not your expected experience.

WINDOW STORYTELLING

My explorations in parallax scrolling and animation within the browser led me to further investigate what happens when we break user conventions. If scrolling was an engaging response to "above the fold", what other browser window based interactions could I find? In my *Window StoryTelling* project I explore the browser window as a convention itself. We use windows to view content, but give little consideration to the form of the window in relationship to the content. *Window StoryTelling* engages users through resizing windows for more or less content, and new windows (pop-ups) for new content. The user is presented with a ball that can travel down a path infinitely (using the infinite scroll techniques from my previous projects), and will be stuck in this pattern unless they resize the window to find a path (new content) moving left or right. Further paths require them to shrink a window to fit inside a box, or might pop-up new windows with new and different paths. *Window StoryTelling* attempts to engage users by introducing new ways to play and explore windows in a familiar setting.

BL
RO
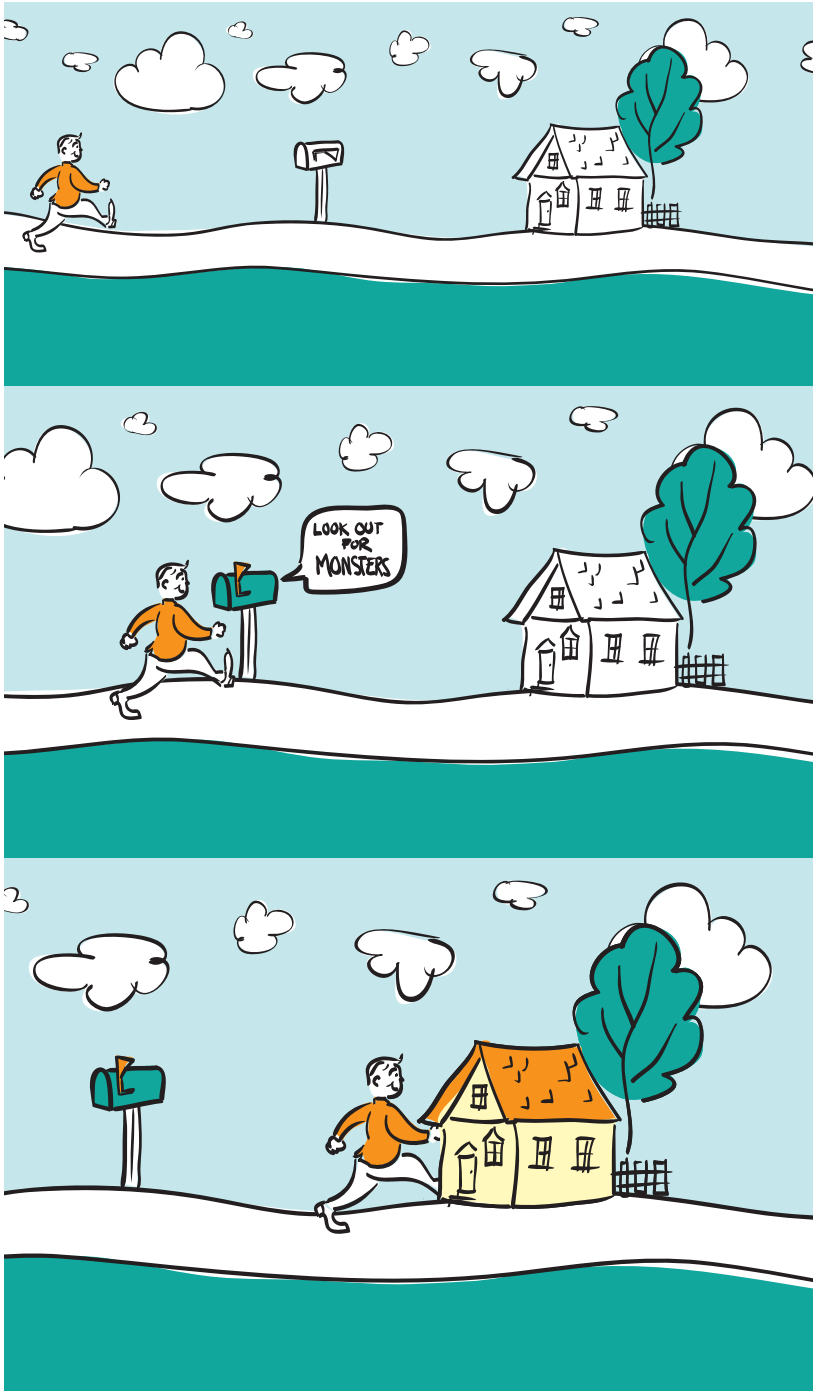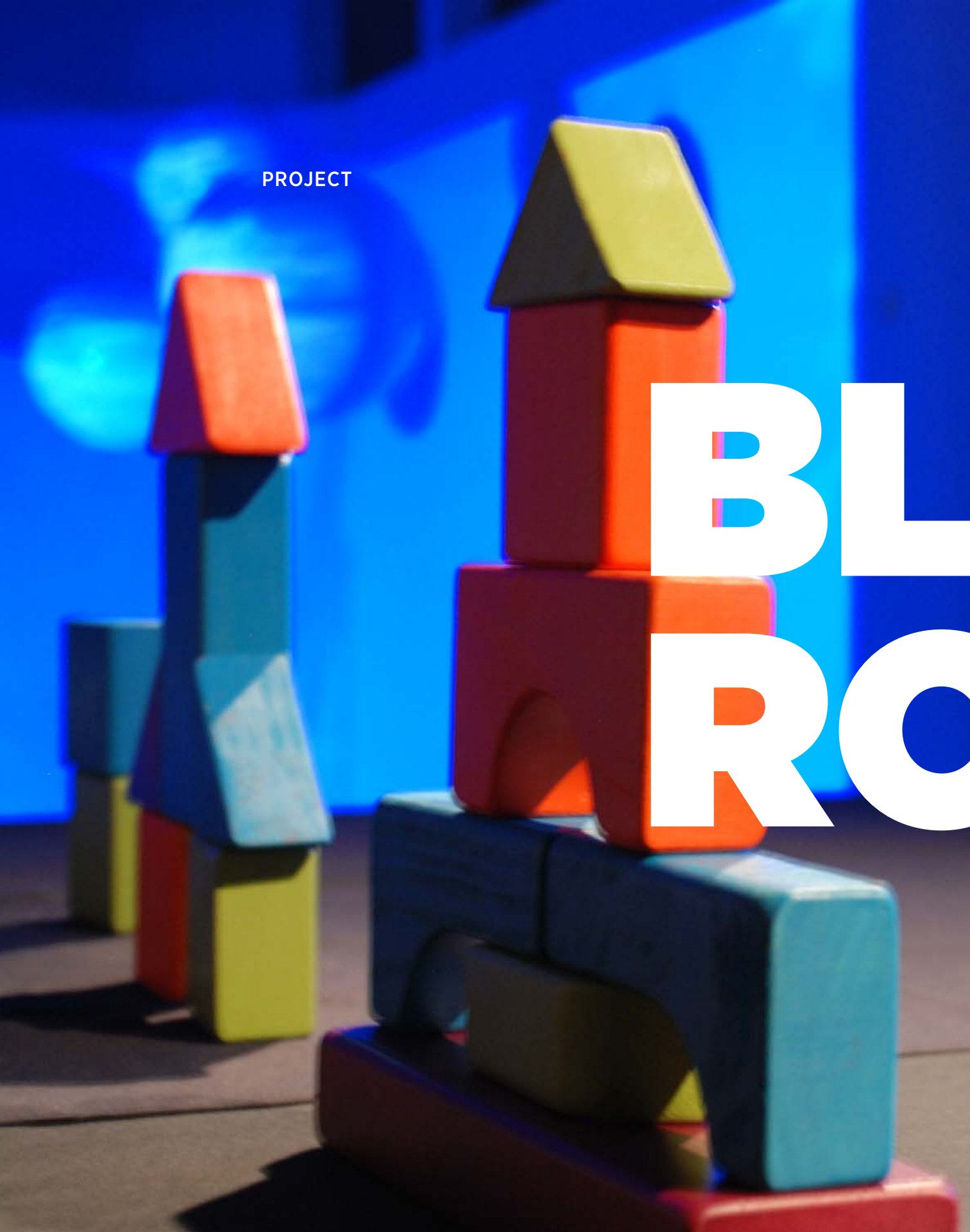
*I'm sprawled on the floor. Belly against carpet,
trains and planes hurtle around and over
me. A city has grown up in front of my eyes with
skyscrapers, trees, and magnificent bridges.
The world is in motion. A fire engine whirs by with
its sirens blazing, as a train carries flats of wood
into the city whistling to announce its arrival.
Suddenly, an angry roar erupts, shaking the
building walls. The sky goes black as two sneakered
feet crash through buildings and send the train
careening into a bridge. Screams of horror break
through the destruction.*

"Mommmmmmy! He broke my city!"
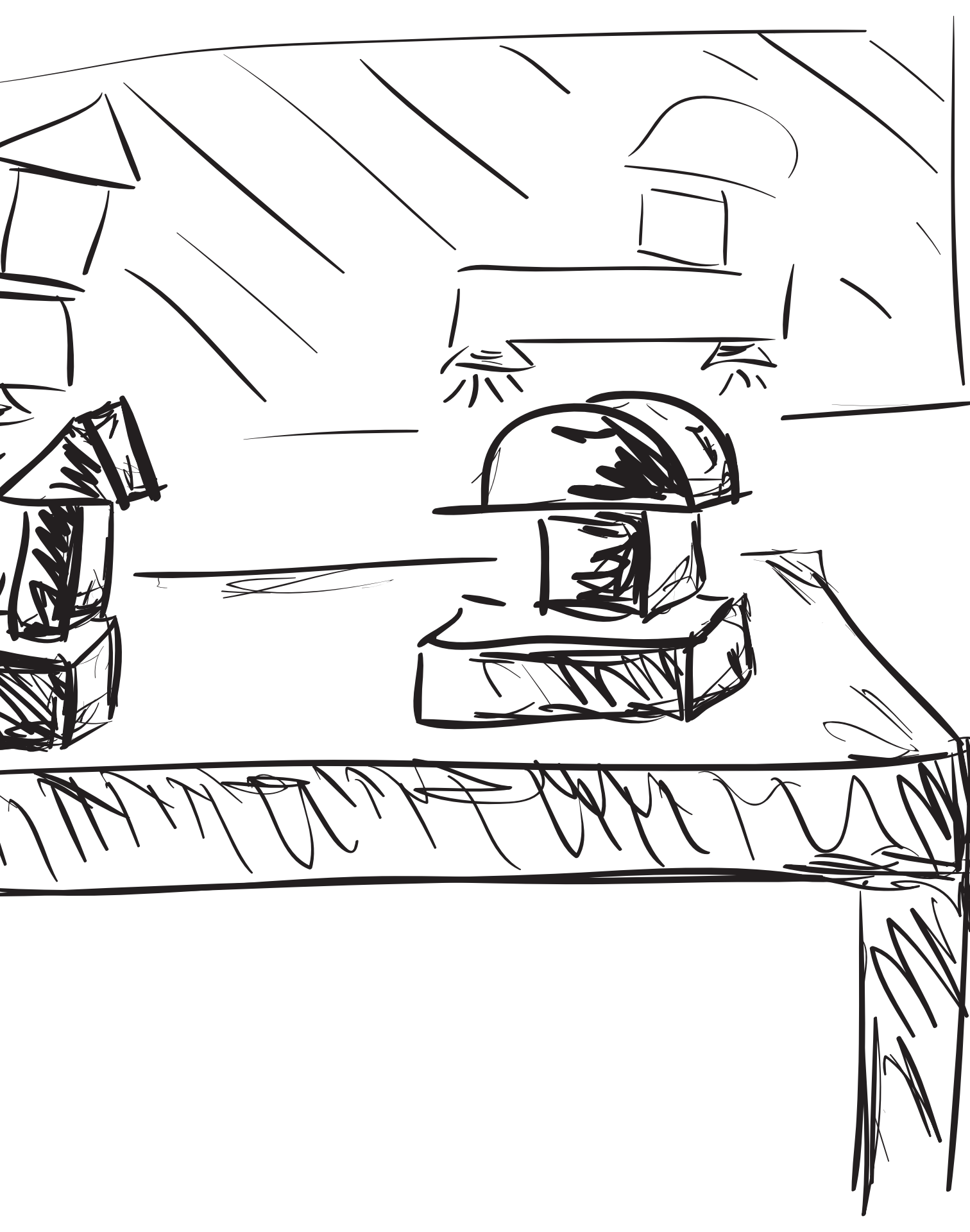
My brief transportation into the imaginary world of my nephew is cut short by his little brother's reenactment of Godzilla. The three of us quickly begin collecting the blocks that are now scattered across the room and rebuilding, only this time it's an alien planet of trains and rocket ships.

This was one memory of many spent with my nephews. Watching their imagination transform anything around them into detailed scenes and stories amazes me still. As an adult I seldom feel that freedom to create and destroy. Their narrative needs no plot, background, or resolution; they find as much joy in exploding one story as in building the next.

As I sat down over winter break, I found myself playing with building blocks, my imagination running like I was six again. Having just written the meat of this thesis I was intrigued by this "moment". I made note of this, and then watched with amazement over the holidays as my 65 year-old father-in-law took these blocks and played with the same enthusiasm.

There was something here to be captured and examined. How could I bring this experience to others? How could I enhance it?

The Experience

Block Rockets is an interactive installation where users build structures with colorful kid's blocks and then launch them into space using 2D physics. The system is built in openFrameworks and uses a Kinect and openCV to detect the blocks and turn them into abstract rockets. Box2D adds in realistic 2D physics and collisions. Users are presented with a table of blocks to construct their rockets. Once they are complete they can hit the "launch" button and watch on a large screen behind the table as their blocks get transformed into an abstract rocket with a booster pack. The screen counts down to launch with friendly "beep, beep, beep". When the rockets take off a loud blasting noise occurs and flames shoot out of their rocket boosters. With each launch a 2D physics engine determines whether each piece of the rocket is balanced and weighted correctly. Unbalanced rocket blocks will fall off their boosters, each piece clinking as it hits the ground. Boosters will continue bouncing around the screen until they run out of gas and begin emitting smoke, eventually dying. Block Rockets attempts to enhance childhood memories of play by combining physical objects and an animated imaginative experience.

Early Experiments

My initial concept for *Block Rockets* recreated the scene I experienced with my nephews. I envisioned an actual animated city scene that users would build from blocks. Red blocks could become cars, blue rivers, and green trees. I could create a program that identified shapes of multiple blocks and turned them into something else; a building over 4 blocks high could be a skyscraper. My first prototype was simply carrying a bag of small blocks around with me, and watching people play with the blocks. After explaining my concept to participants, every single person wanted something different to happen. Some didn't want actual buildings, they wanted the "idea" of a building. Others wanted to be able to recreate very specific pieces of architecture: the Eiffel Tower, the Colosseum, the Empire State Building. It was clear everyone wanted to build something, as every user immediately gravitated towards stacking the blocks and creating their own narrative, often building throughout our conversation. The blocks themselves were engaging enough to distract the most serious users. So what could I add to the blocks that would actually enhance this experience? Simply adding an animation or trying to dictate a narrative to the user seemed to detract from the fun of building.

Refining the Experience

I began exploring ways to add meaning to this already engaging experience. My initial concepts asked users to use my narrative applied to their block constructions which removed them from engaging their imagination. How could I simplify this concept? Did I need the entire city? I reflected back on my experiences of watching my nephews play. They liked building specific structures to see what would happen; like trains, cars, or houses. My users did the same with the blocks only more specific about the buildings or vehicles. Could I pick just one of these objects they naturally gravitated towards and create a system around it? I had also noted that there was a universal joy found in smashing the blocks to pieces. I expected my young nephews to exhibit that behavior, but was surprised at how often my users would knock their creations down with one fell swoop. Perhaps it is an engrained memory from childhood. Was there an object I could build this system around that was inherently fun to blow up? I immediately landed on Rockets. These served as an object that I experienced throughout childhood — from daydreaming my own rockets out of boxes and blocks, to building a live rocket in science class.

```
accel is: -0.47 / 9.40 / -0.05
set near threshold 255 (press: + -)
set far threshold 233 (press: < >) num blobs found 3, fps: 60.1743
connection is: 1
press UP and DOWN to change the tilt angle: 0 degrees
Rocket Count:3
Rocket:0 60 160
Rocket:1 36 108
```

ELEMENTS OF ENGAGING... BLOCKS

```
accel is: -0.19 / 9.35 / -0.19
set near threshold 246 (press: + -)
set far threshold 230 (press: < >) num blobs found 4, fps: 60.0189
connection is: 1
press UP and DOWN to change the tilt angle: 0 degrees
Rocket Count:4
Rocket:0 40 76
Rocket:1 32 72
```

Creating the System

Creating a system that actually worked as imagined proved to be more difficult than I had guessed. The first challenge was related to detecting each block structure and creating the rockets. As the Kinect makes it easy to use its depth data, detecting individual rockets was not a problem. The difficulty turned out to be going from each multi-block structure into something that could be blown up into pieces. Initially I used openCV to create each rocket as its own, unbreakable shape, but this proved not to be terribly interesting. To solve this I needed to break each rocket into its component blocks as best I could. While humans can easily identify which of the primary-colored blocks made up each structure, this proved to be more difficult for a computer to handle. Trying to use the RGB values proved to be unfruitful: lighting shifts dramatically from morning to nighttime, and interior lights and reflections each impart their own color variations. The solution I was able to get working was to transform the RGB source images into Hue Saturation and Brightness (HSB), and then use large chunks of the Hue scale to try to detect each block.

To complicate things further, the blocks I had at my disposal were smaller and shiny - the reflection causing problems with detecting each block's color. The solution was to get a set of large blocks and paint them myself with flat spray paint (of which it turns out there are limited color selections). This made the individual blocks making up each rocket easier to detect in changing lighting.

Finally, while Box2D, the 2D Physics library, handled a lot of the grunt-work, the initial simulations were extremely slow as the complex shapes created by OpenCV's blob detection were generating shapes that were overly complicated.

Working with my husband, Pascal, we integrated a convex-hull detection and simplified the shapes down to convex polygons that only had 6-16 sides, which dramatically sped up the physics simulation and made them less prone to slowdowns when lots of shapes are interacting.

Fresh Media Show

Block Rockets appeared as an installation in the Fresh Media Show in March of 2013. For the final installation I took previous rounds of user-testing into consideration to streamline the user experience. In initial prototypes when a user hit the "launch" button the rockets would take off immediately. By adding a slow countdown with accompanying sounds (5,4,3,2,1...beep, beep, beep , beep) I built anticipation for the impending results. I also added sound effects when the blocks broke apart and struck the ground, as well as sounds of an explosion when there was an extremely forceful impact. Rockets now had a visual and audible component to their animation. To complete the interaction I gave each booster a limited time to stay fueled. After 5 seconds I would slow down the rocket's speed and begin an animation with smoke and bursts of flame to mimic an engine running out of fuel. The remaining pieces of the broken rocket would come to rest on the ground, revealing a screen asking the user to build and launch a new rocket.

Users naturally gravitated to the table of blocks. While there were some technical hiccups with maintaining consistent color recognition on the software side, there were always users at the table playing with the blocks. Most users approached the system with ease, arranging blocks and conversing with others in the gallery — it was an activity that they understood the initial rules to. Hitting the launch button for the first time usually elicited immediate excitement that their rockets were working. Some users approached the system from a quantitative perspective, creating stacks of similar colored blocks, or structures very high or low in attempt to figure out the system.

The constant level of user engagement in Block Rockets delighted me. Most users stayed for longer than one interaction, on average building and launching 3-4 rockets, and the table of blocks had a group of waiting participants for most of the night. Watching users actually create something in a gallery space with smiles of delight and enthusiasm exceeded my expectations for the installation.
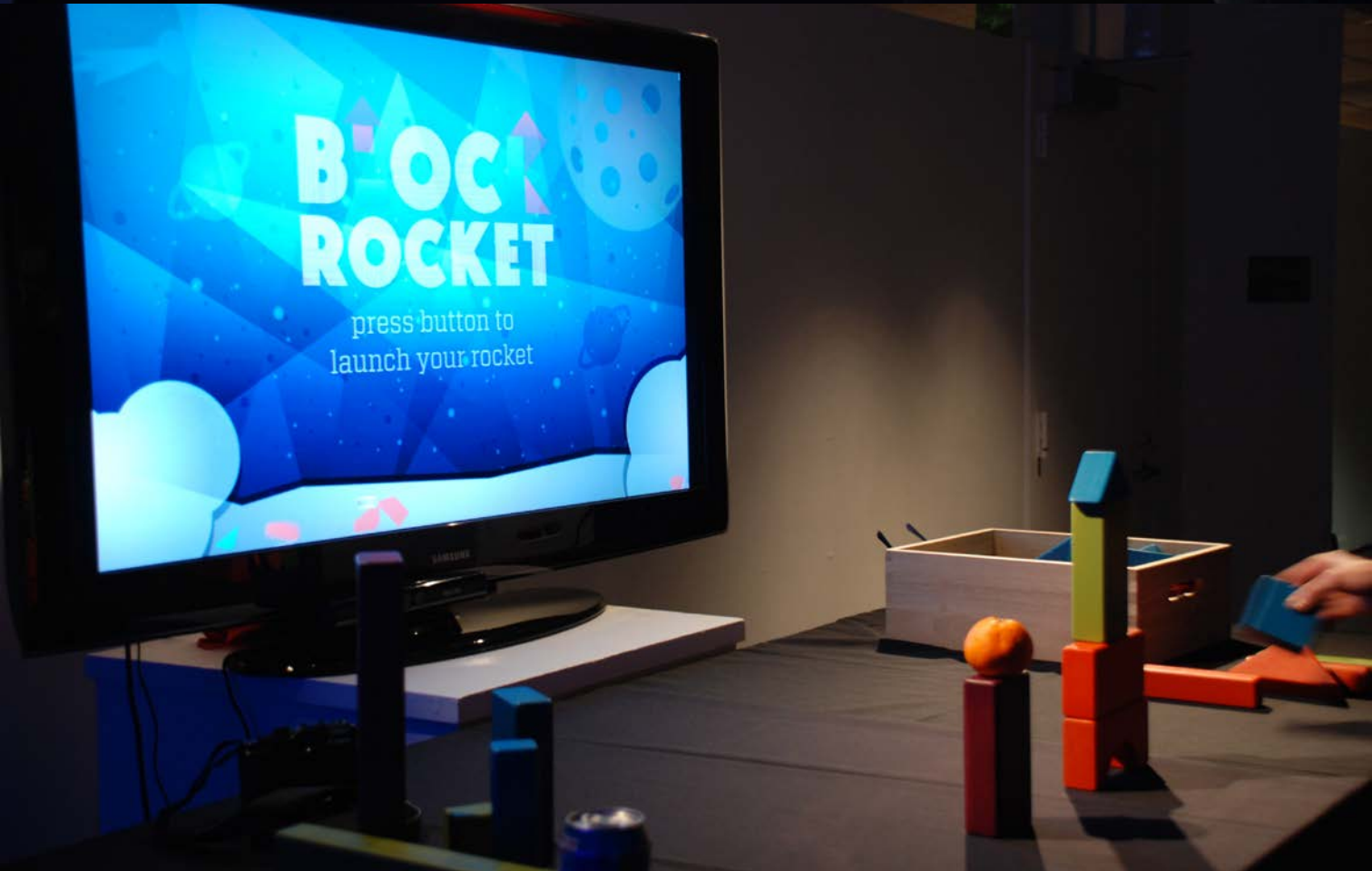
Reflections

On opening night two children accompanied by their mother stopped by Block Rockets several times during the evening. On their way out of the gallery I overheard them begging their mother to play one last time, as there was no more line at the table. She begrudgingly agreed to one more rocket launch before they left. As they made their way over, the table cleared out and the three of them began to build. "One More" turned into ten and suddenly the mother was just as interested in the installation as the children. While the children played games, trying to collide their rockets, the mother carefully tested the system. As they were leaving she approached me and told me that she loved that there was an educational aspect to the system. While the kids were intentionally building their rockets crooked to fall over into a wall or another rocket, they were learning about physics in a way that static blocks couldn't teach them. This feedback excited me, as this is an avenue that has yet to be fully explored in Block Rockets. Until this point my decisions were based on engagement and experience, but along with it came the learning of a system.

While the user interaction with Block Rockets in a gallery setting was extremely positive, there were several shortcomings and learning experiences for me. I struggled throughout the prototyping process with consistently identifying colors and shapes with changing light brightness. During the installation set-up I tested many lighting possibilities, but did not account for the addition of projection based work and interactive lights installed at either side of the piece. This resulted in Block Rockets having calibration issues for some of the night. When users hit launch sometimes entire colors (like all the purple blocks) were missing. While this was painful for me to watch, users seemed undeterred by it and continued playing. One user actually thought it was part of the system. Even though it is not ideal to have inconsistent outcomes for users, it proved to me that the overall concept was powerful enough to keep users engaged beyond some minor malfunctions.

Block Rockets is far from a complete system. There are many avenues I would like to explore further. With more rigorous testing and prototyping I can see this system becoming an educational tool that just happens to be really fun to use.

I also see the possibility to move this into a more accessible setting. With new capabilities of cameras in smartphones this system could be brought to everyday life - could you stack the coffee mug, cereal bowl and pencil holder on your desk into a rocket? Then snap a photo of it and then see if it would take off?

CONCLUSION

As I conclude three years of research and exploration at the DMI, my process and project selection have jumped from screen based explorations to fully immersive installations and back again. At first it seemed there was little connection between each piece, one exploring identities online, another exploring childhood memories. But with deeper analysis and a broader perspective I can see a deep interest in engaging users and in creating engaging experiences. Throughout my projects I have explored techniques to engage and immerse users in both three-dimensional and two-dimensional spaces. By bringing techniques from my 3D exploration into my 2D work, and vice-versa, I am able to start defining specific elements that can be combined to add deeper engagement to my experiences.

For example, the idea for exploring the browser conventions of pop-ups and scrolling in *Window StoryTelling* and *Red RidingHood* came from the discoveries I made in *Firefly*. By breaking the conventions of what is expected, either in a gallery setting or browser window, I could engage my users more deeply in the experience. I also learned from *Firefly* the importance of personality and humanness to connect with users and brought this into the hand-drawn characters and stories in *Red RidingHood*.

In the 2D space of *EyeWanto* I found the level of engagement the user gains by exploring and filtering through sounds and memories could be brought into *Toy Theatre* to create a more enriching and immersive experience for my users.

I had the opportunity to conceive and build Block Rockets after defining my "elements" of engaging experiences, so I could pull information gained from previous research into this experience.

What I've learned

While I have defined a specific set of elements that can help engage users and create more meaningful experiences, these elements are not intended to be applied in a prescriptive manner. Each interaction needs to be examined on its own merits and user observations. We are humans, we need to design for humans. As Donald Norman explains "...utility and usability are important, but without fun and pleasure, joy and excitement, and yes, anxiety and anger, fear and rage, our lives would be incomplete". These elements should not be taken as rules, instead they are opportunities to enhance experiences.

I have also learned that there is no magic combination or recipe for creating engaging experiences. Every element of an experience must be tested with real users. Successfully combining elements comes down to tremendous amounts of iteration. Engagement is a visceral reaction that is apparent when a user is interacting with your work. It's never what you think it's going to be. So the earlier you prototype and the earlier you get someone playing with you work, the more you can enhance the experience. Also, it's important to generally trust your gut reactions - if something's not engaging then it's not engaging.

Potential future explorations

I've only written about a select few elements as they pertain to my work. There are many more elements that I have not begun to cover here. Cognitive scientists like Donald Norman have been researching interfaces based on human cognition since the 1980's. He's written books on the human levels of processing: Visceral, Behavioral, and Reflective. More elements discussed by well-known design researchers such as Schneiderman, Smith, Mosier, Nielson, & Brown include consistency, flexibility, recognition, recovery, closure, systems, control, efficiency, and usability. Many of these topics overlap with ones I've defined in this book, and many I have taken into consideration when developing my experiences. In order to keep my research focused, I have limited myself to a select few elements, but I would very much like to expand on this initial list in the future.

Next steps

While I have limited my discussion in this book specifically to creating an engaging experience, something that I believe is equally important is creating continued engagement. How do we create an experience that users want to return to? Can we create experiences that still feel new and different after the initial "aha" moment? I began to explore this concept in *Firefly, EyeWanto*, and Block Rockets, but acknowledge that the experiences need more testing and need to be pushed further. Leaving room for many more iterations and prototyping.

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