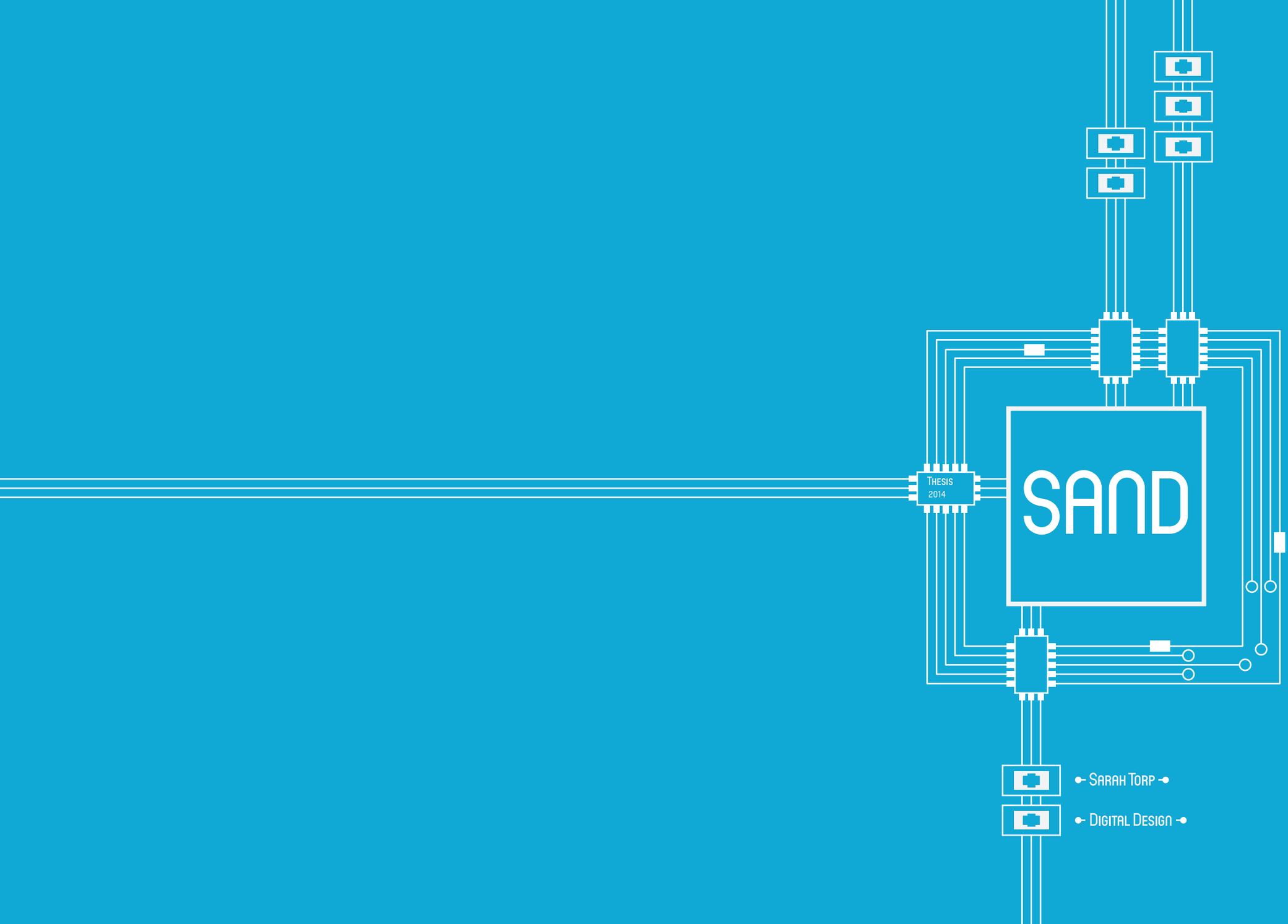
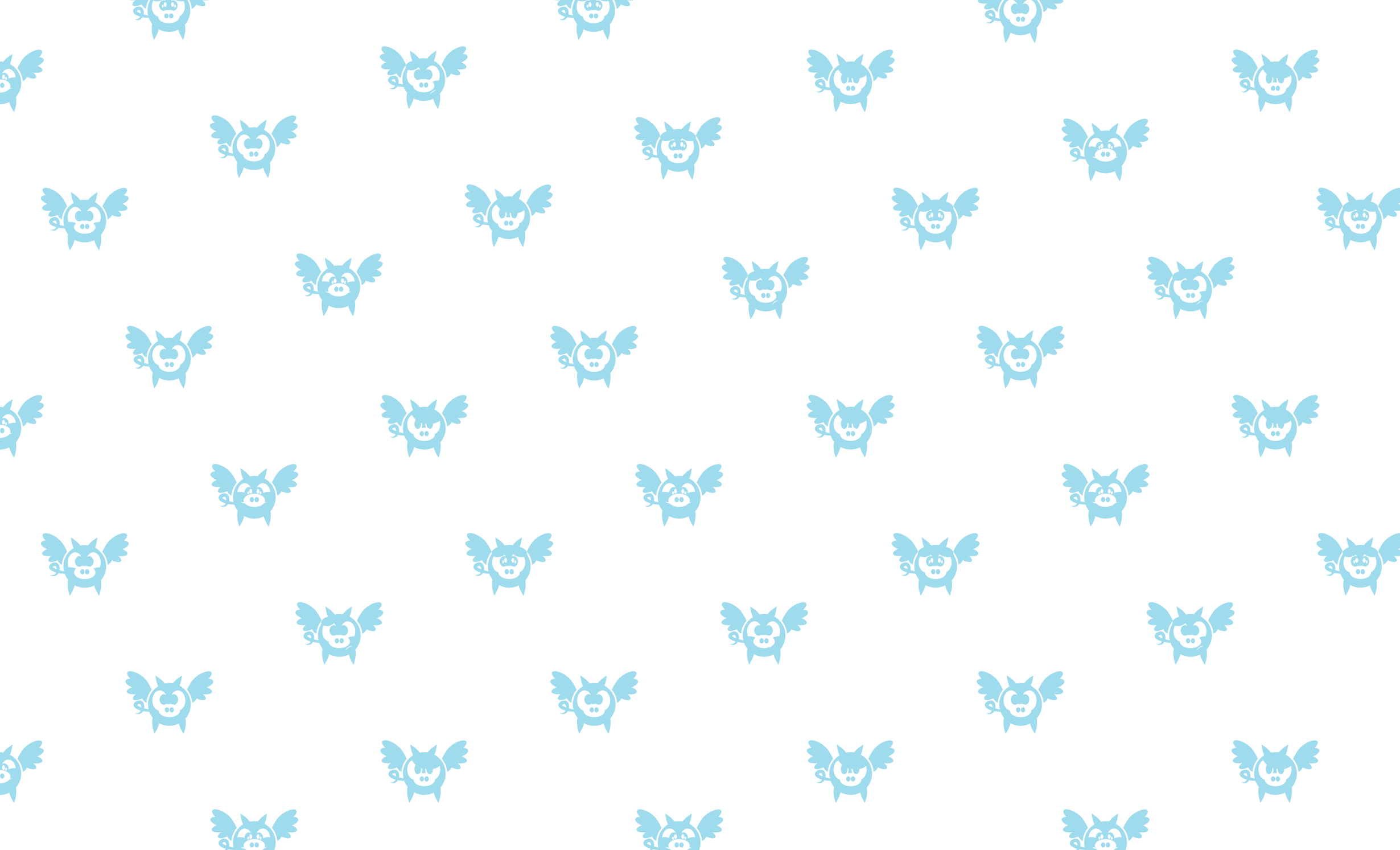

SAND
THESIS
2014
SARAH TORP
DIGITAL DESIGN



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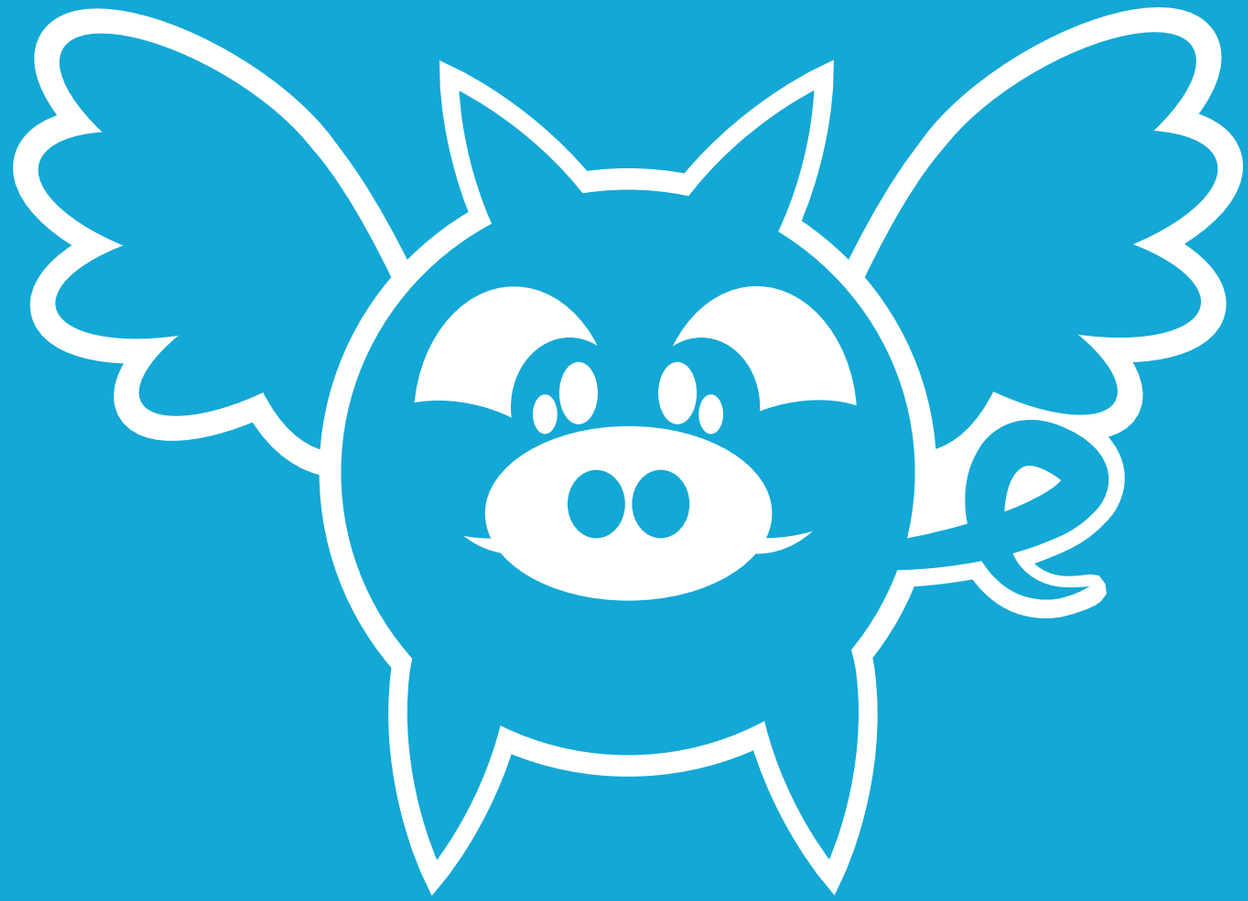
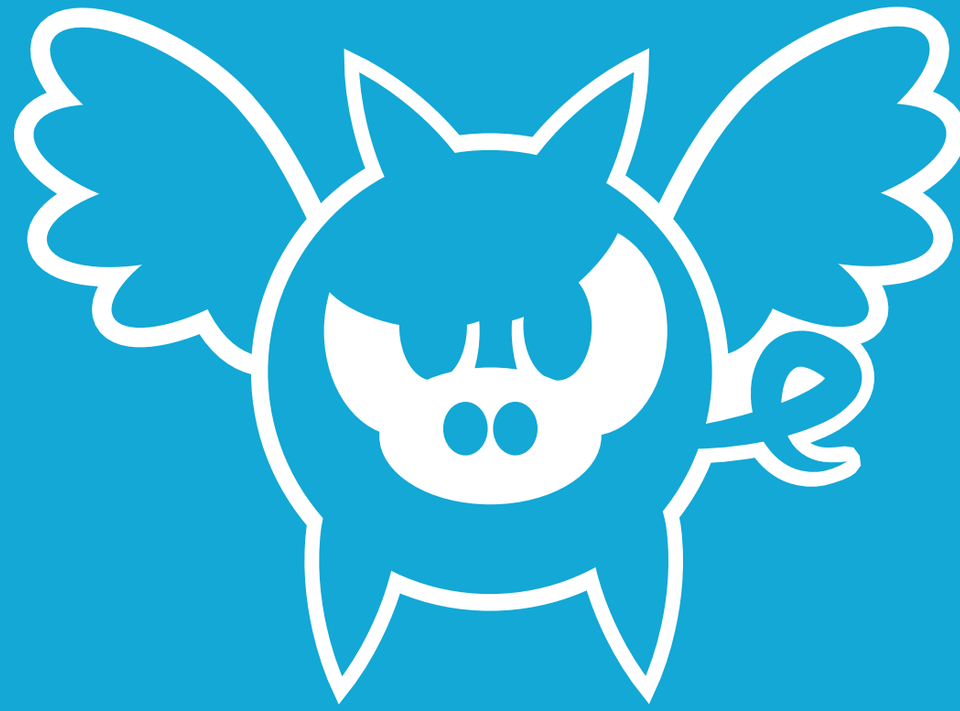
And my Deepest Thanks to my

Family and Friends



For saving my Bacon.



Something that sort of bothered me...

The thing about computers is that they are primarily designed to be used by humans. However, they are programmed to receive mechanical input through clicks and scrolls that are intrinsically robotic, and ignore the biological essence of the user. This has resulted in interfaces that can prove to be overly-complicated, and in some cases can make the translation of certain mediums into digital media somewhat difficult to master, and current skills hard to replicate.

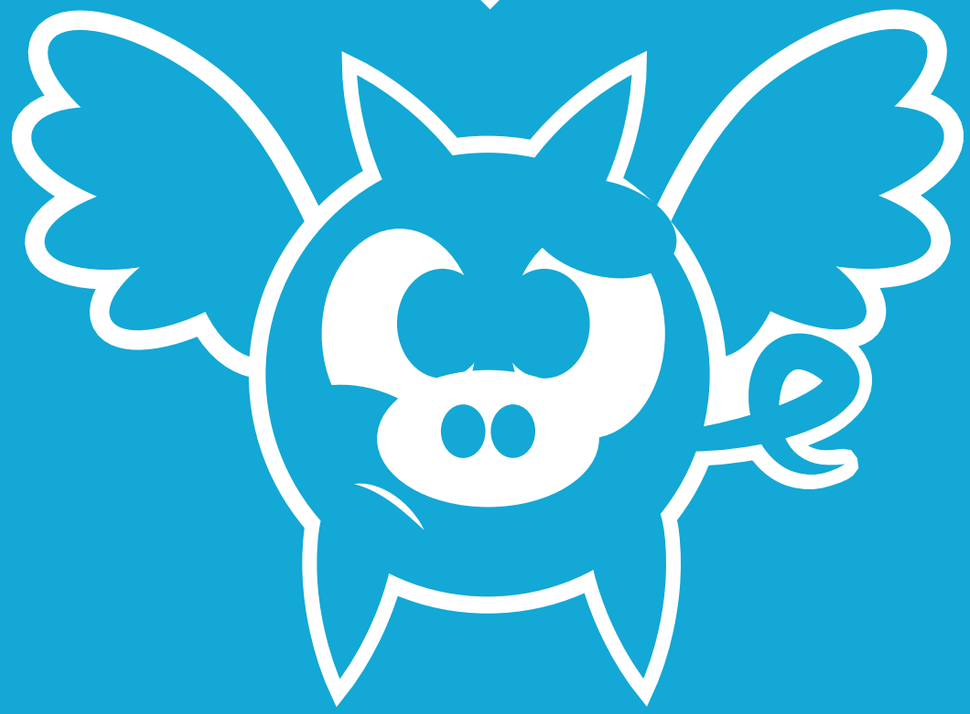
Perhaps as a result, touch-based interfaces have become a growing commodity of our generation, though I find myself still wondering if implementing touch-screen technology is organic enough.

I REALLY JUST WANNA TOUCH IT...

Being able to physically mold and change the shape of the interface, letting the experience be malleable and organic, literally immersing yourself in the interface... I want to experiment with that kind of power.

So here's the Question:

How can Design cater to human interaction if a malleable interface is implemented?



Where to Start...

Remember the User.

According to Larry Marine, "It is far better to adapt the technology to the user than to force the user to adapt to the technology." I wanted a familiar surface that the user could interact with, perhaps integrating a medium that draws from childhood experiences.

If Pasteur & Robespierre are right,

that we can

Resist Poison

only through certain built-in

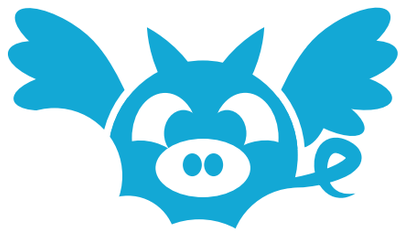
Poison, then some

Specific Frustrations,

caused by

Cybernated Life,

require accordingly cybernated



Shock & Catharsis.

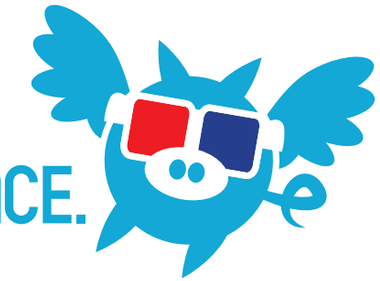
~Nam June Paik

Make the Technology Cathartic.

The easiest way to get people to be comfortable with this sort of interface is to start out with a product that is inherently fun to play with. When Alan Kay was developing prototypes for the first personal computers, he designed programs for drawing and playing games to get the public interested in the future he was producing. He enticed the masses to learn this new technology for the reward of the joy they could earn from participating in the experience.

So Real You Can Touch It.

A Three-Dimensional Interface.

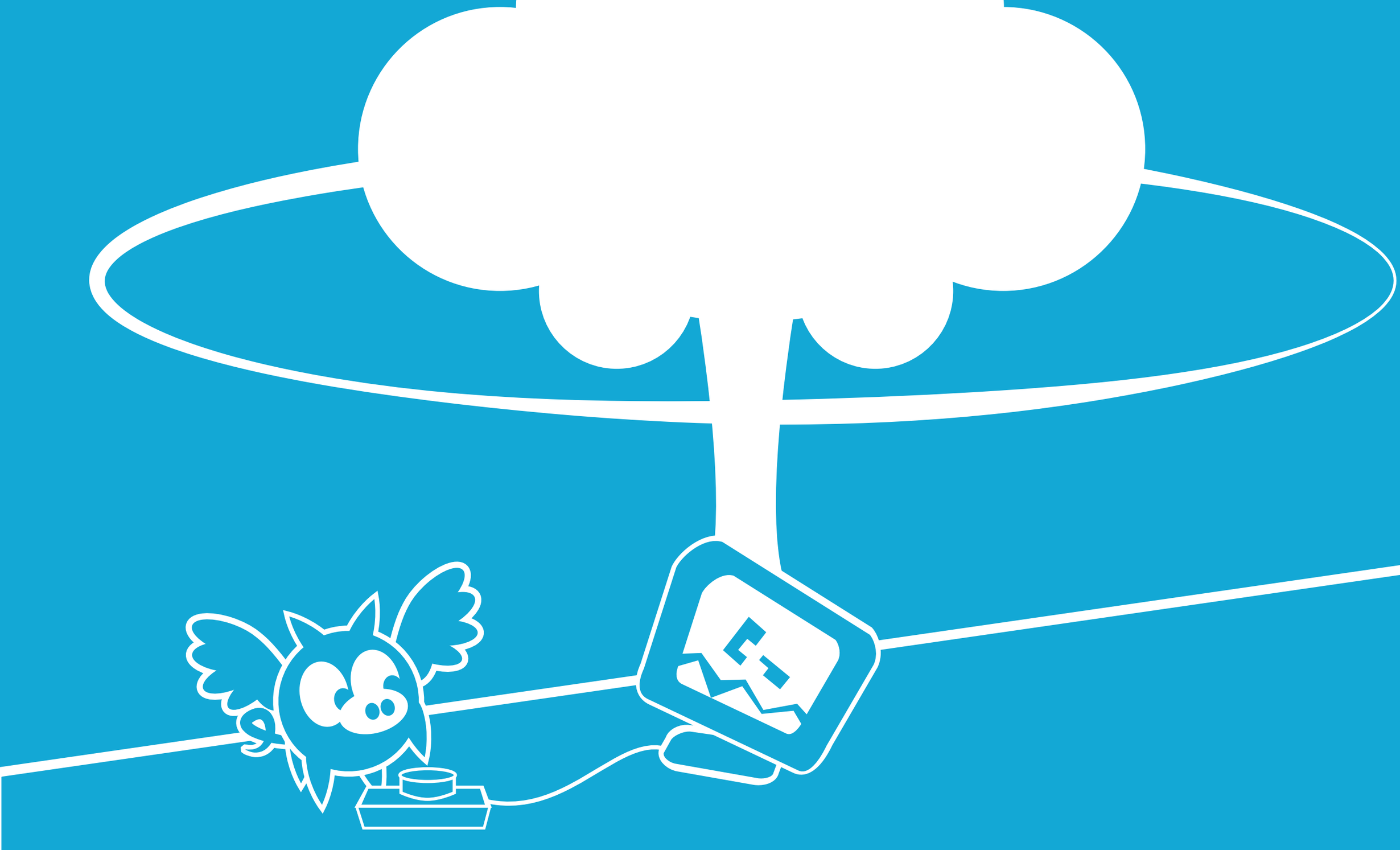


I felt somewhat bored by the flat, two-dimensional interfaces that we are so often expected to accept as the ultimate form of tactile interaction, so what I decided to do was to try and implement a different approach to interact with technology in the form of a coloring pad projected onto a sand surface.

It would be more tactile than traditional forms of computing and would depend on the use of the third dimension in a visible, tangible, alterable representation. I wanted the interface to have additive and recessive qualities, so that users could build up or tear down their artistic creations, while still being easy to manipulate. The surface of the device would be pliable and quick to form, but also familiar to any potential users while retaining some element of fun and entertainment.

When graphic designers got bored with the perfection offered by the newly arrived computers that could render artwork to within a tiny pixel, they rebelled by writing programmes that randomized individual letters and whole pages every time a printer processed them. A designer who didn't like what a copywriter had delivered even set that text in illegible pictograms and icons.

~ERIK SPIEKERMANN



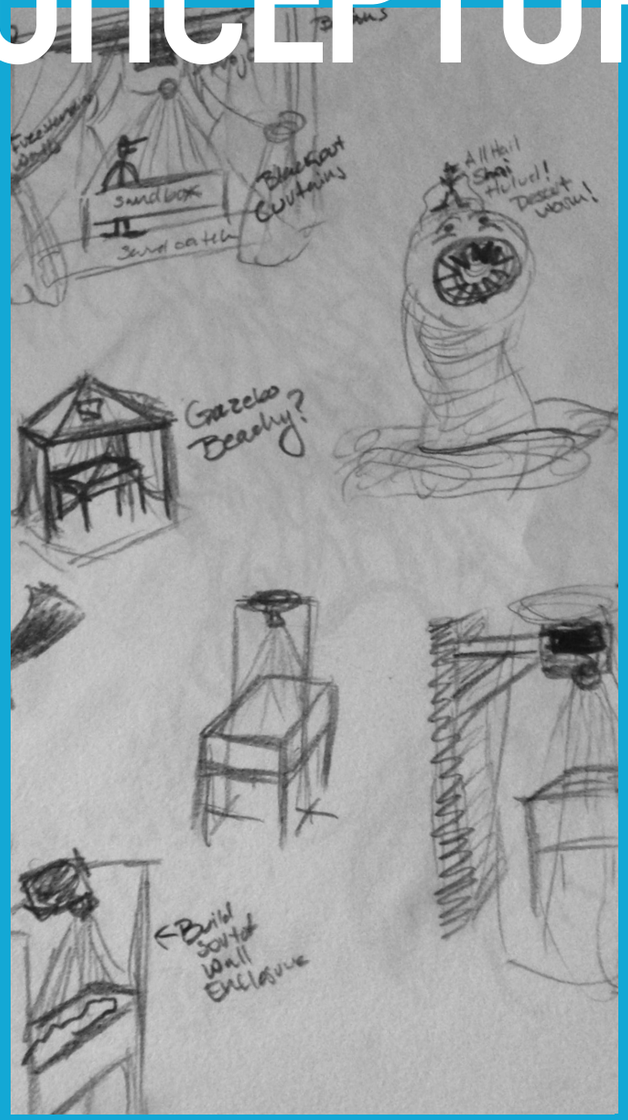
Progress.

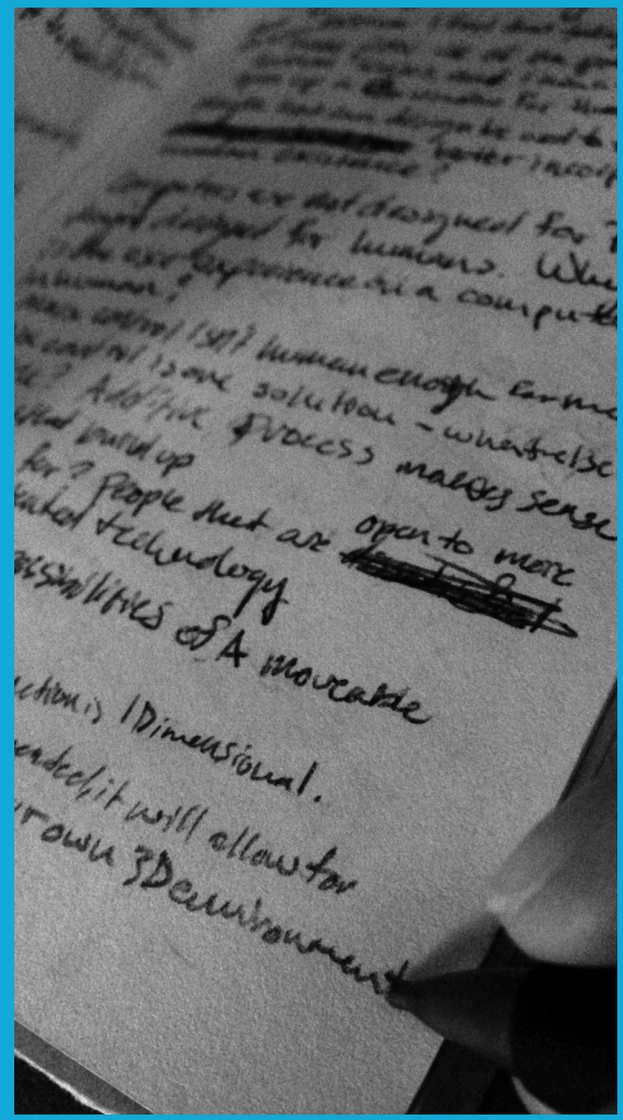
Rocky Road, extra nuts.

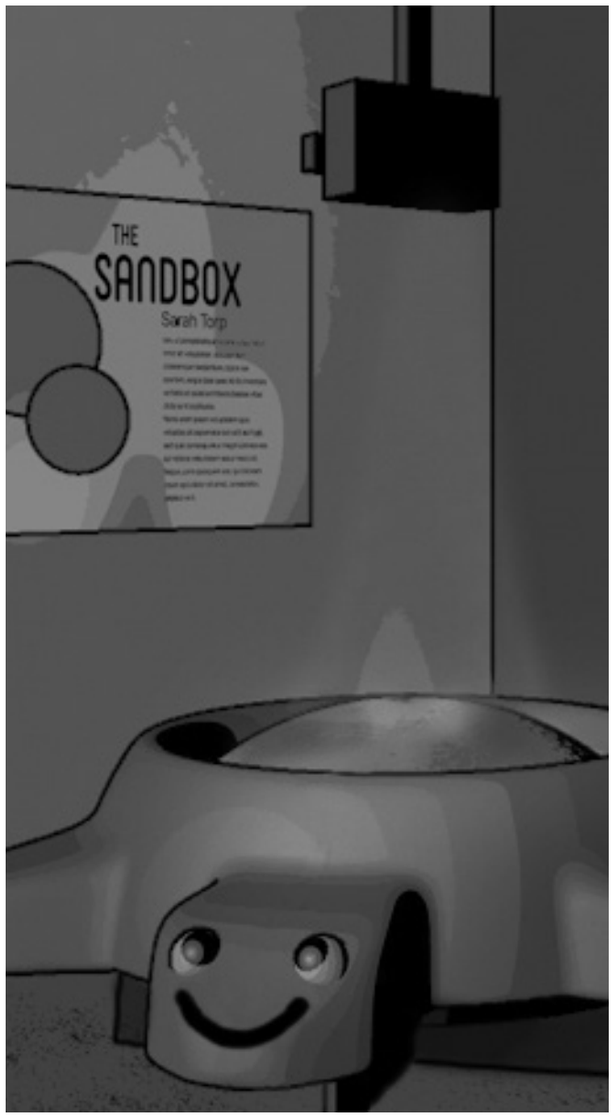
During the course of this project, I had quite the gamut of different challenges pop up to meet me. There was a lot of Googling involved, and a variety of How-To Guides were consulted in this endeavour.

Of course, once I had a sufficient knowledge base, the biggest problem was actually applying that knowledge to the project, and then getting it to function. Go figure.

Conceptualizing

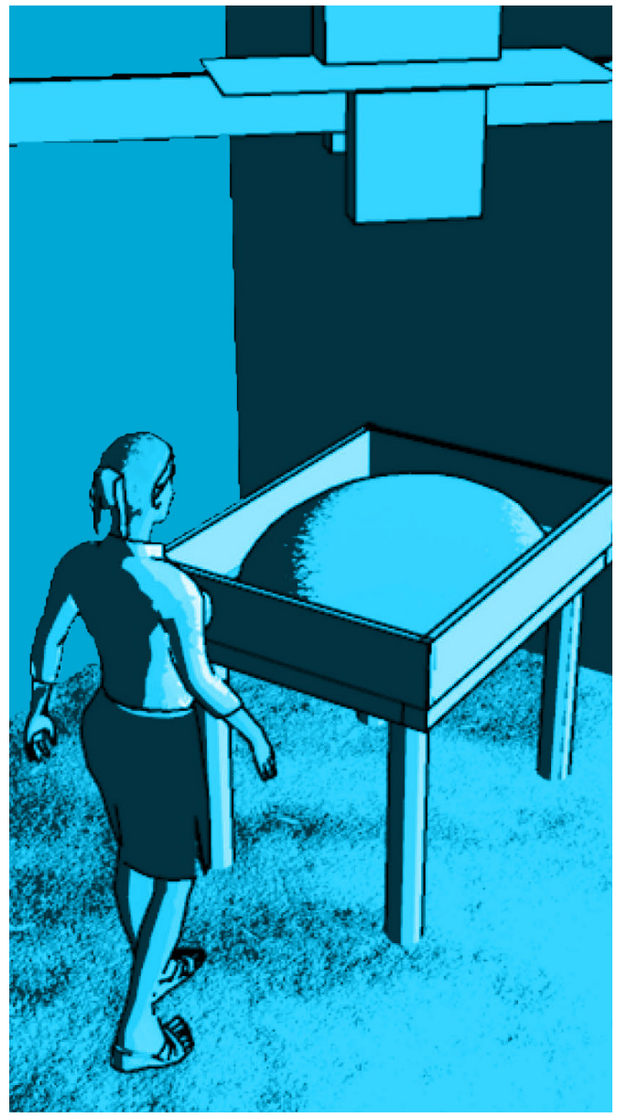




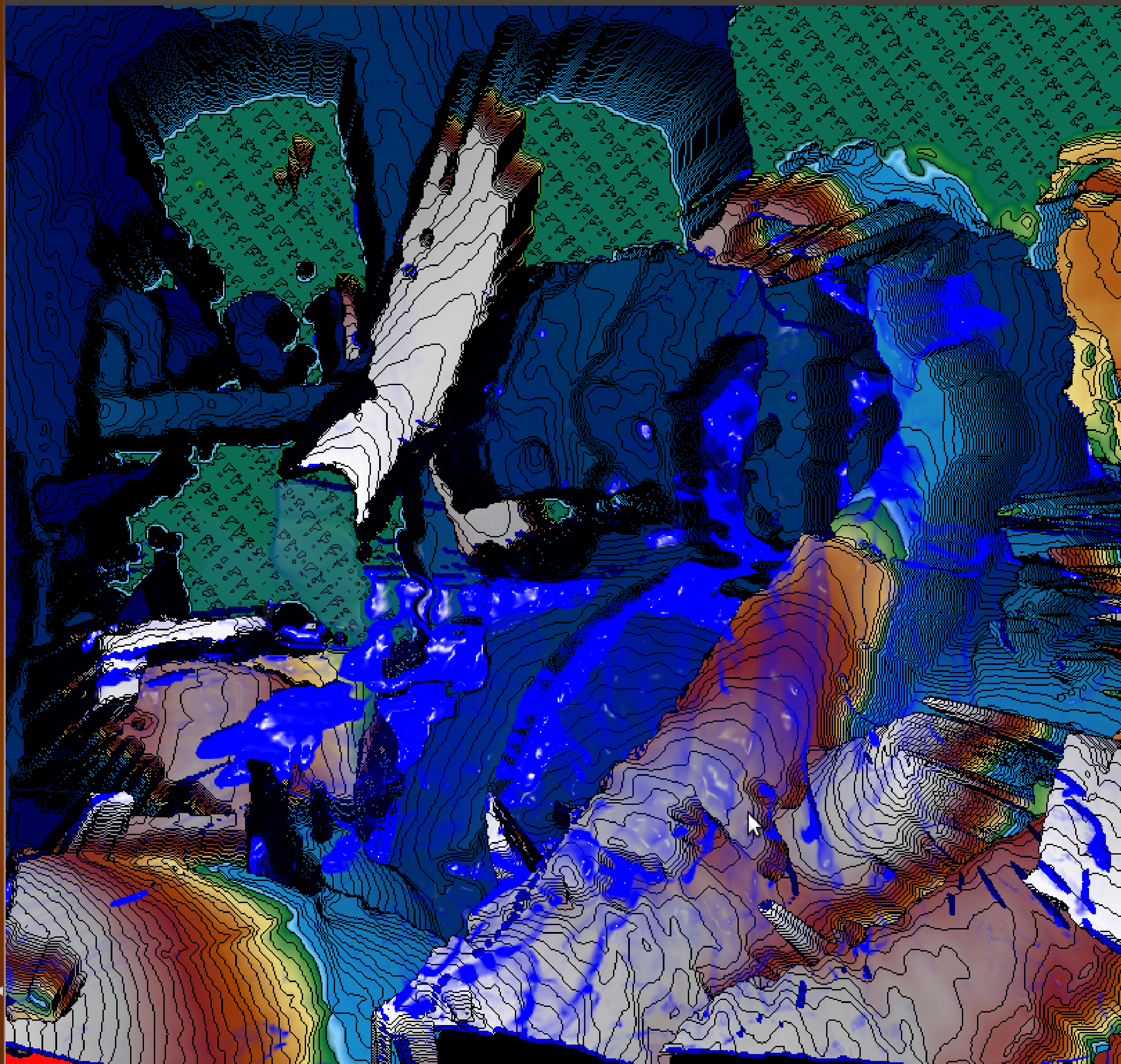

THE
SANDBOX
Sarah Torp


THE
SANDBOX


SANDBOX
Sarah Torp



SARndbox



sarah@Arrakis: ~/src/SARndbox-1.5

```
GL error: Unknown error 1286
GL error: Unknown error 1286
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sarah@Arrakis:~/src/SARndbox-1.5$
```

SurfaceRenderer.h VERSION WaterTable2.cpp WaterTable2.h

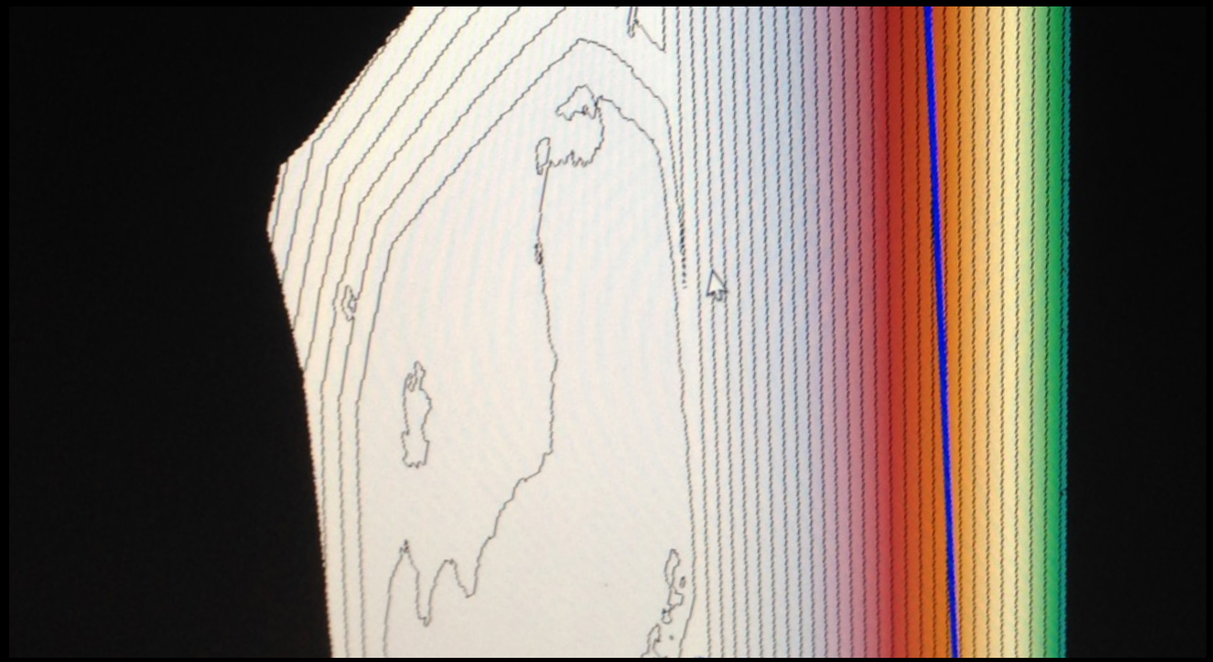
"makefile" selected (5.5 kB)

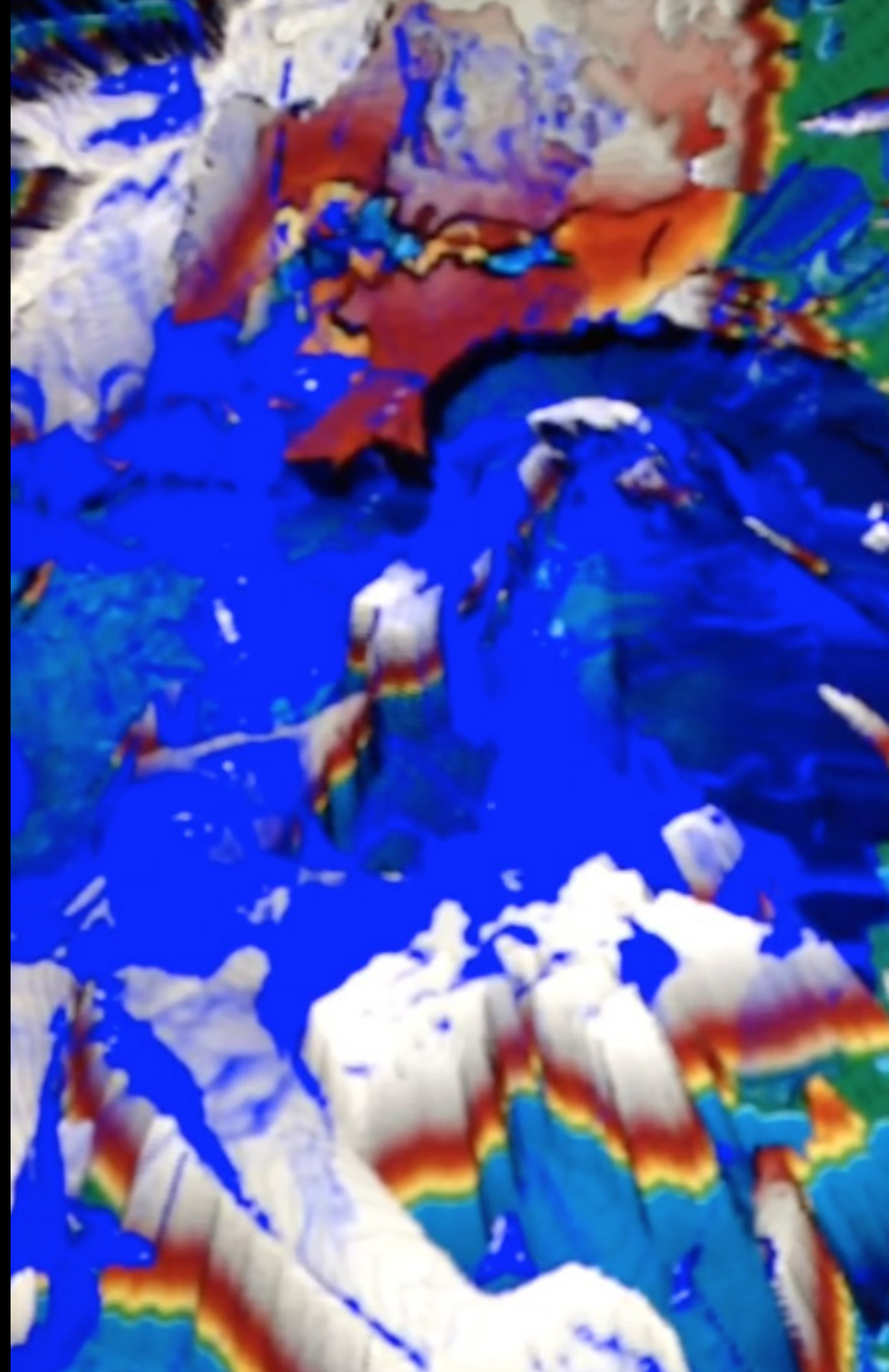
```
ble (~/src/SARndbox-<version>/bin in the default installation,
LDIR>/bin otherwise) to the user's search path. This allows
 the Augmented Reality Sandbox from any directory. Using csh

 PATH ${PATH}:~/src/SARndbox-<version>/bin
 - or -
 > setenv PATH ${PATH}:<INSTALLDIR>/bin
 where <INSTALLDIR> is the target location set in the makefile.
 Using bash:
 > export PATH=${PATH}:~/src/SARndbox-<version>/bin
 - or -
 > export PATH=${PATH}:<INSTALLDIR>/bin
 These lines can also be added to the user's .cshrc or .bashrc files
 to make the additions persist between logins.

Use
===
```

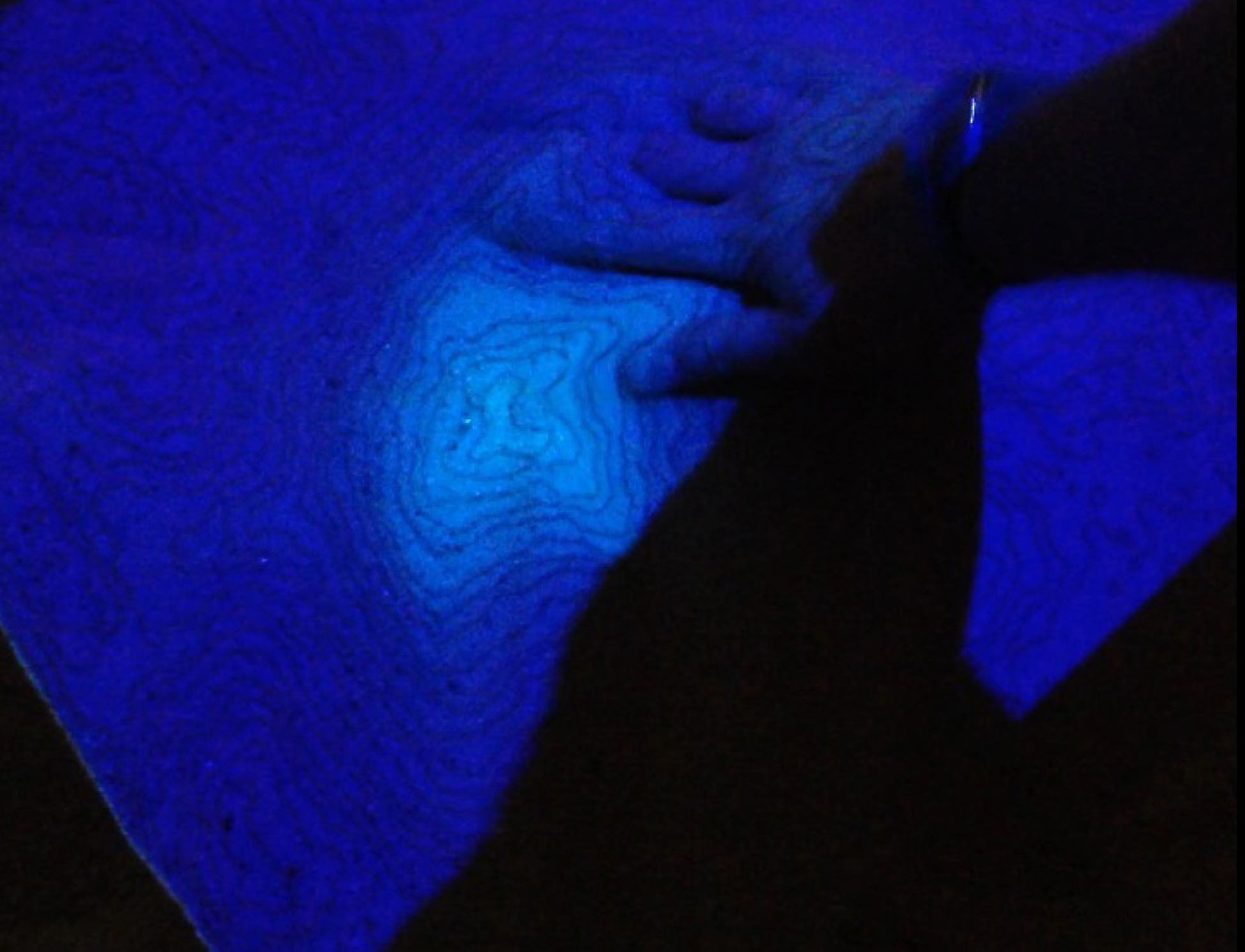
Beautiful Errors I encountered.

There were days, months, even, when my program refused to work properly, or when I did things it would not expect for the sake of curiousity.

Below is an image from a bad configuration, and to the right is an example of what happens when the kinect is pointed at any three-dimensional surfaces.





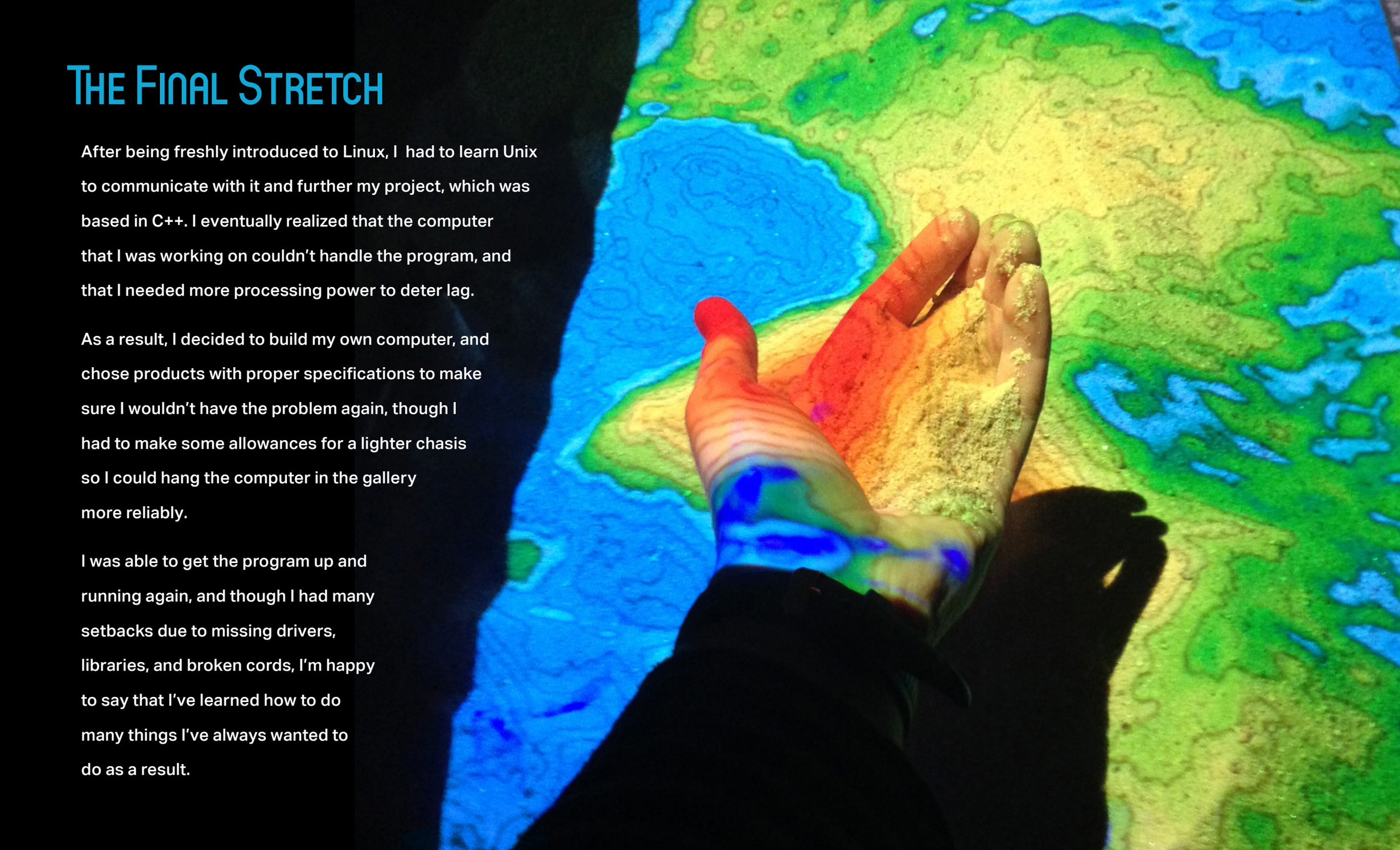


The Final Stretch

After being freshly introduced to Linux, I had to learn Unix to communicate with it and further my project, which was based in C++. I eventually realized that the computer that I was working on couldn't handle the program, and that I needed more processing power to deter lag.

As a result, I decided to build my own computer, and chose products with proper specifications to make sure I wouldn't have the problem again, though I had to make some allowances for a lighter chasis so I could hang the computer in the gallery more reliably.

I was able to get the program up and running again, and though I had many setbacks due to missing drivers, libraries, and broken cords, I'm happy to say that I've learned how to do many things I've always wanted to do as a result.



Professional Materials


INTERACTIVE
MOTION
ILLUSTRATION
503-525-2290
~SARAH TORP
IMPOSSIBLE THINGS
ARE BEAUTIFUL
FOR THEIR
INACCESSIBILITY.
WE REACH, WE GRAB,
AND WE HOPE,
AND SOMETIMES
WE FLY.

Intellectual Sources and References

Ben Shneiderman, Designing for fun: how can we design user interfaces to be more fun?, interactions, v.11 n.5, September + October 2004 [doi>10.1145/1015530.1015552]

Candi, M. 2010. Benefits of aesthetic design as an element of new service

development. Journal of Product Innovation Management, 27, 1047-1064.

Curiosity. Perf. Lama Nachman. Discovery Channel. Discovery Channel Incorporated, n.d. Web. 09 Dec. 2013. <http://dsc.discovery.com/tv-shows/curiosity/topics/lama-nachman-on-technology-frustrations.htm>.

Daniel Vogel , Ravin Balakrishnan, Interactive public ambient displays: transitioning from implicit to explicit, public to personal, interaction with multiple users, Proceedings of the 17th annual ACM symposium on User interface software and technology, October 24-27, 2004, Santa Fe, NM, USA [doi>10.1145/1029632.1029656]

Forlizzi, J. and Battarbee, K. Understanding experience in interactive systems. Proceedings of the 2004 conference on Designing Interactive Systems (DIS 04): processes, practices, methods, and techniques. New York. pp.261ACM.

Hillis, W. D. The Pattern on the Stone. The Simple Ideas That Make

Computers Work; Perseus Publishing: Boulder, CO, 1999.

Jörg Müller , Florian Alt , Daniel Michelis , Albrecht Schmidt, Requirements and design space for interactive public displays, Proceedings of the international conference on Multimedia, October 25-29, 2010, Firenze, Italy [doi>10.1145/1873951.1874203]

Kac, Eduardo. "Satellite Art: An Interview with Nam June Paik." SATELLITE ART: AN INTERVEW WITH NAM JUNE PAIK. O Globo, 10 July 1988. Web. 09 Dec. 2013. <http://ekac.org/paik.interview.html>.

Montfort, Nick, and Noah Wardrip-Fruin. The New Media Reader. Cambridge, Mass. [u.a.: MIT, 2003. Print.

Morris B. Holbrook and Elizabeth C. Hirschman, "The Experiential Aspects of Consumption: Consumer Fantasies, Feelings, and Fun." Journal of Consumer Research, Vol. 9, No. 2 (Sep., 1982), pp. 132-140. Published by: The University of Chicago Press. Article Stable URL: http://www.jstor.org/stable/2489122

Pullman, M. E., & Gross, M. A. (2004). Ability of experienced design elements to elicit emotions and loyalty behaviors. Decision Sciences, 35(3), 551–578.

Scott R. Klemmer , Björn Hartmann , Leila Takayama, "How bodies matter: five themes for interaction design," Proceedings of the 6th conference on Designing Interactive systems, June 26-28, 2006, University Park, PA, USA [doi>10.1145/1142405.1142429]

Watson, Tom. "Technology And Society's Most Intractable Problems: When Innovation Makes A Difference." Forbes. Forbes Magazine, 24 Oct. 2013. Web. 09 Dec. 2013. <http://www.forbes.com/sites/tomwatson/2013/10/24/technology-and-societys-most-intractable-problems-when-innovation-makes-a-difference/>.

Weil, Michelle M. The Psychological Impact of Technology from a Global Perspective: A Study of Technological Sophistication and Technophobia in University Students from Twenty-three Countries." The Psychological Impact of Technology from a Global Perspective: A Study of Technological Sophistication and Technophobia in University Students from Twenty-three Countries. N.p., n.d. Web. 09 Dec. 2013 <http://www.sciencedirect.com/science/article/pii/074756329400026E>.

Pullman, M. E., & Gross, M. A. (2004). Ability of experienced design elements to elicit emotions and loyalty behaviors. Decision Sciences, 35(3), 551–578.

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Places I've taken my Inspiration from.

Amsterdam Awareness *Campaign for it's stunning concept and attention-grabbing qualities*

The Aquatop Display *for it's quirky interface, and its original contribution to the inspiration of this piece*

Design I/O *and their human integration*

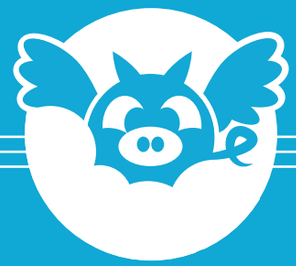
Digital Kitchen *and their Video Pieces*

Knapnok *and their examination of Fun and Play*

Marie Sester *and her ACCESS Piece*

UC Davis *and their Virtual Reality tutorials, without which this project wouldn't have been possible*

Yoke *and their Augmentation Work*



Sarah Torp

Design Thesis 2014