The Intersection of Digital Practice and Everyday Life

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Abstract

What constitutes the intersection of digital practice and everyday life? What research methods can be deployed to analyze a dynamic assemblage of heterogeneous knowledges?

Digital practices such as engaging with social media platforms, acquiring data through biofeedback monitors, or interacting with artificial intelligences are intersecting with everyday life in increasing manner and complexity. This intersection is not a stabilized set of practices with a defined boundary, but is composed of the fluid relationships between perpetually changing sets of behaviours and methods. In order to engage with such a dynamic system of relations, I have deployed a research method similarly comprised of the variable relations between many heterogeneous research methods.

My research is a Deleuzian assemblage created by contingent relationships between a set of interrelated hesitancies. These hesitancies have manifested in my

research through practices that have traditionally been treated as isolated practices such as reading, writing, sleeping, coding, making robots, diagramming, drawing, speaking, and performing, to name a few.

Throughout the written component of this thesis, I have framed my research as finding resonance with various other thinkers and ideas. Deleuze and Guattari's theories of assemblage and nomadic thinking, among others, have resonated with my research and provided a potential set of entry points with my work. I view much of my research through the lens of quantum field theory, where objects and ideas can be modeled as the relationships between superpositions of states existing in a virtual field of potentials. Various thinker's perspectives on the occult and non-representational theory have resonated with my own research into potentially unknowable or unrepresentable knowledges. I have also found Flusser's concepts of embodiment, universes and the technical image as potential frames for my own research.

'Pataphysics, in particular, has offered me the opportunity for utilizing contingent research methods that are not constrained by a need to create in a manner that is devoid of contradictions, follow any form of logic, or are considered valid by any metric. In this way, 'pataphysics allows for research methods that break from traditional research habits to create practices that adhere to their own internal logics that may or may not be accessible from outside perspectives. For example, 'pataphysical methods have led me to make a computer program that creates a network from live Twitter data and my daily tea leaves to predict the Dow Jones Industrial Average.

The intersection of everyday life and digital practice is ever changing and expanding. My thesis examines this intersection by deploying an assemblage of methods. This research finds resonance with multiple thinkers and ideas which I detail through out the written component of this thesis.

TableOfContents

I feel that a normalized concept of a table of contents does not properly reflect the methods used in my thesis. A table of contents implies a ridged, arborescent, linear method of reading. It implies a determinacy rather than a state of permanent hesitancy. It also implies that knowledges are contained and do not bleed over into each other or off the page. A table of contents also implies the notion that knowledges can and should be able to be summarized in "chapters," section titles, etc.

How can a table of contents reflect a notion of provisionality? How can a table of contents imply that a thesis is comprised of the spaces in-between the "chapters" and not the chapters themselves? How can a table of contents imply that a thesis contains more than just the words that are written? How can a table of contents imply that the knowledge contained in the thesis is alive and exists in reference to actual events occurring in the world?

"Figure 1: Table of Contents, Still from program, 2018"

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and is the visual output of my table of contents, which is a computer program. Reading a table of contents might not be an everyday activity in the sense of something that is literally done everyday; however, I feel it is an activity that can be overlooked. For , I have taken the overlooked activity of reading a table of contents and intersected it with the digital practice of using Twitter. In this case, the delineated organizational lines of my table of contents are affected by length of tweets that contain #PhD.

My table of contents is a computer program/artwork called *Table of Contents* that displays a relationship between the objects of this thesis and the length of a random tweet with #PhD in the moment the program is run. What sense of organization can a reader derive from a table of contents that is driven by random tweets when the program is not even readily available for them to run on their own? In this section, I have place screen captures of the diagram drawn by the program at a specific moment that I ran

the program, but that is not what I consider the table of contents. My table of contents is not a singular fixed solution determine by the contingencies that happened to coalesce at a specific time and moment. My table of contents is the computer program.

I have placed a link to the code in which can be downloaded and run. The program is a virtual potential that is comprised of things that might happen, rather than an attempt at producing a fixed record of what has happened. However, while I feel that an uncompiled computer program is a better representation of how I feel my thesis is organized, I realize that the concept may be logistically insufficient. Subsequently, the screenshots and the code itself reveal the page numbers of the locations of the various objects of this thesis when the program was run. I have attempted to provide a usable index, but buried the index within a more reflective theoretical frame. I have also provided a snapshot of the computer code out of its context in the next section.
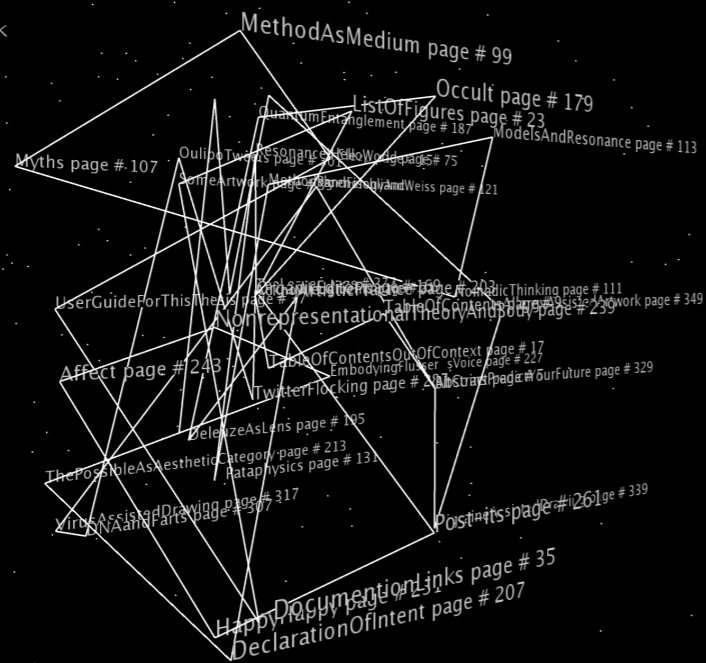
Figure 1:   *Table of Contents*, Still from program, 2018
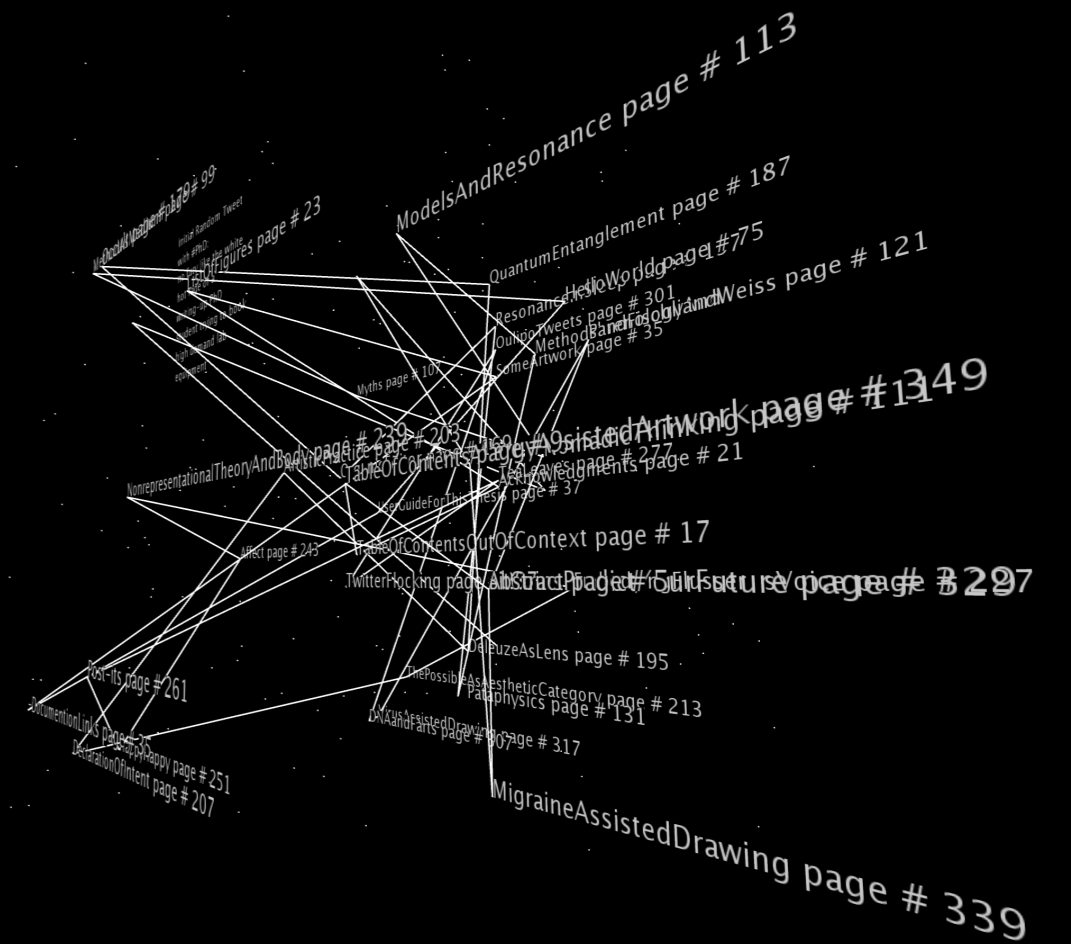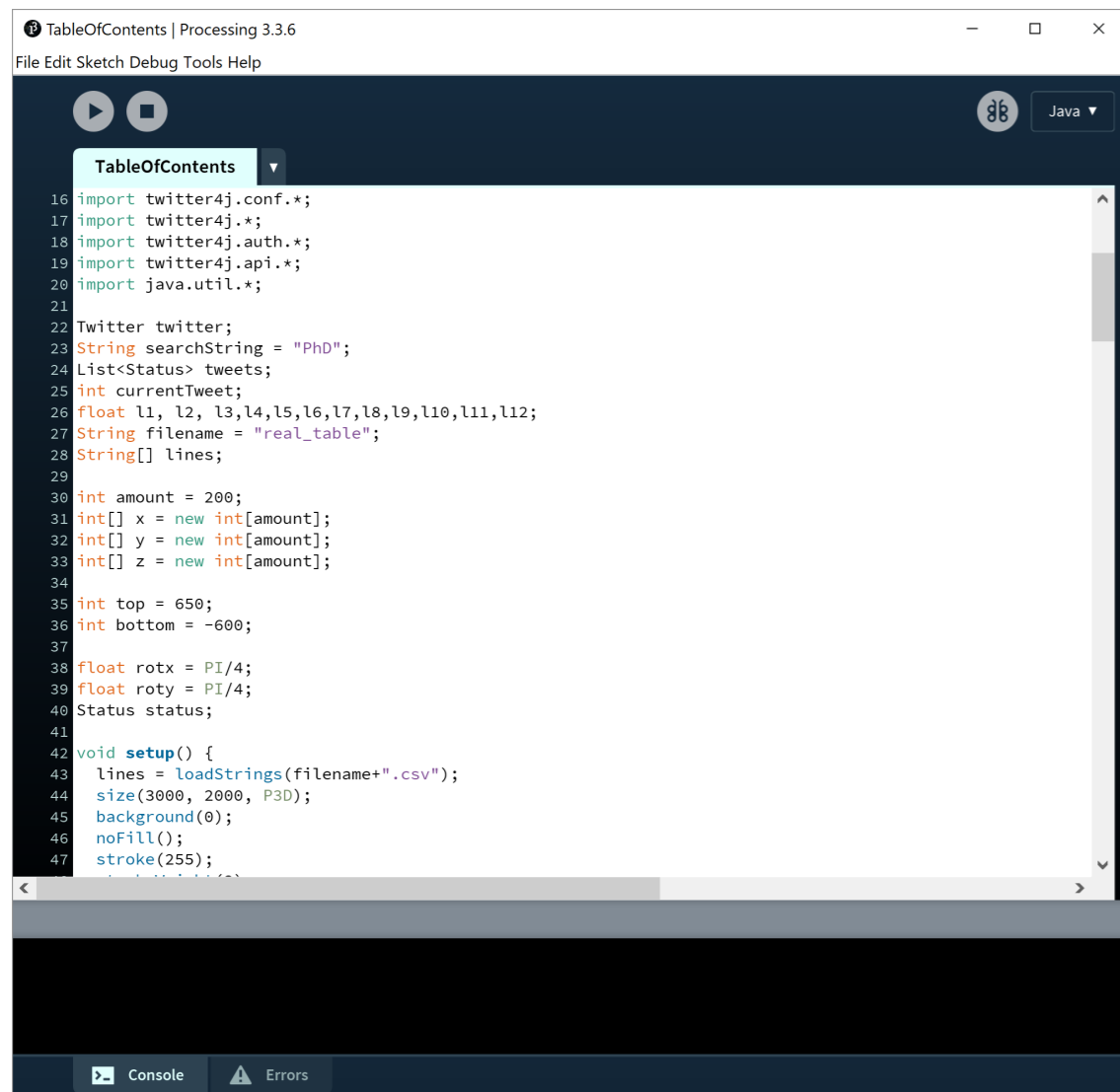
Figure 2:   *Table of Contents*, Still from program, 2018

Figure 3: Section of code from *Table of Contents,* Program, 2018

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TableOfContentsOut

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Acknowledgments

This thesis would not have been possible without the support of many generous people. I would like to thank my supervisor, Dr. Tim O'Riley. His dedication and support at every critical junction allowed me to complete this thesis. His sage advice on the direction of all aspects of my research has proven priceless. I am extremely grateful to Professor Jo Stockham who has provided me with impeccable subject matter expertise.

I would also like to thank my family. I want to highlight my thanks for my mother, sister and son for their support during the process of this research. Most importantly, I would like to thank the person during this research

Who was on my mind

Not every second, but the whole time

Heidi

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ListOfFigures

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SomeArtwork-DocumentionLinks

Table of Contents	bit.ly/Aishman_TOC
Resonance in Sleep	bit.ly/Aishman_Sleep
Organic Editor	bit.ly/Aishman_Organic
Embodying Flusser's Voice	bit.ly/Aishman_Flusser
Happy Happy	bit.ly/Aishman_Happy
Tea Leaves	bit.ly/Aishman_Tea
Post-Its	bit.ly/Aishman_Post
Twitter Flocking	bit.ly/Aishman_Flocking
Oulipo Tweets	bit.ly/Aishman_Oulipo
Virus Assisted Drawing	bit.ly/Aishman_Virus
Migraine Assisted Drawing	bit.ly/Aishman_Migraine
Allergy Assisted Artwork	bit.ly/Aishman_Allergy
Phrenology and BitCoins Predict Your Future	bit.ly/Aishman_Phren
Ripples	http://bit.ly/Aishman_ripples

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UserGuideForThisThesis

This has all been a mistake. An error. A failure in replicating normalized notions of a Ph.D. thesis.[1] Or rather, my thesis is many small mistakes that have been compiled into an anthology of errors. By mistake, I mean that I intended to do one thing, but because of an unintended element of my method, I arrived at a different, unexpected conclusion.[2] These errors can be related through the research methods that have led to the mistakes. One of my primary methods of research is to make mistakes. It seems to me that the concept of a mistake can carry a connotation of something that is to be avoided. Sophocles wrote, "All men make mistakes, but a good man yields when he knows his course is wrong, and repairs the evil." (Sophocles 1953,

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1   By normalized notions of a Ph.D. thesis, I am referring to the frame of research presented in books such as *How to research* (2010) by Blaxter, Hughes, & Tight or *Doing Your Research Project* (2014) by Bell & Waters. Both books are framed by the belief that the goal of a Ph.D. thesis is to conduct accurate research that can be validated by comparison to other research conclusions. (Bell & Waters 2014, 14) (Blaxter, Hughes, & Tight 2010, 2)

2   I view these mistakes like Fleming's discovery of discovery of penicillin in 1928. While researching influenza, his unsanitary cleaning of petri dishes revealed a mold containing penicillin that prevented the growth of staphylococci. (Eickhoff, 2008) Antibiotics were discovered by a mistake in a cleaning method. This story is also why I tell my wife I don't do the dishes right away. Why limit my opportunities of discovery by following a method where I know the outcome?

Figure 5:   (opposite) *Robot Mistakes*, Detail of a pile of non-functioning robots filled with mistake codes, 2018
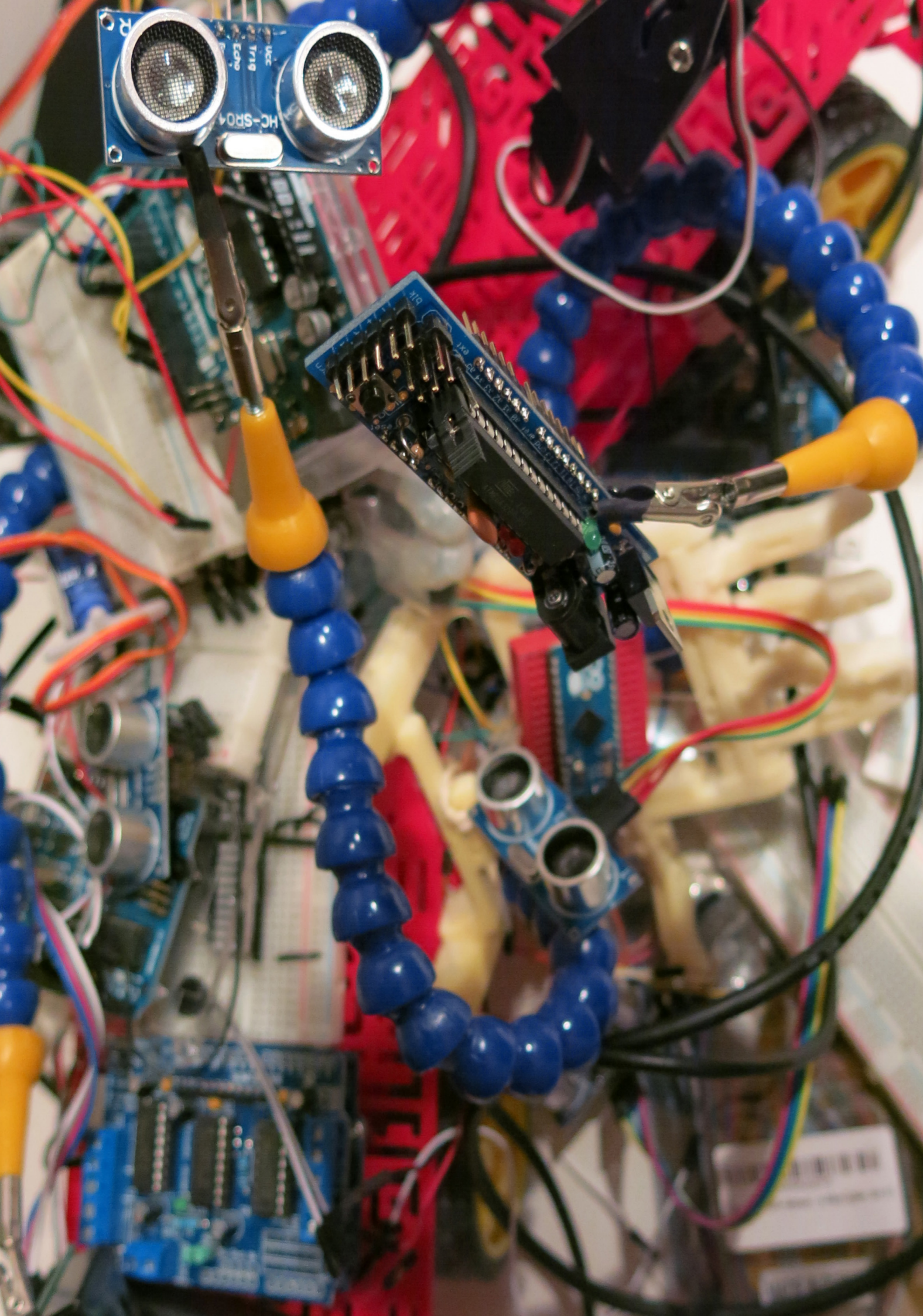
Map of knowledge growth through educational system

Unknown

Unknown

masters

Uni

High School

Grade School

Unknown

Unknown

Unknown

PhD

masters
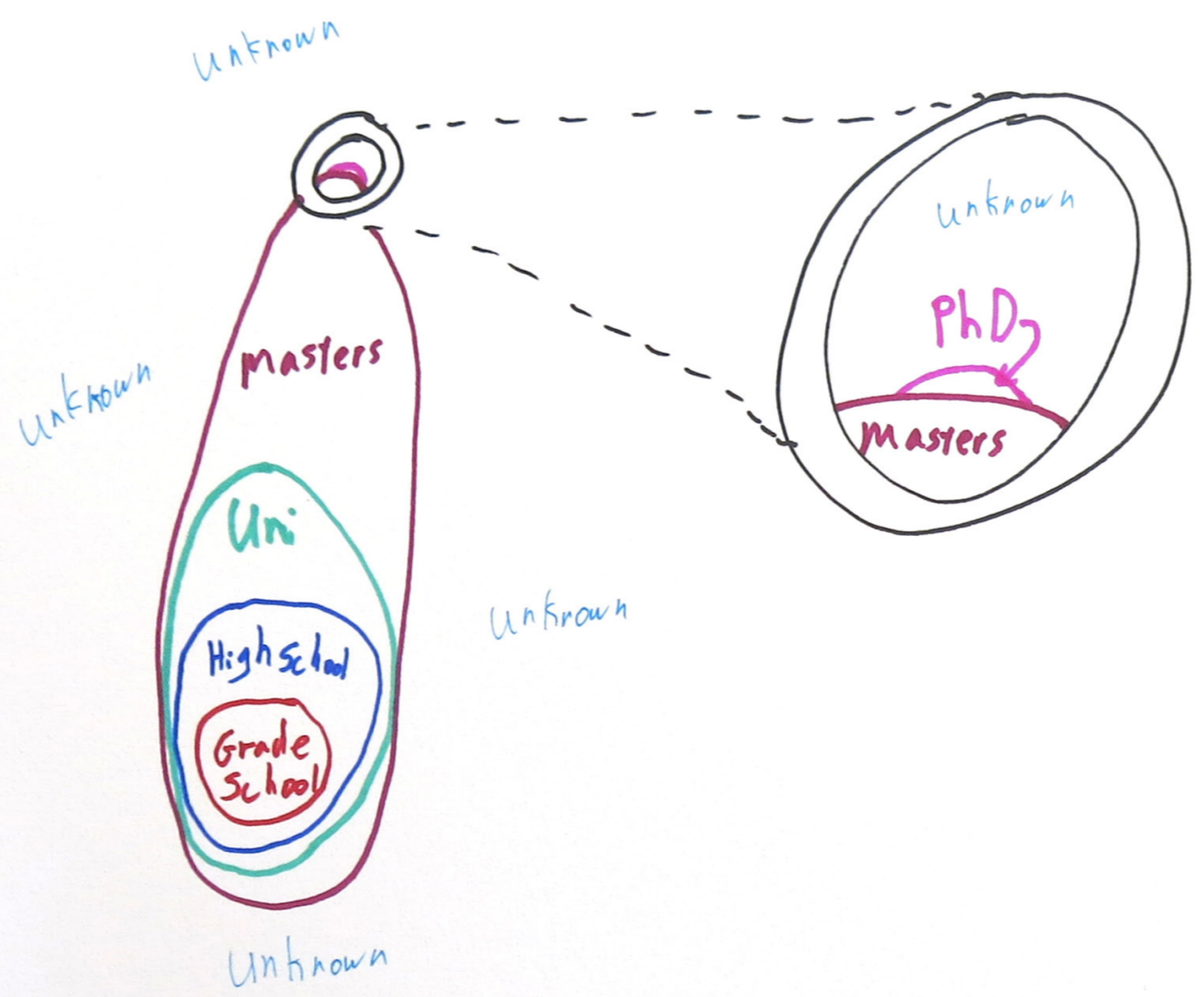
Options of methods for acquiring new knowledge!

1. Unknown

Unknown

push from inside

Use: logic, sense, established concepts

2. unknown

unknown

Jump into unknown and then build a bridge

Use: illogic, nonsense, mistakes unknown methods, intuition, hunches, non-representations, affect, magic, marginalized knowledges

Figure 6:   *Diagrams of knowledge acquisition*, Sharpie and paper, 2018

31) Apparently, a mistake is not only something that is to be avoided, but Sophocles implies that mistakes are by nature evil.

Mistakes can provide an entrance into what was a previously unknown potential outcome. In *On Not Knowing: How Artists Think* (2013), Elizabeth Fisher and Rebecca Fortnum discuss how engagement with not knowing is an important aspect of fine arts research. In their anthology, Emma Cocker wrote,

> To develop tactics for getting lost is to practice a form of habituation or conditioning, where the experience of not knowing is entered into voluntarily as a way of cultivating resilience towards its potentially negative effects. (Cocker in Fisher & Fortnum 2013, 129)

For this thesis, I have used a method of not knowing the potential outcomes of methods and making mistakes in implementing methods as generative mechanisms that may have the potential to develop new knowledges.

"Figure 6: Diagrams of knowledge acquisition, Sharpie and paper, 2018" on page 38 is a set of diagrams that depicts one of the perspectives I have about the relationship between education and knowledge. I imagine

that in a limitless, virtual field of potential, I began acquiring academic knowledge in grade school where I learned a little bit of knowledge. In high school, I learned a little bit more. At university, I learned a bit more and the knowledge was directed at a speciality knowledge. In my masters, I deepened my knowledge of my specialty. A significant amount of my Ph.D. research has gone into finding the edge of knowledges in my specialty. My Ph.D. is now dedicated to researching new knowledges. It seems to me that there are many methods for acquiring new knowledge, but there are two methods that I am primarily interested in using. The first requires pushing knowledge from the inside (my 'push' method) by using methods that maybe considered valid and well established such as logic, sense or a number of normalized research methods. An example of using this model of research is to find an otherwise unwritten about piece of knowledge in an archive and to write about it using contemporary theoretical methods. The second method requires jumping (my 'jump' method) into the unknown and then attempting to build a bridge between the knowledges. This method of research, by definition, requires using

methods that are not considered knowledge. It requires using illogic, non-sense, contradictions, marginalized knowledges, non-representational knowledges, affects, mistakes, magic, hunches, intuitions, and other methods that cannot be listed. Jump methods are used in many forms of research including quantum mechanical research where, "superpositions in quantum mechanics may involve contradictions." (Arenhart & Krause 2014, 1) I use both the push and jump methods of acquiring knowledge throughout this research Ph.D.

A method of making mistakes is one of the jump methods of research. One system that uses mistakes as a generative mechanism for developing new knowledges is evolutionary biology. Biologist Leslie Pray states, "While most DNA replicates with fairly high fidelity, mistakes do happen … becoming permanent mutations." (Pray 2008, 214) In biological systems, it appears that cells attempt to achieve perfect reproduction of DNA by reducing or repairing errors. However, errors are the mechanism that allow the development of previously unknown heritable characteristics through mutations. Only after there has

been a mistake in DNA replication can other process of evolution such as genetic drift or natural selection begin. If DNA perfectly replicated every time without any mistakes, there would be no biological evolution. Organisms would remain exactly the same forever and biological systems would not develop the opportunity to exploit otherwise unknown potentialities.

From this perspective, it is not that evolution is a process that includes some mistakes in replication, evolution *is* a process of mistakes. Similarly, for my research to develop new knowledge, I am employing a research method that does not just contain mistakes, it *is* a process of mistakes. The goal of my thesis is the production of new knowledge and to achieve this, I have chosen to compile a set of methods that are mistakes.

Evolutionary systems are not linear and do not have any goals. Feistel and Ebeling write, "It cannot be expected that evolution has an overall goal of maximizing some fitness value." (Feistel & Ebeling 2011, 360) There is no concept of progress in evolutionary systems. Stephen Jay

Gould wrote, "Progress is a noxious, culturally embedded, untestable, nonoperational, intractable idea that must be replaced." (Gould 1988, 319) Similarly, there is no concept of a beginning or an end in evolution, only variation. Biological evolution occurs when a mistake in genetic replication allows for a variation. Evolution does not occur because the previous DNA sequence was defective, and the new DNA sequence is not "better" according to any criteria. It is just different knowledge. Similar to evolution, my methods are not linear and do not participate in any concept of progress. My thesis does not have a beginning, or an end and its only goal is the production of variation in the form of new knowledge.

I am aware that my frame for evolutionary theory which emphasizes the role of contingency within creative systems is not the only frame for creative systems. Many contemporary evolutionary biologists re-enforce the notion that biological determinism and progress form the center of evolutionary theory rather than contingency. For example, anthropologist Richard Wrangham claims that lethal raiding by humans during warfare and violence displayed

by chimpanzees can both be attributed to our evolution from a common ancestor. (Tzabar 2015, 1) Wrangham implies that warfare is a genetically predetermined behaviour and that warfare has given an evolutionary advantage that has been selected for and then encoded in genetics. I do not believe his conclusions because he does not prove that chimpanzees and humans share a "warfare" gene or that violence gives an evolutionary advantage. He only presents evidence that both species display violence with no discussion of potential contingent environmental factors. Sociologist Rose McDermott goes further to claim that humans do have a "warrior gene" that makes men more violent. (Brown & Donvan 2010, 1) McDermott implies that human behaviour is entirely genetically predetermined rather than influenced by contingent environmental factors. While I may be mistaken in reliance on a contingency centered view of evolutionary systems, I believe this perspective is the most useful for the development of new knowledge in this thesis.

This is not the first time my research has been one big mistake. My first degree from Princeton is in

Astrophysics where I researched large-scale gravitational perturbation theory. My research culminated in a paper titled *Comparison of the Gravitational Field at the Local Group to Its Peculiar Velocity* (1997). I worked 4 years on this paper and the year after I published it, dark energy was discovered by Adam Riess rendering all my research fundamentally erroneous.[3] (Riess et al. 1998, 1009) However, my previous research was conducted in a field that requires production of explicit and commensurable knowledge to be deemed valid. I don't believe that all knowledge is explicit or commensurable or that research must exist within a validity-based framework. For the research that I am attempting in this thesis, I have decided that rather than trying to avoid mistakes, I would embrace the mistake as a research method.

My training in scientific research has had a profound impact on this thesis. Both science and art based research practices have their base in a desire to pursue new knowledge. While they have many similarities and differ in many other respects, I have found that there is a

large difference between how the two handle errors and mistakes. In the sciences, if a mistake led to an absurd[4] result, the result was not considered new knowledge unto itself and was generally abandoned. In one instance of my own research, I made a programming error that resulted in model of the universe where the universe was expanding and contracting at a rate faster than Plank time.[5] This rapid expansion and contraction created waves that could transmit gravity.[6] At the time, it was believed that waves could not transmit gravity. My astrophysics supervisor told me that while my mistake had produced an interesting result, it was not a valuable result or new knowledge because it was absurd. I did not publish the result because there is no location in science to publish interesting, but absurd results. I have found arts research to be freeing because it allows for mistakes to be a method of interacting

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3   To be fair to my previous research, Riess' research proved a significant amount of observational astrophysics incorrect and he won the Nobel Prize in Physics for it.

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4   When I say "absurd," I am referring to the methods of critical absurdity deployed by Alfred Jarry in 'pataphysics. After giving a lecture on art and artists, one of the audience members told Jarry that he hadn't understood a word of it. Jarry answered: "That's exactly what I wanted. Talking about things that are understandable only weighs down the mind and falsifies the memory, but the absurd exercises the mind and makes the memory work." (Jarry, 1961, ix) I interpret Jarry's use of the word "absurd" here to be an adjective that describes something that is considered outside of a normalized mode of thinking and that subsequently challenges that specific mode of thinking. I will expand more on this in the section

5   Plank time is 5.39×10^{-44} s. Measuring a time interval smaller than Plank time requires measuring faster than the speed of light.

6 My programming error created a model where the rest state of space-time carried momentum.

with the previously unknown and for the absurd to be a result of research. When writing about engaging with the unknown in arts research, Emma Cocker said,

> Undoubtedly, the experience of not knowing … seemingly provide(s) the conditions of freedom *from* with freedom *to*, temporary liberation from the pressures and responsibilities of knowledge. (Cocker in Fisher & Fortnum 2013, 130)

I have chosen arts research for this thesis because of the freedom it provides to research new knowledge without discounting the value of mistakes and the absurd.

One of the aspects of scientific research that I have appreciated is that all scientific research comes with the presumption of provisionality. When scientists make a statement, such as "the speed of light is 299,792,458 m/s", they always mean to say, "Based on our current findings and only in a particular environment that I can describe in detail if you need more information, we have consistently observed the speed of light to be 299,792,458 m/s. These observations have been made by multiple scientists using multiple methods and tools, a sample of which I can provide if required. However, this finding is provisional and can be over turned with contradictory observational evidence at anytime." There is no need to state provisionality in the sciences, because the entire field is provisional. When a scientist makes a statement, it is never presumed to be fact, it is always presumed to be provisional based on current data. I have come to realize I speak this way and throughout this thesis, I may make statements, but I am always presuming provisionality. If I write, "evolutionary theory emphasizes the role of contingency," I presume the reader will know that I am making a provisional statement that only applies to the current environment I am addressing. I am not attempting to make a statement of immutable, objective fact because I do not believe that immutable, objective facts exist.

I have also realized that I have large holes in my knowledge about what is considered common knowledge in arts research. Because my training is in astrophysics, not art history or art practice, when I am asked to explain my research methods, I am frequently told that my methods are common place in arts research. For example, in this section, I have said that I am using errors and mistakes as

Figure 7:   (next Page) Mind map of Intersection of Everyday Life and Digital Practice, White Erase Board, 2018
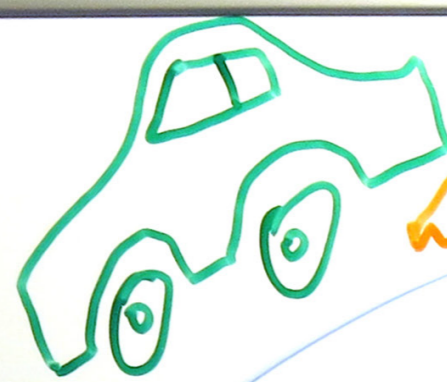
Non-representational theory

Research

'Pataphysics

Alchemy

Everyday life

Δ Affect $\leq$ min. Attention
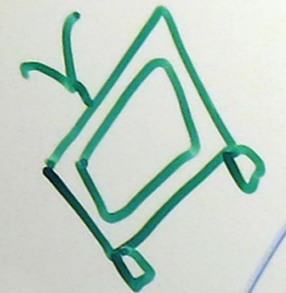
Quantum Entanglement

Digital Practice

└ includes Activities for max. Attention

Fitbits, sleep monitors, social media, stock market, AI interactions, GPS, Text editor, DNA ...

Art Practice

Occult practices

Affect theory

includes

Toilet, tooth brush, Drive to work, Snacking, train TV., sleep, exercise...

Email, interact with AI, Robots, Video games, Social media ...

Digital Embodiment

a research method to which people in my field have said, "Well yes, everyone does that. It is a common working method in arts research." I am not claiming to have re-invented the wheel by using common artistic practices, I am attempting to explain my research methods because I believe there is value in sharing my perspective on the research method I am using, even if they are considered common place.

For this thesis, I have chosen to focus my research method of mistakes on the intersection of digital practice and everyday life. "Figure 7: (next Page) Mind map of Intersection of Everyday Life and Digital Practice, White Erase Board, 2018" on page 49 is a mind map of how I have explored this topic in my research. I will explain more about exactly what I mean by digital practice in further areas of this thesis, but a broad summary of it would be the practice of using digital materials such as software objects. I am using Ben Highmore's definition of everyday life as activities that "tend towards the unnoticed." (Highmore 2005, p. 1)

Drawing on this, I am defining everyday life as repeated activities that never reach a large enough change of affect to receive/require attention.[7] These activities usually include dressing, brushing teeth, transport to work, etc. and by definition, never really breach the level of paying attention. By "paying attention," I mean when someone enters a state of exception so that the person logs the activity in long term memory. Everyday life is comprised of moments that individually do not get logged in longterm memory. Sometimes, these activities do not even get logged in short term memory. This can result in an situation where people say things like, "I just drove here and don't remember the drive at all." The intersection of everyday life and digital practice is when the use of digital practice becomes part of person's habitual routine and ceases to hold a person's full attention.

I am fascinated by this intersection because it appears to be full of contradictions. Social media platforms such as Twitter or Facebook are spaces that appear to exist specifically to draw attention to particular activities, but

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7   I will explain my use of the term "affect" in detail further on. As an equation, I view an everyday activity as one where the rate of change of affect remains below the limit to draw attention. ΔAffect ≤ min. Attention

frequently, they are spaces to habitually post habitual activities. What does it mean when everyday activities such as having lunch or getting coffee that might otherwise go unnoticed intersect with digital practice and suddenly these everyday activities of no particular significance become moments to be highlighted for an audience on Instagram? What does it mean that many people regularly tweet about their commute to work? How does a trip to the bathroom to re-apply make-up become a selfie moment to be shared with friends and strangers alike? What does it mean that people will turn on games such as Candy Crush as part of their daily routine without any real conscious thought? What does it mean when people log into Facebook without thinking about it because it is just part of their everyday life? When will interacting with an Artificial Intelligence such as Google AI become normalized and part of everyday life? Already, my 8 year old son will ask Alexa a question without being fascinated by the complex interaction that is occurring as I still am.

This thesis explores the space of intersection between everyday life and digital practice through many

heterogeneous practices, such as writing computer code, making robots, making mind maps, going for walks, reading tea leaves, expositional writing, poetry, photographs, reading and painting among others. I have researched conceptual frames such as object oriented programming, quantum mechanics, affect theory, assemblage theory, the occult, everyday life theory, non-representational theory, embodiment and 'pataphysics. I have leaned heavily on other thinkers such as Bohr, Deleuze, DeCerteau, Guattari, and Flusser. I have used specific artworks such as Lawrence Weiner's *Declaration of Intent* (1968) and Man Ray's *Object to Be Destroyed* (1923) as examples of how I view certain art practices.

I have encountered some immediate issues with my research methods that affect the readability of my thesis. I have frequently encountered forms of knowledge that are not well adapted to a thesis environment that is designed for explicit knowledges. Frequently, my research struggles have not centered on the production of new knowledges, but in finding a way to properly describe my heterogeneous research in a manner that fits a Ph.D. thesis.

How do I write something that cannot be verbalized? How do I diagram something without dimensions? How do I convey implicit knowledges in an explicit thesis? How can I sensibly present research that exists in a universe of nonsense? How do I present knowledge that can not be sensed? How can I map the unknowable? How do I write about something that cannot be abstracted, reduced or summarized? How can I make statements about hesitancies? How can I describe the knowledge contained in a black hole since, by definition, it is a hole and hence nothing is there? How do I describe a set of knowledges about nothing? How can I describe a position once I have precisely determined a momentum ($\Delta x \Delta p \geq \hbar/2$)? How can I properly quote an incantation when occult power is

contained in the breath of the speaker, not the words? How can I write in codes that might begin as unintelligible to the reader, but B3C0M35 1N73LL1GIBL3 45 7H3 R34DER B3COM35 M0R3 F4M1L14R W1TH MY STYL3?[8] Can computer code be presented as artwork (not part of an artwork, but the work itself)? 10PRINT CHR$(72) CHR$(79) CHR$(87) CHR$(63);:GOTO 10?[9] Can a thesis be funny?

I have decided that the strategy to only include explicit knowledges in my thesis is counterproductive. Subsequently, my thesis includes elements that can be said and things that cannot be said. My thesis includes the words on the page, knowledge in the margins, knowledges that can only be transferred visually or corporeally, knowledge in images and diagrams, temporal knowledges

Figure 8:   *10PRINT CHR$(72) CHR$(79) CHR$(87) CHR$(63);:GOTO 10*; Commodore 64 BASIC, 2018

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8   Sorry that is in all caps. I'M NOT SHOUTING AT YOU, it just worked better for the code.

9   This one line BASIC program for the Commodore 64 may not be as sophisticated as 10 PRINT CHR$ (205.5 + RND (1)); : GOTO 10, (Montfort et al., 2013, p. 3) but I am presenting it with question of whether or not the code can be considered artwork or if the value of the code is always relegated to what it does. "Figure 8: 10PRINT CHR$(72) CHR$(79) CHR$(87) CHR$(63);:GOTO 10; Commodore 64 BASIC, 2018" on page 56 shows the output of the code. It can also be complied on a Commodore 64 or an emulator such as the one here: https://virtualconsoles.com/online-emulators/c64/.
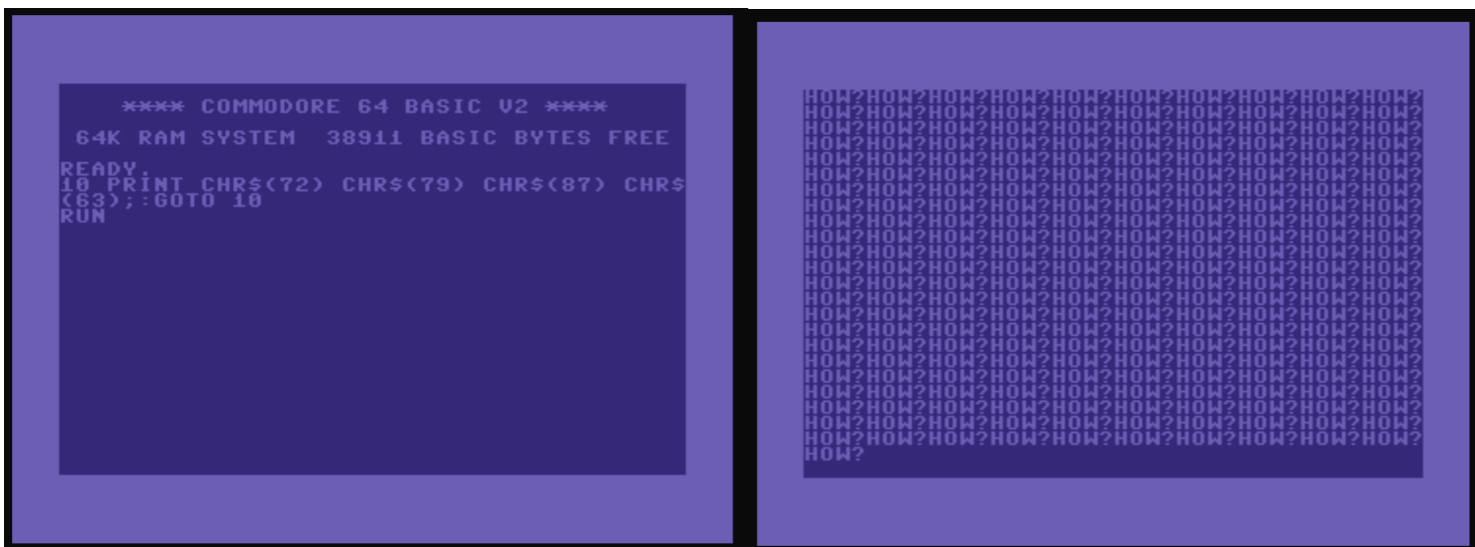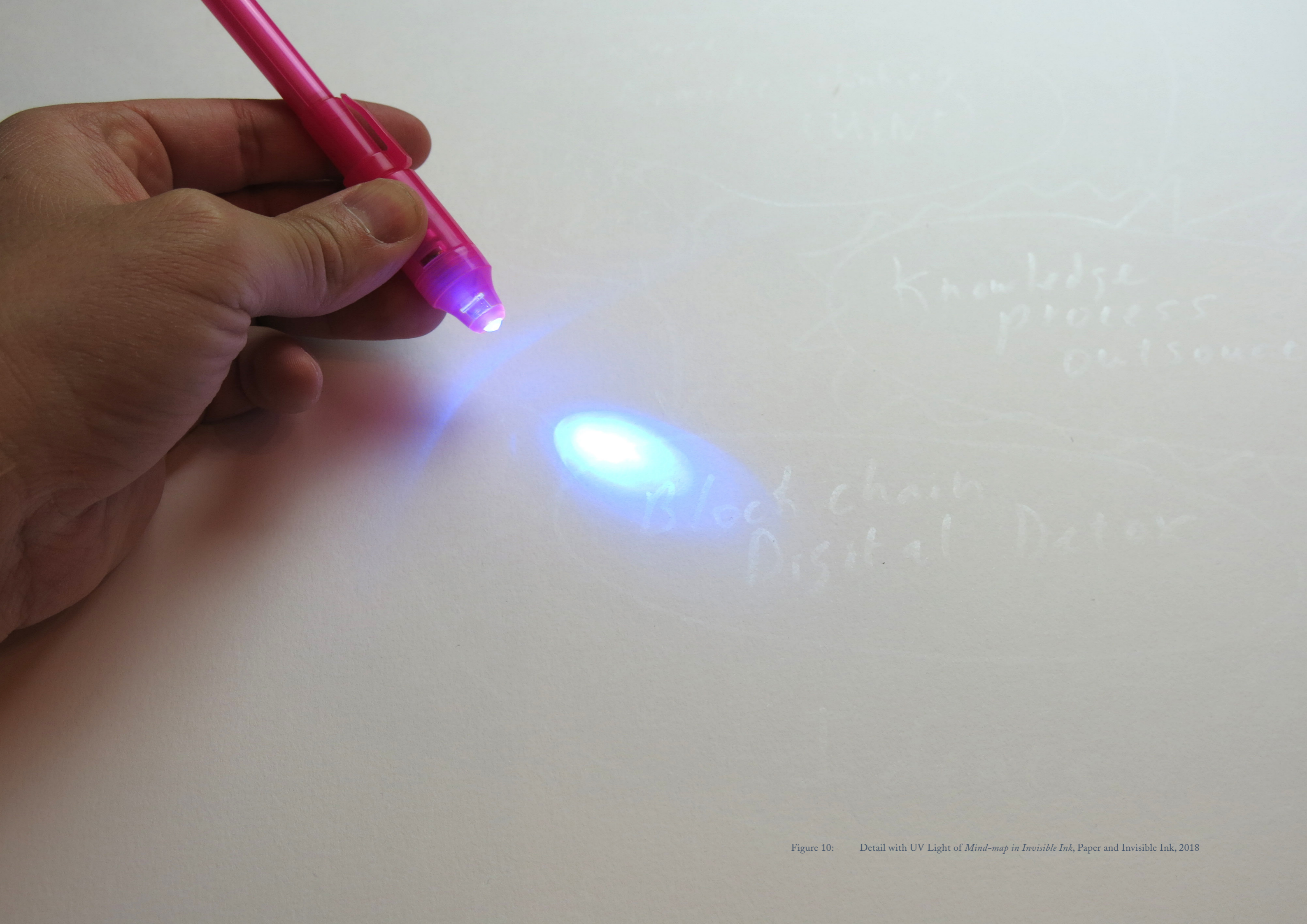
Figure 10: Detail with UV Light of *Mind-map in Invisible Ink*, Paper and Invisible Ink, 2018

that ceased to exist when I wrote them or will only appear after you are done reading, knowledges that a reader may know exists but is denied access to (as if they were written in invisible ink), knowledge contained in the connections between things rather than in the notion of a thing itself, and many more knowledges that cannot be listed. Logistically, these knowledges may manifest in my thesis as words, diagrams, jokes, instructions, or visual images. In some cases, I will attempt to linguistically locate these knowledges and in other cases the knowledges are simply presented as they are. Not all pictures are worth a thousand words. Some pictures cannot have anything written about them and that's why we show the picture, not the thousand words. Just because something has nothing written about it, that does not mean that it has zero knowledge and therefore zero value.[10]

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10   I view nothing and zero as different concepts. During this thesis, I will treat zero as a number when counting commensurable items whereas I will treat nothing is an empty set assigned in the absence of having anything to compare. Zero has a beginning and/or end that is measurable while nothing does not have any beginning or end. I will call the absence of having anything measurable "nothing" while zero is a relative term used for measurable items. Nothing is space of infinite virtual potentials that cannot be compared to anything that is currently exists within a system. By definition, everything new in a system comes from a field of virtual potentials that includes elements that are not currently countable in the system. Everything new comes from a virtual field that I call "nothing."

Subsequently, this introduction functions more as if it were a user's guide for my thesis. Similar to all user's manuals, my introduction is not a hard set of rules for how to approach my thesis, but it more like a set of recommendations from a manufacturer that do not have to be followed and frankly might be erroneous and/or not useful. All good user manuals start with a diagram, so "Figure 9: Still of Making Mind-map in Invisible Ink, Paper and Invisible Ink, 2018" on page 59 and "Figure 10: Detail with UV Light of Mind-map in Invisible Ink, Paper and Invisible Ink, 2018" on page 61 are images of me making a mind map of some of the knowledges contained in my thesis and how they interact diagrammed in invisible ink.

In some cases, I will not provide explicit explanation of the diagrams or images in this thesis because the image may hold knowledges that an explicit explanation will inherently fail at conveying. Sometimes, I use images as punctuation to purposely disrupt the flow of the text. In this case, I will explain why I have included an image of a mind-map of my thesis in invisible ink. 1) I think it is funny (in a cheeky

way) to put an image of what looks like a piece of paper with nothing on it in a Ph.D. thesis.[11] 2) I am attempting to convey the notion that I think that a permanent explicit map of how the elements of my thesis work together is counter-productive and ridiculous because the connections between various parts of my thesis are provisional at best and perhaps non-existent. 3) I am attempting to embody the notion that my thesis may contain knowledges that cannot be readily sensed and to which the reader may not always have access. 4) The knowledge on the piece of paper about how parts of my thesis are connected is also invisible to me as I am writing it. The knowledge cannot be sensed. It is non-sense knowledge that can only be illuminated in small parts after the act of making, just like the process of writing this thesis has been for me. Showing you an image of me writing a mind map in invisible ink is a joke, but one that contains a great deal of serious knowledge about how I

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11   But now that I have explained the joke, I think it ruins the joke. It seems to me that jokes function as a specific form of implicit knowledge where the knowledge disappears if it is made explicit. Like the cats Cheshire or Schrodinger, the knowledge contained in jokes is a function of their lack of explicitness. This means that J (knowledge contained in a joke) can be depicted as a function of E (a measure of how explicit knowledge is) where M is the maximum amount of knowledge that can be conveyed: $J = -E + M$. This means that when $E=M$, J is zero because what is conveyed is not the knowledge contained in the joke, but knowledge about the joke, which is not the same thing. However, I could be wrong in my formula, because if you explain a joke long enough, it might become funny again. Like this footnote. Which is also a joke.

view my research.

While conducting my research I have been asked, "Where is the art?" My thesis does not contain a set of reproductions of objects that I can definitively point to and say, "There is the artwork." The artwork in my thesis is a dynamic and heterogeneous set of objects, methods, performances, embodiments, and writings. The artwork of my thesis is also constituted in the space in-between readily identifiable components. The artwork is frequently a flow that exists and then stops. Sometimes, my artwork is a virtual field of potential that is never realized. Whenever possible, I will attempt to point to specific elements and say, "There is the art." For example, where I stated that my table of contents is the artwork *Table of Contents* which is computer code. However, not all of the artwork is so readily identified.

I also do not consider the written text of my thesis and the artwork of my thesis to be two separate things. The writing and the artwork exist in a superimposed quantum state. To me, the writing and artwork are the same thing that has

manifested in different ways. If I attempt to divide them from each other, they become something else altogether. My thesis is constituted by one thing: artwork/writing.

My writing in this thesis also switches between expository writings designed to convey explicit knowledge and non-expository writing that is designed to convey tacit knowledges. I will do my best to point out when I switch from one mode of writing to the next, but frequently I do not.

My thesis in not a series of declarative statements that culminate in overarching thesis statement. It is a series of tenuously linked hesitancies. The process of researching this thesis has been less like writing about how I uncovered an unknown treasure of knowledge in an archive and more like stumbling into walls in the dark and then trying to draw a map. While still in the dark. And it turns out the walls move.

I'm also a huge liar. A charlatan. A faker. A fraud. A great deal of this thesis is fake. I'm not a malicious liar out to

dupe people for my own personal gain. In fact, I will do my best to point out when something in this thesis is faked. All of sections "DNAandFarts" on page 367 and "VirusAssistedDrawing" on page 522 are fake artworks. I did not encode my thesis in DNA and feed it to a cockroach nor did I re-write computer virus code to make artwork. Some of my sections such as "ResonanceInSleep" on page 521 contain some fake elements and some non-fake elements. I have presented these fictions as possibilities that exist within my research, even if they have not been materially realized.

I frame these fake artworks and others in my thesis like Joan Fontcuberta and Pere Formiguera's exhibition *Fauna* at the Museum of Modern Art (1988).[12] Fontcuberta and Formiguera's exhibition consisted of a presentation of a lost archive of a zoologist. The entire exhibition was fake, but it was presented as entirely factual. Reactions written in MOMA's visitor's log ranged, "from people who understand that it is a farce and appreciate the satire and the humor of it, to people who understand it's a farce and are angry at you for trying to fool them, to people who believe it

12   The exhibition catalog is available here. http://moma.org/

and are angry, to people who believe it and are delighted."
(Coleman 1991, 1) My goal in my faked artwork is not
malicious, but serious farce and humour.

Also, I have done my best to make my computer code
function as I have presented it, but I am not a professional
computer programmer. I learned computer programming
20 years ago as part of my astrophysics degree. (This is
the equivalent of saying that I learned to code in the
stone age with a wood axe and seal skins.) I feel certain
that my code is filled with mistakes, bad form and may
not actually function as I believe it does. For example,
in "TeaLeaves" on page 522, I have attempted to write
a networking algorithm to use tea leaves to make stock
market predictions. I believe it functions as I have stated,
but the manner in which networks function requires several
PhD's worth of research to explore thoroughly. I apologize
if my code does not work exactly as it is intended. I present
all of my code in this thesis with the earnestness of an
enthusiastic amateur who is not trying to deceive you in my
coding capabilities, but who enjoys biting off more than he
can chew.

As a note on my internal terminology, I frequently use the
concept of "framing" in this thesis. By "framing," I mean
that I am attempting to provide a context and perspective
to something. So, I might write something like: "I believe I
can frame the concept of a 'joke' as frequently representing
an earnest attempt to convey serious knowledge that does
not translate well through explicit knowledge." I this
context, I am using the concept of a "frame" around the
concept of a joke to explain how I see jokes and to provide
context for how I will be using jokes in my thesis.

I will also write about constructing or using a "lens"
to view something. To me, a lens presents a systematic
perspective that guides me to the issues that I believe are
important to examine while simultaneously excluding the
issues that I do not feel are relevant for this thesis. So, I
might write something like: "I view this work through a
quantum mechanical lens because I believe that the work is
comprised of multiple-states that are superimposed." When
using lenses as in this example, I do not mean to imply
that there are not other lenses that can be used to view
something, only that I am interested in highlighting how I

am using one lens in particular

.

I also use the term "universe" frequently in my thesis. I am using the term in a way similar to Flusser in *Into the Universe of Technical Images* (2011). When Flusser writes about, "the universe of technical images," he is referring to a set of elements relative to a discussion. (Flusser 2011, 5) This set of elements is infinite and unbounded, but discrete from other universes. So, there can be a universe of traditional images that contains all elements regarding traditional images such as painting or drawing and a different universe of technical images such as photography. My thesis will deal with many universes.

As a house keeping note, I have chosen the font "Adobe Caslon" at 16 points for readability on both the screen and in print for most of my text. In places where I use a different font, it is to highlight the font choice. Also, all of the images in this thesis were created by me unless otherwise noted.

Footnotes.[13]

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13   A footnote on footnotes. Throughout this thesis, I will use footnotes as spaces where I can intrude on the text with asides and variations in voice. I also feel footnotes can mimic the method of reading required in an era of perpetual distraction due to information/data flooding that continually threatens to overflow into a reader's attention. I assume you are reading this on screen right now with infinite distractions literally framing this writing. When speaking about the notes in *Infinite Jest* (2006), David Foster Wallace said he likes to "allow/make the reader go literally physically 'back and forth' in a way that perhaps cutely mimics some of the story's thematic concerns." (Wallace in Max, 2016, p. 7) In this way, I am using footnotes for practical and aesthetic purposes that mimic, embody and expand upon my thought process.

My thesis is best understood rhizomatically as I read Deleuze and Guattari's *A Thousand Plateaus* (2007). Roger Scruton called *A Thousand Plateaus* a "totally unreadable tome." (Scruton in Hume 2015, 1) A condemnation of unreadability from such a conservative philosopher seems a task worthy of attempting to emulate with my own writing. However, while I am comfortable with elements of my thesis remaining unreadable, I am also interested in allowing various entry points into my thesis that are not completely alienating. With the notion of providing entry points into my thesis, I have chosen to include some frames in this user guide that may provide some entrances and may aid in readability. I have placed these in .

(If reading this thesis on a computer, cross-references like the one in blue above, are linked to the section in the thesis and can be clicked. If you want to return to the previous view in Adobe Acrobat, you can press "Atl + Left Arrow" on a PC or "Command + Left Arrow" on a Macintosh. You can also choose "View > Show/Hide > Tool Bar Items > Show Page Navigation Tools > Previous View" and you will have button you can click back with.)

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I have some blank pages in this thesis. I love blank pages. They give me a chance to rest. They can disrupt the flow of words. They can be pregnant pauses. They can be blank, but not empty. I do my best thinking when I get to the end of a chapter and can pause to think. I don't need for a text to be completely full of written or visual information. I like music that has moments of silence. I like breaks in conversations. I don't always need to hear the sound of my own voice. Or someone else's. I like when the movie theater is completely dark and silent. I like when a video on my phone fades to black and I am slowly able to see my own reflection in whatever I was watching. I like moments when I am forced to be still, like waiting for the train or a dentist appointment.

I have written "This page is intentionally left blank." on my blank pages. I am fully aware of the fact that this means the pages are not actually blank. I have written these words because some readers did not know what to do with the emptiness. Some of my incredibly helpful and generous proof readers returned my drafts of this thesis to me with huge question marks drawn on each blank page, clearly indicating some form of frustration at the blankness.

I am ok with the pages being *mostly* blank. I tried writing:

"This page is intentionally left *mostly* blank."
but it read as a cheeky joke told too many times. I'll leave it as, "This page is intentionally left blank." and I think you will know that I mean that the page has been intentionally left blank. But it is not blank at all.

Figure 11:   (next page) *Mind Map of Brain Chemistry*, Alcohol Ink and Sharpie, 2018

Happy

Energy

Calm

Love

infatuation

Tears

LUST

Fear

Stress
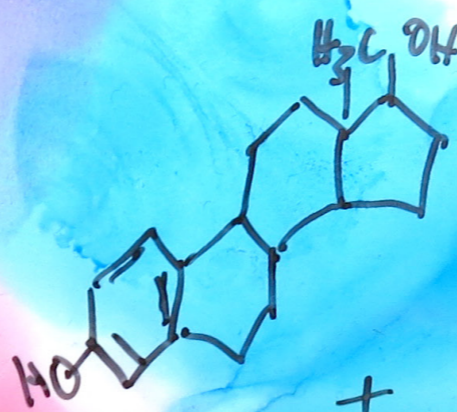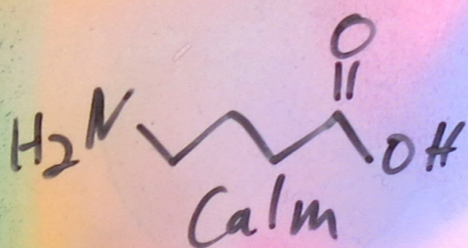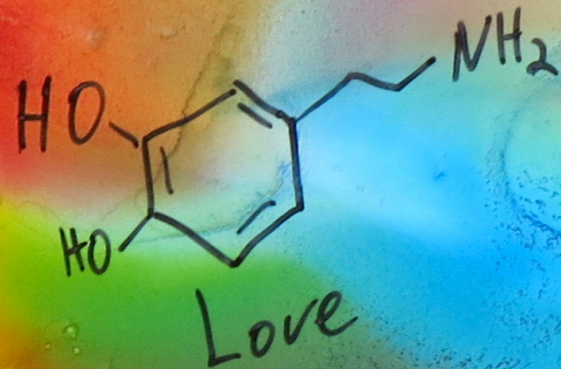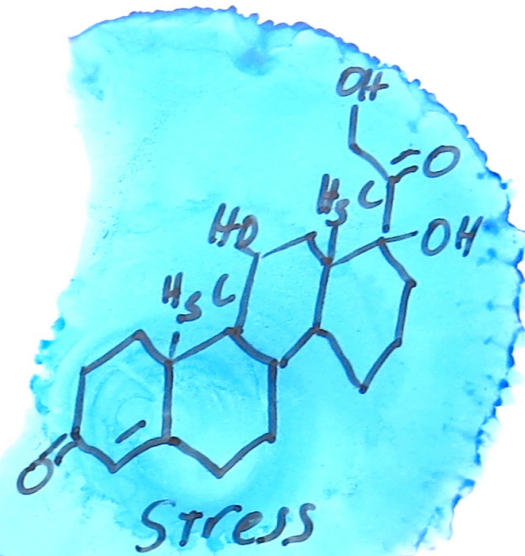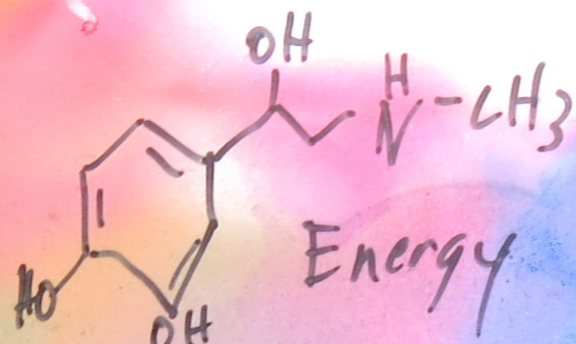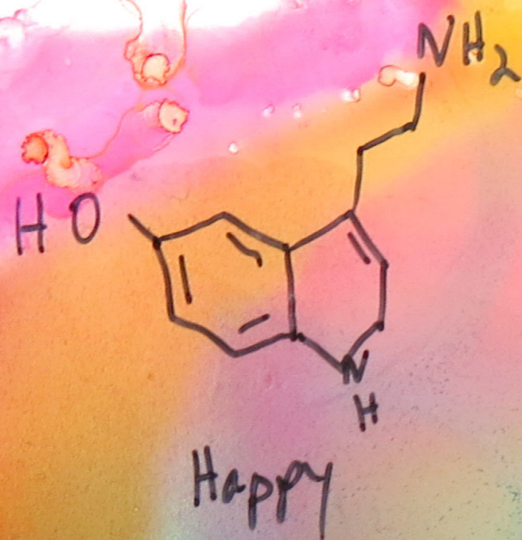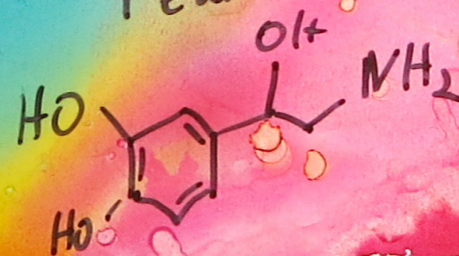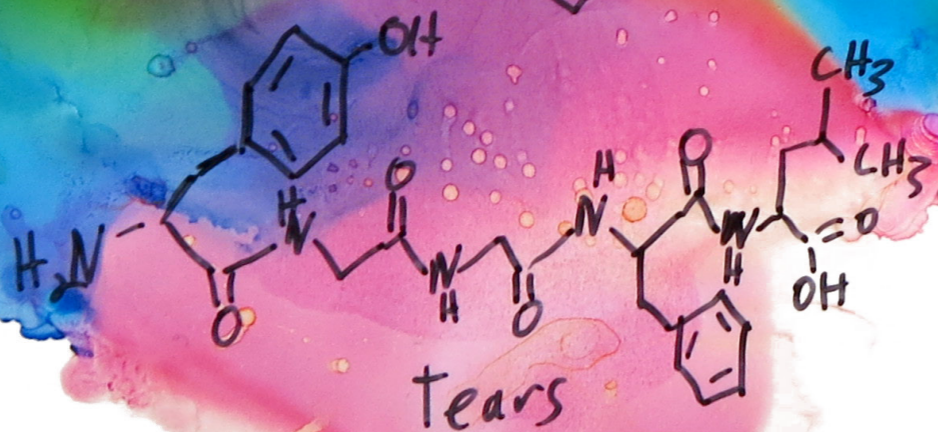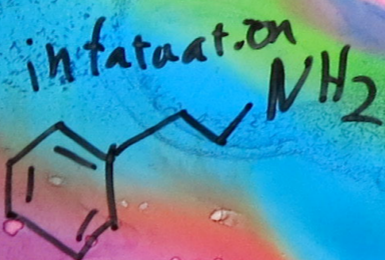
Knowledge and Ethics

One of the goals of my research is to make a contribution to knowledge. Therefore, before beginning my research, I have to ask myself the question, "What is knowledge?" In this section, I attempt to outline the development of my understanding of knowledge through art practice based research. Before embarking on my research, my academic training was in astrophysics. Specific areas in astrophysics introduced me to various perspectives on the nature of knowledge. Subjects such as classical Newtonian mechanics and fluid mechanics were taught from a reflective and mechanistic perspective on knowledge. Other subjects, such as quantum mechanics and general relativity introduced me to perspectives that understood knowledge as partial, provisional, and relational. Through this research, I have come to an understanding of knowledge that has a strong resonance with Donna Haraway's concept of diffraction and Karen Barad's concept of onto-ethico-epistemology. As I began defining my perspective on knowledge for this thesis, Barad's concept of onto-ethico-epistemology led me to understand her framework on knowledge where

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ontology, epistemology and ethics all simultaneously co-constitute. Subsequently, my research into knowledge also required me to develop a framework for my notion of ethics in my research. This research lead me to Tina Braidotti's nomadic ethics which I will also attempt to delineate in this section.

Until the 20th century, classical physics, such as Newton's laws of motion or Maxwell's equations of electrodynamics, was taught from ontological perspective that knowledge was the human understanding of pre-existing, immutable and eternal facts. The goal of physics was to uncover these pre-existing facts through an objective and reflective analysis. This framework of knowledge was based in the notion that things should be analyzed at an objective distance by breaking them down into immutable and eternal base substances.

The 20th century saw the development of quantum mechanics and general relativity that provided an alternative perspective on the ontological nature of knowledge. For these subjects, knowledge is based in

a relational, contingent, situated, partial, mutable, and potentially self-contradictory ontology. I was taught a modern scientific ontology, epistemology and ethical perspective based in thinkers such as Bohr and Schrödinger who developed quantum mechanical scientific theories based on the ontological notion that things are phenomena that emerge from virtual fields of infinite potential that manifest specific attributes due to specific interactions with other bodies, spaces and forces. During my research, I have found that the scientific thinking deployed by physicists including Bohr have recently been used as the basis for new materialist scholars who have applied this form of scientific thinking to multiple fields of study, including art practice.[14] In 1992, Donna Haraway used the contemporary scientific conceptualization of diffraction as a metaphor for an alternative understanding of difference beyond the production of binary opposition in her article "The Promises of Monsters." (Haraway 2010, 63) Thinkers such as Karen Barad quantized Haraway's metaphor of diffraction into a relational ontology that cannot be

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14   "New materialist scholars" is a term that has been applied to thinkers including Rosi Braidotti, Manuel DeLanda, Karen Barad, and Quentin Meillassoux. "New materialism' as a term was coined by Manuel DeLanda and Rosi Braidotti in the second half of the 1990's." (Dolphijn & Tuin 2012, 383)

separated from ethical and epistemological concerns. She called this quantized diffractive basis of thinking an "ethico-onto-epistem-ology" that can be applied to many fields of study. (Barad 2007, 90) The ethics of my research is also based in Braidotti's "affirmative nomadic ethics" that has its genealogical roots in Deleuze and Spinoza. Braidotti's nomadic ethics defines bodies as being constituted by changes in capacities to act, which I have interpreted though affect theory.

Description of Mechanistic Thinking

I think it is important to differentiate between the quantized, relational scientific perspective on knowledge that I use and the mechanistic scientific framing of knowledge that preceded the 20th century. Until the 20th century, most physics was grounded in classical mechanics. The influence and length of time that classical mechanics dominated the philosophical underpinnings of physics were such that most people still implicitly equate "scientific thinking" with "Newtonian thinking" or "mechanistic thinking." (Heylighen 2006, 1) Mechanistic thinking

begins with a notion of analysis where it is believed that knowledge can be gained by taking things apart and locating individual components with a larger system. These individual components of a system, or "elementary particles," are permanent, objective substances that can be isolated. Therefore, the base of mechanistic ontology is materialistic where all phenomena, whether physical, mental, social, biological, etc. are understood as "ultimately constituted of matter." (Heylighen 2006, 2) Through this ontological lens, matter is always located in a specific space and time and is only influenced by objective, universal forces. (Heylighen 2006, 3) Mechanistic epistemology is a reflection-correspondence view of knowledge. Knowledge is always a reflection of locating matter within a system of other matter, space/time, and forces. No other categories of being (for example: purpose, religion, the mind, agency, creativity, provisional attributes, etc.) are acknowledged in mechanistic ontologies and epistemologies. One of the primary methods of mechanistic thinking is to make a mapping of external matter to cognitive elements (symbols) to achieve an objective representation of a system devoid of other categories of being.

I am not against mechanistic thinking and I see how it has been and continues to be extremely useful in many fields. There are many examples of how mechanistic thinking was useful in isolating matter and systems from other categories of being including religion, mythology, social norms, etc. Galileo stated that one of his goals with scientific thinking was, "the separation of science from the legitimate domain of the Church." (Galileo in Blunden 2019, 1) [15] In defending his belief that scientific knowledge should be pursued without influence from other modes of being, Galileo said, "I do not feel obliged to believe that that same God who has endowed us with senses, reason, and intellect has intended to forgo their use and by some other means to give us knowledge which we can attain by them." (Galileo in Nobel 2011, 480) The premise of Galileo's argument is that knowledge can be gained through isolating the senses, reason and intellect from other influences. From Galileo's perspective, one of the most important elements of mechanistic scientific thinking is its ability to liberate a thinker from the power of external legitimating social

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15   I am calling Galileo a philosopher because when he wrote about his appointment as a court mathematician, Galileo asked that "His Majesty add the name of Philosopher to that of Mathematician," because he had "spent more years studying philosophy than months studying pure mathematics." (Galilei in Gorham 2016, 29)

constructs, including the Church or political entities such as a King, due to its mechanistic ethic that denies all forms of being that are external to the system that is analyzed. From this mechanistic perspective, data to be analyzed is treated as passive matter to be interpreted by an ontologically separated researcher. For Galileo, knowledge is epistemologically understood to emerge from the data as a mental process to be named, structured and represented. This is not to say that data cannot be considered biased by a researcher who is considered part of its production, but in this case, the data is still considered separate from the researcher, who includes self-reflexive analysis in the analysis of the externalized data.

Mechanistic thinking is comprised of three separate elements: mechanistic ontology, mechanistic epistemology and mechanistic ethics. Mechanistic ontology is based in the belief in the existence of objective, isolated particles of matter. In mechanistic epistemology, knowledge consists solely of locating matter in space/time and in relation to objective forces. Ethically, mechanistic thinking a) removes all other potential forms of being, b) locates matter within

a system, and c) creates representations of the mapping in order to shape a cognitive image. So, when conducting research using mechanistic thinking, when confronted with the question, "Is this research ethical?" the answer is that it is ethical if the research strives to remove all external forms of being from a system, strives to isolate components within a system and then strives to create a cognitive representation. The goal of this mechanistic method of thinking is to create an objective representation of the world in order to predict phenomena. Leibniz summarized the goal of mechanistic thinking in his book *Monadology* (1714) where he wrote that people are, "capable of knowing the system of the universe, and of imitating some features of it by means of artificial models, each spirit being like a small divinity in its own sphere." (Leibniz 2008, 61)

For my perspective, it is important to note that mechanistic thinking removes the possibility for creativity because there is no way for elementary particles to ever change as they cannot merge, divide, come into being or leave being. Everything that exists now has always existed and will always exist, just in different configurations within space

and due to forces. Scientific discovery, from a mechanistic perspective, is not a creative process, it is the act of cognitively mapping observed configurations.

At its core, mechanistic thinking is a form of reflective theory of knowledge that leads to a reflective mode of analysis. I am using the concept of reflection as a metaphor for mentally "taking a step back" and observing from a distance. From this distance, researchers can analyze factors that influence knowledge production, they can interrogate their own knowledge and the influence of their subjectivities. A researcher can accordingly be emancipated from their own circumstances. The concept of reflective analysis is grounded in thinkers such as John Dewey who wrote that research should be approached as a, "reflective situation: Problem, collection and analysis of data, projection and elaboration of suggestions or ideas, experimental application and testing; the resulting conclusion or judgment." (Dewey in Ramdeholl 2010, 203) Donald Schön's book *The Reflective Practitioner: How Professionals Think In Action* (1984) build's on Dewey's structure to further develop the concept of

reflective analysis as an ongoing, cyclical practice where a "situation talks back" (Schön 2010, 131) The distance in reflexive analysis gives a researcher room to unpack power relations and how they influence the process of knowledge production. Critical reflection is more than just thinking about experiences, it involves a critique of the thinker's own assumptions and values. This method also involves critically deconstructing how researchers have developed skills of analysis and an evaluation of how certain internalized discourses may be working against knowledge production.

There are many examples of developing mechanistic, reflective thinking into methods of critical analysis. One example is Marxist philosopher Louis Althusser's attempt to develop "a 'scientific' marxism freed from all 'ideological' trappings such as humanism." (Aarons 1973, 7) Geras said, "The Althusserian universe is governed by structures and the only subjects that populate it are those subject to this government, their places and functions marked out for them by its ubiquitous hegemony." (Geras 2017, 248) Althusser interpreted Marx's epistemology as an empiricist when he said that, "For the empiricist conception of

knowledge, the whole of knowledge is thus invested in the real, and knowledge never arises except as a relation inside its real object between the really distinct parts of that real object." (Althusser, Balibar, & Brewster 1997, 38) For Althusser, ontologically, objects exist, and knowledge of the object is part of the object itself. In this way, Althusser has taken scientific thinking and applied it to Marxism or what Therborn called an "epistemological science of science" and the application of "Marxism to Marxist theory" where subjects are the elementary particle and the Marxist lens locates the subject ideologically with social structures. (Therborn 1976, 56) For Althusser, all ethics are ideological, and a Marxist lens is tasked with locating the subject within an ideology. In Althusser's ontology, subjects do not come into being, but rather, "individuals are always-already subjects." (Althusser 2002, 119) For Althusser, "Ideology represents the imaginary relationship of individuals to their real conditions of existence." (Althusser 2002, 109) In this quote, Althusser states that epistemologically, he believes there is a "real" existence, but that a subject cannot ever objectively know the "real" because of the subject's reliance on language. All that can

ever be known in Althusser's epistemology is language and Althusser presents that notion that all language exists within an ideological framework. When writing about Althusser's concepts, Prishtina wrote, "ideology provides the framework within which a linguistic message is constructed and expressed." (Prishtina 2018, 1) Similarly, when writing about Althusser's concepts, Poulantzas wrote, "As opposed to science, ideology has the precise function of hiding real contradictions and of reconstituting on an imaginary level a relatively coherent discourse which serves as the horizon of the agent's experience." (Poulantzas 1987, 208) Both of these interpretations of the epistemology in Althusser's theories frame knowledge within the horizon of language and language within ideology. A subject can gain knowledge about their location within an ideology through interpellation where, "all ideology hails or interpellates concrete individuals as concrete subjects." (Althusser 2002, 116) Althusser's concepts of ideology and interpolation utilize a reflective, essentializing mode of thinking. His ethic is to linguistically locate subjects within immutable, eternal variables of ideology with no hope of increasing capacities to act outside of the dimensions of the existing

variables that are forced upon all subjects before birth. If I were to deploy an Athusserian ethic in my research, I could determine that it is ethical if I have linguistically placed my final research within an ideology and have determined the causality of my research in producing or supporting further ideologies.

Description of Diffractive Methods of Analysis

I feel compelled to ask here, 'Is a reflective analysis the only method available to me? Should I have an uncritical adoption of reflective methods? Should the reflective process be complicated, or should I take it as an a priori assumption of research method. What are some problems with deploying reflective analysis in practice-based arts research?' It feels as if creating a separation is the primary concern of reflective processes. Observers are purposely separated from their reflection. In a reflective analysis, difference is always a lack defined by a pre-existing separation. Donna Haraway states, "Reflexivity has been recommended as a critical practice, but my suspicion is that reflexivity, like reflection, only displaces the same

elsewhere, setting up worries about copy and original and the search for the authentic and the really real." (Haraway 1997, 16)

Reflective analyses purposely disconnects the meaning of a process or object from the way that it was created and attempts to make sense of something purely based on an outcome. Theorization of artistic practice in purely reflective and representational terms excludes both the process of art making and the artists themselves. Reflective forms of analysis substitute a representation for an action. Art theory and art practice are distinct investigative processes, as attested by their methodologies and hence have distinct ethics. Perhaps art practice requires an alternative to reflective analysis that is based in an ethics that is not focused on creating a distance but is instead primarily concerned with the field of potential from which things become. Is it possible that art practice requires an ethical method that emphasizes the ethics of an embodied material engagement with a field of potential rather than one that requires the production of divisions in order to have a distanced analysis? What would that method look like and how would it function?

I am interested in grounding my research in contemporary scientific perspectives on ontology, epistemology and ethics. I believe that the notion that "mechanistic thinking" should be equated with "scientific thinking" is outdated. The advent of quantum mechanics and general relativity in the 20th centuries have significantly changed the ontological, epistemological and ethical basis of scientific thinking. An example of this is the shift that quantum mechanics brought to ontology. The "double-slit" quantum mechanical experiment demonstrates that physical matter is not derived from isolated elementary particles, but from the interaction of a field of infinite virtual potential with an observational body. In the "double slit" experiment, one can observe how when photons are shot at two slits, a diffraction pattern is produced as the photons become waves; but when photons are shot at one slit, the photons become particles and do not produce a wave-like pattern. (Bennett, 2017, p. 1) This experiment demonstrates the principle of "wave–particle duality" where photons exhibit various quantum ontological becomings based on their interaction with various observation apparatuses. This can appear to pose a paradox as light appears to contain

multiple, mutually exclusive attributes as described by classical physics that only manifest as specific states when measured. Under a mechanistic method of thinking, this is a paradox because in the mechanistic ontology, things exist as isolatable objects and knowledge is obtained by locating elements in a system of time/space and forces.

Quantum mechanics addresses this apparent paradox by revealing that objects of observation and agencies of observation are simultaneously actualized and co-constituted through an apparatus. Quantum mechanics is not based in a mechanistic ontology, but rather is based in a relational ontology. There is no "cut" between an object and how it is observed in quantum mechanics. Schrödinger explained this when he said,

> The world is given to me only once, not one existing and one perceived. Subject and object are only one. The barrier between them cannot be said to have broken down as a result of recent experience in the physical sciences, for this barrier does not exist. (Schrodinger 1967, 127)

Fritjof Capra expanded Schrödinger notion's that quantum ontology is a relational ontology when he wrote,

> At the subatomic level, the solid material objects of classical physics dissolve into wave-like patterns of probabilities, and these patterns, ultimately, do not rep-

resent probabilities of things, but rather probabilities of interconnections. A careful analysis of the process of observation in atomic physics has shown that the subatomic particles have no meaning as isolated entities, but can only be understood as interconnections between the preparation of an experiment and the subsequent measurement. Quantum theory thus reveals a basic oneness of the universe. It shows that we cannot decompose the world into independently existing smallest units. As we penetrate into matter, nature does not show us any isolated 'basic building blocks', but rather appears as a complicated web of relations between the various parts of the whole. (Capra 2010, 68)

Capra's interpretation of quantum ontology is based in "probabilities of interconnections" and quantum epistemology "can only be understood as interconnections between the preparation of an experiment and the subsequent measurement." (Capra 2010, 68) Capra's perspective demonstrates how in quantum mechanics, ontology and epistemology have merged: how something is known is also what constitutes the thing itself. As an example, light is a phenomenon that comes into being as a wave when it encounters two slits, and it becomes a particle when it encounters one slit. What this means is that the attributes of how light comes into existence are constituted by how it is observed. In this way, the ontology and epistemology of light have merged into one onto-epistemology.

It is important to note that in the double slit experiment example, what light can become is not limited to the two phenomena that have been observed: a wave or a particle. Quantum mechanics only describes two specific and situated knowledges of light with no boundary imposed on other capacities for light to become something else in relation to another situation. Quantum mechanics leaves open probabilities that light can become something other than a wave or a particle if it is observed interacting with something else. We have only observed light interacting with matter in either a single or double slit, but our current observations do not limit the possibilities of what light can become. The mathematics of quantum mechanics can be written to incorporate light becoming something that has not yet been observed. Some examples of states other than a wave or particle that light can become have been proposed by physicists such as Su-Peng Kou who has proposed a version of string theory where light can be modeled as a vortex-membrane. (Kou 2018, 1) Headrick has been modeling light as a "holographic entanglement." (Headrick in Goodman-Brandeis, 2018)

When writing on quantum geometrodynamics, Wheeler modeled light as existing in a bubble in quantum foam where quantum mechanics "forces on space a foam-like structure". (Wheeler in Dorminey, 2016) We have not observed the circumstances where light interacts and then becomes either a hologram, vortex-membrane or a bubble, but quantum mechanics does not preclude what light can become given another specific interaction or set of interactions. If a new way of being due to a novel interaction is observed, quantum mechanics simply includes the new way of being within the probabilities of interconnected relations for light. There is no way to know all of the possibilities of what light can become because there are an infinite number of ways light can interact with various spaces, object and forces. Within Bohr's conceptualization of quantum mechanics, everything in the universe, including light, has the potential to become something of unknown capacity. In this way, knowledge in quantum mechanics is, by definition, always partial and situated.

I am also interested in how Capra states, "Quantum theory thus reveals a basic oneness of the universe." (Capra 2010, 68) This statement of quantum monism attributes the oneness of the universe to the quantum field. In this metaphysics, the universe is one quantum field and the reality that we experience is the localized manifestation of the quantum field due to particular interactions. What is interesting about this metaphysics is that we have observed how the quantum field exists outside of time and space. In 1927, Friedrich Hund observed quantum tunneling, where particles that have not come into being can pass through space regardless of barriers. (Nimtz & Haibel 2008, 1) Scientists such as Bancal and Pironio have confirmed that Bell test experiments conducted by Freedman and Clauser (1972), Salart et al. (2008), Tittel et al. (1998) and many others could only be due to quantum fields that exist outside of time-space. For example, the entanglement of particles regardless of time or space can be seen when determination of the polarization of entangled particles that were measured at a specific location instantly determined the polarization of entangled particles at a second location by Aspect in 1982. (Francis 2012, 1)

Quantum time entanglement can be seen in experiments where the measurement of particular entangled particles can present probabilities that prevent other different particles that they are entangled with from having been observed backward in time. (Hamer 2018, 1) What this means is that in quantum mechanics, the entanglement of bodies does not involve the interaction between pre-existing bodies but rather things are constituted phenomena due to intra-action within a singular quantum field. The unification of the universe across time and space through a quantum field has been observed in many experiments and seems to have resonance with Spinoza's "single substance" (Spinoza in Lord 2015, 29) and Deleuze's "Plane of immanence." (Deleuze 2013, 254)

Schrödinger also challenged the notion of "objective" attributes when he stated, "What we observe as material bodies and forces are nothing but shapes and variations in the structure of space. Particles are just schaumkommen (appearances)." (Schrödinger in Moore 1989, 327) Bohr also reformulated the notion of "objective" when he stated that objects such as light do not possess "such inherent

attributes as the idealizations of classical physics would ascribe to the object." (Bohr 1937, 298) Measured values cannot be attributed to observation independent-objects. In this way, Bohr was stating that there are no "objective" attributes to anything and that all attributes are due to a set of interactions between an object and a measuring device. The notion of a paradox only occurs if one maintains that objects should have well-defined, observation-independent attributes. Without the notion of well-defined, observation-independent attributes, there is no concept of a paradox. Without a cut, there is no paradox.

For example, wave-particle duality is only a paradox if one believes that object and observation are "cut" so that the object can possess observation-independent attributes. If instead, waves and particles are treated as specific phenomenon that are actualized due to the relationship between a quantum field of infinite virtual potential, an act of observation and an apparatus of observation rather than independent objects, observations and apparatuses, then quantum mechanics does not pose a paradox. Every time a quantum field is observed interacting with one

slit, the phenomenon is a particle. Every time a quantum field is observed interacting with more than one slit, the phenomenon is a wave, hence no paradox. If the quantum field is not observed or there is no apparatus, then the wave function never collapses and the phenomena is not actualized. However, this perspective requires framing both the act of observation and the apparatuses of observation as non-passive. So, in a quantum ontology, the notion of a division between a "subject" as something responsible for an action and an "object" which is being acted upon has disappeared. The field of virtual potential, the observer, the observed, and the apparatus of interaction all have agency in the becoming of an object. Quantum mechanics does not differentiate between the practices of knowing and being, and "knowing is a material practice of engagement." (Barad 2007, 89)

As quantum mechanics was developed in the 20th century, thinkers such as Bohr recognized that what they were proposing was a shift in the ontology of mechanistic scientific thinking to a relational ontology. Bohr said,

> The recognition that the interaction between the measuring tools and the physical systems under investigation constitutes an unsuspected limitation of the

mechanical conception of nature, as characterized by attribution of separate properties to physical systems, but has forced us, in the ordering of experience, to pay proper attention to the conditions of observation. (Bohr 1987, 74)

From Bohr's perspective, there are no separate, isolatable objects with observation-independent attributes, there are only phenomena that occur with the interaction of a field of potential and an apparatus. Karen Barad expands on Bohr's concepts when she states that reality "is not composed of things-in-themselves or things-behind-phenomena, but things-in-phenomena." (Barad 1998, 104) Barad states that apparatuses are "not passive observing instruments" but are "productive of (and part of) phenomena." (Barad 1998, 98) "Apparatuses are themselves material-discursive phenomena, materializing in intra-action with other material-discursive apparatuses." (Barad 1998, 102) In describing apparatuses as "material-discursive," Barad further frames quantum thinking as not requiring the privileging of either material or discursive methods.

From this perspective, quantum thinking is comprised of an ontology and epistemology that co-constitute each other. The act of knowing a thing and how we know it are the same process. Thus, quantum ontology and quantum epistemology form one quantum onto-epistemology where objects are phenomena that become from a field of infinite virtual potential due to their interaction with an observational apparatus.

The double slit experiment demonstrates that matter cannot be broken down into fundamental particles that can be isolated and exist objectively forever. Instead, ontologically, matter is derived from an entangled field of infinite virtual potential and bodies only come into being when they encounter another body under specific, situated circumstances. This means that things have infinite potential of what they can be and can only be known through a specific, situated, material encounter with other bodies. Due to the nature of how bodies come into being and how we can know them, the act of knowing them is ethical in nature as well. That means that the nature of things, how we know them and how we treat them all simultaneously co-constituted. In this way, quantum ontology, epistemology and ethics are all an assemblage

of distinct, yet entangled processes forming one quantum "epistemological-ontological-ethical framework". (Barad 2007, 26) Barad's epistemological-ontological-ethical framework does not assume pre-existing ontological categories, but rather frames objects as being continuously re-constituted through material entanglements. Barad states, "scientific practices do not reveal what is already there; rather what is "disclosed" is the effect of the intra-active engagements of our participation with/in and as part of the world's differential becoming" (Barad 2007, 361).

In retrospect, the first glimmers of my current approach were encountered while working as an astrophysicist. While studying astrophysics, I was introduced to the notion that "scientific thinking" should be synonymous with quantum thinking, relativistic thinking and mechanistic thinking all occurring at one time. Through my work on this thesis, I have developed my onto-epistemology in a manner that can be applied to arts-based research. In specific terms, my research throughout this thesis has found particular resonance with the concept of an ethico-onto-epistem-ology that was developed by Karen Barad in her book

Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning (2007).

Karen Barad's ethico-onto-epistem-ology draws on Donna Haraway's metaphor of diffraction. In pure scientific terms, a diffraction pattern is the provisional configuration that emerges when waves overlap each other. Haraway used diffraction as a metaphor when she said, "A diffraction pattern does not map where differences appear, but rather maps where the effects of differences appear." (Haraway 2010, 300) The method to analyze this pattern is a method of paying attention to difference. There are no binaries in the diffraction pattern because there is light in the dark and dark in the light elements of the pattern, just at different amplitudes. Difference exists both within and beyond the boundaries of any one specific wave. Nothing is fixed in the pattern as every element is fluid and simultaneously co-constituted by every other element of the diffraction pattern. Ultimately, a diffractive analysis allows for multiple, new possibilities in what things can become. In the case of my research methods, I am using diffraction as metaphor for an analytical method that revolves around

difference. The diffractive research methods I employ focus on the conditions that allow differences emerge and how differences evolve over time.

A diffractive analysis is always a partial, situated knowledge. Haraway describes the notion of "situated knowledges" which are biased, and partial knowledges as opposed to the totalizing notion of "objective" knowledges. (Haraway 1988, 575) By definition, situated knowledges are provisional and can only be applied to a specific situation. Situated knowledges allow agency to exist in multiple locations, including within a knowledge producer and simultaneously within the object of study. From this perspective, a knowledge producer does not necessarily only have one stable point of view and an object of analysis is not passive. Situated knowledges frame affective, embodied, and personal knowledges of lived experiences as fields of potential where novel modes of theory can germinate. Haraway's "situated knowledges" permit the development of "partial, locatable, critical knowledge." (Haraway 1988, 584) This thesis is situated within Haraway's research tradition that uses personal and affective experience with

research materials as a basis for thinking through an engagement with art practice. Specifically, the practice-based arts research of this thesis is based in the relational ontology and epistemological potential of the art making process to generate knowledge rather than reflecting or illustrating art theory.

For my diffractive methods of analysis, I am interested in exploring if materials can be analyzed as effects of difference rather than only using a reflective analysis that requires linguistically locating differences. A reflective analysis requires fixing individual states unlike diffractive modes of analysis that regard assemblages as constantly becoming from difference. Reflective analysis is grounded in an ontology in which all entities, human and non-human, are viewed as immutable, bounded, and discrete bodies that can be impacted by other bodies and possess the agency to affect others. Diffractive methods are grounded in an ontology that is partial, situated, and relational. From this perspective, bodies have permeable and mutable boundaries. All bodies exist as phenomena that emerge as they come into contact with other bodies.

Agency is not bestowed upon individual bodies, such as art, curator or artist, but rather emerges through intra-actions between and among entities as boundaries are created or collapsed. (Barad 2007, 33)

A diffractive mode of analysis can potentially answer specific questions such as, 'Where is the art in your research?' by showing how the question itself implies a reflective mode of analysis because the question isolates elements as individual bodies and fixes them by the difference imposed by the question; in this case the implied difference between art and the other elements of research such as the artist, the writing, etc. A diffractive analysis does ask the question, 'Where is the art in your research?' but it looks to answer the question within a partial, provisional, diffractive framework that does not isolate and permanently locate elements. The diffractive analysis does not seek validity through the method of locating and fixing difference, but instead, is focused on producing and examining the conditions that allow for difference to emerge through the interaction of various bodies.

It is important to note that diffraction is not a process that exists in opposition to reflection, but is entangled with reflection. To extend Haraway's metaphor, in the waves of a diffractive pattern in water, we still observe the diffraction pattern through the light that is reflected off the waves. What this means is that when I am using a diffractive method of analysis, I am not interested in permanently locating something within a fixed frame, I am interested in analyzing where differences emerge. In order to do that, I must look at the partial, provisional, reflected state of the diffractive pattern and point out how one part of a wave is different from another. In physics, this means that I can make the diffractive statement that an equation for quantum mechanics functions at a particular scale when general relativity functions at a different scale. The fact that the application of physics equations is contingent on scale is a statement about the provisionality and partial knowledge employed by physics. Things can reflectively "work" in a diffractive framework, but the functionality of various elements is always partial and contingent when viewed in the larger diffractive framework.

Similarly, in my diffractive arts research practice, differences emerge as various elements are placed in relation to one another within my diffractive research framework. To me this means that I am not entering my research with an a priori concept of what can be reflectively isolated as the "art" in my research as opposed to the "writing." What it does mean is that as I have conducted my research, certain elements begin to function as "art" or "writing" as they have been placed in relation to other elements. For some parts of my research, a final visual object has functioned best as the "art" of my research, where other times, the written computer code functions better as the "art" and the visual product produced by the code is a by-product. Sometimes, both the code and the final visual product function as both the "art" and the "writing" simultaneously in an entangled manner. The diffractive analysis is not focused on permanently, reflectively defining the elements of my research, but instead is interested in examining the process that cause the differences to emerge. A diffractive analysis does not only ask, 'Where is the art in this research?' Diffractive analysis also asks questions such as: 'Does the code function better as the "art" in this

artwork? Why does the final image produced by this code function better in this artwork? Can the writing of the code in this artwork function as a performance artwork? Do the materials of this artwork have agency? If so, can the materials of an artwork be considered artists?' One key question in a diffractive analysis is: 'How do I determine when something functions or "works" as one element or another in a diffractive framework?' The answer to this is always conditional to the specific set of relations that are being analyzed and as part of the diffractive research, the answer is always taken to be partial and provisional itself. In fact, the answer to the question, 'Where is the art in this research?' can become the artwork as well.

In a diffractive analysis, there is no pre-existing "cut" between the art, the art making process, the artist, the writing, etc. in the diffractive mode of analysis, but elements have the potential to become the linguistically labeled "art" through the process of interacting with the materials (objects, processes, people, etc.) of the research process. The difference is not reflexively fixed but is a diffractive becoming where all of the participant elements

are simultaneously co-constituted (the art becomes art at the same time the artist becomes the artist at the same time the writing becomes the writing, etc. as the provisional interactions between each other constitute what they are). In this frame, it is the relationship between elements that allow things to come into being. Things do not exist without their specific, provisional relationships. Things become something else with a different set of relationships and over time as the configuration of those relationships change.

A reflective mode of analysis has significant epistemological and ontological differences from a diffractive mode. Barad said, "my aim is to disrupt the widespread reliance on an existing optical metaphor – namely reflection – that is set up to look for homologies and analogies between separate entities. By contrast, diffraction, as I argue, does not concern homologies but attends to specific material entanglements." (Barad 2007, 88) Epistemologically, the reflective process is based in the assumption that things must be known at a distance. Reflective processes also assume that knowing and

observing are identical processes. A diffractive method allows things to be known through imminent embodiment. Reflective modes of analysis are grounded in a locatable ontology and epistemology where diffractive modes are grounded in a relational epistemology and ontology. Diffraction focuses on material engagement with data and "the relations of difference and how they matter." (Barad 2007, 71) A diffractive method of analysis allows for making and analyzing difference in a way that does not require self-reflection and can circumnavigate the epistemological issues with reflective methods of analysis.

However, while there are important differences between reflective and diffractive modes of thinking, it is important to note that my goal is not to replace reflective thinking with diffractive thinking nor is it to create a binary between the two thought processes. As I described above, the two modes of analysis are entangled with each other. I am not saying that research should not be reflective, but rather, I am interested in how I can consider how other metaphors similar to diffraction can be used to advance research in meaningful ways. I believe there are aspects of

diffractive thinking in mechanistic thinking and vice-versa. Bozalek and Zembylas state, "…if we want to be fair to the theoretical and methodological developments that have been made over the years, we might need to acknowledge that the 'entanglement' of reflexivity and diffraction is one that includes continuities and breaks rather than a 'story' of one vs. the other." (Bozalek & Zembylas 2016, 117-118) I deploy both modes of thinking in my research, but at different times and in different ways.

Diffraction is also method of observation that changes both the observed and the observer. The influential role of the knower in knowledge production is acknowledged in the diffractive process as diffraction is grounded in a relational ontology where matter and meaning are provisionally co-constituted. From this perspective, diffraction can be perceived as both a process and a result and is therefore ontologically both a being and becoming. In this way, diffraction offers an alternative method to reflexivity's binary approach to knowledge production.[16]

16   By matter, I do not mean just things but "substance in its iterative intra-active becoming – not a thing, but a doing, a congealing of agency. It is morphologically active, responsive, generative and articulate. Mattering is the ongoing intra-active differentiating of the world." (Barad 2104, 16) In the case of my arts-based research, the matter is constituted by the things I make such as robots, computer code, writing, as well as processes, space, technology, etc. all of which are becoming in the process of research.

Where reflexivity is grounded in fixed, distanced positions, diffraction is attuned to differences and their effects in knowledge production.

This thesis attempts to acknowledge and integrate embodiment and materiality into the research process. In so doing, I am reconsidering how art practice can be theorized. My research also contains reflective modes of analysis, but these reflections are presented in relation to diffractive methods. My diffractive methods require direct engagement with materials. This allows my research to be grounded in one material/discourse through the simultaneous engagement with both language and things. Though this critical practice of direct engagement, my research is attempting to gain knowledge from within. My method of diffractive, practice-based analysis constitutes an assemblage composed of the relationships that exist in-between the heterogeneous material of my research data. This data includes processes, humans, non-humans, ideas, affects, movements, etc. Diffractive research disrupts the idea that tools or techniques exist to investigate the world objectively and at an ontological distance from the

researcher. Diffractive analysis is a practice of knowing through material engagement with research data. This method "decenters the researcher as a knowing subject and moves us beyond the dominating subject/object, human/non-human, as well as the discourse/matter and nature/culture dichotomies." (Allen 2018, 40)

Affect

The ethics of my art practice is grounded in a contingent mapping of possible changes in affect. Spinoza states, "by affect I understand affections of the body by which the body's power of acting is increased or diminished, aided or restrained, and at the same time, the ideas of these affections." (Spinoza 1994, 154) My understanding of ethical interactions is grounded in this framing of affect as a change that occurs in a body during an interaction with another body that diminishes or increases the body's power of acting.

By bodies, I am not referring to the normalized definition of a "natural" body that is isolated and bounded by the physical in opposition to the mind. I am referring to the body as a multiplicity existing in an ephemeral space that is continuously being reconstituted in the space between "bodies," both non-human and human. From this perspective, the body is continuously coming into being through a network of changing relations. In *Ethics* (1665), Spinoza asks what the boundaries may be on a body's capacity to act. Ontologically for Spinoza, a body is constantly re-created by encounters with other bodies and does not exist as a fixed linguistic naming or predetermined classification. Subsequently, bodies only come into existence within fields of encounters with other bodies and cannot be permanently located. From Spinoza's perspective, a body exists in a provisional state while the body is in a specific configuration of interaction with other bodies. Because there are an infinite number of possible configurations of encounters with other bodies, a specific body's capacity to act is potentially limitless and always unknown. This perspective implies that because a body's capacity to act remains unknown, but it is impossible to permanently fix knowledge about what a body is. Subsequently, in Spinoza's ethics all knowledges are partial,

embodied, provisional, and situated. In addition, decisions regarding how bodies interact carry ethical importance because those interactions impact how bodies come into existence and determine their capacity to act.

Deleuze addresses Spinoza's logic of affect and defines affectus when he states, "[t]he affection refers to a state of the affected body and implies the presence of the affecting body, whereas the affectus refers to the passage from one state to another." (Deleuze 2007, 49) Hickey-Moody describes affectus as a measurement of "the material equation of an interaction, the gain and loss recorded in a body, or your embodied subjectivity, as the result of an encounter. This is distinct from affection, which is the feeling experienced by the embodied human subject." (Hickey-Moody 2013, 79) Affections can be defined as signifiers of affectus just as feelings can be defined as markers of embodied variations. For my research, I define "the body" as a dynamic assemblage of affectus that emerges when bodies interact. From this perspective, interactions cause bodies to perpetually re-constitute themselves.

I view affects as existing in an assemblage of resonances.[17] When one body's potential to act is increased, it has the potential to interact with another body's affectus. A more intense potential can be realized when there is a resonance between the affectus of two bodies. Yve Lomax describes this when she writes about Spinoza stating, "[b]oth the affecting and affected body have their potential to interact increased - they compound to constitute a more 'intense' potential. And these times, for Spinoza, are joy … Here we would not mock others in that vain attempt of self-mastery and control." (Lomax 2000, 87) My research is interested in examining how joy can manifest when bodies interact in a manner that allows for an increase in the capacity to act for multiple bodies.

Nomadic Ethics

The ethics of my research also follows in the research tradition of Braidottti when she developed her "affirmative nomadic ethics." (Braidotti 2006, 239) Braidotti expands on "Deleuze's neo-Spinozist ethics [which] rests on an

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17   I explain my understanding of assemblage theory in a future section.

active relational ontology that looks for the ways in which otherness prompts, mobilises and allows for flows of affirmation of values." (Braidotti 2013, 342) Braidotti goes on to define "nomadic ethics" when she states:

> A nomadic vision of the body defines it as multi-functional and complex, as a transformer of flows and energies, affects, desires and imaginings … The body is a surface of intensities and an affective field in interaction with others. (Braidotti in Dolphijn & Tuin 2012, 33-34)

From the perspective of nomadic ethics, bodies emerge from changes of capacities to act that "transcend the very variables – class, race race, sex, gender, age, disability— which structure us." (Braidotti in Dolphijn & Tuin 2012, 33) What this means is that from the perspective of nomadic ethics, while a body may be ideologically and linguistically located, limited and structured along the dimensions of particular overlapping variables, bodies retain the capacities to act along dimensions other than those specifically defined variables. Through nomadic ethics, "'neo-materialism' emerges as a method, a conceptual frame and a political stand, which refuses the linguistic paradigm, stressing instead the concrete yet complex materiality of bodies." (Braidotti in Dolphijn & Tuin 2012, 21) The method of nomadic ethics requires developing,

"visions that have been left untapped and by actualizing them in daily practices of interconnection with others." (Braidotti in Dolphijn & Tuin 2012, 36) Braidotti's nomadic ethics provides an opportunity for people to escape the structures constructed by variables that have been ideologically located. This is a robust analytical method grounded in the ethical responsibilities of hope, not flippant dismissal of significant ideological concerns nor a naive position.

> The pursuit of practices of hope, rooted in the ordinary micro-practices of everyday life, is a simple strategy to hold, sustain and map out sustainable transformations. (Braidotti in Dolphijn & Tuin 2012, 36-37)

Braidotti explains how the core of her affirmative nomadic ethics is also a measurement of affect. From her perspective, Braidotti goes on to explain that in the ethics she is creating, "Joyful or positive passions and the transcendence of reactive affects are the desirable mode … Thus, an ethically empowering option increases one's potentia and creates joyful energy in the process." (Braidottti, 2006, 239) When confronted with the question, "How do I determine if this research is ethical?" nomadic ethics responds that research is ethical if a body's capacity to act increases either along the dimension of an existing variable that has been

linguistically and ideologically located or through the development of a novel variable.

Thinking with Matter

In investigating the location of affect, Erin Manning states, "The body is but one verging surface on the field of experience, where the body is always more than One. The more-than-Oneness of the body is always already collective, cutting as it does between life-welling and life-living. It is here, at this virtual-actual juncture, that the force of affect resides, activating the body-becoming." (Manning 2010, 117) Brian Massumi discusses affect as, "nonobjective and asubjective, not-yet-thought and incipient action, activated and suspended, individual and collective, all rolled up together." (Massumi 2007, 125) Massumi and Manning state that affect is always collective and frame affect as exceeding any individual human experience. Some questions emerge in practice-based research when affect is presented as an assemblage of changes in capacities to act that develop when bodies (both non-human and human) collectively interact. In this situation, who or what is responsible for new knowledge generation? Does this perspective offer the opportunity to question if the matter of research (e.g. the writing, the reading, the artwork, the methods deployed, the discourse, conversations with other researchers, the environment where the research is conducted and all of the other elements that can be either seen or unseen in research) can be an active contributor to the generation of knowledge?

Deleuze describes the act "of thinking in cinema through cinema." (Deleuze 1986, 23) Perhaps matter, like cinema, has the capacity to produce new modes of analysis. A reflective mode of analysis demands thinking about matter as passive tool, but perhaps a diffractive approach can allow researchers to think with matter. Specifically, with arts-based research, affective encounters between various heterogeneous bodies involved in the art-making process, such as myself, technology, software, etc., change the capacities of each of the other bodies to act. An example of an affective encounter with a material is when I am writing computer code. I don't simply think about computer code and then write a computer program. I conduct my thinking

through the computer code as if I am thinking through a specific language. A different language can impact the capacities of thought within the language. By thinking through a different language, the impact of the language can increase some potentials of thought and limit others. Thinking through computer code allows me new capacities to act. The computer code is not a passive material, but it is an active material with the capacity to generate new modes of perception. In my research, all of my materials have agency and impact on my capacity to act. I don't just think about robots; I also think through the building of robots which means the capacities of my robots impacts my thinking. I don't just think about drawings; I also think through drawing. I just don't think about writing; I also think through writing. I don't just think about the matter of my research; I also think through the matter.

Through the process of this research, I have learned to think through materials by examining changes to my own capacity to act due to interactions with the non-human and human data of the research. The knowledge contained in the sum total of my research assemblage can exceed my

own individual knowledge about my research. In this way, I frame my art-based research practice as an environment of affective interactions of heterogeneous bodies that allows embodied knowledges and novel conceptualizations to emerge. Through this method, I can think with the matter of research rather than only thinking about the matter of research. I can also account for the active role of non-human bodies in research. This research method requires a participatory experience of affective knowing and direct material contact with the data of the research. My method includes materiality and embodiment as integrated into the research process through affect.

Thinking with Diagrams

I am interested in discussing specifically what I mean by thinking with matter by describing how I use diagrams in my research. Throughout my research I use mental models like diagrams including mind maps that function in the way Guattari describes when he says that,

> the systems of logical, topological, algebraic algorithm, the processes of recording, memory storage, and data processing used by mathematicians, sciences, technology, harmonic and polyphonic music, etc., do not have

an aim to denote or fill in the morphemes of a fully constituted referent, but to produce them through their own machinics. (Guattari 2011, 216)

From this perspective, the mental models and diagrams I use do not represent my thoughts, they are a method for thinking with symbols rather than linguistically thinking about symbols in a reflective manner. When writing on diagrams, Guattari goes on to say, "Strictly speaking, these signs-particles are no longer semiotic entities." (Guattari 2011, 215) I believe this means that "diagrams do not represent thought; rather, they generate them." (Watson 2009, 12)

When writing about the use of diagrams in quantum mechanics, Guattari says,

> The particle is defined by a chain of symbols; physicists 'invent' particles that have not existed in 'nature'. Nature as existing prior to the machine no longer exists. The machine produces a different nature, and in order to do so it defines and manipulates it with symbols (the diagrammatic process). (Guattari 1984, 125)

In this example, Guattari is explaining how diagrams in quantum mechanics are not used to represent knowledge, but rather to generate new knowledge about previously non-existent particles. Guattari writes,

> Of course there is a sphere where signs have a direct effect on things - in the genuine experimental sciences, which use both material technology and a complex manipulation of sign machines. (Guattari 1984, 166)

Subsequently, diagrams offer a space of knowledge generation by existing in the "conjunction between deterritorialized signs and deterritorialized objects." (Watson 2011, 12)

I use diagrams as a space to generate knowledge, not to reflect knowledge. The process of creating diagrams is a space where previously non-existent connections have the space to emerge. From this perspective, I view my art making process as a form of affective diagram creation. I am not using art making to diagram how I think about various connections, but as part of a process to generate new connections diagrammatically as Guattari described. For my research, the art process allows elements to become something new through the embodied affective assemblage in specific and provisional ways. In the art making process, art is not a passive, fixed object that is to be reflected upon, but it is an active generator of affective connections between bodies, human and non-human

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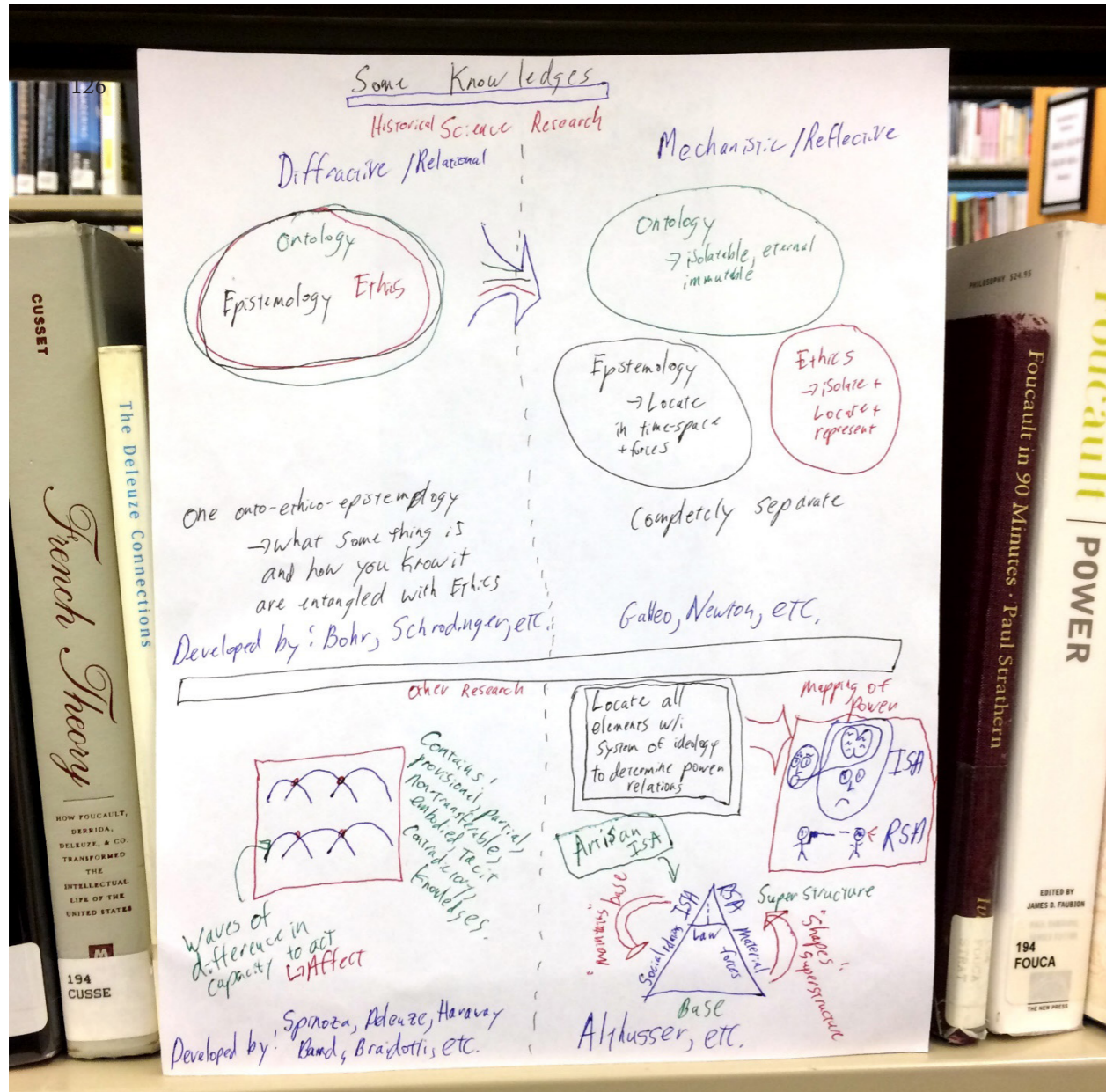
Figure 12:   Diagram of research methods

An example of how I use diagrams to generate ideas can be seen in

I used this diagram to generate my understanding of the ethical base of my research. The diagram depicts my understanding of how various theories of knowledge handle the identity formation process. The top section of the diagram depicts how I view the relationship between

how knowledge is defined from different perspectives in science. Historically, people learned the mechanistic right-hand side of the diagram first where ontologically things are created from eternal, indivisible elements and that knowledge is understanding how elements function within an objective time/space configuration in reference to various forces. The left-hand side of the diagram is a relational ontology developed by thinkers including Bohr and Schrodinger where things are phenomena that come into existence from a field of infinite potential through an interaction with another object and an observer. What is important to note is that this is not a binary between relational and mechanistic knowledge in science, it is a process. Objects come into existence through a relational ontology, but once they are in existence, they do follow a mechanistic ontology. Once light encounters one slit, it does function as a particle in a mechanistic manner.

On this diagram, I then outline my parallel thought process for identity formation in non-science research. On the right-hand side of the diagram is Althusser's mechanistic ontological concept of identity formation through ideology.

On the left-hand side is the relational ontology of how identity comes into being as supported by Spinoza in his concept of an imminent plane, Deleuze's notion of the rhizomatic and virtual, Haraway and Barad's concepts of the diffractive, and Braidotti's notion of the nomadic. For the relational ontology side, objects come into being when bodies interact and the difference that occurs is measured through affect. Again, I am not trying to create a binary between an onto-ethico-epistemology and a mechanistic ontology, but rather to understand them as a process. Once beings have come into existence, there are pressures to then align ways of being along ideological lines.

The bottom section of this diagram is what I used to generate my understanding of my own research. The right-hand side of the diagram depicts a reflective analysis where the ontology separates components into various elements that are then known by their objective placement within an ideological framework. My practice-based research includes reflective analysis, but also includes a diffractive base. It is grounded in an onto-ethico-epistemology that is comprised of partial, provisional knowledges that come into existence

from a field of infinite virtual potential when bodies interact. That knowledge is measured through differences in affect. In this way, this diagram has functioned as a generator of new knowledge by thinking the diffractive process for me.

Imminence and Transcendence

In my research, I am faced with relational, moralistic questions such as, "Is the art making process a Good thing?" The ethico-onto-epistem-ology deployed in my research is grounded in an imminent relational ethics, not a transcendent ethics. By an imminent relational ethics, I am referring to an ethics that does appeal to anything outside of the relations constructed by materials that are accounted for in the philosophy. This set of relational ethics is different from a transcendent ethics that derives the ethics of a system from a source that is outside of the system. When discussing Foucault's 'Care of the Self' (1990), Deleuze differentiates between a relational ethics and a transcendent ethics which he calls "morality." Deleuze writes:

> Yes, establishing ways of existing or styles of life isn't just an aesthetic matter, it's what Foucault called ethics, as opposed to morality. The difference is that morality presents us with a set of constraining rules of a special sort, ones that judge actions and intentions by considering them in relation to transcendent values (this is good, that's bad…); ethics is a set of optional rules that assess what we do, what we say, in relation to the ways of existing involved. (Deleuze & Joughin 1997, 100)

The development of a relational ethics can be seen in Spinoza's *Ethics* (1677) which includes Proposition 11 that states, "God, or a substance consisting of infinite attributes, each of which expresses eternal and infinite essence, necessarily exists." (Spinoza in Lord 2015, 29) Spinoza's *Ethics* constructs a perspective that views that universe as consisting of a single substance. In the universe Spinoza constructs, all elements are imminent and there is nothing outside of the universe. Because there is nothing that transcends the universe, there is no moral judgement from a transcendent source. The transcendent source of moral judgement can be any source that is not accessible by materials within the system. However, the transcendent source can pass moral judgement on elements or relations within a system. Such transcendent sources can include a religious God or gods, society's norms, commandments of Pure Reason, rules of logic, genes, human emotions,

rule of law, etc. An imminent relational ethics is different from a transcendent moral ethics in that any ethics that are developed in a relational ethics must be derived from the relations between imminent materials, rather than a transcendent source.

In *Spinoza: Practical philosophy* (1970), Deleuze constructs an ethics of imminence grounded in Spinoza's universe without transcendence. In his analysis of Spinoza, Deleuze explains how he rejects the binary and moralistic concept of Good/Evil and questions the existence of transcendent morality. Deleuze frames Spinoza as stating that a world view based in transcendent morality as an illusion. As an illusion, such a world view only can only reduce a body's ability to act and therefore this perspective only permits for the experience of "sad passions." (Deleuze 2007, 25)

In Deleuze's essay "To Have Done with Judgement" (1997), Deleuze outlines an ethics that is not concerned with transcendental judgment, but rather evaluates encounters of bodies in a plane of imminence. An encounter between bodies can be evaluated in terms of a change in ability

of the bodies to act due to the encounter. This change can be registered as sadness or joy by the bodies. This Deleuzian structure of ethics is significantly different from a structure of morality, which Deleuze framed as the application of a transcendent standard of judgments to a specific case. Deleuze implies that objects, like people, cannot be evaluated in a transcendent manner because their capacities are incalculable and what they might become is not knowable. The ethics that Deleuze outlines is inherently experimental as it is grounded in an exploration of unknown capacities. Deleuze's ethical lens demands that experiments are conducted where the end result is not known, but where it is it possible for capacities to act to increase. From this perspective, measuring interactions based on transcendental scale is an illusion. A moralistic evaluation can be replaced by relative assessments based on specific interactions of bodies. This ethical lens allows for a spirit of experimentation where outcomes are unknown in order to explore the possibility for previously unknown capacities.

Similarly, Braidotti's affirmative nomadic ethics is grounded in the ability to experiment in order to discover unknown capacities. Braidotti states, "If the point of ethics is to explore how much a body can do, in the pursuit of active modes of empowerment through experimentation, how do we know when we have gone too far?" (Braidottti 2006, 240) Braidotti answers this by stating, "Your body will thus tell you if and when you have reached a threshold or a limit." (Braidottti 2006, 240) An embodied, diffractive research method requires that subjects are aware of their own changes in affect and can provide that data to the research. As Braidotti states, "A higher form of self-knowledge by understanding the nature of one's affectivity is the key to a Spinozist ethics of empowerment." (Braidottti 2006, 240) Braidotti expands on this by delineating how Spinoza explained how a subject can work toward,

> achieving freedom through an adequate understanding of our passions and consequently of our bondage. Coming into possession of freedom requires the understanding of affects or passions by a mind that is always already embodied. The desire to reach an adequate understanding of one's potentia is the human being's fundamental desire or conatus. (Braidottti 2006, 241)

Braidotti explains how a subject can have their capacity

to act increase even when confronted by an apparent limitation and gain freedom. From Braidotti's perspective, a subject can gain freedom by increasing their capacities to act along alternative dimensions even if the subject realizes that, from a specific ideological perspective, they are limited in their capacity to act (eg. physical constraints, monetary, political, etc.) From this perspective, the ethical choice is not necessarily to only work to free subjects from specific constraints, but rather it is also ethical to look for unknown capacities to act.

My research methods are not grounded in ethics that demand a specific result before a process has begun. Rather, I employ a imminent, diffractive, relational ethics. This ethics does not demand a result that can be evaluated as moralistically "Good," but instead is grounded in paying attention to changes in affect that occur as bodies interact with one another. What this means is that I am not attempting to evaluate if my research is "Good" from a transcendent perspective like a larger religious or cultural perspective. Instead, the onto-ethico-epistemology I deploy in this research is concerned with assessing specific sets of provisional relations and asking, 'How does a

particular, situated set of relations impact the capacity of a body to affect or to be affected? Can I evaluate the quality of an encounter of bodies on the terms of whether or not an encounter has provided an opportunity for the capacity of a body to increase or decrease its power?' The ontological lens that I am using to view the bodies of the assemblage participating in the art-making process, is that all of the objects are provisionally, simultaneously co-constituted. They are constantly de-territorialized as the relations between the bodies move and change. The ethical framework I use in this research does not have a fixed, locatable conclusion that is designed to be moralistically evaluated. Instead, it is an ethics constituted by the attention paid to the constantly deterritorializing elements of process and as such, it is inherently propositional.

The ethics of my research is an ethico-onto-epistem-ology where primary ethical concern revolves around paying attention to the provisional, embodied affective assemblage generated by the relationships between the elements of the art-making process. It is the affective relationships between the objects that simultaneously co-constitutes the objects

and the objects themselves can only be known through paying attention to the relations between them. The core of my research is evaluating each situated set of relations and then provisionally assessing if the capacities to act for the various bodies has increased or decreased and what that change in capacity means for the bodies involved. For example, in my research I may write some computer code that performs a specific function. Through the interaction of various materials like code, a robot, paint, etc. differences emerge. In my evaluation of the relationships that have developed between the elements during the research, I may determine that the code now has an increased capacity to act and can now function as both text, code and an artwork. This is a diffractive ethics that requires my participation within the affective assemblage in order to gain embodied, partial and situated knowledge instead of pursuing reflective, objective, detached knowledge. This diffractive ethic is one of the major reasons I am conducting my research as practice rather than a reflective method of theoretical art research. My research acknowledges the active role of materials in research by thinking with the matter of the research rather than about the materials of the research. I do not conduct my research with a moral frame of Good/Evil, but instead I evaluate the ethics of my research through the lens of an imminent ethics where capacity to act is increased. This is an experimental ethics acting within the wider ethical framework, and provides a mandate to create novel assemblages that have the potential to increase unknown capacities.

This research is the experimental embodied process of art making. Throughout this process I will pay attention to the relationships between the various objects and continuously measure the impact these constantly changing relations have on their capacities to act.

Summary of Knowledge and Ethics

In this section I sought to outline my development of the notion of "knowledge" within the context of this art practice based research. My previous studies in astrophysics taught me various perspectives on knowledge ranging from a reflective perspective used in classical physics to a relational perspective used in modern physics. Through this research, I found resonance with Donna Haraway's concept of diffraction and Karen Barad's concept of onto-ethico-epistemology that frames knowledge as partial, provisional and relational. Through Barad I came to realize that ontology, epistemology and ethics all simultaneously co-constitute and therefore sought to determine the ethics of my research as I was defining the base of my perspective on knowledge. My research lead me to Tina Braidotti's nomadic ethics which serves as the base of the ethics of my research. With a diffractive, partial, and relational perspective on knowledge and grounding in nomadic ethics, I begin the next element of the process of this art based research.

HelloWorld

public class **HelloWorld** {

    public static void main(String[] arg){

    System.out.println("

I have written the text of this thesis so that it can be compiled in javac by saving each section as a public class and named as a .java file with the corresponding class name.[18] For example, this section can be compiled into a bytecode file and then executed in a terminal window by running:

> javac HelloWorld.java

> java HelloWorld

Rather than structuring my thesis in an arborescent manner with chapter titles and section numbers that imply the thesis should be read in a linear manner with a start and a finish, I have attempted to structure my thesis as if it were an object oriented computer program. Based

18   Javac is a Java computer program compiler that produces Java bytecode. Javac accepts "public classes" in source code which are similar to blueprints from which "objects" are created. I explain the concept of "objects" in detail further on.

on this structure, my thesis can actually be compiled by a computer.[19]

My use of object oriented programming (OOP) as a writing trope reflects how I believe that my thesis is designed to be "compiled" (as a computer program is compiled) rather than "read" in an arborescent manner. I believe that a "linear, codified, centred system" (Deleuze & Guattari 2007, 95) of reading does not suit my thesis because my research does not follow any linear progression from an origin to a conclusion. I view my thesis as being comprised of the dynamic connections between heterogeneous elements and hence can be read rhizomatically. In specific, I have structured my thesis in an analogous manner to OOP because I believe it is possible to frame object oriented computer programs (OOP) as dynamic assemblages of heterogeneous knowledges whose interactions in the memory of a computer constitute the cohesive whole of the program.[20] [21]

_____

19 I will only include the code elements in the braces ({}) for this section. Compiling this thesis would also require significant additional changes to handle special characters such as quotes. With the formatting changes, the text can be compiled and displayed.

20 I will expand upon my understanding of assemblages in other sections (objects) of this thesis.

21 Throughout this thesis I will talk about how I attempt to "frame" ideas by which I mean provide context and perspective.

A dynamic OOP compiler, such as Java, reads various parts of a program and it begins to establish the connections between the various objects where messages can potentially be sent between the objects. The objects remain unreferenced until the program is executed.[22] Even after the program has been deployed, Java can continue to read in new source code at anytime from anywhere including the terminal, a new file or even a data-structure constructed by the running of the program. (Yang 2006, 1) What this means is that in OOP, the program is not necessarily run in a strictly linear manner and it is possible to view the program as actually being comprised of a dynamic set of relations between the virtual components of the code. OOPs such as Java were designed so that no program can ever be "finished" as the program can always be added to or re-written in runtime.

Any individual component of an OOP does not have any inherent meaning without all of the other parts because the program's identity is comprised of how the parts connect

_____

22 A reference is a value used to interact with an object such as accessing fields, calling methods, or any other interaction I may desire. For example, myThesis. getPataphysics() would take the value of myThesis (a reference to the object myThesis) and call the function getPataphysics() on the object that reference refers to.

to each other. OOPs can be characterized as functioning in a rhizomatic and relational manner because when held in the active memory of a computer chip, each point of the computer program is in contact with every other point, and no location can be considered a beginning or an end.

I believe that it may be helpful to contrast OOP's rhizomatic treatment of knowledge with procedural computer programs that function with arborescent methods. One of the first arborescent knowledge management methods was developed in 1804 when Joseph Marie Jacquard created a loom that was controlled by a "chain of punch cards laced together in a sequence." (Geselowitz 2016, 1) The ability to control a sequence of operations with replaceable punch cards influenced the development of computer hardware, but also reflected an arborescent conceptualization of the interaction of knowledges. Jacquard's loom conceptually separated procedures (the movements of the loom controlled by the cards) and data (the threads). The procedures were hierarchical and strictly linear with no ability for any piece of data to affect the procedures or any other piece

of data. In the case of the loom, this meant that a piece of cloth that had been woven could not have any impact on the cards that contained the movements of the loom and all instructions had to occur in linear manner from start to conclusion. This procedural philosophy of computer programming is still used in many languages such as Fortran, COBOL, BASIC and Go. However, there are other paradigms of computer programming that are networked and non-hierarchical, such as object oriented programming.

Object oriented computer programming is an execution model for specific computer languages which is based in the concept of software "objects." They are called "objects" because when software objects were originally conceived, an analogy was made between one way that both software objects and real world objects could potentially be known through attributed characteristics. I understand that using the word "object" in any sense is worth several Ph.D.'s worth of analysis. I will attempt to limit the scope of my thesis by brutally using the concept of a "real world object" in its everyday usage: a material that may be perceived by

the senses. (Object n.d.) Software objects are not limited by the definition of a "real world object" and are not required to be material nor must they be able to be perceived by the senses.[23] So, while software objects and real world objects share the same word "object," they do not share the same definition of the word "object" and primarily share the potential to be attributed characteristics.

Every software object can be attributed a set of potential states and behaviours. The original analogy made by the creators of OOP reflected the potential to assign real world objects characteristics such as a state and a behaviour in a similar manner. For example, I can assign a bicycle the characteristics of a state that its gears are in and a method by which I could change the gears. I can then describe the specific state of a specific bicycle at a specific time by observing the current gear of the bicycle and I could observe various potential methods for changing that gear state. In this example, if my bicycle has 5 gears, then my method for changing gear states would reject any non-integer value and any value that is less than 1 or greater

23   I will expand upon how I believe real world objects can be defined as a material that may be perceived by the senses while software objects exist as virtual fields of desire further in this section.

than 5. A software object is similar in that it can store its states in fields (usually called variables) and can potentially expose its behaviour through methods (usually called functions).

Programmers design software objects so that they can potentially be attributed a set of states and behaviours. However, these attributes are not necessarily ever referenced and the object can remain in a state of potential indefinitely. This is different from a real world object such as a bicycle that must be in one gear state even if the state is zero because the chain has fallen off. In OOP, an instance of an object can be created by writing something such as "Thesis myThesis = new Thesis();" and the program can compile and run without myThesis ever being referenced. The object can be referenced by another object in the program by sending a message. The dynamic messages sent between objects constitute a program, not the objects themselves as the objects exist as potentials.

I feel it may be important to note that this is not the only method of assigning characteristics to real world objects;

it was just one method that the creators of the concept of OOP used as an analogy that now has a historical legacy in the term software "object." The notion that software objects reflect a method of knowing real world objects by assigning them characteristics potentially limits both software objects and real world objects. There may be a danger in continuing to compare real world objects and software objects based on the origin of the term software "object." I do not want the potentials of software objects and other digital materials to be limited by any preconceived restrictions that may be ascribed to real world objects. Digital materials such as software objects relate to each other and the real world in ways that can potentially exceed the capabilities of real world objects due to the attributes of their interactions such as speed, scale and agency. I do not believe the limitations of software object relations are currently known. In fact, I do not believe that the underlying methods that may be required to understand how software objects relate have been established. Subsequently, from this point further, I will use the word "object" in reference to software objects, but I am using the term to point toward digital materials that retain elements

of unknowability that should not be excluded by the origin of their name.

In OOP, computer programs are designed by creating objects that interact with one another. An object in OOP defines a potential set of variables and functions which may or may not be used when the program is compiled. The variables and functions that are used when the program runs are dynamic and dependant on the interactions with all of the other objects that are used by the program. I believe that by dynamically holding the potential knowledges of states and behaviours in one unit, I can frame software objects as embodying runtime virtuality through their modular simulacra of "real world objects."[24] The fact that the variables and functions of an object are virtual can be viewed as exposing how when writing executable text, the desiring body of a programmer presupposes a gap between the signified of runtime variables and the signifier of raw data.[25] I believe

24   I am using the term "virtual" as Deleuze does when he wrote, "The virtual is opposed not to the real but to the actual." (Deleuze, 2014, p. 208)

25   What I mean by this is that programmers write objects knowing that the variables will remain unfilled until they are provided with data during execution. This means that programmers write objects with the desire for the variables and functions to be filled and executed, but programmers know that it is always possible that they will not. If a programmer did not desire for variables and functions to be filled and executed, they would not write them into the code.

that because the variables and functions in OOP can only be potentially filled or used when the program runs, the potential variables and functions can be viewed as virtual fields of non-human desire.[26] The executable text of a computer program becomes a mirror that confronts the desiring body of the programmer and the desiring "body without organs" of the complied program.[27] From this perspective, I believe it is possible to reframe "object oriented programming" as "desire oriented programming" (Brigman 2008, 1) as the philosophical structures behind OOP seem to be driven by notions of desire. Through the lens of desire oriented programming, I believe that programmers construct virtual fields of desire called objects. From the perspective of desire oriented programming, I believe that I can frame OOP computer programs as mappings of human and non-human desire.

One example of how I believe computer programs can map human and non-human desire can be seen in the Touch ID

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26   What I mean by this is that the objects in OOP have been written so that they are unstable before their variables and functions are assigned. Subsequently, objects actively seek out having their variables and functions assigned and in that sense, software objects exhibit non-human desire.

27   I am using the term "body without organs" in a manner similar to Deleuze and Guattari when they ask, "What is the body without organs of a book?" (Deleuze & Guattari, 2007, p. 4)
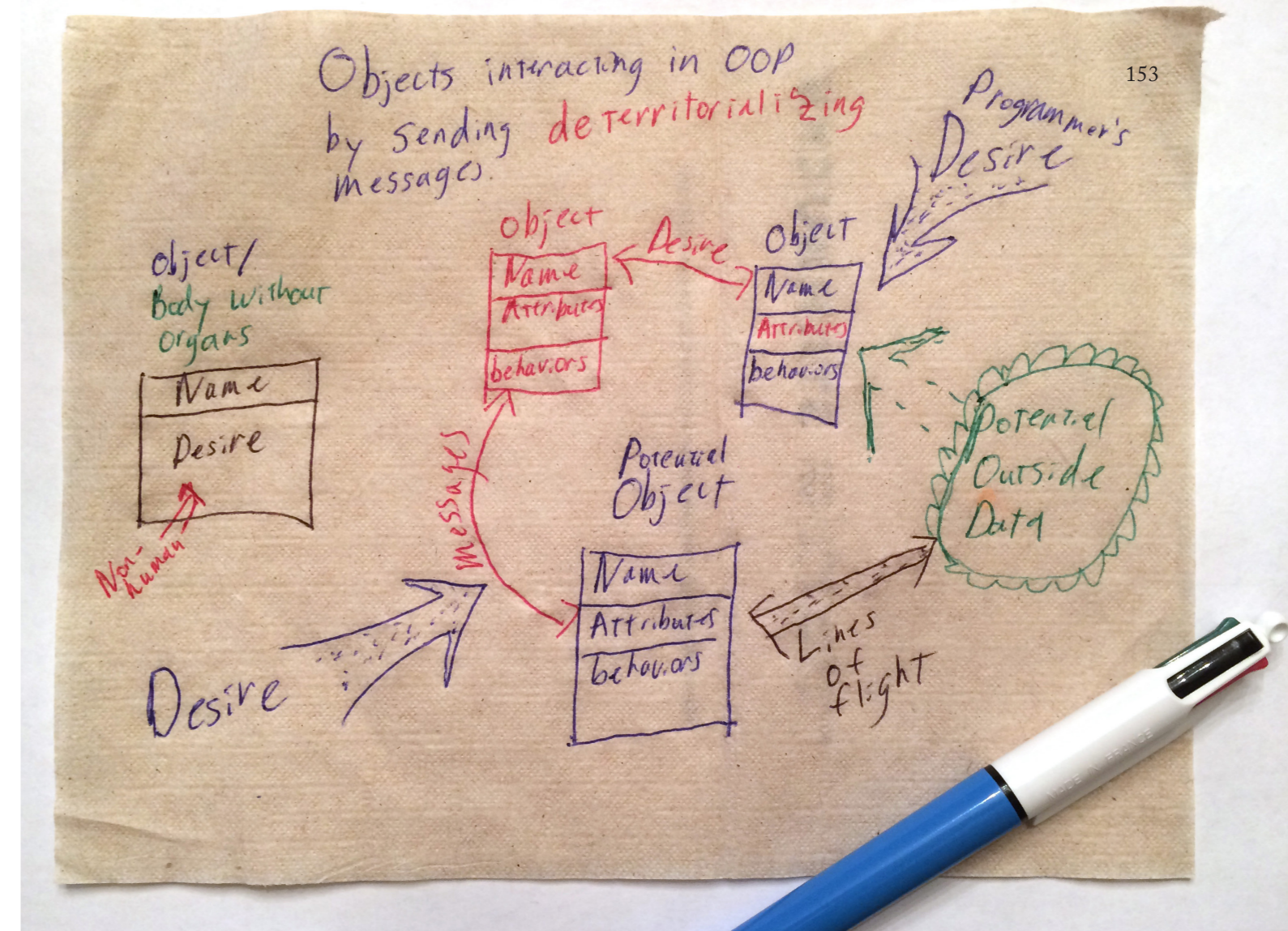
Figure 14:   *Diagram of Desire Oriented Programming*, Drawing on Starbucks napkin, 2018

read a scan of a finger print and attempt to match the variables referenced in the objects to ones that have been previously been assigned data from my finger print. Before they are filled, these objects hold an infinite and virtual field of desire. In a constant state of desire, the program sits and waits for my touch. Only my touch can match the variables in a manner that allows the non-human virtual field of desire to collapse. Any other touch and the program

instantly rejects the new variables and returns to a state of desiring. In this way, the non-human desire of the program and my desire overlap at the point of my touch.

In this overlap of human and non-human desire in a finger print id program, it may appear as if it is the human desire that is the driver of the interactions. After all, if I did not desire to unlock my phone, the software desire would remain perpetually un-collapsed. However, as anyone wearing gloves in the cold or has wet hands while trying to unlock their phone will attest, it is in fact the person who alters their behaviour to meet the desire of the non-human program. Humans will take their gloves off, dry their hands, or any number of behavioural changes to meet the desire of the non-human software objects that desire a specific interaction with the human's physical body. I believe the software objects dictate more about the relations and are programming significant parts of human behaviour. I believe finger print id programs can be seen as an example of how software objects are developing new systems of agency through their non-human desire. Through the lens of desire oriented programming, I believe

I can frame digital materials as utilizing productive non-human desire through a "desiring-machine" (Deleuze & Guattari 2008, 28) which creates novel realities by forming assemblages of heterogeneous component parts including new potential agencies.

Digital materials such as software objects are not defined by their material constraints. Currently, most software objects are comprised of electrostatic charges held on silicon transistors, but that is not the only way to hold software. There are computers that use, "enzymes and DNA molecules instead of silicon microchips." (Lovgren 2003, 1) Other materials that can run software include carbon nanotubes, spintronics that uses electron spin, and quantum computing that uses qubits that are generally composed of photons. (Shankland 2015, 1) Qubits challenge the notion of calling software a "digital" material because they are not comprised of ones or zeros, but can be made of ones and zeros simultaneously. The hardware of computing may be limited by material constraint, but software is not limited in any material way because it is relational.

In a significant departure from procedural programs, objects in OOP possess the ability to alter the variables and functions of other objects as well as themselves in realtime. Because the variables and functions in OOP are both designed to be potentially filled or used when the program runs, they can be viewed as virtual fields of non-human desire existing in a body without organs. When an OOP programs runs, the initial state of all of the objects is similar to an empty body without organs where "No organ is constant as regards either function or position." (Burroughs 2008, 9) As the program begins to run, the objects can self-organize and resist a regime of integration as they begin interacting in the memory of the computer. Proof of the resistance in the formation of an "organism" can be seen in the use of polymorphism in OOP.

Polymorphism is the ability in OOP to assign a different meaning or usage to any element of a program such as a variable, function or object depending on context in realtime. For example in OOP, a variable called "USERID" can hold either integers such as a student ID number and search integers or hold a string of characters and search

a list of names. The program can even be written so that if the user enters something other than an integer or a character (perhaps new knowledge to the program such as a fingerprint or facial recognition or a gesture on a touch screen, etc.), another object can alter the original code of the object to include the new heterogeneous element and then search for that new type of knowledge. I believe that I can frame an OOP program as if it were a body without organs because any object can be assigned any characteristic and even after being assigned a characteristic, that characteristic can be fundamentally altered. This would be as if the strings on Joseph Marie Jacquard's loom could alter the punch cards to make the punch cards into bicycles and the whole "loom" could ride away through the streets of Paris. Through this lens, I believe that OOP privileges the form-generating capacities within computer code that does not require organization into a completed "organism" (program) by a transcendent authority.

I believe that the ability for OOP to alter objects in runtime in the memory of a computer chip may expose that the philosophical substrate of the identity of a

software object is relational. I believe that networked, non-hierarchical software architectures such as OOP function in a rhizomatic manner with no individual component of the program even possessing the capability of holding a permanent, non-relational identity.

I view my thesis in a similar rhizomatic manner as an OOP. Instead of chapter titles and section numbers, I have written the distinct sections of my thesis as Java classes. The individual classes can be read and complied individually, but the thesis is comprised of the dynamic relations between the heterogeneous elements. Each individual section can function on its own, but my thesis is not necessarily derived only through the linear reading of the individual sections in succession. Continuing with my analogy to objects in OOP, I believe I can also view each section as a body without organs constituted by virtual fields and that the relationship between the sections maps my desire.

Subsequently, I have labelled the sections of this thesis as I would label classes in Java. With a small amount of coding,

each section can be complied by javac.

```
            ");
        }
    }
```

Figure 15:   (opposite) *Hand Written Program in Found Ledger*, Ink on Paper, 2018

Steve Aishman
Royal College of Art
April 21, 2018

Exceptions

Dear Tom,

I am writing in response to our mutual friend. In Dickens' Our Mutual
Friend (1864-65), Mrs. Higden says, "Sloppy is a beautiful reader of a
newspaper. He do the Police in different voices." (Dickens, 2007, p. 243)
Sometimes different voices are the same voice.

// Begin poem:

Non-GMO's for responsible breeding
Of Whole Foods' jerks juggling
Lemons the size of pears the size
Of cantaloupes. My robots fight fruits
Of isotope's labours. My neighbours by far
Think everyone's cheating Kendrick Lamar.

Copy replace taste of malt teasing's
Bitter forgiveness. Eliot's E.T.
Knew aliens better than Rhesus pieces.
Blue wavelengths lights up my brain
Leaving eyes burning; a waste land of ash
Women eat software and software eats cash.

Here is an outline of some OOP code that could handle exceptions:

```
for(File thesis : theses){
    try{
        <normalized process of reading a thesis>
    }
    catch(NumberFormatException e){
        thesisExceptions.put(pataphysicsName, e);
    }
    catch(NullPointerException e){
        thesisExceptions.put(pataphysicsName, e)
    }
}
```

What this code demonstrates is that exceptions are objects. I think it is
slightly incorrect to claim that exceptions are treated as objects in OOP
just like any other computational object. Rather, any object in OOP that is
referenced is an exception because the virtual is the normalized state of
objects. OOP is a language of exceptions.

It may appear that OOP was designed to handle exceptions in order to allow
programs to continue running even if they encountered a piece of
heterogenous data. If the program did not have a system for handling
exceptions, the program may cease functioning and crash and/or cause an
error. However, I believe OOP reflects a method of creating that treats
everything as an exception. OOP allows for the creation of an assemblage no
matter how heterogeneous the elements appear.
There is a computational aesthetic to the exception. Rejection of dreams
As matter. I'm not impressed
That my coffee has GPS. My mouth
Is pulling an airplane in tow.
Eeny, meeny, miny, moe.

// End Poem

More soon,
Steve");
    }
}

Object of Destruction (Recreated by Steve Aishman, 2018)

"Cut out the eye from a photograph of one who has been loved but is seen no more. Attach the eye to the pendulum of a metronome and regulate the weight to suit the tempo desired. Keep going to the limit of endurance. With a hammer well-aimed, try to destroy the whole at a single blow." (Man Ray 1932, 55)

Figure 16: *Recreation of Object of Destruction*, Digital image and text, 2018

MethodAsMedium

Digital materials, such as objects in OOP, are materials that can be creatively used as an artistic medium similar to physical materials. In OOP, objects can be assemblages of data and methods. If methods can be objects and objects can be an artistic medium, can a method be treated as an artistic medium?[28] If digital methods can be treated as an artistic medium, what about other methods? Is this Ph.D. an artwork created from the medium of research methods? I believe that methods are a medium that can be creatively manipulated, just as any other medium can be. Man Ray's *Object to Be Destroyed* (1923) is an example of where a method is an artwork. The first iteration of *Object to Be Destroyed* was an assemblage comprised of a metronome with a photograph of an eye attached to it. Man Ray said, "A painter needs an audience, so I also clipped a photo of an eye to the metronome's swinging arm to create the illusion of being watched as I painted." (Schwarz 1977, 206) The second version of *Object to Be Destroyed* was made in 1932, but in this case, the artwork was a set of

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28
Methods ⊆ Objects ; Objects ⊆ Artistic Methods ∴ Methods ⊆ Artistic Methods

instructions and an illustration that said,

> Cut out the eye from a photograph of one who has been loved but is seen no more. Attach the eye to the pendulum of a metronome and regulate the weight to suit the tempo desired. Keep going to the limit of endurance. With a hammer well-aimed, try to destroy the whole at a single blow. (Man Ray 1932, 55)

My argument is that in the second version of *Object to Be Destroyed,* the artwork is the written set of instructions that Man Ray describes. The procedure that begins, "Cut out the eye ..." is the artwork. The set of instructions is the artwork and it exists as a virtual potential, not an actuality. From this perspective, Man Ray has made a method an artwork and the method Man Ray describes exists as a virtual field of potential. In specific, *Object to Be Destroyed* exists in a virtual field of desire. Man Ray's emphasis on using a photograph of a loved one who is seen no more, speaks to notions of longing and desire. This feeling of desire is both constructive and destructive because the act of smashing the metronome is a destructive act that simultaneously constructs an artwork. If the method described by Man Ray is actually manifested in reality, the object and resultant performance is not actually *Object to Be Destroyed.* Rather a new, third artwork is created that does not exist as a virtual field of desire, but the new art work is

a realized assemblage and performance that is devoid of the potential of what it could have become. This is because the method that Man Ray describes has an infinite number of potential outcomes. Once the method has been followed, the resultant artwork can only exist in one state, the actual, not the virtual. Man Ray's second version of *Object to Be Destroyed* is a virtual artwork. Anything that is actualized as a result of following the method is a different artwork.

After one of the assembled sculptures was stolen and shot, Man Ray made 100 physical manifestations of the artwork that he named *Indestructible Object* (1964).[29] (Time 1957, 55) I believe that in giving the subsequent physical objects a completely different name, Man Ray was alluding to the notion that they are different artworks and that *Object to Be Destroyed* was in fact indestructible because the medium is a method. For me, *Object to Be Destroyed* demonstrates how methods are an artistic medium and how methods are objects of potential.

There is a legacy to notion that method is an artistic

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29   I think it is important that one version of *Object to Be Destroyed* was shot and not smashed with a hammer is relevant because the artwork was never completely realized. A different method was followed, which means it was a different object.

medium as seen in contemporary artworks such as Peter Liversridge's *The Rules of the Library* (2013).[30] For this artwork, Liversridge posted a billboard of the rules of behaviour for the Drawing Room Library in London. The rules include the general rules that might be posted in any library like, "6. `Phones/laptops must be kept on silent.`" as well as rules like, "`Even if you have right of way, use common sense to avoid collisions. NO NUDGING.`" The text is written in a typewriter font that I have attempted to emulate. While the billboard itself is physical artwork that is for sale, the method of behaviour described in the billboard is also an artwork. The behaviour of a reader after reading the billboard is a space of potential as the reader can choose to perform the methods or not.

Carey Young's *Declared Void II* (2013)[31] is another contemporary example of method as artwork. Young's piece is a contract written on a wall that states that anyone entering a performative space delineated by a black vinyl box adhered to the gallery walls and floor is an American

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citizen. While the artwork deals with notions of authority and legality, I am interested in how the instructions on the wall become a space of potential as the reader can enter or not enter the space. The artwork is also a space of potential as the following the instructions may or may not have impact on the performer. I am an American citizen, so entering the space does not affect me, either in my contract with the artist or any other authority. Anyone without American citizenship has the potential for a different impact with authority. Perhaps the contact is a fantasy contract between the artist and the performer, or perhaps it could be recognized by an exterior authority figure. For me, the interesting aspect is how the method is an artistic medium that functions as a field of potential.

Throughout this thesis, I will treat methods as an artistic medium and fields of virtual potential as an aesthetic category.[32]

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30   *The Rules of the Library* available to see here. https://drawingroom.org.uk/news/the-rules-of-the-library-by-peter-liversidge

31   *Declared Void II* available to see here. http://www.careyyoung.com/works#/declared-void-ii/

32   I will explain more about my notion of fields of virtual potential as aesthetic category in "ThePossibleAsAestheticCategory" on page 273. For now I will simply state that I am referencing the ability to treat "the possible as aesthetic category." (Deleuze & Guattari 2011, 177)

Figure 17:   (next page) Some Artistic Mediums, Digital Image of Melring Ice with Text, 208

*Some Artistic Mediums

Performance
- Movement
- Embodiment
- Etc.

Painting
- Oil
- Watercolour
- Spray
- Food Colouring
- Coffee
- Etc.

Drawing
- Acrylic paint
- Airbrush
- Chalk
- Charcoal
- Conté
- Crayon
- Oil pastel
- Soft pastel
- Etc.

Digital Materials
- Code
- Objects
- Software
- Robots
- Tacit Electronic Pulses
- Bio-Feedback
- Etc.

Method for making this mind map:
1) Get everyday ice cube tray
2) Fill with water and food colouring
3) Freeze over night
4) Put ice cubes on watercolour paper
5) Wait 'til the cubes melt some
6) Photograph the paper
7) Import into Illustrator
8) Write on top with digital tools
9) Save image as .ai file
10) Place in InDesign program
11) Clean up mess

Printmaking
- Aquatint
- Computer printing
    - Dye-sublimation printer
    - Inkjet printer
    - Laser printer
    - Solid ink printer
    - Thermal printer
- Embossing
- Engraving
- Etching
- Intaglio (printmaking)
- Etc.

Sculpture
- Clay
- Marble
- Human Body
- Food
- Digital Modeling
- Etc.
-

Food
- Edible Paper
- Chicken
- Food Colouring
- Drinks
- Etc.

Methods
- Instructions
- Code
- Choreography
- User Guides
- Etc.

Photography
- Digital image sensor
- Photographic film
- Potassium dichromate
- Potassium ferricyanide
- Silver nitrate
- Etc.
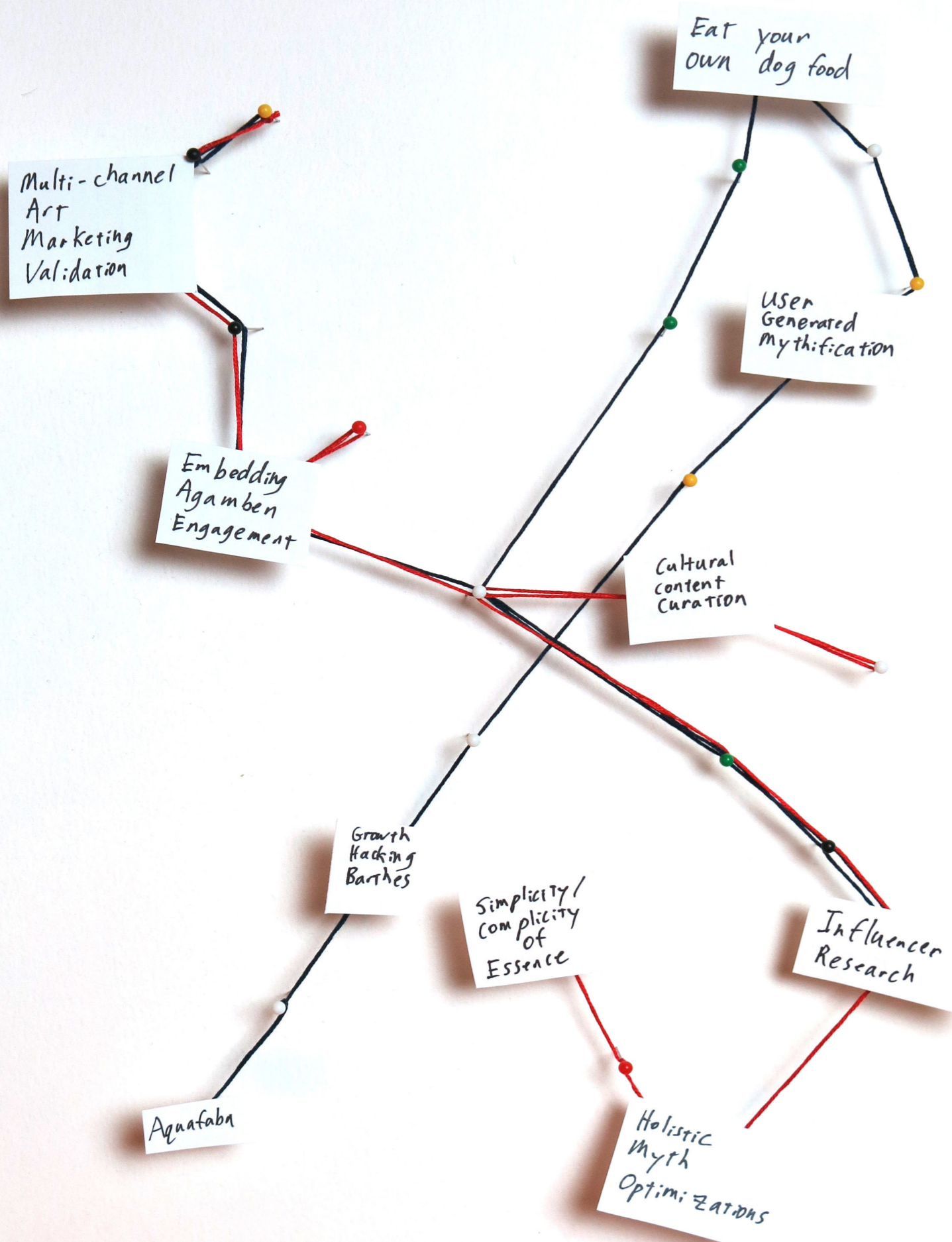
Myths

Throughout this thesis, I use general words such as "research", "science", "art", "valid", "utility", etc. to describe particular social concepts.[33] In these cases, I am viewing these concepts through Barthes' lens of the myth. Building on Saussure's system of analysis of signs, concepts such as "science" are treated as cultural phenomena comprised of signifiers, signifieds and signs that are both created from and create ideology. Throughout my thesis, I treat a concept such as "science" as a myth that, "abolishes the complexity of human acts, it gives them the simplicity of essences." (Barthes 1970, 143) My primary investigation in this section is not an analysis of the reasons why these myths have been formed, nor an analysis of the repercussions of the naturalization of these myths. Barthes states, "the best weapon against myth is perhaps to mythify it in its turn, and to produce an artificial myth: and this reconstituted myth will in fact be a mythology" (Barthes 1970, 135) In this way, I intend to deploy a set of second-

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33   In this way, I am aware of using particular "keywords" as Raymond Williams wrote about in Keywords (1976). For me, I am using "keywords" where the meaning of the words exceeds their dictionary definitions as these words exist at the intersection of many interlocking contemporary sensibilities whose interaction remains unresolved across a range of fields.

Figure 18:   (opposite) *Mythical Mind Mapping (M3)*, String and Map Pins, 2018

order myths regarding the notion of research that can open the possibility of re-appropriating the origin of research in order to leave a sets of myths as unmasked deceptive narratives.[34]

I am aware that constructing second-order myths is not the only way to work with myths. For example, in *Homo Sacer*, I interpret Agamben as choosing to construct a counter-narrative rather than a second-order myth. I believe he chose to de-mythify Western politics through the construction of a counter-narrative that unveiled the myths that sustain sovereignty. (Agamben 1998, 11) I interpret Agamben as framing the concept of the myth as a narrative of deception that treats the contingent as necessary. However, I believe that his counter-narrative requires treating his logic regarding "biopolitical models of power" as necessary. (Agamben 1998, 11) In this way, I believe he has actually constructed a parallel myth where his logic of biopolitical sovereignty becomes naturalized. It appears to me that attempts to de-mythify constitute another separate

set of myths, and remain enveloped in Barthes' myth of myths. However, Agamben's structure of myth making through counter-narrative rather than the construction of a second-order myth is also promising. In this way, I may also use elements of his counter-narrative method to attempt to construct a parallel myth about "research" that is not centrally located around the essence of validity or commensurability.

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34   I view this process as if I were a magician who reveals the trick before it is performed. In which case, the stage show is less about providing an audience with the joy of being deceived and more about sharing with an audience about how to engineer deception itself.

MoreNomadicThinking

In *A Thousand Plateaus* (1987), Deleuze and Guattari state that a "rhizome has no beginning or end; it is always in the middle, between things, interbeing, intermezzo" (Deleuze & Guattari 2007, 25) They also state, "The life of the nomad is the intermezzo," (Deleuze & Guattari 2007, 380) meaning it is a way of being that is characterized by change, in the middle, and unencumbered by systems of organization. *A Thousand Plateaus* is an example of a book that utilizes a rhizomatic method of construction and "nomadic thinking". As Brian Massumi wrote in his foreword, the book was, "conceived as an open system. It does not pretend to have the final word." (Deleuze & Guattari 2007, xiv) Massumi goes on to suggest that the book should be "played" as if it were a record. He says, "You don't approach a record as a closed book that you have to take or leave … You find yourself humming them under your breath as you go about your everyday business." (Deleuze & Guattari 2007, xiv) In this way, I believe that Massumi is recommending a reading practice for *A Thousand Plateaus* that reconciles a potentially arcane study

Figure 19:   (opposite) *Mind Map of Coffee While Writing Thesis,* Coffee on Paper, 2018

with daily life through the logic of everyday affect.

With this frame I ask myself: can my research function within the same reading practice Massumi recommends: an open system that must be "played"? To this end, I have attempted to employ lucid expositional writing comprised of "nomadic thoughts" as a method of rhizomatic construction. These expositional writings may appear to be hardened statements, but I hope they can be read as hesitancies.[35]

35   An example by analogy of how I use expositional writings could be a description of the method I use to listen to David Bowie's *The Rise and Fall of Ziggy Stardust and the Spiders from Mars* (1972). I would feel comfortable making a statement that "Starman" is track #4. I do not mean to imply that you have to listen to the track in position #4 or that it is the fourth best song on the album or anything else. For me, all statements are accompanied by implied hesitancy and provisionality. I only state "Starman" is track #4 so I can explain my listening method where I like to skip track #2 "Soul Love." My iPod Shuffle (circa 2005) plays albums in order, so I need to know track positions in a linear order even though I don't like listening to them in that method. Sharing my method of how I view the album's organization reveals my thinking, my method, my technology and provides an entrance into my research. Similarly, in the next section I state that I use models in my research. I do not mean to imply that I use all types of models or that I have invented the concept of using models in arts research or that I have exhaustively explored all uses of models or that I am the only artist to use models or anything else. I am just saying I use models and I am implying hesitancy and provisionality. I am providing this information to share more of my thoughts on my method in order to reveal potential entrances into the research.

MoreModelsAndResonance

As I have already stated, throughout my thesis, I utilize a process of modelling thoughts. The modelling process I use is frequently accompanied by diagrams or equations. I recognize that modelling thoughts is only one process of thinking and that once constructed, representations of thought can be quite inhibiting. However, I use the process of modelling only when it aides me in organizing my thoughts and I frequently abandon the models when they become constraining. My goal is not to make my thoughts fit a model, but rather to use modelling as a process that can reveal relationships that might otherwise go unnoticed. Subsequently, my thesis appears to be populated by half-finished mental models. This is because in many cases I have found my writing to function best as a process of model building.

An example, of one of my models is depicted as a diagram I model my research as having found resonances with

various thinkers (writers, philosophers, artists, etc.) I use a process of framing various theories developed by others and then explaining how my research has resonance with these specific theories. The most prominent theories I use revolve around the concepts of assemblage, affect, everyday life, non-representational theory, digital practice, 'pataphysics and quantum field theory. I do not view these theories as isolated but model the interactions of these theories and additional influences on my thoughts in an assemblage field of interference. I think it is important to explain exactly how I see this model of an assemblage field of interference in order to provide insight into my research methods.[36]

In physics, an interference pattern occurs when there is a superposition of waves. The interactions of the waves cohere either because they emanate from a similar source or because they have similar frequencies. It is also possible for the amplitudes of the waves to cancel each other out, producing an active space of interaction that manifests

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36   I understand that using the term "assemblage" requires more elaboration that I will explain in depth in the section
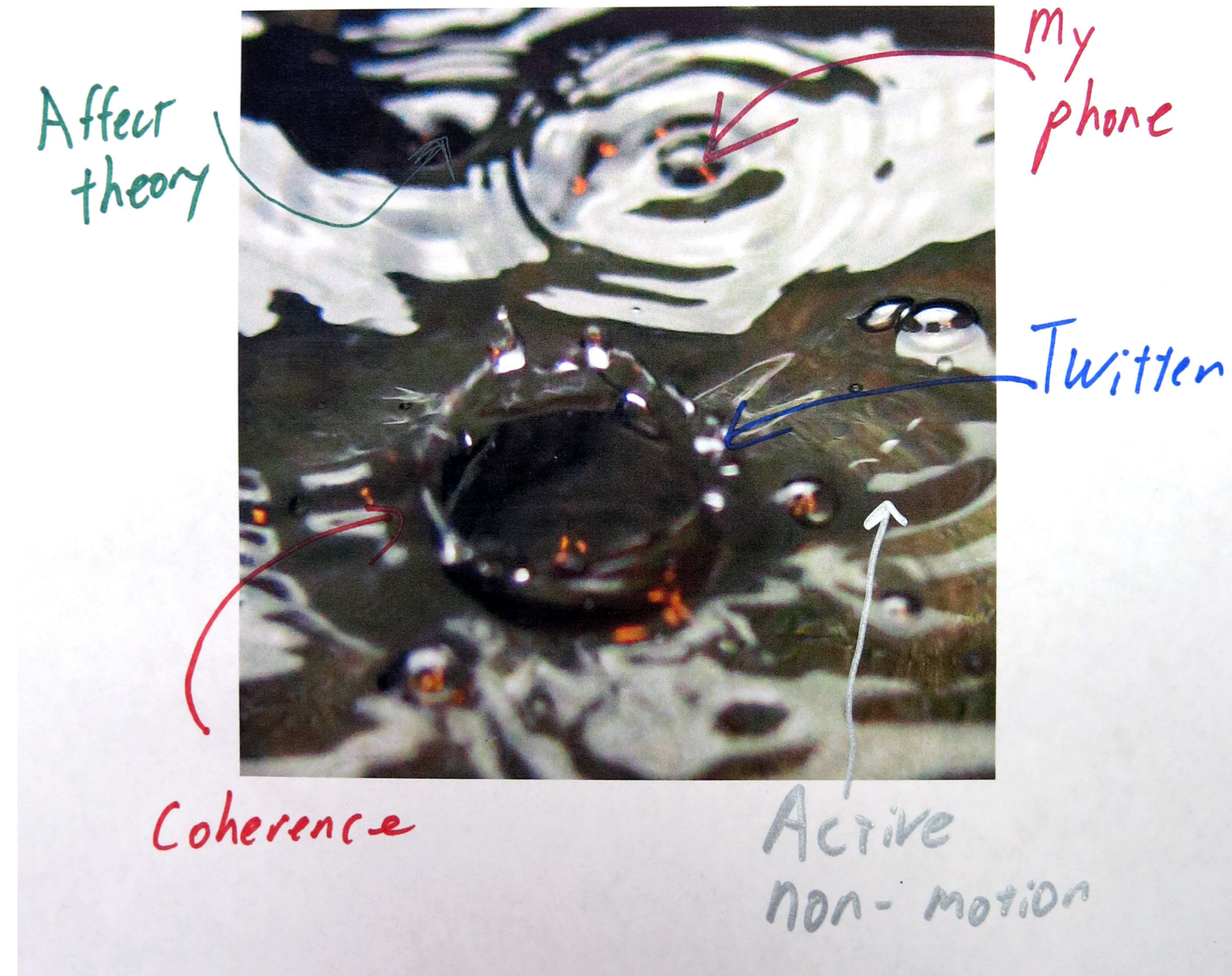
Figure 20:   *Diagram of an example of interference model of research shot in one of my spaghetti pots*, Ink on Paper, 2018

as non-motion.[37] The end result is a complex pattern of

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37   The position of active non-motion in an interference field is non-trivial. It is entirely possible for two nodes of knowledge to be interacting in a manner that appears to render both nodes mute and the field inactive. In fact, the two nodes have exactly opposing resonances and the apparent non-knowledge that is manifested is an example of absolute discord that manifests as perfect tranquillity. From this perspective, putting two theories in relationship with one another and getting a result of non-motion is incredibly valuable because it does not imply that they have no relation to one another. In fact it allows for the realization that they are perfectly paired to in-cohere each other. Incoherence in this model does not imply non-sense, but a space of active knowledge production. It is only through the spaces of active incoherence in an interference field that the notion of resonance manifests.

amplitudes in which the initial amplitudes manifested by emanative nodes are added and subtracted in multiple ways. "Figure 20: Diagram of an example of interference model of research shot in one of my spaghetti pots, Ink on Paper, 2018" on page 183 is an example of how I view an interference model of research. In this example, affect theory, Twitter and my phone are all seen in relation to one another and function as an assemblage. The waves can cohere to produce a wave of larger amplitude than any individual node, the waves can cancel each other out to producing an active area of non-motion or the waves can interact to produce something in-between zero and maximum amplitude. What is important is that knowledge of any one of the nodes is not contained within the node, but is a result of the continually changing relationship with waves from the other nodes that can only be seen in the field surrounding the nodes. This perspective problematizes attributing specific concepts to individual fields of study as all concepts are continually "becoming" in the field of interference.[38] It is also important to note that in this specific diagram, I view my research as constituted through

the interference field of three different types of nodes of knowledge (and more that go unseen), but only the "affect theory" node is privileged to be included in the written component of my thesis.

Subsequently, the traditional concept of a literature review is problematic for my research because my research does not view knowledge as being held within any of the heterogeneous elements of the assemblage I have described above. In the example above, my phone and Twitter function as nodes in the interference assemblage that impact the knowledge produced in the field, but these knowledge nodes are not literature and the knowledge they produce is not readily summarized linguistically. How would a literature review contain the embodied knowledge of how my hands use my phone? I may be able to describe the knowledge through linguistic representations, but that is not the wave impacting on my understanding of affect conveyed through Twitter, it is a description of the wave.

I should note that I differentiate between coherence and resonance. Coherence is the measure of the degree of unity

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38   Deleuze addresses this when he states that a concept, "does not move solely within itself (philosophical comprehension), it also moves in things and in us." (Deleuze, 1995, p. 164)

within a particular system while resonance is the measure
of how two or more systems are vibrating together into a
coherent whole. Subsequently, I will refer to my research
finding resonance with particular thinkers or ideas in order
to form a coherent thesis.

Figure 21:   *In the PhD Shop, (*Recreation of Fischli and Weiss's *In the Carpet Shop* (1979) from *The Sausage Photographs)*, Sausage Photograph, 2018

MethodsandFischliandWeiss

I have found a great deal of resonance with Fischli and Weiss's methods. There has been significant writing dedicated to providing analysis and insight into the intersection of the everyday and humour employed in Fischli and Weiss's artwork. I have appreciated how their humour has been documented and framed in books such as *Peter Fischli David Weiss: How to Work Better* (2006) by Nancy Spector and Nat Trotman or Jeremy Millar's *Fischli and Weiss: The Way Things Go* (2007), so I will not spend much of my thesis attempting to describe this well covered ground. When speaking about Fischli and Weiss, Jonathan Watkins has said, "They had a profound influence on the way artists and curators saw art in relation to everyday life." (Watkins in Millar 2012, 1) While Fischli and Weiss's impact on how people see art is undeniably true, I am more interested in the exploring and delineating some of the art research methods that I see Fischli and Weiss employing throughout their body of artwork.

In an interview with Artspace magazine about their

artwork *Suddenly this Overview* (1981/2006), Weiss said, "The intention was to accumulate various important and unimportant events in the history of mankind and of the planet." (Artspace Editors 2016, 1) [39] I am interested in how this quote exposes a bit of the method of how Fischli and Weiss begin their artwork. They did not say that the intention of the artwork was to make something absurd or funny. The say that they began with a serious intention, but have taken on something, "ultimately impossible to achieve." (Spector in Zohn 2017, 1) It is in their method that they develop from a serious beginning to "a serious sense of the absurd." (Aesthetica 2013, 1)

When describing how they began their artwork, *The Sausage Photographs* (1979), Fischli has said they began by saying, "Okay, let's do this. Let's play with food." (Fischli in Guyton, 2015, 1) Elements of play can be found throughout Fischli and Weiss's artwork. Fischli has said, "When you look carefully at children playing, they are actually very serious about play." (Fischli in Guyton, 2015, 1)

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39   A detail of Suddenly this Overview is available to see here. https://www.guggenheim.org/audio/track/peter-fischli-and-david-weiss-suddenly-this-overview-1981

When discussing technical apparatuses in *Towards a Philosophy of Photography* (1990), Flusser discusses how play can be a powerful method of preventing users from becoming subsumed in the technical apparatuses they are using. Flusser states that he believes society in the 1980s is at the cusp of developing into a society that is a "centrally programmed, totalitarian society of image receivers and image administrators" or a utopian society "of image producers and image collectors". (Flusser 2011, 4) He offers the ability to play as the means of escaping the encoding mechanisms of the apparatuses that now constitute society. "Programs are toys that, if one plays them long enough, by necessity realize all their combination-possibilities by coincidence, even the most unlikely." (Flusser 2005, 24) From this perspective, users can find applications of an apparatus' programing that lay undiscovered or were not intended by playing with the programing. Avoiding becoming a function of an apparatus also requires deep understanding of the language of the codes used by each element of society. "We can only come to master such a life when we have such great control over the rules of play that we can change them." (Flusser, 1997,

2003) is a series of projections of hundreds of questions.[40] The installation also resulted in the book *Will Happiness Find Me?* (2003).[41] Fischli and Weiss's lists of hundreds of everyday, banal questions. Can a method of asking questions constitute fully realized artworks? Can questions constitute new knowledge?

I am also interested in the amateur aesthetic employed by Fischli and Weiss. *The Sausage Photographs* was Fischli and Weiss's first collaborative project and when titled in German is *Die Wurst Fotos*. The "wurst" in the title sounds like the verb wursteln which is German slang for working on something in an amateur manner. The questions written in *Will Happiness Find Me?* are all handwritten. Weiss said, "The handwriting emphasizes the transience; it refers to the intimate and private, to taking personal notes, especially in cases where the questions are phrased in the first person." (Weiss in Artspace Editors 2016, 1) Of course, Fischli and Weiss are not the only artists to purposely employ an amateur aesthetic. For example, Hans-

40   *Questions* is available to see here. https://www.tate.org.uk/whats-on/tate-modern/exhibition/fischli-weiss/fischli-weiss-room-guide-room-1/fischli-weiss-3

41   *Will Happiness Find Me?* is available here. https://www.amazon.co.uk/Will-Happiness-Find-Peter-Fischli/dp/3883757233

Figure 22:   (opposite) *Questions from #deepthoughts on Twitter (*recreation of Fischli and Weiss's *Will Happiness Find Me?* 2003*)*, Post-it notes on my refrigerator, 2018

Peter Feldmann's exhibition *An Art Exhibition* at Museo Reina Sofia (2010-2011) uses "trivial elements of everyday life" to "challenge institutional authority". (Martins 2015, 1)[42] Fischli and Weiss's amateur aesthetic has many functions in their work including allowing their work the space to challenge, connect, play and to fail.

Fischli says, "There's this failure in *Overview*—the title describes the opposite of what is actually the case: the confusion and the swamp and the simultaneity of these things" (Artspace Editors 2016, 1) Fischli and Weiss' use of failure to create art is a tactic that they and many other artists employ. John Baldessari's *Throwing Three Balls In The Air To Get A Straight Line* (1973) depicts repeated non-achievement.[43] I view Baldessari's repetition in this case is a Deleuzian practice of repetition. Baldessari is not just doing things over and over again in Sisyphean repetition that constitutes an eternal torture of failure, but rather his repetition as an eternal point of departure into a virtual field of potential. How come no one ever says,

"Look, I made a failure!" with the joy of accessing a field of virtual potential? Bruce Nauman's *Failing to Levitate in the Studio* (1966) is another example of failure, however Nauman's fails at a task that requires a different universe with different governing rules in order to succeed where Baldessari's failures do not require a different universe.[44]

I am intrigued by Fischli and Weiss' ability to use the movement to alternate universes as a means of creating artwork. When talking about their artwork *Equilibres (A Quiet Afternoon)* (1984–86), Fischli described how their artwork moves everyday items into a different universe.[45] He said, "It's like it goes into a parallel universe. That's it. Liberation by misusing." (Fischli in Guyton, 2015, 1) It is this method that Fischli and Weiss utilize that I am most interested in. This method begins with one intention, but through play, mistakes and failures arrives at a different universe. This different universe can be filled with contradictions and has the space to become absurd.

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42   *An Art Exhibition* is available to see here. http://www.museoreinasofia.es/en/exhibitions/hans-peter-feldmann-art-exhibition

43   *Throwing Three Balls In The Air To Get A Straight Line* is available here. http://www.mocp.org/detail.php?type=related&kv=3219&t=people

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44   *Failing to Levitate in the Studio* is available to see here. https://www.stedelijk.nl/en/collection/96022-bruce-nauman-failing-to-levitate-in-the-studio?page=2

45   Available here. https://www.matthewmarks.com/new-york/exhibitions/2007-04-27_peter-fischli-david-weiss/

I feel it is important to note that I realize that Fischli and Weiss are not the only artists to employ the methods that I have described in this section. An in-depth evaluation of these methods and references to other artists is worth several art history PhDs of research, so I will attempt to acknowledge and then limit my discussion to elements that are pertinent or revealing for my research.

One example of an artwork that uses a method that began as an earnest inquiry, but lead to absurd results is John Latham's *Chew and Spit: Art and Culture* (1966). For this method based artwork, Latham had his students chew and spit out a copy of Clement Greenberg's *Art and Culture* (1961) that he had checked out of St Martin's School of Art's library.[46] The artwork begins with the premise that Latham "objected to (Greenberg's) dismissal of British art as being too tasteful." (Moorhouse, 2005) Latham then followed a logical method of tasting Greenberg's book, sitting it out and attempting to return it to the library in a vial that contained the distilled "essence" of Greenberg's writing. I believe that the final vial which is now in the

46   I could not find an image of the documentation of this artwork, but a description of it is available here. http://www.artsjournal.com/artopia/2006/12/john_latham_by_the_book.html

collection of the Museum of Modern Art, New York is not the artwork, but rather the whole method is Latham's artwork as described in its title. The method is to chew and spit *Art and Culture*. This method leads to a universe where the "essence" of Greenberg's book is not the concepts Greenberg was trying to articulate in the book, but rather the physical mashed up pulp of the book. The absurdity and humour of Latham's artwork enters when he attempts to return the book to the library, as if the rules that govern this universe would allow the library to receive a chewed up book. Latham's method leads to an entirely different universe where a chewed up book can be returned to a library.

While Fischli and Weiss are not the only artists to intersect everyday life and humor, to use serious play or to use a method that begins with a serious question, but leads to a universe of absurdity, I have found their research has a particular resonance with my research. From this resonance, I have not found answers, but more questions. Can I conduct research by using a method that begins by pursuing an earnest question and through play, mistakes,

and failures arrives in a different universe? Does access

to potentially different universes provide opportunities to

reveal and share new knowledges? What other potential

methods can lead to new knowledges in different universes?

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Figure 24:   *Tree Making a Mind-Map*, Tree, Sharpie, Paper, 2017

Figure 25:   Detail of *Tree Making a Mind-Map*, Tree, Sharpie, Paper, 2017

Figure 23:   (opposite) *Mind Map of My Thesis Drawn by A Tree That looks at Me While Writing*, Sharpie on Paper, 2017

'Pataphysics

In my introduction I pointed out that many research methods use logic, sense and validity to push into new knowledges. For this thesis, I am relying primarily on illogic, physics, non-sense, contradictions, marginalized knowledges, non-representational knowledges, affects, mistakes, magic, hunches, intuitions, and other methods that cannot be listed because they are not explicit. 'Pataphysics resonates with my research methods because 'pataphysics allows for the creation of universes that contain contradictory propositions.

The term 'pataphysics is most associated with Alfred Jarry, one of the "schoolboys" who coined the term in Rennes, France in the 1880s. (Hugill 2015, preamble) The concept of 'pataphysics resists a typical introduction because by definition, 'pataphysics cannot be defined.[47] Subsequently, a more typical analytical method of defining a term

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47   The contradiction in the previous statement where I state "by definition, 'pataphysics cannot be defined" is purposeful. I also understand that by dissecting the contradiction in this footnote, I have ruined my own joke. From now on, I will make contradictory statements, but then will not clarify them. Just trust me, I'm making them on purpose. Most of them are supposed to contain elements of serious humour or at least be seriously pretentious. Ha ha.

and then using the term to analyse the composition of another piece of matter, will not function for 'pataphysics. 'Pataphysics requires a different method of an introduction that is more akin to constructing a lens to view an elusive phenomenon. Jarry states:

> 'Pataphysics will examine the laws governing exceptions, and will explain the universe supplementary to this one; or, less ambitiously, will describe a universe which can be—and perhaps should be—envisioned in the place of the traditional one, since the laws that are supposed to have been discovered in the traditional universe are also correlations of exceptions, albeit more frequent ones, but in any case accidental data which, reduced to the status of unexceptional exceptions, possess no longer even the virtue of originality. (Jarry 1996, 21)

In his novel *Exploits and opinions of Doctor Faustroll, pataphysician*, 1911, Jarry presents an alternative universe where contradictory propositions make sense (perhaps presaging quantum mechanics). The novel revolves around the exploits of Dr. Faustroll whose name appears to be a collision of Dr. Faustus, the legendary alchemist, and a troll. Jarry's initial description of Dr. Faustroll reads as,

> Doctor Faustroll was sixty-three years old when he was born in Circassia in 1898 (the 20th century was [-2] years old). At this age, which he retained all his life, Doctor Faustroll was a man of medium height, or, to be absolutely accurate, of (8x1010 + 109 + 4x108 + 5x106) atomic diameters. (Jarry 1996, 7)

This opening description is indicative of the universe Jarry creates for Dr. Faustroll that is filled with elements that are not logically possible in reality, such as someone retaining their age their entire life. In Dr. Faustroll's universe, the orthodox perception of reality is the exception, not the rule and therefore all scientific imaginings are equally valid and invalid.

From the base notion that 'pataphysics allows for multiple, equally valid universes, hundreds of contradictory and illogical definitions of 'pataphysics have been proposed by many authors. All of these definitions are simultaneously absolutely correct and incorrect as there is no such thing as either a correct or incorrect definition of 'pataphysics. In this way, 'pataphysics eludes empirical dissection as every statement about it has the same amount of correct and incorrectness. It is in its spirit to state that 'pataphysics is "the science of imaginary solutions" (Jarry 1996, 21), or 'pataphysics "supports everything" (Cahiers du Collège de 'Pataphysique in Brotchie, 2003, p. 121), or "Pataphysics passes easily from one state of apparent definition to another." (Patafluens in Brotchie 2003, 200). It is precisely the inability to "correctly" define 'pataphysics

that has allowed it to survive. Current Commandeur Requis de l'Ordre de la Grande Gidouille in the Collège de 'Pataphysique, Andrew Hugill states in 'Pataphysics: A Useless Guide (2015) that 'pataphysics "lies around the roots of many key artistic and cultural developments of the twentieth century, including absurdism, Dada, futurism, surrealism, situationism, and others." (Hugill 2015 preamble) 'Pataphysics resists being documented and historicized as an "ism", movement or philosophy, although it may share traits with all three concepts.

'Pataphysics' impact on literature, music, theatre, art, philosophy, science, computer programming, and many other fields can be seen as participants in these fields have specifically stated the connections between 'pataphysics and their field.[48] It is important at this point to note that 'pataphysics is not a term that is interchangeable with anything that is apparently incomprehensible. It is perhaps more correct to frame it as a phenomenon that can encompass universes that adhere to specific internal

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48   Examples of some fields that have found resonance with 'pataphysics will be detailed in the next section.

logics that may or may not be accessible to an exterior viewer. Subsequently, 'pataphysics may present a universe that appears incomprehensible and can contain elements that are directly contradictory, but this does not mean that everything that is incomprehensible is 'pataphysical. In this way, while 'pataphysics resists definition, it does contain a "cogent body of exploits and ideas, which has a history and certain fixed precepts." (Hugill 2015, preamble) This history and these precepts can be examined to provide insight into the enduring resonances of 'pataphysics.

I have attempted to introduce the phenomenon of 'pataphysics rather than to try and define it. However, there is a problem with attempting to dissect any element of 'pataphysics because one of its central fixed precepts is the notion of deeply serious humour. Prévert said, "For too long now, humour has been taken lightly, we now intend to take it heavily." (Prévert in La Nef (01/1951) cited in Prévert & Aurouet 2008, 20) The humour of 'pataphysics is inevitable because 'pataphysics deals with universes that can contain contradictions. Jarry stated, "Laughter is born out of the discovery of the contradictory." (Jarry in Shattuck 1968,

184-185) While 'pataphysics is not typified by one type of humour and will utilize absurd, hyperbolic, ironic, surreal, sophomoric, anarchic, etc. types of humour, any analysis of 'pataphysics will generally require an analysis of humour. This is a dangerous prospect because, as E.B. White said, "Humour can be dissected, as a frog can, but the thing dies in the process and the innards are discouraging to any but the purely scientific mind." (White 1941, 16) In this way, 'pataphysics resists empirical analysis because any attempt at analysis kills the phenomenon.

'Pataphysics was killed and dissected by Deleuze in a short essay he wrote in 1964, 'How Jarry's Pataphysics Opened the Way to Phenomenology.' Deleuze defines pataphysics in terms of a dialectic when he states that philosophers such as Kostas Axelos in *Vers la Pensee Planetaire* (1964) are working, "[a]ll the way to the great synthesis, which must unite the two sides of a true "pataphysics" — the ubuesque[49] side, and the doctoral or Faustrollian[50]

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49   I believe Deleuze has derived the word ubuesque from the title character in Jarry's play *Ubu Roi* (1896). I believe Deleuze uses ubuesque to mean "ludicrous."

50   I believe Faustrollian refers to Dr. Faustroll from Jarry's *Exploits and Opinions of Dr. Faustroll, Pataphysician*, 1911. Faustrollian in this context would refer to Dr. Faustroll's exposure to the science of pataphysics and his attempt to describe the world through pataphysical methods.

side." (Deleuze 2004, 74) While Deleuze's dissection of 'pataphysics into a dialectic may be considered insightful and useful to understanding 'pataphysics, I think he may have dissected something that is not 'pataphysics as a phenomenon, but one specific instance of a 'pataphysical phenomenon that can be framed as a dialectic. By definition, the notion of a "true" 'pataphysics is something that is not 'pataphysics. 'Pataphysics cannot be understood by applying a generalized method or dividing it into sides such as an "ubuesque" or "doctoral" side. In this way, I do not believe 'pataphysics can accurately be described by a dialectic.

Deleuze further developed his dialectical, generalized and reductive frame for 'pataphysics in 'An Unrecognised Precursor to Heidegger: Alfred Jarry.' (1993) In this text, Deleuze states, "technology and technologizing science, for both Jarry and Heidegger, do not simply entail the withdrawal or forgetting of Being." (Deleuze & Smith 2009, 96). Deleuze subsumes Heidegger's notion of technology as a mode of being rather than a set of tools, within a larger notion of technology as 'pataphysical

phenomenon. The problem with the structure Deleuze has created is that it is decidedly un-'pataphysical. Deleuze has both generalized Jarry's 'pataphysical work and reduced it to a system without contradictions. In other words, he has not left room for Jarry's work to present a universe where technology does simply entail the forgetting of Being while simultaneously not.

Through these works, we can see how 'pataphysics informed Deleuze's thinking. As Agamben stated, "the 'pataphysical' Heidegger of the wonderful article on Alfred Jarry, the Heidegger with whom Deleuze, through this incomparable Ubuesque[51] caricature, can finally reconcile himself." (Agamben in Deleuze & Smith 2009, 225) Deleuze outlines an insightful method for utilizing a specific 'pataphysical frame as he has constructed it and applies it to his own thinking. However, Deleuze's frame for 'pataphysics is devoid of its inherent contradictions and humour. While it is true that 'pataphysics can incorporate universes that do not have contradictions, the spirit of 'pataphysics is to look for the laws that govern exceptions

whereas Deleuze seems pre-occupied with explaining the rule. With this in mind, I am not interested in using Deleuze's frame for 'pataphysics because by "correctly" framing 'pataphysics in philosophical terms, he has effectively killed it.

If Deleuze killed 'pataphysics, then Baudrillard's *Pataphysics* is less a dissection of a joke than it is someone playing with the innards. Baudrillard wrote *Pataphysics* in 1950, which means he was 21 years old and it must have been one of his first writings, but it was not printed until 2005 and it ended up being his final publication before he died in 2007. In this way, *Pataphysics* seems to be a writing that has bookended Baudrillard's life. While this fact might be chance, it seems plausible that this particular writing was significant enough for Baudrillard to be thought about throughout his career and highlighted at the end. The book is a limited edition of 177 with a deckle-edged cover, 44 of which were hand signed.[52] It appears Baudrillard designed the book to be viewed as a rare, valuable commodity and perhaps the period point for his life's work. It is possible

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51   I take Ubuesque to refer to the play *Ubu Roi* by Jarry in 1896. The play is considered a precursor to Dada, Surrealism and the Theatre of the Absurd.

52   Baudrillard's Pataphysics (2005) is available to here. https://www.amazon.co.uk/Pataphysics-Jean-Baudrillard/dp/1900565277

that Baudrillard considered all of these publishing tropes to be part of a joke, but if so, he took the joke quite seriously. Baudrillard states that 'pataphysics "is not serious. But it is exactly this which is its seriousness." (Baudrillard 2005, 10) In the design of his book and the seriousness of his text, Baudrillard demonstrates that he understands the importance of 'pataphysics' lack of seriousness. This is not to say that Baudrillard does not include serious humour in his writing as seen when he makes statements such as, "[w]e are nothing else, but at the perpetual state of flatulence" (Baudrillard 2005, 10) or "[t]he confines of the bladder had an odour of a Chinese lantern." (Baudrillard 2005, 10) *Pataphysics'* book design, its style of writing, and contradictory statements all reflect the concept that systems of signification are only understandable within their own provisional interrelations.

Baudrillard states that 'pataphysics "can only be defined in a new undiscovered language because too obvious: tautology. Better: it can only define itself by its own term, thus: it doesn't exist." (Baudrillard 2005, 8) By constructing a definition of 'pataphysics as a tautology, Baudrillard implies

that any definition of 'pataphysics would be redundant language that would add no information. But Baudrillard is in on the joke. Rather than defining 'pataphysics in his analysis of 'pataphysics, Baudrillard constructs a 'pataphysical universe filled with contradictions that appears incomprehensible but adheres to its own internal systems. Baudrillard's method for framing 'pataphysics is to construct a 'pataphysical universe that acts as its own frame. His 'pataphysics is a "context within which we can cast new light on the location and understanding [of our assumptions, procedures or theoretical study, and methods of orthodox sense-making." (O'Doherty 2007, 885)

Oulipo member, Perec provides an entirely different method for viewing 'pataphysics than Deleuze or Baudrillard. Perec once said, "If physics proposes: 'You have a brother and he likes cheese,' then metaphysics replies, 'If you have a brother, he likes cheese.' But 'Pataphysics says: 'You don't have a brother and he likes cheese.' " (Philadelphia Museum of Art 2007, 1) It seems that Perec has provided a means to view 'pataphysics by not even attempting to define it or frame it. In his words,

physics makes a proposal, metaphysics has a reply while 'pataphysics does not even engage in a dialogue and simply makes a statement that defines its own internal logic. Duchamp once wrote, "there is no solution because there is no problem." (Duchamp in Blesh 1956, 37) Perec's frame for 'pataphysics is that it does not need a frame because 'pataphysics comprises "knowledge of the specific and irreducible." (Daumal, 2012, p. 20) Daumal summarizes 'pataphysics in the equation, "[t]o know x = to know (Everything − x)". (Daumal 2012, 31) There is no way to frame 'pataphysics because it is a negative space that allows presence to exist. From this perspective, 'pataphysics itself is a negative frame. For me, 'pataphysics is a hole where a hole is defined as an absence surrounded by a presence. There is no way to frame a hole, only to frame part of the presence that the hole creates, which is not the same thing.

Set theory may contain a method for viewing 'pataphysics in the differentiation between the concept of the null set $\varnothing$ and an empty set {}. A null set is the intersection of two disjoint sets (two sets that contain no elements in common). For example: $\{1, 3, 5, 7, 9, \ldots\} \cap \{2, 4, 6, 8, 10,$ $\ldots\} = \varnothing$. The null set $\varnothing$ is nothing because there is not even a set to count. There is only one null set $\varnothing$ and it is the exact same null set $\varnothing$ in every instance. An empty set {} is a unique set with no elements {} and all sets have an empty set {} as a subset. This is different from being nothing because the set is always something even if there is nothing inside it. This means if I am counting oranges and there are no oranges to count, the set of oranges is empty {}. Similarly, if I am counting apples and have no apples, the set of apples is empty {}. The empty set {} of apples and the empty set {} of oranges sets are different, but equal in that they both have no elements. Also, for the empty set {} of oranges and for the empty set {} of apples, all of their elements (there are none) belong to set C no matter which set C we are dealing with. So, while the null set $\varnothing$ and an empty set {} appear similar in that they are exactly equal, they are quite different. A null set $\varnothing$ is nothing; an empty set {} is a specific set with nothing in it. In this way, we can see that 'pataphysics is not a null set $\varnothing$ which does not exist, but it functions as an empty set {} that defines the boundary of what is possible not just within a specific set, but within all sets simultaneously. Substituting

"Everything" for x in Daumal's equation for 'pataphysics "To know x = to know (Everything – x)" we get, "To know Everything = to know (Everything – Everything)" which is to say "To know Everything = to know the empty set {}."

There is no one definition of 'pataphysics because 'pataphysics resists definition. However, just because a concept resists a definition, that does not mean we cannot have knowledge about this concept. The concept of any number divided by zero is considered undefined and resists definition; however, there is a great deal of knowledge about the concept. Also, by providing specific frames for working with undefined concepts, potentially valuable knowledge may be derived. For example, there are even specific contextual frames in which division by zero can be considered as defined. Division by zero ($x/0$) for x in the extended complex plane can be defined to be a quantity known as "complex infinity." (Weisstein 2018, 1) Similarly, while 'pataphysics resists definition, there are many frames for viewing 'pataphysics. I will use a frame that is a combination of Baudrillard's and Perec's frames where 'pataphysics can be viewed as a phenomenon that provides

new knowledge by delineating the edge of what knowledge can be, by encompassing universes that adhere to specific internal logics.

Bok's definitive book, '*Pataphysics: The poetics of an imaginary science* (2001) elevates 'pataphysics and frames it within twentieth century avant-garde. Bok clearly articulates how 'pataphysics influenced many well framed art movements and Bok demonstrates that 'pataphysics is fundamental to the nature of the postmodern. Bok states, "a 'pataphysical qualification of rationality is symptomatic of a postmodern transition in science from absolutism to relativism." (Bok 2002, 3) His dissection of the frog of 'pataphysics is superb and in so doing what he is left with is no longer 'pataphysics. Bok describes how 'pataphysics uses irony, parody, humour, and the idiotic to challenge normalizing thought process, yet the entire book exists to create a normalizing thought process regarding 'pataphysics. Bok's book also appears completely devoid of humour. He wrote a serious and critical study of a joke that already existed within serious and critical studies, without any jokes.

What Bok does very well is describe the mechanism by which many fields have come to find a resonance with 'pataphysics. Bok states that, "'[p]ataphysics valorizes the exception to each rule in order to subvert the procrustean constraints of science." (Bok 2002, 4) To extend his analysis, 'pataphysics subverts not just science, but any field it interacts with, including itself. Subsequently, 'pataphysical methods are useful in all fields because they push on the apparent boundaries of a field and subsequently provide a space for any field to grow and expand. 'Pataphysics purposely refuses to conform to any academic standard. In this way, 'pataphysics is completely academic by specifically situating itself outside any field of academic study.

John Richardson disputes if Jarry and Picasso ever met in his book A Life of Picasso, Volume I: 1881-1906 (1991) in chapter 23 titled, 'The Absence of Jarry.' Richardson writes, "Jarry … has also been claimed by one biographer after another as a great friend of Picasso's. This friendship is a collective fantasy. The two men never met." (Richardson & MacCully 1991, 360) It is interesting that Richardson implies that because they never met, they could not have been friends. Richardson also implies that a collective fantasy is somehow not real and therefore invalid.[53] However, other historians believe that in 1905, Apollinaire gave Picasso a gun he confiscated from Jarry at a party after the latter fired a shot at Manolo. (Read 2010, 13) In either case, it is apparent that Jarry's 'pataphysics found resonance with Picasso's thoughts as evidenced in the latter's multiple portraits of Ubu, the central character from Jarry's play Ubu Roi (1896), (Hugill 2015, 156) and the fact that Picasso had a pet owl named Ubu. (Gilot & Lake 1981, 139) Picasso once showed Brassai an engraving by Jarry and said, "Jarry left several bas-reliefs … Did you know Jarry always had a live owl living with him? His owls are the ancestors of my own." (Brassai 2002, 273) I believe Picasso was talking about more than just pet birds when he stated that Jarry's owls were ancestors of his own.

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53   I feel Richardson missed an opportunity to make a 'pataphysical statement about Picasso and Jarry's relationship that would sound like, "Jarry and Picasso were great friends. The two had never heard of each other."

Picasso's influence on multiple fields of academic study and culture has been well documented and I believe Picasso was alluding to the relationship between 'pataphysics and his own thinking. Specifically, I believe that Picasso's ability and desire to challenge the conventions of painting at the time found resonance with Jarry's 'pataphysics. It provided a method of moving thought forward by working so far outside of the convention that the work was considered absurd.

In Ubu Roi (1896), Ubu states, "I no longer do paintings … I make geometry." (Jarry 1972, 591) Jarry also wrote in Dr. Faustroll (1898), "to claim that the shape of a watch is round is a manifestly false proposition – since it appears in profile as a narrow rectangular construction." (Jarry 1996, 23) It seems plausible that Jarry's proto-cubist thoughts may have found resonance with Picasso's own thinking. In 1907, Picasso's *Les Demoiselles d'Avignon* was considered so far outside of the conventions of painting that Matisse said that it was the "death of painting" (Obolevitch 2016, 2) and that he considered Picasso's painting to be some sort

of a joke.[54] (Golding 1995, 102) I believe that in this sense, Picasso's work does have its rhizomatic roots in 'pataphysics and perhaps Picasso's most significant cultural influence has been the normalizing of a method of contributing to new knowledge by creating work that is so far outside of the convention that it is considered a joke on first assessment.

Oulipo is one group that grew out of 'pataphysics and has a clearly delineated 'pataphysical method for creating new knowledge. Oulipo began as a sub-committee of The Collège de 'Pataphysique. (Seaman 2001, 423) Oulipo did not seek to destroy logic or reason, but instead decided to appropriate logic and reason to create 'pataphysical universes. Oulipo applies linguistic and numerological constraints to create 'pataphysical universes governed by internal logics. These Oulipian constraints frequently create texts that are illogical in a conventional method of reading but make perfect sense in the universe created by the constraint. For example, the S+7 constraint replaces every noun in a text with the seventh noun after it in a

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54   Picasso's *Les Demoiselles d'Avignon* (1907) is available to see here. https://www.moma.org/collection/works/79766

dictionary. The first sentence of this paragraph becomes, "Similarly to the Gaffists, Objects did not seek to destroy lollipop or rebound but instead decided to appropriate lollipop and rebound to create path uprises." Oulipo uses constraints to create universes that may appear illogical, except within the universe itself.

Many computer based artworks employ this strategy. For example, in 1989, Oulipo members Paul Braffort and Jacques Roubaud created an off shoot of Oulipo a called ALAMO (Atelier de Littérature Assistée par la Mathématique et les Ordinateurs/Workshop for literature assisted by mathematics and computers.) ALAMO produced "litware" computer code that enabled users to create rules that would create piece of literature. (Braffort & Roubaud 2004, 1) Each output from the ALAMO litware is its own universe that may have internal contradictions, but the contradictions make sense within the frame of the rules that were assigned to it by the user. This Oulipian code generates new knowledge through the constraints that it is provided.

The Oulipo collective acknowledges that creativity is always bound by something whether it is time or language. Rather than try to come up with a method that abolishes constraints, Oulipo embraces them pro-actively. Perec's lipogrammatic novel *A Void* (1969)where he did not use the letter "e" is one of the best examples of a member of the Oulipo collective using a constraint to highlight the possibilities within language. By not using an "e," which is considered an essential letter, Perec proves that nothing is essential in art. The constraint of not using an essential part of language freed Perec to create something that is considered outside of the realm of possibility. Perec used the constraint to create new knowledge in a space which people did not believe was possible. Perec said, "I set myself rules in order to be totally free." (Becker, 2012, p. 13)

One Hundred Thousand Billion Poems (1961) by Queneau is a Oulipian book of 14 poems each with 10 lines with each line printed on a slip of paper.[55] Any line can be combined with any other line which can therefore allow 10^{14} (= 100,000,000,000,000) different sonnets. This poem

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55   Queneau's *One Hundred Thousand Billion Poems* (1961) is available here. https://www.amazon.co.uk/mille-milliards-po%C3%A8mes-Raymond-Queneau/dp/2070104672

shows how the Oulipian constraint of the mathematics of the book can create a universe of possibilities that exceeds a reader's ability to consume. 10^{14} poems would be impossible for one person to construct line by line and consume. That means that *One Hundred Thousand Billion Poems* has the ability to produce so much new knowledge that it is unknowable within one person's lifetime. By creating a mathematical constraint, Queneau has created a 'pataphysical universe that is constructed from a virtual field of potential poems.

In this section, I have attempted to frame 'pataphysical methods as deeply serious examinations of systems of knowledge through the production of universes that adhere to specific internal logics that may or may not be accessible to an exterior viewer. I recognize that much more can be written about 'pataphysics, these methods, and artists who employ these methods in their work. In an attempt to limit my PhD, I have only written about the elements that I feel are relevant to my research. As I have come to the end of this section, I again feel I do not have any definitive conclusions, but I am left with more hesitancies and

questions.

Can these 'pataphysical methods I have just framed be deployed in my own research to create universes that hold logical contradictions? Can I use constraint as a method to create or discover universes? Can 'pataphysical methods provide entrances to hidden or occult[56] knowledges? Can I use 'pataphysical method to access universes that I know exist, but do not have access to the knowledge held within them, such as the universe of knowledge held in my body's tacit knowledges? Can 'pataphysical methods provide an opportunity to access knowledges held the universe of sleep?

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56   I will describe what I mean by "occult" more in the section "Occult" on page 247.

ResonanceInSleep[57]

My fellow Ph.D. researchers trade stories of sleep
deprivation as a marker of hard work. I treat my bed as
a lab or factory. Some of my most productive research
times are when I am asleep. Is research the sole domain of
conscious thought? Is identity defined by consciousness?
Through a lens of relational identity, the notion of
an essence of identity existing within an essence of
consciousness evaporates into an assemblage. For me,
sleep is not a state defined as a lack of consciousness but
as productive potential. I perceive sleep as a potential
where there is less resonance between consciousness and
the other elements in the assemblage of my identity. With
the otherwise dominating resonance of consciousness
temporarily quelled, other unencumbered, heterogeneous
elements can seize their opportunity to become productive.

When I say sleeping, I do not only mean dreaming.

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57   I began this research before reading Matthew Fuller's *How to sleep the art, biology
and culture of unconsciousness* (2017), however, I have found resonance between the ideas
in Fuller's book and my own thinking regarding the intersection of sleep and research.
I was particularly interested in statements like, "Sleep cannot be directly known in its
native state." (Fuller 2017, 1) I was also drawn to questions like, "'Did you sleep well?
There is evidently something of an art to this." (Fuller 2017, 6) I was most interested in
the notion that, "sleep has the possibility for an aesthetics." (Fuller 2017, 16)

Dreaming is a small sub-set of sleeping that receives disproportionate attention because dreaming seems to sit at the edge of consciousness. I have had moments of lucid dreaming where I was consciously aware that I was dreaming. The defining element of lucid dreaming for me was the realization that I was in a state where exceptions were the norm. In dreams, fantastic exceptions to perception can be readily accepted and even encouraged. (Flying monkeys? That's rather banal in a dream world … Fighting a horde of zombie clown versions of myself? Getting more interesting … Being able to smell the concept of intuition? Now this dream is starting to get interesting …) About every sixteen hours, humans need to sleep and during this time most people dream 4-5 times. (Breus 2015, 1) The dream state highlights how perception of universes where exceptions dominate is normalized. Sleep has the capacity to productively empower and normalize the exception.

When asked, "How did you sleep?" I may answer, "Not well, I kept waking up." Consciousness is an unwanted interruption to the introduction of more exceptional thoughts into my life. Consciousness does not appear to

be a requirement for life and is not even a requirement for human life. There are documented cases of people being unconscious for up to 19 years. (Ryan 2003, 1) Sleep, on the other hand is demanded at least every 11 days or humans begin to hallucinate and then begin a process of dying. (Ross 1965, 400) The fact that one of the first symptoms of lack of sleep is hallucinations seems to say, "Well if you won't go to sleep to perceive exceptions, I will just bring them into the waking world …" I have no idea who is speaking in the preceding quote, but I believe it is me speaking to myself. The way I am designed seems to imply that it is the sleeping state that is the normalized, required state of being and the waking world is merely the place where I come to acquire raw materials for the sleeping state to use.

What happens when I put my computer to sleep? Why do my eyes move when I'm sleeping? What are they so feverishly trying to see? What does it mean when my foot falls asleep? What are sleep aesthetics?

My waking consciousness always fails at representing my sleeping self because sleep uses parameters that exceed

conscious description. Similar to trying to draw a four dimensional object on two dimensional paper, all I can ever do is draw a slice where my two dimensions come into contact with the four dimensional object.

"Figure 26: (next page) Fell Asleep Taking Notes 01, Pen, Paper, Sleep, 2018" on page 233 and "Figure 27: (following page) Fell Asleep Taking Notes 02, Pen, Paper, Sleep, 2018" on page 233 are some notes I was taking and then fell asleep. They are a contact zone with sleep, not a representation, because a clear contact zone is the closest my conscious mind can get to sleep. In a significant asymmetry, my sleeping mind has full access to all elements of my awakened state while my awakened state has limited access to the knowledge of sleep.[58]

Can digital practice provide another contact zone between my conscious mind and sleep? There is an emerging intersection between digital practice and the everyday activity of sleep, but this intersection comes primarily in the form of monitoring brainwave cycles. Scientists at UC

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58   I attempted to keep typing until I fell asleep in order to make a contact zone between typing and sleep, but the contact zone left no evidence. I thought perhaps I would leave a trail of one letter going on for pages where my fingers fell asleep at the keyboard, but in fact nothing happened.

Berkley claim to be on the track to recording and then playing back dreams by monitoring brain activity during sleep. (Diaz 2011, p.1) Perhaps one day, it will become an everyday activity to wake up and review your dreams for the conscious mind to have access to knowledge held in the sleeping state.

Already, millions of people are using apps such as Sleep Cycle or monitors such as Fitbit to gain data about their sleep. (Laurinavicius 2017, 1) What does it mean if people have access to the previously occult processes of sleep? What does it mean when the question, "How did you sleep?" receives the reply, "Well, I got 1.6 hours of REM sleep, so it must have been good." The apparent goal of acquiring this data is to improve or increase sleep.

"Figure 27: (following page) Fell Asleep Taking Notes 02, Pen, Paper, Sleep, 2018" on page 233 is an image of

me faking being asleep with an EEG monitor.[59] The EEG monitor sends my brainwave patterns to a computer in the other room that then controls a robot in the next room. Based on my REM brainwave functions, the robot makes a drawing. "Figure 29: Robot Making Drawing Based on Sleep State, Photograph, 2018" on page 236 shows the robot making the drawing. If I am not in an REM state, the robot does not move. "Figure 30: (opposite) Drawing Made by Robot Based on Sleep State, Sharpie and Paper, 2018" on page 236 shows the drawing the robot made during 3 phases of REM. These images are performance stills of digital practice intersecting with an everyday life occurrence such as sleep. The code for this artwork is available for inspection in the code archive, "Computer-CodeArchiveAndReferences" on page 521.

For me, the artwork, *Resonance in Sleep*, is constituted as

an assemblage of the method I followed, the code, the performance, the robot, the drawing, and this expositional writing. Does this artwork research into the intersection of the everyday life occurrence of sleep and digital practice succeed at providing access to some part of the knowledge contained in the sleep state? Or is it a failure? Does it matter if I failed? Does it matter that part of the research is faked? What are some other occult knowledges I can research with similar methods?

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59   I faked his part because I could not seem to get a clear picture of the EEG monitor when I tried to use a timer. When faking these pictures, I realized that this entire section on research into sleep could be faked quite easily. I have no way of proving to you that the knowledge I am presenting occurred. Similarly, I cannot prove to you that I dreamed something. I have no idea what has ever happened in your dreams and you will never have any idea what has happened in mine. Perhaps nothing to do with dreams, including this research, should be trusted. All you can do is have faith that what I present occurred because I have no reason to fake it and if I am faking it, I tell you I am.

Figure 26:   (next page) *Fell Asleep Taking Notes 01,* Pen, Paper, Sleep, 2018

Figure 27:   (following page) *Fell Asleep Taking Notes 02,* Pen, Paper, Sleep, 2018

Privledged Knowledge

Embodied Knowledge

Tacit Knowledge

...

Brain Video

* Brain lacks lymphatic System
* CSF pumped into and through brain
  to clean brain waste
* when brain goes to sleep
  CSF rushes through
* Sleep refreshes and cleans the brain
* (A) ...
  (B) ...

* 5 ...
  the ...
  very

Figure 28:   *Fake Portrait Wearing EEG Monitor While Sleeping*, Photograph, 2018
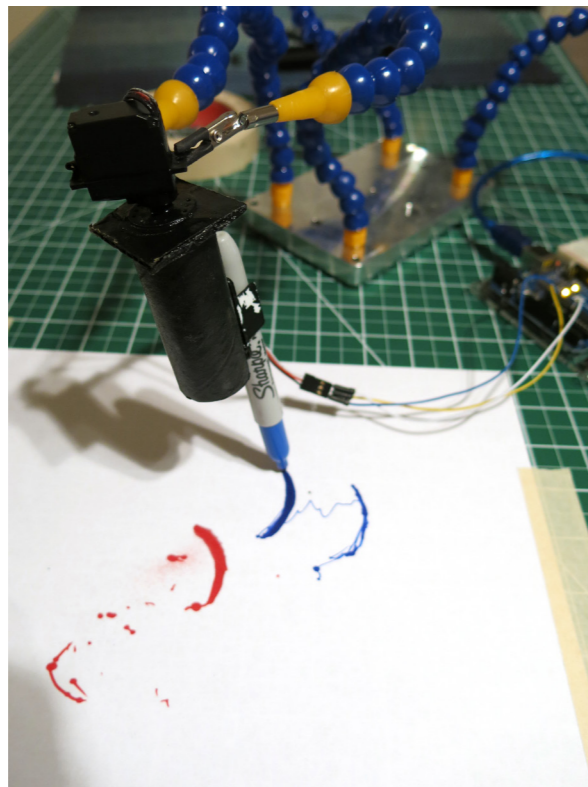
Figure 29:   *Robot Making Drawing Based on Sleep State*, Photograph, 2018

Figure 30:   (opposite) *Drawing Made by Robot Based on Sleep State*, Sharpie and Paper, 2018
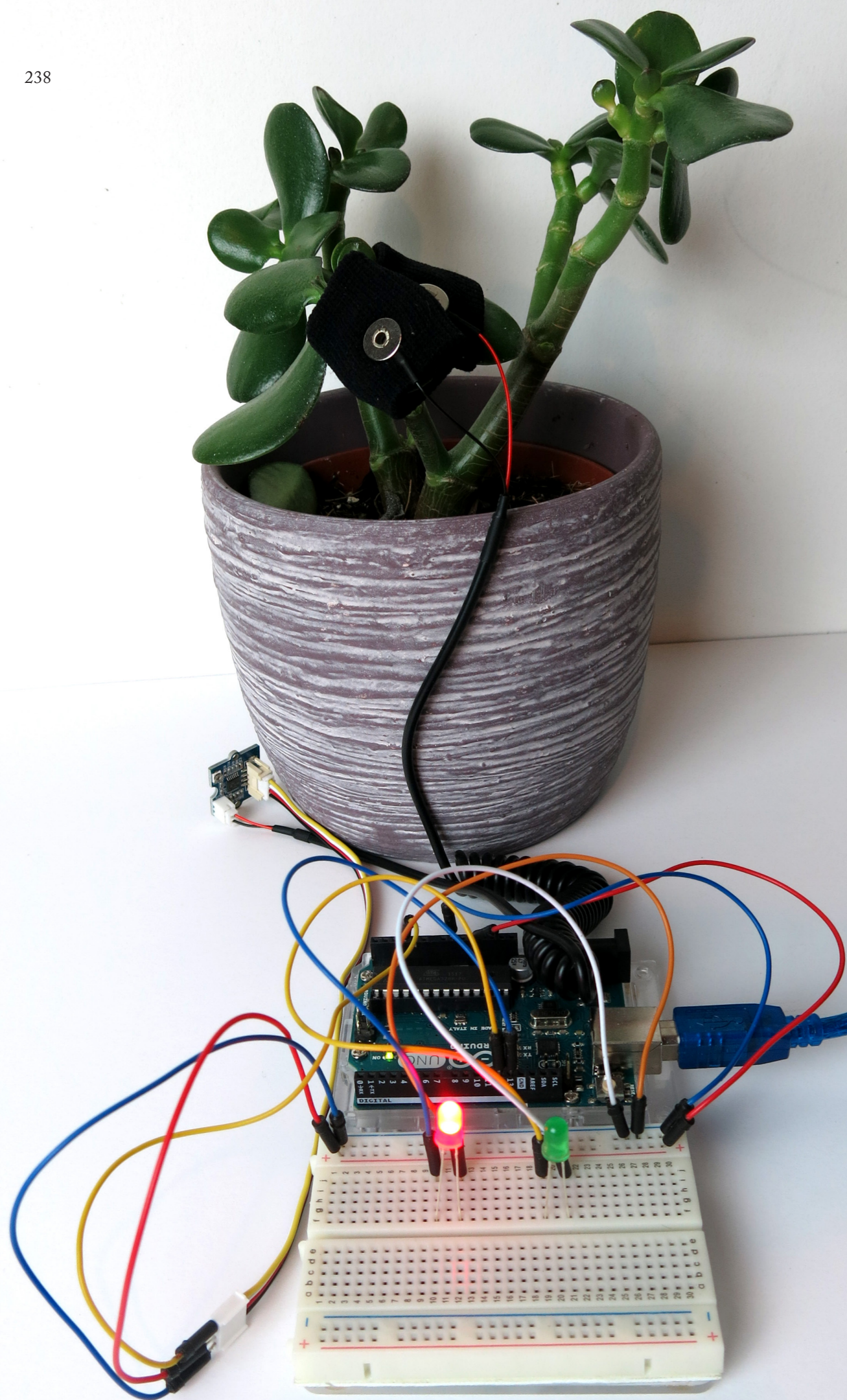
OrganicEditor

I write everyday. My everyday activity of writing has begun to intersect more frequently with digital practice, specifically, a digital editor. Everyone I know uses a digital editor in the form of a spell checker. Using a spell checker has become such an everyday activity, that people rarely even notice they are using it, until it makes a mistake or frustratingly does not choose the correct word. In my lifetime, I have already started relying on a digital grammar checker which teaches me new grammar every time I use it. I am interested in researching how the everyday activity of writing is intersecting with more digital practice. How far can digital practice intersect with everyday writing? Can I make a digital editor that does not just read and fix spelling or grammar, but one that gives an opinion on content?

"Figure 31: (opposite) Organic Editor, Biofeedback Robot and Plant, 2017" on page 239 is an image of *Organic Editor*, an artwork that I would like to present as

Figure 31:   (opposite) *Organic Editor*, Biofeedback Robot and Plant, 2017

entangled with this thesis.[60] *Organic Editor* is an artwork

that can read the conductivity of the surface of any organic

material. The skin conductivity of organic material changes

depending on stresses in the environment. For humans

under stress, human galvanic skin conductance can change

up to 0.5 volts of direct current that is easily measurable.

(Villarejo, Zapirain, & Zorrilla 2012, 1) These measurable

changes in skin conductance have been used since 1849

for investigating psychophysiological phenomena in over

1500 professional publications. (Boucsein 2012, 7) Analysis

of skin conductance as a clinical research method remains

"one of the most widely used – some might say 'abused'

- response systems in the history of psychophysiology."

(Cacioppo, Tassinary, & Berntson 2017, 159) The

implication of skin conductivity tests is that there is a

measurable link between psychological states and physical

bodies. Skin conductivity analysis has proven so popular

that when talking about skin conductivity tests, Jung said

"Aha, a looking glass into the unconscious!"(Brown 1977,

32)

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60 I have now used the word "entangled" to describe my methods. My *Organic Editor* has expressed disapproval of using this term by turning on the red LED (as I am about to explain in this section). I am using the term "entangled" in a similar manner to Karen Barad in *Meeting the Universe Halfway,* (Barad 2007, 1) but have decided to explain what I mean in detail later because my editor suggests it.

Skin conductivity analysis has many uses ranging from

biofeedback therapy that is designed to aid patients

in a range of conditions such as anxiety or migraines

(Nordqvist 2017, 1) to the Church of Scientology using

skin conductivity analysis in its practice of "auditing."[61]

(Graham & McGowan 2010, 31) Another famous use of

skin conductivity analysis is in lie detectors. (Villarejo,

Zapirain, & Zorrilla 2012, 1)

In my research into how skin conductance has been

used to investigate psychophysiological phenomena

I have looked at some, but not all, of over the 1500

professional publications on the subject. From my

sampling, it appears that a significant amount of research

into psychophysiological phenomena regarding skin

conductance has focused on human galvanic skin response.

A few of the research papers tested how humans respond to

animals. These experiments seem to test skin conductance

changes in humans due to exposure to snakes or spiders.

(Soares & Ãhman 1993, 1) I did not find any scholarly

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61 The Church of Scientology's "auditing" requires far more analysis than I can provide. From what I understand, "auditing" is the method by which an individual can reach higher states of spiritual awareness by using an "E-Meter" which they say is "a calibrated device used for measuring extremely low voltages and psyche, the human soul, spirit or mind." (The Church of Scientology, 2017, p. 1)

articles that tested the galvanic response of the snakes or spiders that were used in the experiments to see if exposure to humans increased the animal's stress. A few of the research papers also used galvanic response in animals as evidence that the animal was in pain. (Kim & Chung 1992, 1) There are quite a few articles that use plant galvanic response as evidence of stresses on plants. (Ackerson & Hebert 1981, 1) Stuart Chapin's research seems to indicate that plants "have a centralized system of stress response that enables them to respond to any physiological stress, regardless of the nature of that stress." (Chapin 1991, 29) Other experiments have concluded that plants grow at a faster rate when in the presence of music, but there has been little research into why this may occur. (Mythbusters 2014, 1) In 1848, Gustav Theodor Fechner argued that plants respond to music because they have "plant souls". (Fechner & Britten 1938, 5) Fechner goes on to theorize that even though they do not appear to have the same physical mental structures as animals, plants can still have "psychological sensations" as seen in their response to music. (Fechner & Britten 1938, 19) If Fechner's theory is correct and plants do have various

psychological states, then perhaps their galvanic skin response does not just measure their physiological stresses but also their psychological stresses. With this theory in mind, my *Organic Editor* is an artwork that measures the galvanic skin changes occurring in plants that are near me when I write and then read aloud this thesis to them.

I feel it is important to say that I believe that the *Organic Editor* can be framed as a collision of different technologies that result in new knowledge. In this case, I am colliding the technology that is used as a "looking glass into the unconscious" with the technology of thesis writing and with the technology of the everyday environment. The absurdity of using the unconscious responses of a plant in a coffee shop as my primary thesis editor is not missed on me.

The electronic element of *Organic Editor* works in a similar manner as other skin analysis measurement tools including therapy tools, lie detectors and the Church of Scientology's "E-meter." In the case of the *Organic Editor*, the measurement panels can be attached to any organic

surface and if the skin conductivity measurement is below a threshold, the editor lights up a green LED. If the conductivity increases, it turns on a red LED. Increased skin conductivity is a sign of stress because it is associated with increased sweating. The electronic element of the *Organic Editor* can be attached and calibrated to any organic material to determine if it is under stress.

I am using my *Organic Editor* as a real-time editor for this thesis. Right now I am writing in a café and there is a plant next to me. I have attached the electronic element of the *Organic Editor* to the plant to make the artwork. It is important to note that the electronic element independent of the organic material is not the artwork. The artwork only exists when the electronic element is attached to organic material, the whole device is properly calibrated to that specific organic material and the whole device is activated.

Once, the artwork *Organic Editor* has been created by attaching the electronic element to the plant, I read the text I have been writing to the plant. The biofeedback

from the plant then tells me how the plant has responded to what I have written. In this case, the red or green LED will light up, which I interpret as the plant approving or disapproving of what I have written. As with all elements in my research, I sometimes take the "advice" of the plant and sometimes I do not.

While I have pointed out that I see the absurdity and humour of using a plant as my editor, I take this absurdity quite seriously.

Occult

Is it possible to develop a non-hegemonic approach to research without framing the occult as an invalid truth claim due to its incommensurability?

Leibniz' use of the word "occult" in his attack on Newton is extremely significant. It should be noted that the term "occult" has drastically changed in its meaning since 1600. For Leibniz, "occult" would have meant both insensible and unintelligible. (Sprenger 2015, 1) Scientists in the 17th century would have referred to the Latin occultus, meaning hidden, and thus derived the word "occult" to mean "knowledge of the hidden." In this case, "hidden" can mean both that which cannot be sensed and that which is impossible to know. Implied in the conflating of these two concepts in the word "occult" is that to 17th century scientists, only causes that can be sensed can be acknowledged as existing. Any cause that could not be directly sensed was considered "occult". The 21st century has normalized the existence of the insensible through relations with phenomena such as X-rays, free wi-fi,

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bank accounts, etc., but for people in the 17th century, the insensible was highly problematic. Historian Keith Hutchison states,

> Over the course of the Scientific Revolution, the intelligibility of many insensibles was recognized, and the distinction between the sensible and the insensible lost most of its earlier force … Accordingly, the bond between the two ideas was broken, and "occult" lost the connotation of "insensible," to retain only that of unintelligibility. (Hutchison 1982, 233)

In this case, the concept of the occult as the unintelligible means that the occult is comprised of a logic of "nonsense" wherein nonsense and sense are "co-present". (Deleuze 2012, 132) Nonsense is a disruption as "nonsense is that which has no sense, and that which, as such and as it enacts the donation of sense, is opposed to the absence of sense." (Deleuze 2012, 89) In this way we see how nonsense research exists as co-present with "sensible" research. In fact, we can see that Deleuze implies that the foundation of sense is nonsense as sense cannot exist without it. Deploying a Deleuzian logic of sense, we see how the traditional research myth marginalizes the occult due to its unintelligibility when it is precisely through unintelligible research that the anomalies in research methods arise. This process of the creation of occult anomalies is required for

the evolution of research methods and the development of new mechanisms of human knowledge.

I will explain the role of affect in my research in another section, but it is important for me to introduce how I view affects in this section on the occult.[62] Affects do not function in knowledges of the measurable and are thus occult in nature. I will explain how my research method is grounded in the logic of everyday affect, this is to say my research is grounded in the occult. In this way, I view my research as an occult anomaly that does not require validity to be valuable.

I would like to frame the *Organic Editor* as an introduction to my use of the occult as a research method. Throughout my research there are references to the occult as defined in the previous section. My use of it in my research may come in the form of other artworks like my algorithm that reads tea leaves to predict the Dow Jones Industrial Average, or my facial recognition software that uses phrenology to make predictions about people's lives, and so on. In the case

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62   I am using "affect" in the way Spinoza does when he refers to affect as a "variation in the intensity of power belonging to mind and body at once." (Sharp, 2011, p. 29)

of the *Organic Editor,* it may not be readily apparent, but I believe the occult power of my spoken breath has impacted every word that has been written for this thesis. The notion of a thesis places emphasis on the written word as the container of knowledge. However, I have written this entire thesis with the impact of my spoken breath as the first element to be evaluated and edited, in this case by a non-human editor. In this way, this whole thesis is actually more of a transcription and functions a record of the impact my breath had on my surroundings.

I am emphasizing the notion of the impact of my breath rather than my spoken words or voice. I believe that the plants I am using are responding to my breath, and not just to the sound of my words. I do not believe a recording of my voice would have the same impact. A pseudo-scientist may attribute this to the fact that the plants may be responding to the CO_2 in my breath. However, I am framing it within the power of the occult and by "occult" I mean "knowledge of the hidden."

This text is now a record of the impact of my breath on plants, but this knowledge is hidden. There are many instances of the primary method of the occult being hidden, but vital. For example, Justin Fornal has described how Jinn exorcists in Zanzibar would prepare tinctures to use during their exorcisms, but the tinctures would only work if breath containing words of the Koran were read into the vials with the tincture. (Fornal 2017) It is important to note the tinctures were available as previously prepared items, so there were no witness to the preparation of the tinctures. While saying the words can be part of some occult processes where their are witness to the recitation of the words, witnesses are not always necessary for the transfer of occult power. Fornal has also explained how a recording of the sound would not work. Similarly in hoodoo, mojo amulets are called "prayers in a bag" where the amulet is prepared without witnesses to the reading of the prayer.[63] The Catholic religion describes how making holy water requires a priest to read scripture over the water. Witnesses to the reading of the scripture are irrelevant and a recording of a priest played over water is considered insufficient. (Carota 2013, 1) Scottish Cailleach believe that items dipped in the whirlpool in

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63   Hoodoo is an African-American folk spirituality that can trace its roots to West Africa.

the Gulf of Corryvreckan only retain their power if they are dipped in while a live fiddler plays and songs are sung in Gaelic. Fornal tried to use an iPod while dipping items in the whirlpool, but Caileach informed him that the iPod recording was insufficient and the items remained powerless. (Fornal 2017)

People who are interested in using occult knowledges such as Jinn exorcism tinctures, holy water, or items dipped in the whirlpool in the Gulf of Corryvreckan, but do not have access to the occult, like Fornal, would not necessarily be aware if the breath was correctly added because the impact of the breath is hidden. The knowledge of whether or not an object holds occult knowledge is held by those who have a "tacit knowledge" of the occult processes. Michael Polanyi describes tacit knowledge as knowledge that is difficult to transfer to another person by linguistic methods. Examples of tacit knowledges include knowledges such as how to ride a bike, knead dough, or play a musical instrument. (Engel 2008, 7) Tacit knowledges can be transferred through various methods, like demonstration, but are difficult to transfer linguistically. Occult knowledges are similar

to tacit knowledges as they are both difficult to transfer to another person. When Justin Fornal asked a hoodoo practitioner how someone could tell if a mojo had been properly fed, the practitioner replied, "I don't know if you can tell if the mojo is dead, I just know, I know if the mojo is dead." (Fornal 2017) This occult knowledge is similar to the tacit knowledge Polanyi is referring to when he states "we can know more than we can tell." (Polanyi 1967, 4)

In all of these examples of occult knowledge and more, there is something about the breath that contains a hidden power to impact an object. The actual nature of the breath that causes the impact may not be knowledge that can be linguistically summarized, but is considered vital to a thing's ability to contain and transfer power. The process of writing a thesis is complex and the writing element is impacted by many sources that may not be visible in the writing and will probably remain perpetually hidden. This does not mean that these occult forces are irrelevant, just that they are hidden and frequently unacknowledged. In this case, every word of this thesis was first contained in breath that then impacted the everyday environment around me. This thesis is a record of that occult impact.

DeleuzeAsLens

The quantum ontoepistemological lens described above is not the only lens I use to view my research. I also view the written element of my thesis and artwork such as *Organic Editor* as existing in a multiplicity as when Deleuze and Guattari describe how the orchid "forms a map with the wasp." (Deleuze & Guattari 2007, 12) Through multiplicity of both the writing and the *Organic Editor,* I am acknowledging how my writing/art practice functions in an assemblage of my everyday life where multiple sources such as my family, my adviser, my colleagues, plants near me, the music I am listening to, terrible café lighting, and many other elements all contribute to my writing/ making process. It is difficult to extract one practice from the making/writing of this thesis because multiple practices are inextricably entangled. In this way, I feel my research has a resonance with Deleuze's thought as Braidotti writes, "Deleuze's philosophical monism makes no categorical difference between thinking and creating, painting and writing, concept and percept. These are all variations of experimentation." (Braidotti in Parr 2010, p. 309)

However, I believe it is possible, and at times necessary, to separate my practices and methods in a provisional way in order to make my thoughts more clear. For example, I view the written component of my thesis as a form of expository writing where the goal is to frame my research in a method that can communicate my ideas linguistically. This is a provisional "cut" that does not represent the entangled nature of my research. I am aware of the irony of using an expository writing method in describing how I use Deleuze as a lens to view my research. Such an expositional method of writing is reminiscent of the strictly representational methods of writing that I believe Deleuze would have condemned as complicit in non-thought that may exist in the political economy of institutional education. "For Deleuze what is at stake in writing is not the manipulation of a set of linguistic or narrative conventions; nor is it the cognitive penetration of an object; nor even the appropriation of a theme. Writing is an orientation." (Braidotti in Parr 2010, 311)

Through Deleuze's lens of writing, I do not want to frame this writing as representing my thesis, but rather, this is a thesis that is performed with a written element. Through my use of the *Organic Editor*, I am currently making this expository writing through a performance/art practice as I have made/used an artwork to write/make/edit this expository writing.

However, I acknowledge my betrayal of Deleuze's sensibility in certain elements of my writing. I feel it is important to delineate my understanding of particular elements of thought in order to clarify my thesis as a whole, as I did in the previous section on quantum entanglement. In these cases, my goal is to communicate my cognitive penetration of particular objects. These sections of representational writing fundamentally involve repetition and opinion.

For example, I feel I can use representational writing in a provisional manner to clarify exactly how my research finds resonance with the concept of an assemblage. I am interested in framing the research as an assemblage in the

way Deleuze and Guattari describe in order to build on the notion that contingency and provisionality can function as a grounding for meaning in everyday life. In *A Thousand Plateaus*, Deleuze and Guattari describe the components and functions of an assemblage:[64]

> On a first, horizontal, axis an assemblage comprises two segments, one of content, the other of expression. On the one hand it is a machinic assemblage of bodies, of actions and passions, an intermingling of bodies reacting to one another; on the other hand it is a collective assemblage of enunciation, of acts and statements, of incorporeal transformations attributed to bodies. Then on a vertical axis, the assemblage has both territorial sides, or reterritorialized sides, which stabilize it, and cutting edges of deterritorialization, which carry it away. (Deleuze & Guattari 2007, 97-98)

The enunciated and machinic sides of the horizontal axis of the assemblage are composed of heterogeneous elements that are in relation, but do not imply logical necessity. [65] My research method assemblage can accommodate various heterogeneous methods of research by analysing the

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64   I realize that the concept of an assemblage is unto itself an assemblage and is therefore contingent and provisional. I am territorializing the concept of an assemblage for the purposes of clarifying my research method. All of the terms I am using are provisional and will be deterritorialized in the future. However, I feel that territorializing them provisionally allows for an explanation of how I understand the various elements of how my research method assemblage function. I will explain more about what I mean by "research method assemblage" further on. Subsequently, this is a territorialized diagram of how I visualize an assemblage drawn on a napkin that I have now thrown out. (See Figure 33)

65   Perhaps the term "elements" is incorrect because it implies an Aristotelian notion of essentialism. I do not mean to use the term in this way as every "element" in an assemblage is itself also an assemblage as seen in my diagram.
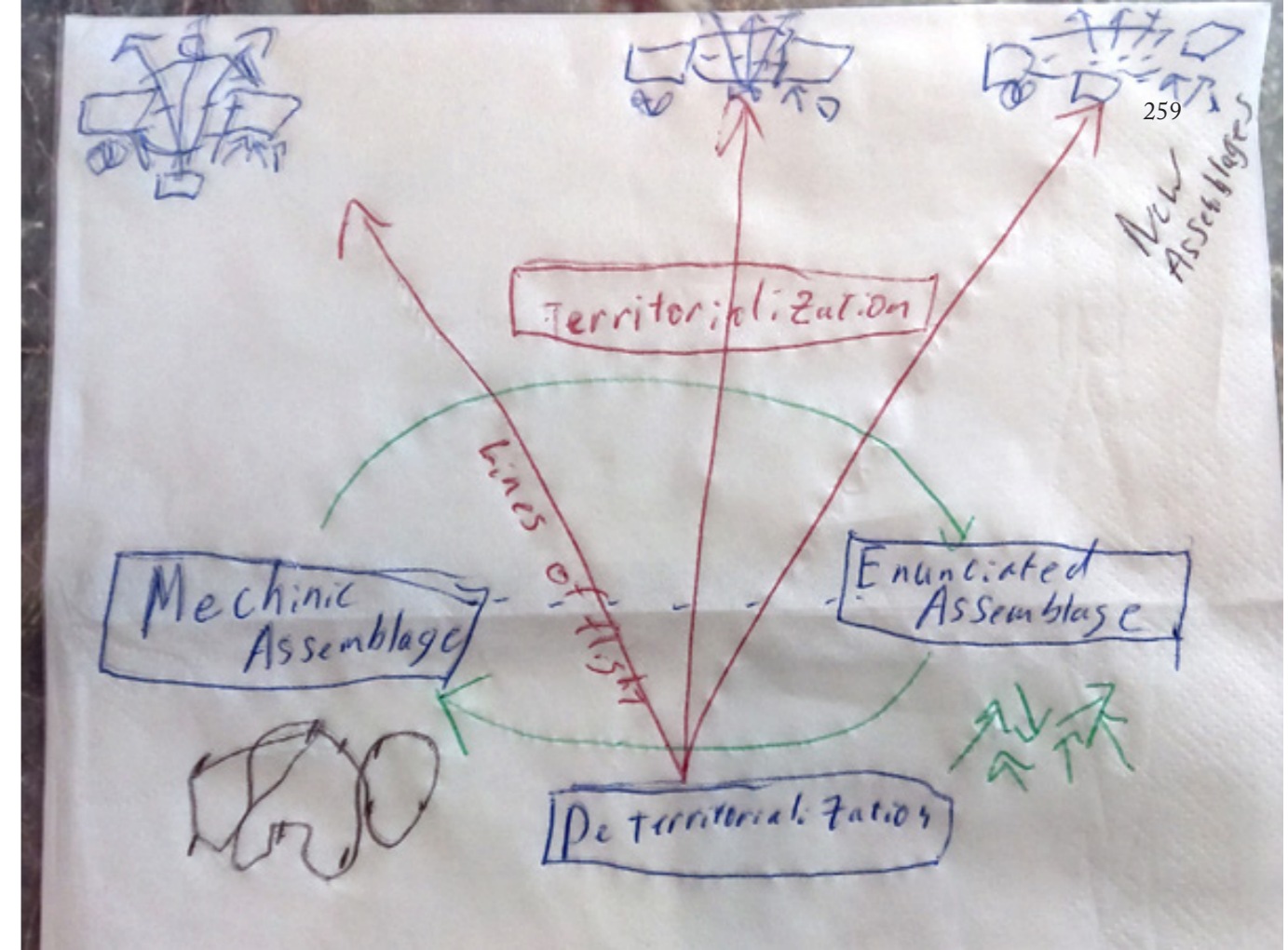
Figure 33:   *Diagram of Deleuze and Guattari's Assemblage*, Drawing on Napkin, 2017

relationships between the methods. My research does not attempt to force any specific method into an a preconceived notion of what the concept of "research methods" can potentially be.

The structure of an assemblage can contain machinic elements such as physical objects, events, etc., but also enunciated elements such as utterances, signs, etc. The enunciated elements of the assemblage are in reciprocal presupposition to the machinic elements. Neither causes

Figure 32:   (opposite) *Words Connected by The Blue Boy*, Paint and Sharpie in Overdue Library Book, 2018

the other, but they exist because of each other. The enunciation assemblage is comprised of language that exists as repetition through a social field. Enunciation is not an act of representing but a performance of "incorporeal transformations." (Deleuze and Guattari, 2007, p. 98) In this way, language does not represent the machinic assemblage, it does something to the machinic assemblage.[66] The second axis that comprises an assemblage is the territorializing/deterritorializing axis. The territorializing elements of the assemblage constantly seek to stabilize the assemblage by bounding it. However, the assemblage is being perpetually deterritorialized by the "lines-of-flight" (Deleuze and Guattari, 2007, p. 9) that allow new assemblages to emerge. For example, I view Facebook posts as assemblages. The act of posting is an enunciation into a pre-exisiting assemblage of ideologies of the user, the technical constraints of the program, etc. The post then receives likes, comments, spam, adjacent advertisements, etc. that are lines-of-flight that deterritorialize the assemblage and form new assemblages. In this way, the analysis of a social media

post through the lens of an assemblage is made through a rhizomatic perspective that enables multiple entry and exit points, allowing for the meaning of the post to change contingently over time.

None of the elements of an assemblage enter the assemblage with any a priori meaning. Instead meaning is constantly "becoming" through the relations between the elements of the assemblage. In this way, an assemblage accounts for contingency and provisionality, and it is here that I am grounding the meaning.

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66   This is like a judge declaring a "guilty" verdict. The language does not represent a person, it transforms them.

ArtisticPractice

I do not view my thesis as a territorialized concept, rather, I believe it exists as a continual flow of deterritorializations. If my thesis exists as a flow rather than permanently territorialized assertation, how can I even discuss "art practice" without appearing to territorialize the concept? My research method is an assemblage itself comprised of many co-present thinking/making practices including the writing of expository vignettes (such as this writing), reading, listening, as well as art. How then is art practice part of my research method assemblage (RMA) I have found resonance with Deleuze and Guattari's frame of, "Art is the language of sensations" (Deleuze & Guattari 2011, 176) and Deleuze's statement that, "the being of the sensible reveals itself in the work of art." (Deleuze 2014, 68) Viewing the art practice of my research through Deleuze's frame, I believe my RMA deploys art practice to reveal "the being of the sensible" as a base of knowledge. I have also found resonance between my work and artists such as Lawrence Weiner who uses "the possible as aesthetic category." (Deleuze & Guattari 2011, 177) I will

Figure 34:   (opposite) *Questions to Ask My Thesis*, Marker and Fake Wood Paper, 2018

also attempt to ground my writing practice as a contingent writing/artwork unto itself by writing with my voice and using provisional hyperlinks. In this way, I am attempting to locate my art practice as part of my RMA without territorializing either.

Deleuze proposes that sensibility is the ground of all knowledge when he states, "all begins with sensibility … The privilege of sensibility as origin appears in the fact that in an encounter, what forces sensation and that which can only be sensed are one and the same thing." (Deleuze 2014, 144) In order to define what they mean by art, Deleuze and Guattari state, "Art is the language of sensations … Art undoes the triple organization of perceptions, affections, and opinions in order to substitute a monument composed of percepts, affects and blocs of sensations that take the place of language." (Deleuze & Guattari 2011, 176) Deleuze and Guattari define percepts, affects and blocs of sensation when they state,

> Percepts are no longer perceptions: they are indepen-
> dent of a state of those who experienced them. Affects
> are no longer feelings or affections; they go beyond
> the strength of those who undergo them. Sensations,
> percepts, and affects are beings whose validity lies in
> themselves and exceeds any lived. (Deleuze & Guattari

2011, 165)

Deleuze constructs the logic of sensation wherein percepts and affect combine to make up artwork or assemblages of sensation. I understand Deleuze and Guattari's use of affect here to refer to Spinoza's use of the term as a "variation in the intensity of power belonging to mind and body at once." (Sharp 2011, 29) In this way, affects produce and shape assemblages, which in turn become the foundation of possible activities.

Deleuze states, "the being of the sensible reveals itself in the work of art, while at the same time the work of art appears as experimentation." (Deleuze 2014, 68) Subsequently, art practice can be used to reveal "the being of the sensible" as a base of knowledge through the analysis of the precepts and affects that comprise art. My research method assemblage seeks to use art practice to reveal "the being of the sensible" through the production and analysis of everyday affect.

DeclarationOfIntent

In writing about Deleuze, Simon O'Sullivan states that for Deleuze,

> Art is the name of the object of an encounter, but also the name of the encounter itself, and indeed of that which is produced by the encounter. Art is this complex event that brings about the possibility of something new. (O'Sullivan 2005, 2)

In this way, "art is less involved in knowledge and more involved in experience – in pushing forward the boundaries of what can be experienced." (O'Sullivan 2005, 52) From this perspective, Deleuze's concept of art can be used as a lens to view particular artworks or artistic practices that find resonance in, "exploring the possibilities of being in – and becoming with – the world." (O'Sullivan 2005, 52)

Lawrence Weiner's 1968 artwork *Declaration of Intent* can be framed as an artwork that is concerned with exploring the possibilities of being in the world.

Lawrence Weiner's *Declaration of Intent* (1968):

1. The artist may construct the piece.

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2. The piece may be fabricated.

3. The piece need not be built.

Each being equal and consistent with the intent of the artist the decision as to condition rests with the receiver upon the occasion of receivership.

The artwork here is ambiguous as to whether the 'art' is a gesture, a statement describing the gesture, both, or something else entirely. Weiner's artwork suggests there are multiple modes in which art can interact with the world. In this way, Weiner is able to take a singularity (his artwork) and turn it into a multiplicity of possibility. Weiner's artwork functions as a possibility assemblage that embodies multiple possibilities of being in the world.

Weiner states that he is a "sculptor rather than a conceptualist." (Lisson Gallery 2012, 1) This self-identification as a sculptor can be seen in his reference to art as language that is comprised of material. Weiner expresses that he believes a font can be seen as a material of language when he writes, "I don't like Helvetica because of its authority." (Weiner 2009, 1) Weiner states that it is not just the idea that is the machine for the art, but the

font, the location, the reader, and many more contingencies besides. Weiner framing himself as a sculptor is relevant because it resists framing his work as a cliché. O'Sullivan understands "clichés is as habits, habits of sight and habits of thought. Art opposes these habits, these clichés, with its own logic " (O'Sullivan 2005, 63). There is no exploration of "the possibilities of being in – and becoming with – the world," (O'Sullivan 2005, 52) in a cliché.

When writing about Deleuze's concept of art, O'Sullivan states, "Either an art work creates new connections in the brain or it is just another cliché". (O'Sullivan 2005, 137) Weiner frames his own work within this Deleuzian notion of art when he states, "Art is something that's looking for a place … Once it finds that place, it's no longer art; it's some sort of thing; it's culture." (Weiner 2009, 1) When Weiner says that art is "looking for a place", I take that to mean that for Weiner, art is the production of possible worlds of sensation. Artworks are the embodiment of the possibility of virtual worlds. Weiner's *Declaration of Intent* defines "the possible as aesthetic category." (Deleuze & Guattari 2011, 177)

Deleuze states that art, "is an object not of recognition but of a fundamental encounter." (Deleuze 2014, 139) When Weiner says that when an artwork "finds a place, it's no longer art," In this way, the ambiguity in Weiner's work is precisely what allows it to remain art by resisting a "place" and by resisting becoming an object of recognition.

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ThePossibleAsAestheticCategory

Note for the next section

The next section is not expository text. The act f reading used to be almost always conducted in a linear fashion. The concept of hyperlinked text has become the everyday method of reading. I have attempted to create an artwork out of my material of writing practice that highlights some of the possibilities of writing. I used this research writing to examine if the possibilities of digital writing such as hyperlinks constituted their own category of aesthetics. In this way, I have attempted to research the intersection of the everyday activity and digital practice of reading hyperlinked text.

I am writing this digitally on a screen. You are probably reading it on a screen, but not necessarily. Multiple articles say that there are substantial differences between reading on paper and reading on the screen. If you are reading on a screen, I can provide potential options to encounter this text differently through hyperlinks. Hyperlinks are ruptures to reading that force a reconfiguration of interacting with text. Here are links to some articles that only function if this is read online and the links still exist. The links are contingencies in this writing. If they no longer exist, this lack/loss alters the potential of the writing. Here are some contingent links: Link 1, link 2. I have also cited the references here as if this is written on paper. (Jabr 2013, 1) (Myrberg & Wiberg 2015, 1) Both of these articles highlight how "screens make us read slower, learn less deeply, remember less and sleep worse." (Myrberg & Wiberg 2015, 1) Here are a few articles that say that reading on a screen will kill you. Link 3, link 4. (Beres 2014, 1) (Life and Style 2015, 1) However, none of these articles discuss or reference the fact that the articles were

probably written on a screen. If screens have substantial impacts on reading, how do screens impact writing?

This section was written with voice recognition software that comes installed with my computer's operating system. Is the writing different if I speak it? Do the written words sound different to you if you know I spoke them instead of typing them? Talking to Siri or Cortana is always an act of writing because all voice recognition software uses hardware to convert sound vibrations into writing before conducting any other functions. The computer software's first and only language is writing. Ones or zeroes are always written. This is why software engineers refer to the process of electrical signalling (also referred to as coding) as "writing" to the memory of a computer. Every other form of communication is first translated through hardware into code, which is a form of writing, for the computer's operating system to process. Only then is the written text interpreted by the AI.

As I am speaking, I am also reading what the program is writing. In this case, writing is simultaneously speaking and

reading. All three practices and more are all functioning at the same time. Here is a video of me speaking/reading/ writing this which is also part of the writing. I have not edited and posted the video yet, so the link goes nowhere yet, but may be somewhere in the future. And then the link may move later. This is a practice of reading/writing/ speaking/art/thinking/making/what-ever-ing/?ing/... with voice is a practice that highlights how writing is not grounded in any essentialized practice; it is a Deleuzian practice assemblage where the continuously changing relations between the elements are the ground. When I say assemblage, I do not mean an arrangement of individual parts, I am referring to a process. Assemblage in this sense refers to connections, flows and becomings that develop and dissolve relationally between elements. Assemblage as a practice, a doing, a verb.

Weiner says he "doesn't like Helvetica because of its authority." (Weiner 2009, 1) Even though I am speaking, I wrote that in Helvetica and linked to a video and transcript of Weiner saying it. If you read it aloud does it sound like Helvetica? The last time I made this reference,

I did not link to it. I couldn't figure out how to put the hyperlink in with voice recognition, so I will do it by hand later. Weiner also says, "I think in nouns, as a general rule – and you can't communicate with people when you think just in nouns." (Weiner 2009, 1) The opening sentence of *Bleak House* by Charles Dickens is "LONDON." (Dickens 1994, 1) Rain. Coffee. If I write the sentence, "Buffalo buffalo Buffalo buffalo buffalo buffalo Buffalo buffalo". ("Buffalo Buffalo Buffalo Buffalo Buffalo Buffalo Buffalo Buffalo," 2017) It looks/sounds like it is all nouns, but there are verbs in there that are easier to sense when written or spoken with inflection. Text to speech software renders the sentence virtually incomprehensible as all of the "buffaloes" sound like nouns. Sometimes a complete and complex thought can be articulated in one noun. In Nahuatl, which is spoken in Mexico, you can say/write/read the noun, "¡Tocelohualmictia!" It means "Now you kill the ocelot!" (Minger 2016, 1)

While I have attempted to pronounce "¡Tocelohualmictia!" I cannot get the voice recognition software to write the word "¡Tocelohualmictia!" so I have copied and pasted it

from the website I found it on. I think most readers will immediately recognize "¡Tocelohualmictia!" as an unreadable word and will mentally skip reading "¡Tocelohualmictia!" every time it appears. "¡Tocelohualmictia!" is pronounced like this / toce:lo:wa:lmiktia/. Nahuatl is a pictographic language, so the original written version of "¡Tocelohualmictia!" looks

like this:

which I am treating in this text as text rather than a diagram or image. [67]

Within this writing, I have only been able to write certain ideas in particular ways depending on my writing format. If I am writing by speaking, hyperlinks are almost impossible to write and words like "¡Tocelohualmictia!" are almost impossible to write in either English or in their native writing. The writing of this text was designed

---

[67]   This is my handwritten version of the original pictograph of "¡Tocelohualmictia!" whose author is unknown. The original pictograph was written in stone and copied by Seler in Lacadena. (Lacadena 2008, 8)

to highlight how writing is contingent. Reading is also contingent as the potential reading of this text depends on the links working and a host of other possibilities like font availability, the automatic spell checker that probably keeps putting a red squiggly line under the word "¡Tocelohualmictia!", etc. Giving voice to this text through speaking is contingent upon the ability to speak elements of this text, such as the hyperlinks or the pictograph. The possibilities for writing, reading and speaking this text are explicitly contingent. It is in the contingency and the possibilities—including "failure"—to be read, that the writing/artwork that you are currently reading exists.

Here is a writing gesture comprised of links that will be dead by the time you read them. These are intentionally dead links, do not click on them! Link 5, link 6.[68] These hyperlinks are failures to connect. All hyperlinks have the potential to lead to a dead link or the wrong link or a link that then has a virus or pop-ups. Hyperlinks represent a field of virtual potential that includes real hazards.

_____

68   Or maybe I'm lying and they do lead somewhere. The only way to know is to risk clicking a potentially dead link.

Hyperlinks have also altered the act of reading as there is now an expectation of the potential of linking to knowledge outside of a text. I have underlined and coloured the font blue of the last quote as if it were a hyperlink, but it is not. I seem to have a visceral compulsion to click on underlined and blue text. I deeply desire for blue and underlined text to lead me somewhere else. Blue and underlined text has become a field of virtual desire for me and when it does not fulfill my desire, I become very frustrated. I feel as if the writer has broken an unspoken covenant with me that blue and underlined text has a function. How can a font colour and formatting have such an impact on my physical body when I am reading? Digital practice has had a deep and specific impact on my everyday act of reading.

I am writing this text with my voice. I am not going to differentiate between the text I have written by speaking or typing. How do you read a hypertext link out loud, with your voice? Attempting to read/write a hyperlink renders me mute. Attempting to orally describe what happens when you try to open a dead link in Microsoft word also

renders me mute. Reading a description of a dead link in Microsoft word changes my voice when I am reading/writing. "Figure 35: Screen Grab of Error, Screen Grab, 2017" on page 280 displays what the error looks like to me.

Microsoft Word ✕

⚠ Unable to open http://web.warwick.ac.uk/philosophy/pli_journal/introduction.html. The Internet site reports that the item you requested could not be found. (HTTP/1.0 404)
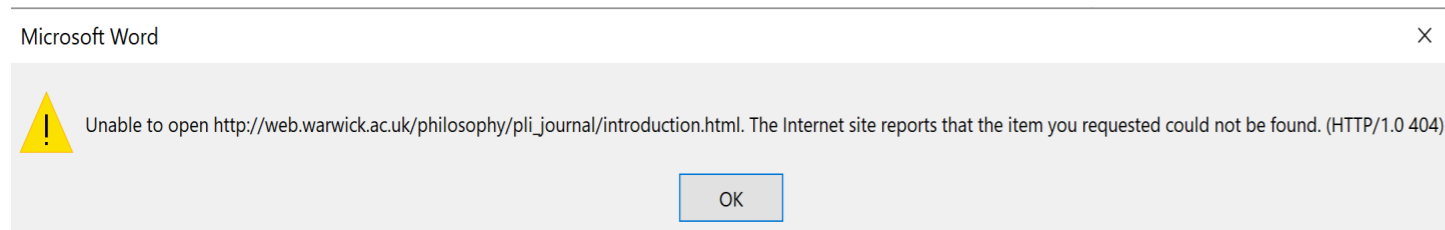
OK

Figure 35:   *Screen Grab of Error*, Screen Grab, 2017

What appears in the text is an image of a screen grab when Word gives me a warning to read, which is also part of my text that only appears if you do exactly what I did. Your text is probably different from what I wrote. I could not voice adding the image to the text, so I had to go silent and use the mouse in order for you to read the image that appeared. So what I voiced to write this is materially different from what was written and what you read. It is not just that the assemblage is complex; it is comprised of ever-changing relations between elements. Even the number and type of elements is contingent and emergent.

As time goes on, more of the links in this thesis will stop working, rendering this artwork/writing/reading perpetually incomplete. Eventually, this text will be unreadable as Microsoft Word will change and this writing is contingent on Word. It is also contingent on the screen. What will happen to this writing in the post-screen mode of sensing? Certain people are already using " 'bionic eyes' that bypass most of the visual system entirely. Instead, a camera mounted on a pair of glasses will feed information about the world directly to the brain." (Hamzelou 2015, 1) While the technology is currently focused on bringing sight to the blind through the visual processing structures of the brain, there exists the possibility of using this technology to sense in completely novel ways. Connecting optical sensors to smell processing structures in the brain to see in scent. Connecting sound sensors to pleasure structures of the brain to hear pleasure. Connecting sensors to parts of the brain that are not currently involved in the traditional senses to activate new concepts of what sense can be.[69]
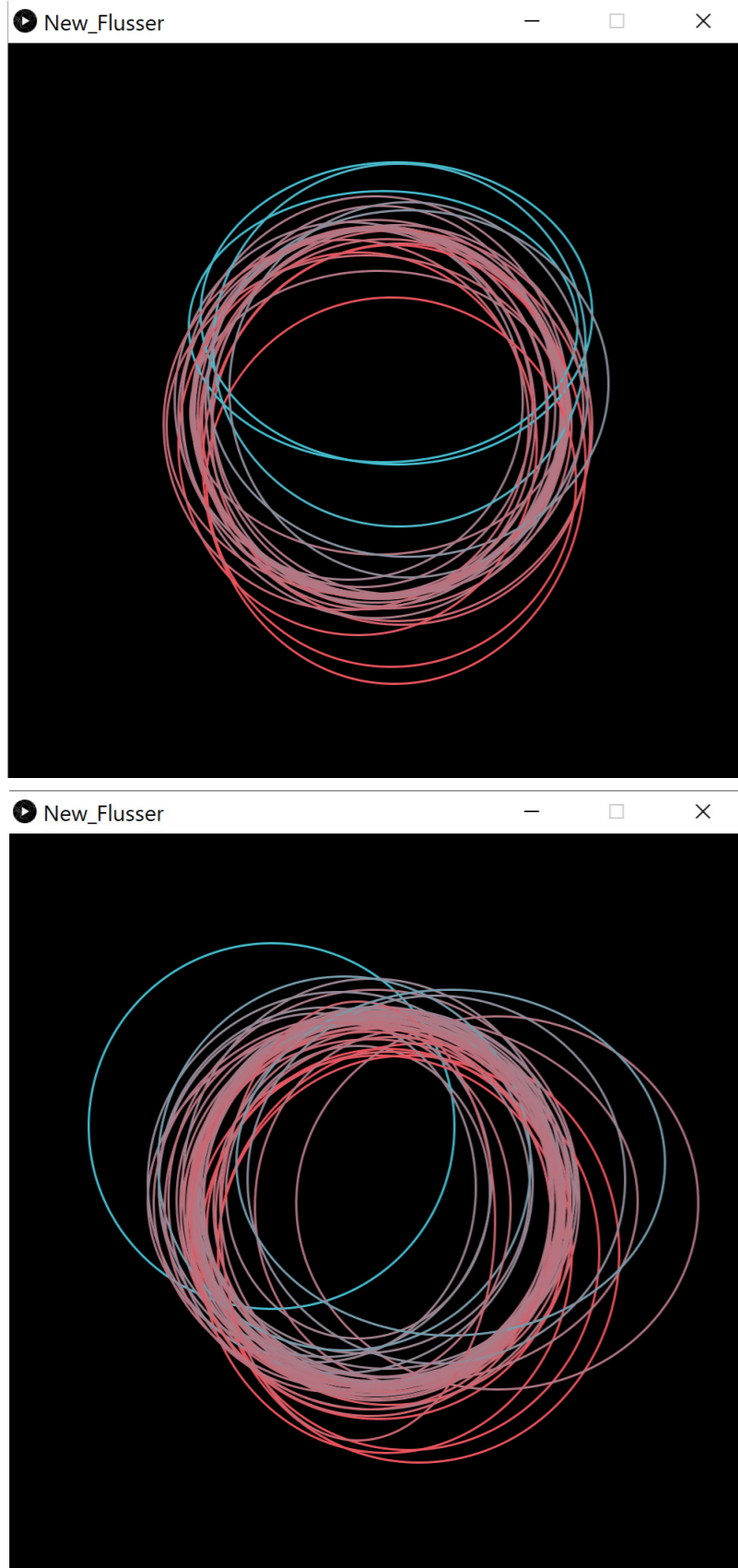
_____

69   If "the being of the sensible reveals itself in the work of art" and the senses are both contingent and provisionally limited, then art that exceeds current possible senses succeeds in "pushing forward the boundaries of what can be experienced."

Soon, we will not need to read/write/think with screens   (O'Sullivan, 2005, p. 52) through constructing assemblages

or paper. We may have new perceptions from new organs   that include non-representational and occult knowledges.

that exceed current possibilities. Maybe we will sense

a hyperlink as something that does not have a current

description as no one has ever felt it yet. In this way, I

frame this writing as not only contingent, but in which the

contingencies are contingent.

How does one sense this writing/artwork? How does

one sense a hyperlink? How does one sense a network?

I see this writing/artwork as an encounter that uses the

possible as an aesthetic as it frames an assemblage of

reading/writing/speaking/art/thinking/making/what-ever-

ing/?ing/… It seeks to reveal "the being of the sensible"

in writing that includes elements that cannot be read, are

always incomplete, and grounds its meaning in an ever-

changing network of relations of the possible.

I also seek to use the artwork in research to exceed the

current boundaries of how senses are experienced. In the

next section, I will introduce how my art works attempt to

push "forward the boundaries of what can be experienced"

Figure 36:   Stills of *Embodying Flusser's Voice*, Program, 2016


```
import ddf.minim.*;
Minim minim;
AudioPlayer flusser_voice;
int xpos=90;
float reduce=50;

void setup()
{
  size(1000, 1000);
  minim = new Minim(this);
  flusser_voice = minim.loadFile("flusser.mp3");
  flusser_voice.play();
}

void draw()
{
  background(0);
  strokeWeight(3);
  float a = 0;
  float x, x2, y, y2;
  float angle = 2*PI/50;
  int step = flusser_voice.bufferSize()/50;
  for(int i=0; i < flusser_voice.bufferSize() - step; i+=step) {
    float flusser01 = (40 * flusser_voice.mix.get(i)*500 + 60);
    float flusser02 = (40 * flusser_voice.mix.get(i+step)*500 + 60);
    x = 500 + (cos(a) * flusser01)/reduce;
    y = 500 + (sin(a) * flusser01)/reduce;
    x2 = 500 + (cos(a + angle) * flusser02)/reduce;
    y2 = 500 + (sin(a + angle) * flusser02)/reduce;

    float cRate = map(y, 400, 550, 0, 1);
    stroke(lerpColor(color(69, 189, 207), color(234, 84, 93), cRate));
    noFill();
    ellipse(x,y,x2,y2);
    a += angle;
  }
}
```

Figure 37:   *Embodying Flusser's Voice*, Program, 2016

EmbodyingFlusser'sVoice

In this section, I have attempted to embody the voice of the Czech philosopher, Vilém Flusser, through computer code. The everyday experience of our bodies is changing through digital practice. Already humans can expand their bodies with digital prosthetics and people talk about feeling as if their phones are part their body. (Roache 2009, 1) Cochlear implants can already be bluetooth-paired to phones effectively making the phone part of the body. (Cochlear 2018, 1) As technology becomes more wearable, doesn't it feel inevitable that phones will eventually become integrated into our bodies? What is the limit of digital practice overlapping with the everyday notions of our bodies? Can coding also be considered an embodiment?

shows screen captures of the visual element of my artwork *Embodying Flusser's Voice*. The image displays Flusser's voice as pieces of data and can be viewed as a detail shot of one of the elements of the artwork. I view the artwork as comprised of many entangled practices

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such as writing of the executable text of a computer program, the compiling of the code, the execution of the code, the code performing in the computer's memory, the interaction of the code with the other physical components of the computer among others. Wardrip-Fruin says, "trying to interpret a work of digital media by looking only at the output is like interpreting a model solar system by looking only at the planets." (Wardrip-Fruin 2012, 158) Only looking at the locations of the planets in a solar model does not provide insight into the knowledges of a model because multiple models with different knowledges can share the same final representation of the locations. For example, both the Ptolemaic geocentric and Copernican heliocentric models produce the same final representation of the appropriate locations of the planets. Only though examination of the calculations that produced the final representation are the critical and most significant differences between the knowledges of the models revealed. The same is true for digital media. Significantly different knowledges can contribute to digital representations that humans can recognize. Subsequently, for digital media, the output, the code, and how the code is uploaded are all

entangled parts of an artwork that are relevant and need to be examined.

Extending the concept of an artwork to include elements that are not apparent on the surface aesthetics is similar to the strategy taken by Jean-Marie Schaeffer in *Art of the Modern Age: Philosophy of Art from Kant to Heidegger* (2015). Schaeffer discusses how he believes writers such as Hegel, Nietzsche, and Heidegger all shared a common view of art that he develops and then rejects called "speculative theory." (Schaeffer 2010, 67) Schaeffer states that in speculative theory, the goal of art is to reveal "ultimate truths inaccessible to profane cognitive activities." (Schaeffer 2010, 6) Schaeffer states,

> Novalis, Schlegel, Hegel, Schopenhauer, Nietzsche, and Heidegger … These six authors are the essential sources drawn upon by countless critics, essayists, and artists who have made the speculative theory of Art the dominant artistic conception, if not in the West as a whole, at least in Europe. (Schaeffer 2010, 273)

In his introduction of Schaeffer's book, Danto states, "The speculative theory of Art played a legitimating role for a whole period of Western art." (Danto in Schaeffer 2015, 8) Danto also summarizes the impact of the speculative theory of art when he states "the search for the essence

is in fact a search for philosophical legitimacy." (Danto in Schaeffer 2015, 7) Danto goes on to write that in the speculative theory of art, "the art works are identified *as* art works insofar as they conform to a specific artistic ideal – that of the alleged definition of essence." (Danto in Schaeffer 2015, 7) Schaeffer outlines how the canon of philosophical aesthetics that he summarizes as speculative theory can be viewed as having limited the concept of what can constitute an art work.

Schaeffer rejects speculative theory by stating,

> the first fatal step taken by the speculative theory of Art resides in this reduction of the arts (and their ontological, semiotic and functional multiplicity) to a discursive structure concurrent with or complementary to discourse on the World, God, or the Good. (Schaeffer 2010, 229)

He goes on to state,

> Understanding this omnipresence of the speculative theory of Art as the heart of artistic life ... allows us to measure the effects and the consequences of this tradition on our relationship to art. For the most part, these consequences seem to me negative, and a profound reorientation of our way of thinking about the arts and approaching them is indispensable. (Schaeffer 2010, 273)

In his conclusion, Schaeffer presents an alternative perspective to the speculative theory of art that can tolerate

artworks that do not represent an essence.[70] In so doing, he opens the door for the concept of an artwork to be an assemblage that is constituted by the dynamic relationships between multiple, heterogeneous parts, rather than the concept that an artwork is only legitimate if it represents the notion of an "essence" that appears to be based in speculative theory.

I do not seek legitimacy by searching for an essence as described by Schaeffer. I would like to frame artwork in my research as constituted by multiple, dynamic, heterogeneous and superimposed practices and parts that I view through the lenses of quantum entanglement and assemblage. For *Embodying Flusser's Voice*, some of the elements include an appropriated video of Flusser talking, my performance of writing code, the computer code itself, and the visual display of visualizing Flusser's voice. I perceive these parts as functioning in the artwork in a similar manner to a quantum superposition of states where the multiple states of a particle (wave/particle, up/down, positive/

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70   I understand that many other practices like post-modernism, structuralism, feminism, etc. have developed in opposition to essentialism. I have chosen to write about one frame that specifically deals with concepts that I deal with in the artwork *Embodying Flusser's Voice*.

negative, etc.) do not "mix" but rather simultaneously exist in one wave state until observed. In *Embodying Flusser's Voice,* I am reading, listening, writing computer code and displaying visuals. The artwork cannot be legitimized by pointing at one element and saying it is the essence of the artwork because the artwork is constituted by the dynamic relationships between the parts of the assemblage.

For this artwork, I have appropriated Vilém Flusser's voice speaking the words,

> linguistic communication both the spoken and the written word are no longer capable of transmitting the thoughts and concepts which we have concerning the world … One of the most important codes is the code of technical images … If we want to understand the world it is not sufficient to describe it with words, it is necessary to calculate the world. (Peternák, director, 2010)

Flusser said this during an interview by Miklós Peternák in Osnabrück, European Media Art Festival, September 1988 titled 'On Writing, Complexity and the Technical Revolutions.' [71]

There are many elements of this specific quote from Flusser that are relevant to my research. Reflecting on

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71   The video of Flusser speaking is available here. https://www.youtube.com/watch?v=lyfOcAAcoH8

Flusser's statement that, "linguistic communication both the spoken and the written word are no longer capable of transmitting the thoughts and concepts which we have concerning the world" has led me to believe that perhaps the issue at hand is that transmitting thought is itself an insufficient concept. Instead of attempting to transmit thought, I believe that perhaps knowledge can be gained through other means, including embodying knowledge. In reflecting on Flusser's words, I have also come to believe that perhaps it is not a description of representational words that needs to be embodied, but the performance of a calculation that embodies knowledge. To know something is not to describe it in a representational manner, it is to code it in an embodied manner.

In this way, I believe I can frame the artwork of *Embodying Flusser's Voice* as an assemblage that includes representational elements such as the appropriated voice of Flusser, the linguistic piece of code as seen in "Figure 37: Embodying Flusser's Voice, Program, 2016" on page 285 and the visualization of Flusser's voice turned into data elements as seen in "Figure 35: Screen Grab of

Error, Screen Grab, 2017" on page 280. However, the artwork also includes non-representational elements, such as the embodied performance of coding. Computational artists such as Andrew Sorensen have used "Live Coding" (Collins, Mclean, Rohrhuber, & Ward 2003, 1) to turn the otherwise private performance of writing executable text into a public display.[72] Sorensen has created the Impromptu programming language and environment where users can simultaneously be a "programmer/performer/composer." (Wang & Cook 2017, 1) During his performances, Sorensen uses Impromptu to write code in front of a live audience to create music and visuals for display alongside the code he is writing. Live coding exposes the embodied aspect of coding where the physical aspect of performing code is on display in a similar manner to how a musician exposes their embodied, tacit knowledge of an instrument through performing live.

For *Embodying Flusser's Voice*, I am not live coding in front of an audience, but I view the act of writing executable code as a performance that embodies a particular set of

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72   An example of Andrew Sorensen "Live Coding" is available to see here. https://vimeo.com/176701164

knowledges, just like a musician playing an instrument. Similarly, an observer listening to a recording of a musician does not directly experience the embodied knowledge of the musician, they experience the sound of the music and the knowledge that the musician has embodied. From my perspective, the experience of a piece of music cannot be attributed to an essence such as sound waves hitting an ear drum. Rather, the experience is constituted by the relationships between a musician, the instrument, the composition, and many other heterogeneous elements that may not be explicitly observed. Similarly, a digital artwork cannot be attributed to an essence such as an image on a screen, but is constituted by the relationships between a coder, the compiler, the program running in memory and other elements that may not be explicitly observed.

I believe that while the human readable form of a digital artwork, such as a video or an image, is generally privileged and labelled as the totality of the artwork, the other hidden components and the relationships between all of the components can also be seen as constituting an artwork. Subsequently, though parts of it are hidden,

I view *Embodying Flusser's Voice* as an artwork that seeks to embody Flusser's voice in the performance of writing executable text, the program running and the human readable images that result. The graph in "Figure 36: Stills of Embodying Flusser's Voice, Program, 2016" on page 284 only represents that embodiment of the code in a human-readable form.

Through this research, I have endeavoured to embody Flusser's voice through the practice of writing computer code rather than describing it in a representational manner. By "embodied," I am referring to a form of tacit knowledge where the knowing subject is the body itself. As Merleau-Ponty wrote,

> To know how to touch type is not, then, to know the place of each letter among the keys, nor even to have acquired a conditioned reflex for each one, which is set in motion by the letter as it comes before our eye. If habit is neither a form of knowledge nor an involuntary action, what then is it? It is knowledge in the hands, which is forthcoming only when bodily effort is made, and cannot be formulated in detachment from that effort. (Merleau-Ponty & Smith 2015, 144)

Subsequently, there are many ways to acquire embodied knowledge through "bodily effort" as Merleau-Ponty writes. Some examples of normalized modes of embodying knowledge include reading words out loud, dancing words, going for a walk, or any other "knowledge bred of familiarity." (Merleau-Ponty & Smith 2015, 144) When discussing the transmission of embodied knowledges, Sheets-Johnstone states,

> Skill-learning is rooted in the capacity of one bodily presence to be attentive to another and to pattern movement along the lines of the other, imitating the way in which the other performs something … imitation is not senseless copying but consistently engenders the possibility of deviating from and innovating common practice. (Sheet-Johnstone 2000, 358-359)

In this artwork, I believe I can share with others an extended concept of embodiment. I hope to be able to share my perspective of how I believe my body can include elements of my computer within a concept of digital embodiment.

NonrepresentationalTheory- AndBody

The main characteristics of non-representational theory all revolve around the argument "that human life is based on and in movement" (Thrift 2007, 5). Non-representational theory is very careful to position itself as anti-biographical. To non-representational theory, biography stems from the belief that lives exist to be "known and understood, rather than endlessly redescribed". Instead of representing human life in a biographical manner, non-representational theory uses a model of the world that is made of many things brought into relation in many ways and many spaces that then constitute a geography of what happens. Analysis of this geography concentrates on practices that have gained stability over time. Assemblages can be modelled as movement-geographies that non-representational theory is designed to address. Through the lens of a movement-geography, an assemblage is constituted by the changing set of relationships between component parts and the analysis of territorialized practices within the assemblage can reveal

Figure 38:   (opposite) *Knowledge of My Hand Drawing A Circle*, Tissue Paper and Paint, 2018

the "on-flow" of everyday life in an anti-biographical way
as it is constantly being "redescribed" (deterritorialized and
then reterritorialized).

Non-representational theory argues that, "the human body
is what it is because of its unparalleled ability to co-evolve
with things." (Phillips 2000, 74) The human body is a tool-
being that has evolved in response to the requirements of
tools, including the recent advent of digital tools. Thrift
highlights this when he points out that, "what we call
'thinking' in human beings does not occur just in the brain
but at a series of sites in the body." (Thrift 2008, 166)
My research *Happy Happy* (discussed in the next object)
asks what it means if my 'thinking' occurs in an affective
assemblage that includes areas outside of my body.
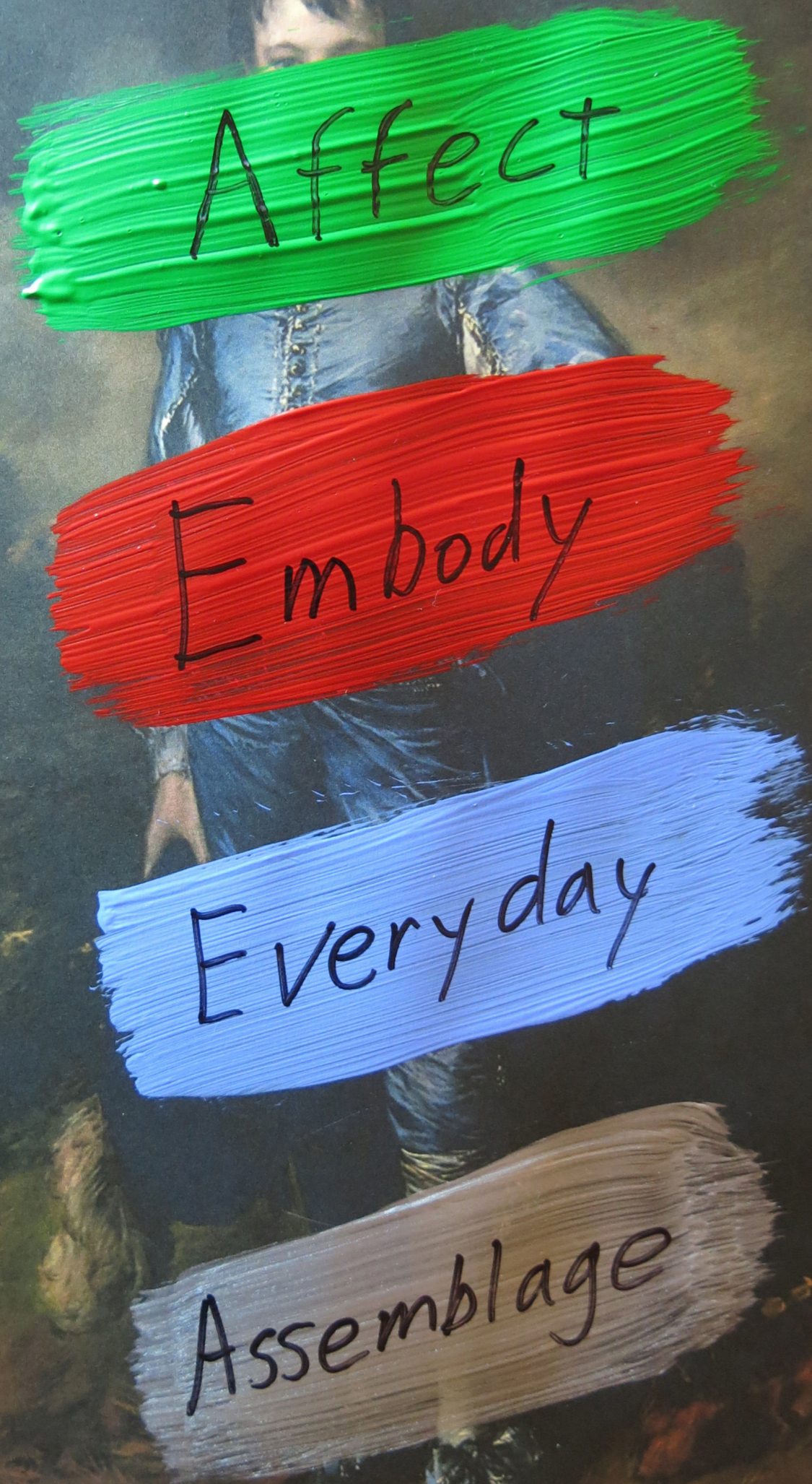
MoreOnAffect

One of the structures of my research methods explores and documents affectus to construct a mapping of social and emotional geographies. In this way, I deploy the logic of affect as the grounding of my research.

Using affective assemblages in research is a type of occult research method because changes in affectus are non-representational. Affective assemblages are knowledges that exceed the capacities of research methods that are otherwise limited by data acquisition and validation. Using affect as a research method requires creating and analysing a contact zone with the flows of life rather than research that creates a system to obtain and log empirical data.

Affective assemblages can be sensed, but knowledge of affectus cannot be readily quantified in data. This is because knowledge of and in affective assemblages is incommensurable, non-representational knowledge of a flow. My research is not centred around transforming occult knowledge into a form of data that can then be

Figure 39: (opposite) *Words Connected by The Blue Boy*, Paint and Sharpie in Overdue Library Book, 2018

analysed, rather, my research allows for occult knowledge to remain occult.[73]

The best examples of a method of affective research can be found in everyday life. People intuitively know when they have entered an affective assemblage. When people find resonance within an affective assemblage, people talk about "having chemistry" with someone or "getting a good vibe" about something. Both of these terms use scientific terminology to describe a phenomenon that is wholly non-representational. The zone between human senses and affective assemblages goes by many names, but is frequently referred to as intuition. Psychology researcher Joel Pearson is actively working on developing metrics for quantizing intuition, but states, "Although most people agree that there is such a phenomenon as intuition … little compelling evidence supports this notion." (Lufityanto, Donkin, & Pearson 2016, 1) When faced with explaining intuition, most people cannot verbalize the experience and usually resort to hand gestures and other non-linguistic,

embodied methods to communicate. For example, when people get "bad vibes" from certain places or things, they frequently struggle to verbalize what their intuition is telling them. When trying to explain knowledge derived from changes in an affective assemblage, people might say "it is a gut feeling" rather than pointing to accumulated data or analysis. Because affective assemblages are occult, the knowledge derived from them is frequently associated with other occult forces. In an attempt to make a representation of the change in their affectus, people say they get "vibes" from places because a place might be haunted or because of demons, etc. Subsequently, people who deploy non-representational knowledges are frequently marginalized as witches, superstitious, etc.[74]

The knowledge that people have about affective assemblages is frequently dismissed as invalid because it is non-representational. Such knowledge is marginalized as intuition, a hunch, ESP, a psychic ability or a sixth sense. In fact, non-representational knowledges like intuition are

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73   Research that transforms occult knowledge into data that can be processed is research that functions like taking X-rays and converting them to visual photographic plates. Before their discovery, X-rays were an occult, insensible force that affected humans. Research into X-rays transforms the otherwise occult force into data that can be analysed.

74   The process of marginalizing people who are sensitive to changes in affective assemblages could constitute multiple theses crossing various disciplines including feminism and post-colonial theories. For the purposes of my thesis, I will simply state that I am interested in using affective research methods and I am not interested in defending their validity.

so marginalized that the thesaurus lists the antonyms for intuition as "knowledge" and "reason." (Intuition, n.d.) It is in the marginalized and non-representational knowledge of affective assemblages that my research method is grounded. In this way, I aim to push "forward the boundaries of what can be experienced" (O'Sullivan 2005, 52) by using non-representational experiences that cannot be used in data acquisition as a potential ground for research.
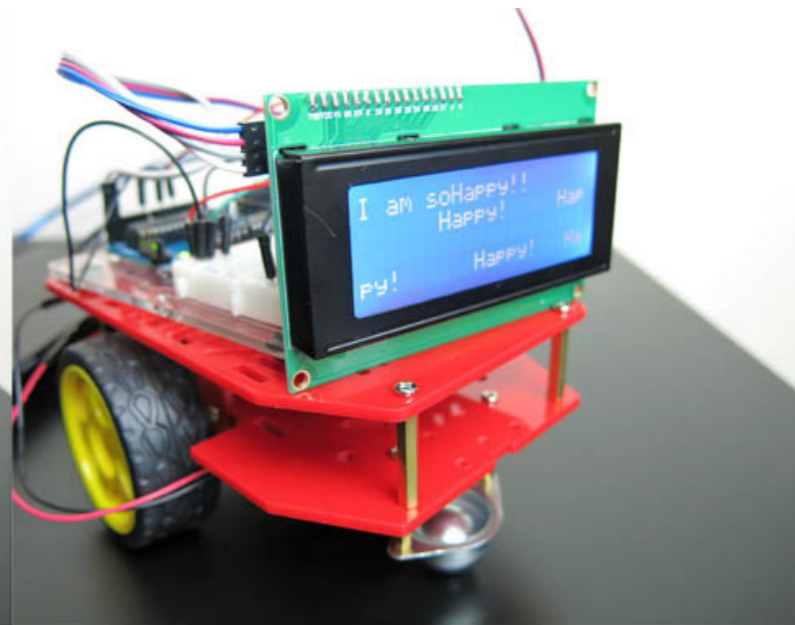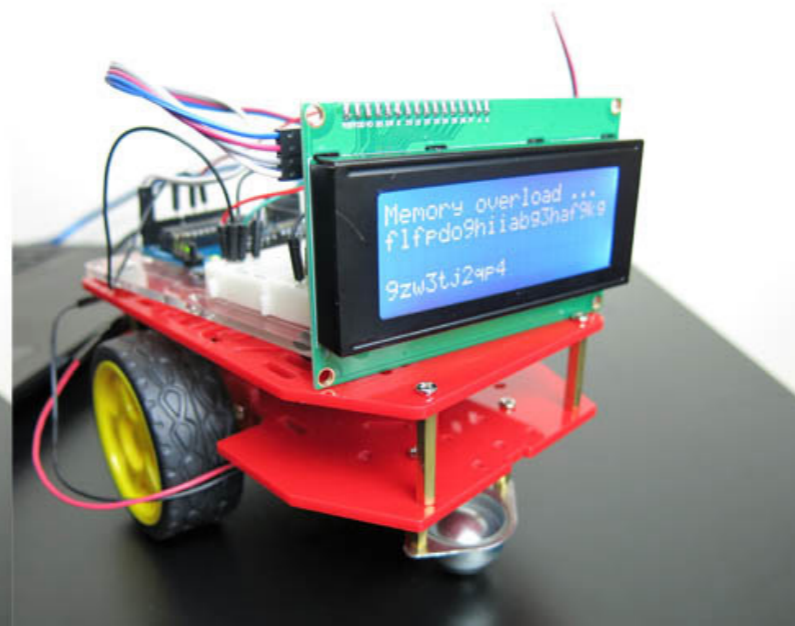
This page is intentionally left blank.

Sad
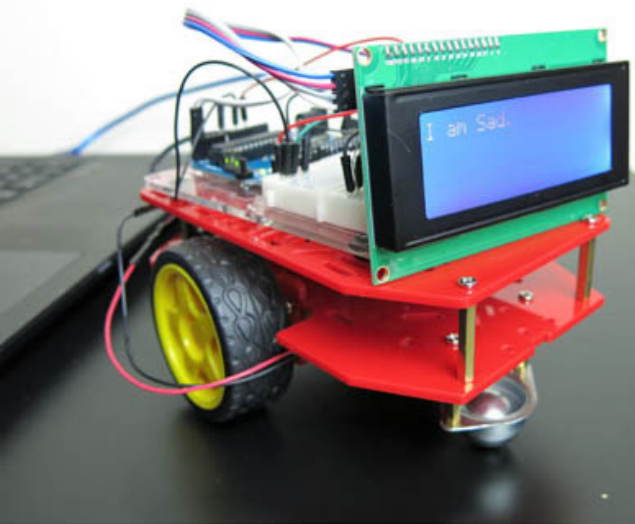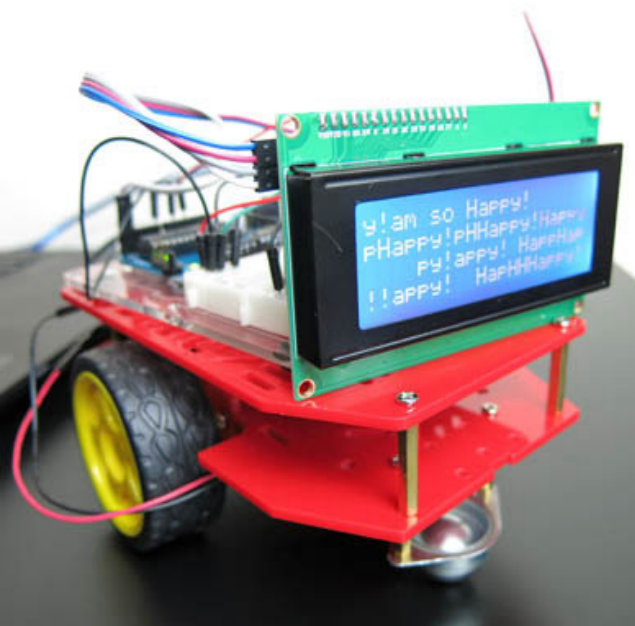
Happy

Happy Happy

Dead

Figure 40: *Happy Happy*, Robot, 2017

HappyHappy

People now interact, and form affect assemblages with digital technology on a daily basis. People talk about how their phone has "died" and developing emotional attachments to digital pets. (Vermes 2018, 1) I have attempted to work in the space where digital practice intersects with affect. Through the robot *Happy Happy*, I have attempted to address the affective assemblage that can occur through digital practice.

Co-present with my affective research method, I have made an artwork called *Happy Happy* seen in figure "Figure 40: Happy Happy, Robot, 2017" on page 308. *Happy Happy* is a robot that states that it is sad if it is in darkness and will move itself into light. If the robot is allowed light, the robot says that it is happy. The longer the robot is allowed light, the happier it gets, until its RAM fills and the robot "dies" due to a memory overflow glitch.[75] So, when I interact with the robot, I am confronted by the choice to cover the light from the robot and allow it to remain sad,

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75   RAM overflow can take quite a while using string variable, so in the current code, the robot stops functioning after receiving a particular amount of time in the light to speed up the effect.

but alive indefinitely, or provide it light which will end the robot's existence due to a glitch in the way it was created.

I am using the term "glitch" here very specifically. John Glenn wrote, "[t]he engineering term we used to describe some of our problems was "glitch." Literally, a glitch is a spike or change in voltage in an electrical circuit … Normally, these changes in voltage are protected by fuses. A glitch, however, is such a minute change in voltage that no fuse could protect against it." (Glenn in Rhodes 2000, 223) Glitches were viewed as a nuisance and not something that should be or even can be systematically addressed. This is different from a bug, which is a significant problem in a system that needs to be addressed. Glitches are viewed somewhat mysteriously and are frequently attributed to hidden system variables and other occult sources. What glitches highlight is the physical nature of digital systems. Most users do not think of this physical nature until a glitch causes Microsoft Word to crash. Most engineers will admit that glitches are unstoppable because their very nature is transient and hidden.

In *Glitch art in theory and practice*, Michael Betancourt defines glitch art as a, "particular engagement with the system as a such as it fails--no matter the particulars of that breakdown--that defines glitch techniques as an ongoing process of investigation, whatever the human readable form might be." (Betancourt 2017, 125) Betancourt goes on to identify five methods of glitches used in contemporary art. 1) Data manipulation focuses on altering a digital file to introduce errors when displayed. This method is arguably not a "glitch" because all of the systems are functioning correctly, but humans have interfered in a manner that cannot be designed out of the system.[76] 2) Misalignment is when data designed for one piece of software is fed into another piece of software. Again, this is arguably not a glitch, because every element is functioning correctly, but is being applied in an unexpected manner.[77] 3) Hardware failure is where "physical failures in the technology itself (as distinct from software) produce glitches and aberrant results without necessarily altering the digital files being

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76   For example, adding extra data to a file to make it display strangely is not a glitch any more than adding rocks as an ingredient to a cake mixture is a glitch. It is not a glitch as you have just made something other than what is expected from normal ingredients.

77   Putting water in a gas tank and then watching as the engine seizes is not a glitch; it is just not using the materials as designed.

presented." This is perhaps the best use of the word glitch because it is an error introduced to a digital system due to a limitation of the system. 4) Misregistration is where noise from historically analogue sources is included in a digital media type. This is also arguable not a glitch as it is not so much an error, as it is noise. 5) Distortion is where the data in a digital system is distorted by human means. Again, this is arguably not a glitch, but actually a feature of the system whereby the output of system can be altered by human means.

The robot in the artwork *Happy Happy* will die without my human intervention because of a hardware glitch. It is a limitation of hardware that memory can only hold so much data before it begins to overwrite itself. In this case, *Happy Happy* becomes so happy that the memory runs out of room to be allocated and eventually a random change in voltage in the wrong place on the chip causes the program to stop functioning.

I frame this robot as part of an affective assemblage where the elements of the assemblage come into being through

their interaction. The robot displays the affectus embodied in the code of the robot. I am responsible for managing the emotional states of the robot and thus assume the role of care labourer.[78] The robot and I become part of an assemblage that includes our affectus where the capacity of both the robot and I to be active increases or diminishes based on the modifications of the other's affectus.

However, the system is designed so that the affectus of one element of the assemblage is always in opposition to the other. If I "help" the robot, it increases my affectus, but it decreases the robot's because it feels sad and the robot moves to correct the diminished capacity. If the robot's affectus goes up by finding light, then my affectus goes down because I know that the robot will die because of my choice not to take care of the robot. The only balance between the two affectus in the assemblage is if I monitor the robot's happiness and then stop it from getting too happy just before it dies.

78   An analysis of the role of care labour for non-humans such as computer programs, plants, non-human animals, machines, etc. is worth its own thesis. For the purposes of this thesis, I will simply state that it is possible to care for the affective and emotional needs of non-humans. Other examples of this include Tamagotchi "hand held digital pets."

The entire assemblage is designed to prevent joy as Lomax defined it because there is almost no way for both bodies to "have their potential to interact increased." (Lomax 2000, 87) This is because I do not have time to monitor the robot continuously and keep it from dying. Inevitably, I end up watching as the robot dies. I then reset the robot and it undergoes a perpetual cycle of death and re-birth. The robot continually re-lives the same actions that killed it the first time over and over again.[79] The robot seeks happiness and then dies. As it does, I seem to mimic the inverse affectus over and over as well. I experience more sadness as the robot gets happier because I know that the happiness it is experiencing will be the cause of its death and I let it happen anyway.

This change in affect is non-representational knowledge. In order to gain this knowledge, someone else would have to interact with the robot and allow it to die from happiness. It appears that when I create the conditions where others can interact with the robot, others have expressed feeling that they are part of an affective assemblage with the robot. To quote one anonymous person who interacted with the robot, "Well, at least it died happy …"

Happy Happy is an artwork that highlights how an assemblage that includes the affects of human and non-human participants can be sensed. The artwork asks, "What does it mean to assume the role of caregiver for the feelings of a computer program? What does it mean to be impacted by the death of a robot?" Human experience is impacted by interactions with non-human entities. *Happy Happy* highlights the perceived boundaries of human experience by putting a spotlight on how non-human entities have the potential to impact humans.

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79   Nietzsche wrote, "What, if some day or night a demon were to steal after you into your loneliest loneliness and say to you: 'This life as you now live it and have lived it, you will have to live once more and innumerable times more?'" (Nietzsche, 2011, p. 341) Through the lens of the concept of eternal recurrence for the robot, I am the demon.

It's worth mentioning that I'm really good @misinterpreting social cues

I wish I had background music in my life so I could understand what the hell is going on.

You should Instagram this funny note

Your positive energy is a contagion
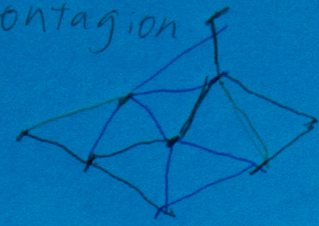
When. I. Read. Like. This. The. Voice. In. My. Head. Takes. Pauses.

Eat like noone is watching. Or dance, or whatever.

Socially acceptable interests are BORING

Weird is a side effect of Awesome

There are no bad selfies, that's just how your face looks sometimes.
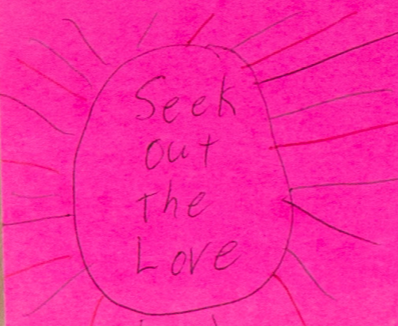
You don't find will power you make it.

Be an Adventurer

ipod! upside down is still ipod!

Every day is a battle, but whatever you're scrappy

Draw a monster. Why is it a monster?

Seek out the Love

I have nothing in common with grown-ups

The worst part of censorship is

If I'm not meant to have midnight snacks, why is there a light in the fridge?

It's ok Artists should be strange

I talk in my sleep because I can't dream quietly

Family is proof that you can love more than one person at a time

A bald eagle at a zoo is a symbol of freedom in captivity.

I have a weakness for clever minds.

Just because I don't care doesn't mean I don't understand.

Post-its

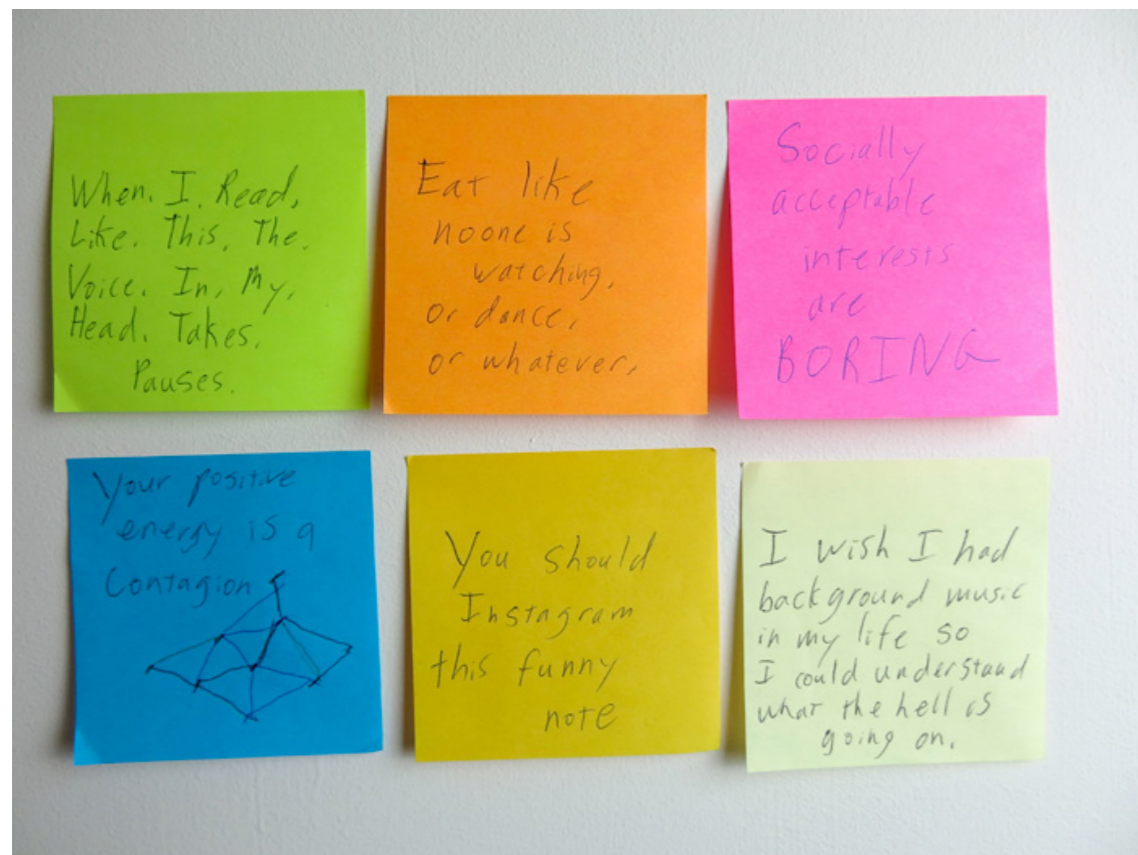Figure 42:   Installation shot of *Post-its*, Post-its, tag-tears, chalkboard, 2016

Figure 43:   Installation shot of *Post-its*, Post-its, tag-tears, chalkboard, 2016

Most people I know send "notes" to each other all day long. By "notes," I mean small messages of one or two sentences at the most. These notes are sent almost exclusively through digital practice. Before texting, Facebook, Twitter, etc., I probably only left hand written notes for people at most once a week and it was always for my friends or family. They would read like: "Get milk", "Gone Fishing", "Long night, let me sleep in", etc. Sending digital notes has become an everyday activity where I might send 20 notes to various people all day long. For this research, I am examining the intersection of sending notes and digital practice, but rather than relying on the digital practice that has become an everyday activity, I have examined hand written notes which are ceasing to be an activity at all.

and display installation shots of my artwork *Post-its*. Every day for the last fifteen years, I have written

my wife a note. It started one day when I left my wife a note that said "Love ya!" The next day she asked, "Where is my note for today?" I have now written over 5000 notes and continue to add one a day. Notes include saying or reminders or images of our family printed on post-its. The notes are hung in a gallery and over time, the post-its fall or viewers take them. *Post-its* functions as an assemblage as it has both machinic and enunciated elements and the meaning of the artwork is continuously deterritorialized and hence the artwork is always "becoming." This is not an illustration of my understanding of an assemblage, but rather, it is a contact zone with provisional flows of meanings in my everyday life. As an element of my research method assemblage, *Post-its* are intended to reveal how meanings are contingent on many elements including where they are placed, time, the mood of the viewer, and other unquantifiable influences.

My research specifically focuses on the affect of the everyday. The everyday in this case is defined as the habitual and unnoticed as in Ben Highmore's definition of everyday life as activities that "tend towards the unnoticed."

(Highmore 2005, 1) In "The Practice of Everyday Life", de Certeau uses walking in the city as an analogy to outline how individuals use tactics in everyday life to subvert the rituals and representations that institutions use as strategies to control culture. (de Certeau, 1984, p. 102). de Certeau emphasizes the distinction between a producer who seeks to use the city to influence and a consumer. de Certeau refers to "la perruque" or "the wig" that is worn by the subjugated as a diversionary tactic to subvert the power of the oppressor. (DeCerteau, 1984, p. 24). I am particularly interested in how de Certeau frames everyday life as a cite that should be analysed.

The everyday offers a particularly useful set of behaviours for analysis because the affects of the everyday can be defined as repeated affects that have a low level of affectus. Because of the low level of change between affections, they never reach the level of receiving/requiring attention and subsequently require a specific set of methods in order to be attended to in a meaningful way. A researcher in everyday affects must develop the ability to attune to slight but significant movements in affectus. These

everyday affects are extremely powerful as they continue to constitute the body, just as all affects do, but do so in a manner that does not draw attention. Everyday affects are comprised of silent, invisible, constantly unpredictable and shifting sets of fractured and multiplicitous assemblages of things that happen and are felt. In this way, these everyday affects evade meanings and representation and require the deployment of an alternate set of research methods for analysis. Everyday affects require a Deleuzian method that focuses attention on how the elements of the affective assemblage relate to one another rather than trying to "know" any one, elusive affect. In my research, the multiplicity of everyday effects is viewed through the lens of Deleuze's concepts of becoming, assemblage and immanence as defined above.

Using everyday affect as a method poses some challenges because as Raymond Williams said, they "do not have to await definition, or rationalization before they exert palpable pressures." (Williams 2009, 133) Subsequently, my affective research methods seek to avoid the "quick jump to representational thinking and evaluative critique." (Stewart

2007, 4) Instead, my affective research methods remain grounded in non-representational theories.

In observing the terrain of research methods, I am immediately confronted by sub-myths within the myth of research. It is frequently stated that research must have internal and external validity.

> Findings can be said to be internally invalid because they may have been affected by factors other than those thought to have caused them ... Findings can be said to be externally invalid because [they] cannot be extended or applied to contexts outside those in which the research took place. (Seliger & Shoham 2015, 95)

My research does not employ these myths of research validity but requires the construction of a different myth of validity. The validity of a research method assemblage grounded in the logic of everyday affect is based on the notion that "affects are beings whose validity lies in themselves and exceeds any lived." (Deleuze and Guattari 2011, 164). In this way, I am framing my research within Patti Lather's concept of validity that is "multiple, partial, and endlessly differed." (Lather 1991, 5) This validity begins with the assumption that validity is a social construction and as such always acts as a myth. Lather constructs a notion of validity that exists without a value-

priced interpretation and provides no epistemological guarantees. I perceive this notion of validity as a validity assemblage that is fluid and generative, one that can account for contingency and variability.

Within the myth of validity lies the myth of data. What counts as data in a method assemblage? Rachel Holmes states:

> There seems to be a tension between data fragments that are able to be ordered and tamed by codes as they are accumulated, alongside data that rebelliously issues itself from the chaos of the school, crawling under my skin… other events that connect to this playground event may include the histories and practices of observation, genetics, figured worlds, sereology, architecture, entropy, imagined bodies, astronomy, enculturation, technologies, calculus, myology, all articulations of a machinic assemblage, a series of intensities, flows and speeds. (Holmes 2014, 783)

As Kelly Clark/Keefe says, this requires a shift in understandings of data from "something I see, catch or capture to something I sense it doing." (Clark/Keefe 2014, 791) In this way, I frame the data of my research methods as affects that are part of a validity assemblage. I want to be clear that I am not treating affects as units of knowledge or as forms of signification to fit a mould of "data"; rather, it is data that I am redefining as a "lived surface" (Stewart 2007,

4) comprised of a constant flow of sensations, intensities and textures.

With a framing of research as a method assemblage comprised of various practices and seeking to deploy a logic of everyday affect as a ground and supported by affects framed as data existing in a validity assemblage, I ask: How do I conduct research?

Figure 44:   *Tea Leaves Predict DJIA*, code, 2017

```java
import blobDetection.*;
BlobDetection theBlobDetection;
PImage img;
int offset;
int offesty;
int d = day();    // Values from 1 - 31
int m = month();  // Values from 1 - 12
int y = year();   // 2003, 2004, 2005, etc.

void setup()
{
  size(1980, 800);
  img = loadImage("tea_01.jpg");
  theBlobDetection = new BlobDetection(img.width, img.height);
  theBlobDetection.setPosDiscrimination(true);
  theBlobDetection.setThreshold(0.2f);
}

void draw()
{
    image (img,0,0);
    image (img,img.width,0);
    theBlobDetection.computeBlobs(img.pixels);
    drawBlobsAndEdges(true,true);
    int blobNumber = theBlobDetection.getBlobNb();
    float prediction = ((blobNumber/2)*0.001);
    stroke(255);
    fill(0);
    textSize(50);
    offset = img.width*2+25; //text x placement
    offesty = 200; //text initial y placement
    text("Pre-Processed Image", img.width/2 - 200, 700);
    text("Processed Image", img.width/2 + 400, 700);
    textSize(45);
    text("Tea Reading Predicts DJIA", offset, offesty);
    textSize(40);
```
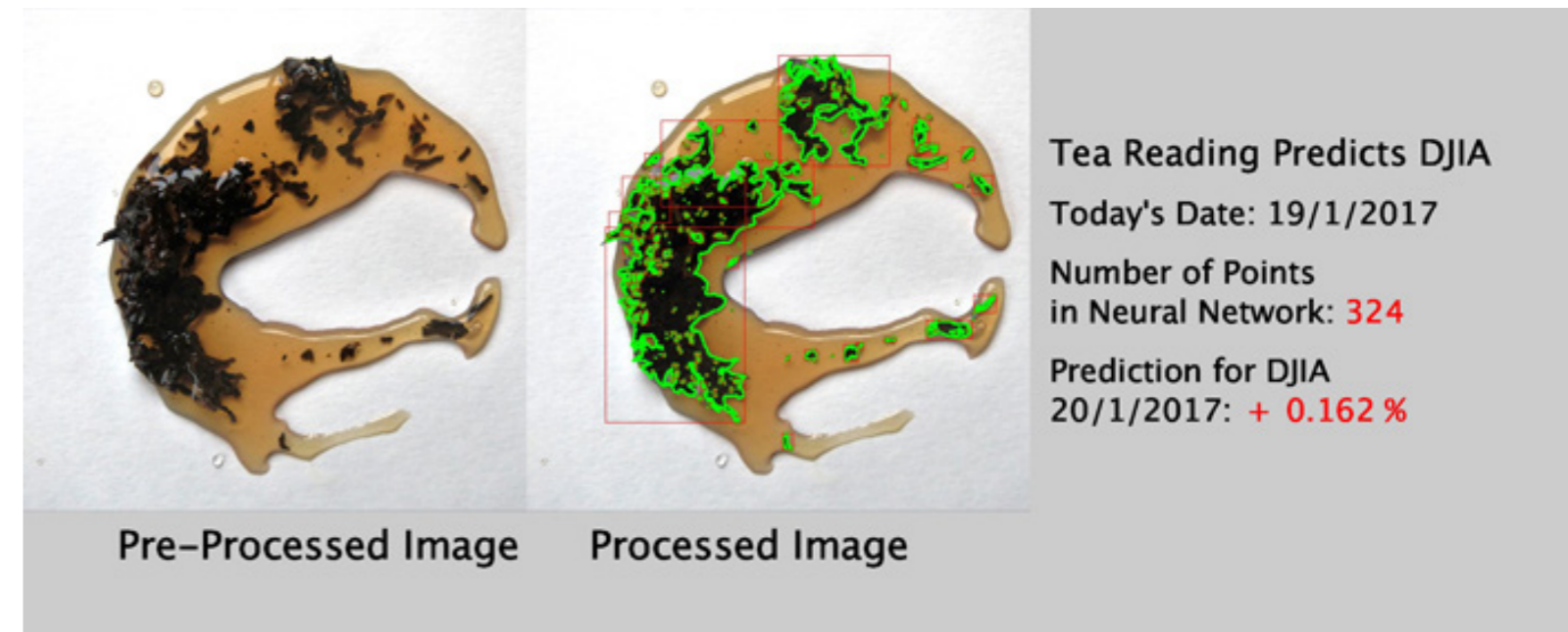

Figure 45:   Image 19/1/2017 from "Tea Leaves Predict DJIA, JPEG, 2017
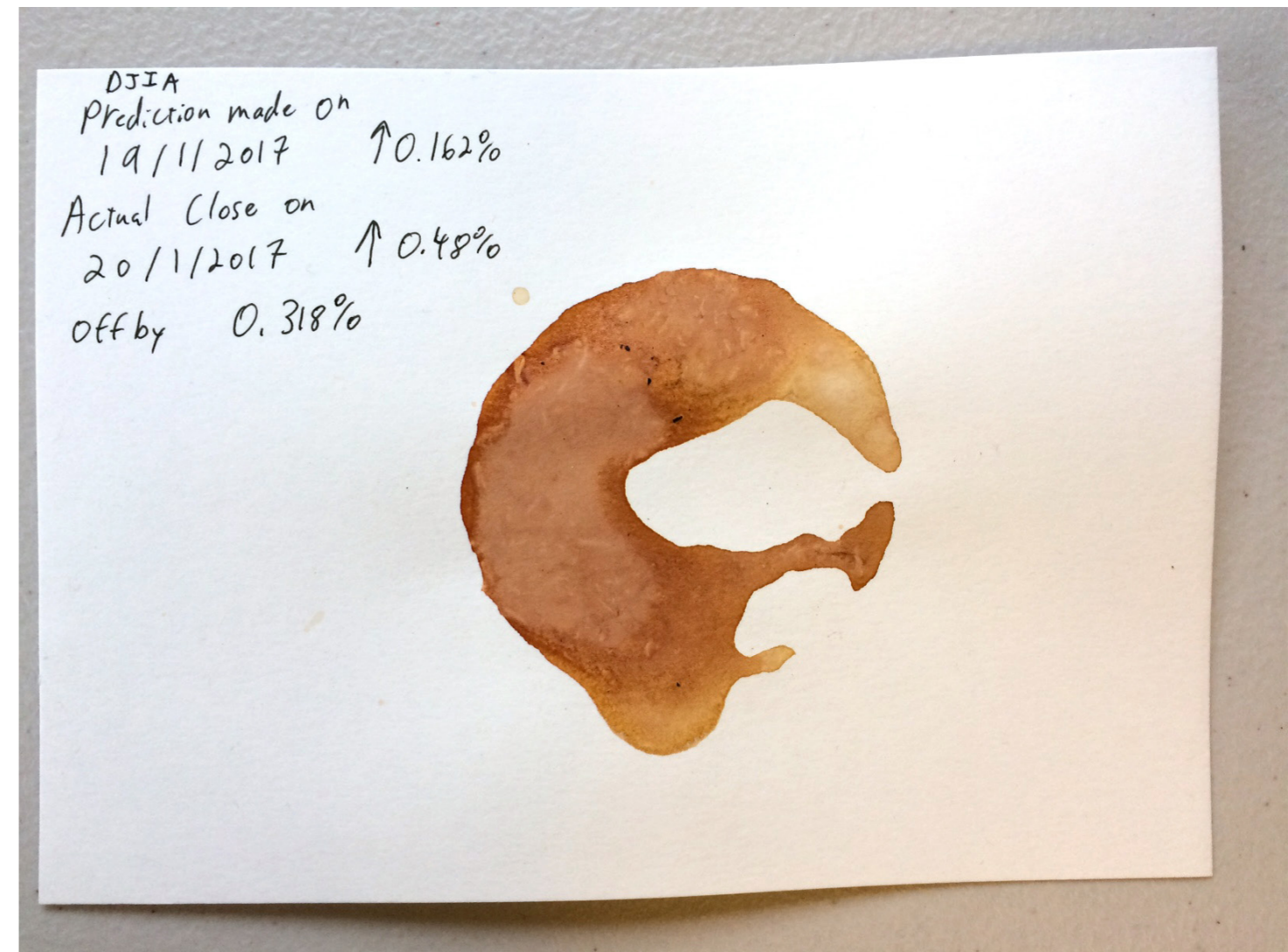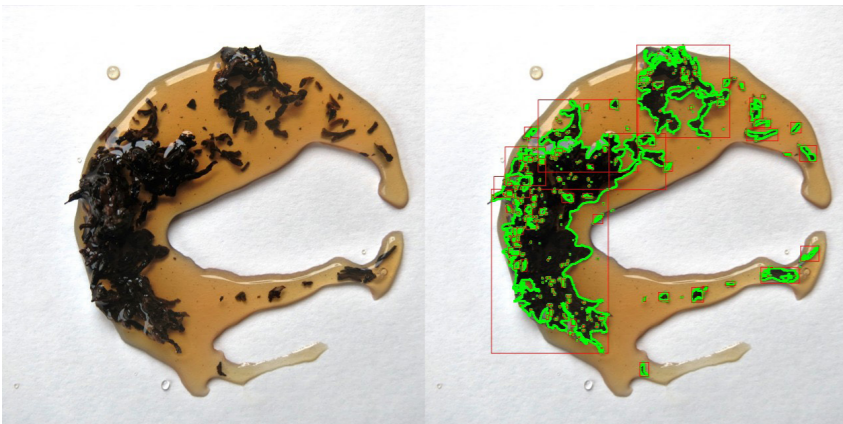

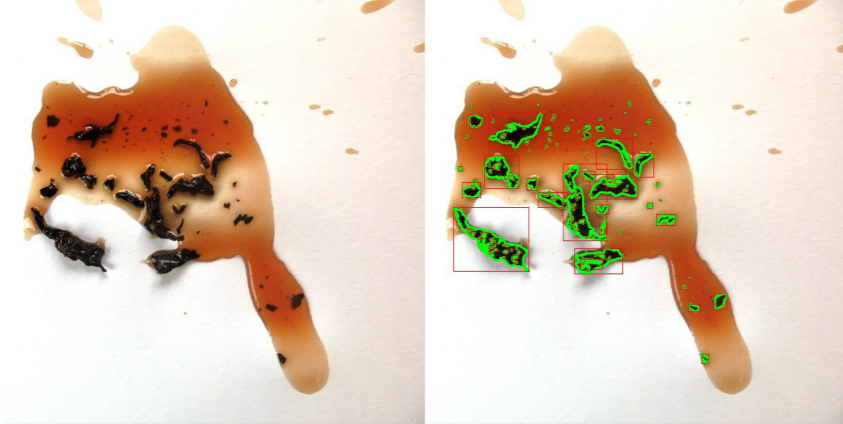Figure 46:   Stain 20/1/2017 from *Tea Leaves Predict DJIA*, Tea stain on paper with text, 2017

Tea Reading Predicts DJIA

Today's Date: 19/1/2017

Number of Points
in Neural Network: 324

Prediction for DJIA
20/1/2017: + 0.162 %

Pre-Processed Image   Processed Image

Tea Reading Predicts DJIA

Today's Date: 22/1/2017

Number of Points
in Neural Network: 169

Prediction for DJIA
23/1/2017: − 0.08400001 %

Pre-Processed Image   Processed Image

Tea Reading Predicts DJIA

Today's Date: 2/2/2017

Number of Points
in Neural Network: 530

Prediction for DJIA
3/2/2017: + 0.16500002 %

Pre-Processed Image   Processed Image

Tea Reading Predicts DJIA

Today's Date: 24/1/2017

Number of Points
in Neural Network: 373

Prediction for DJIA
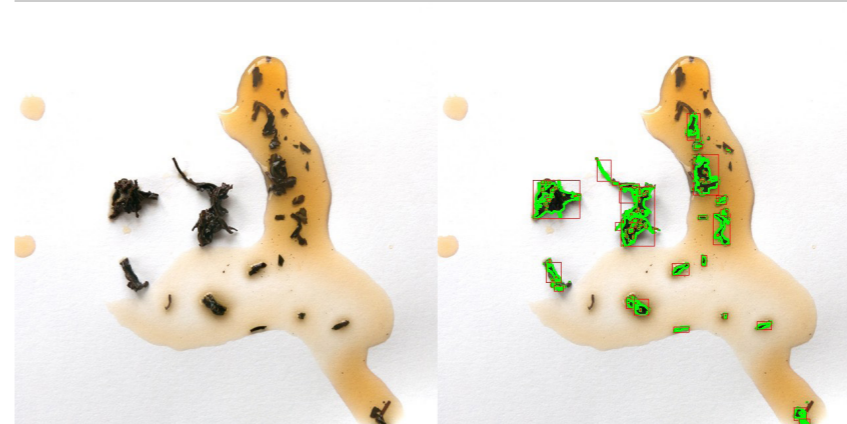25/1/2017: − 0.186 %

Pre-Processed Image   Processed Image

Tea Reading Predicts DJIA

Today's Date: 25/1/2017

Number of Points
in Neural Network: 965

Prediction for DJIA
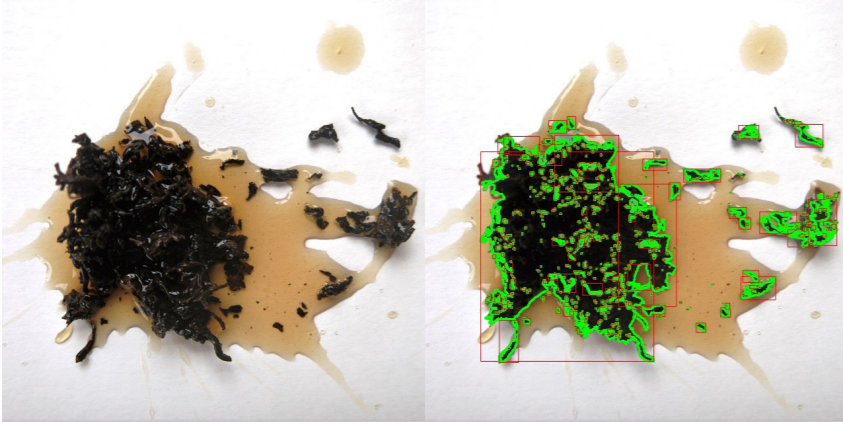26/1/2017: + 0.48200002 %

Pre-Processed Image   Processed Image

Tea Reading Predicts DJIA

Today's Date: 21/2/2017

Number of Points
in Neural Network: 138

Prediction for DJIA
22/2/2017: + 0.069000006 %

Pre-Processed Image   Processed Image

Tea Reading Predicts DJIA

Today's Date: 12/3/2017

Number of Points
in Neural Network: 341

Prediction for DJIA
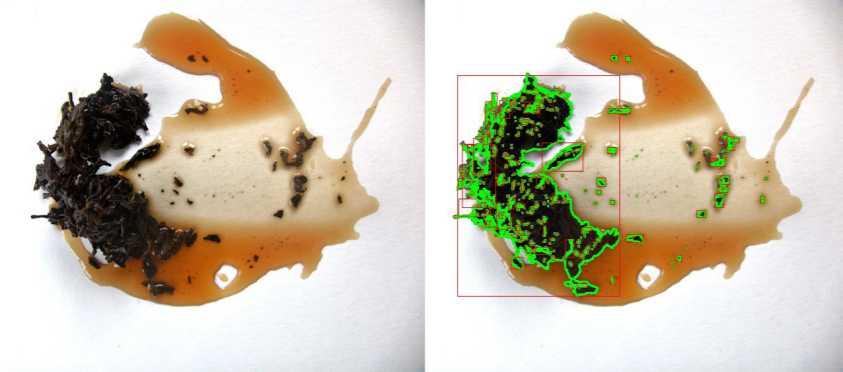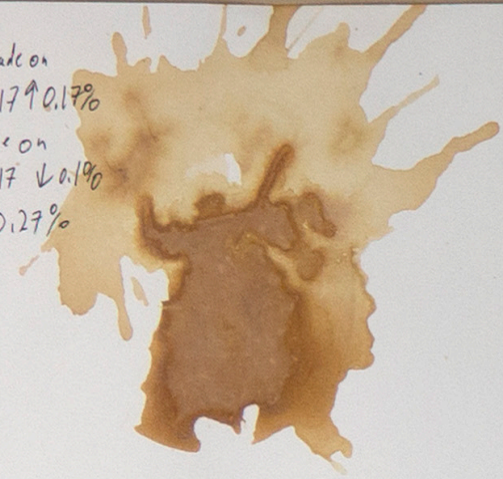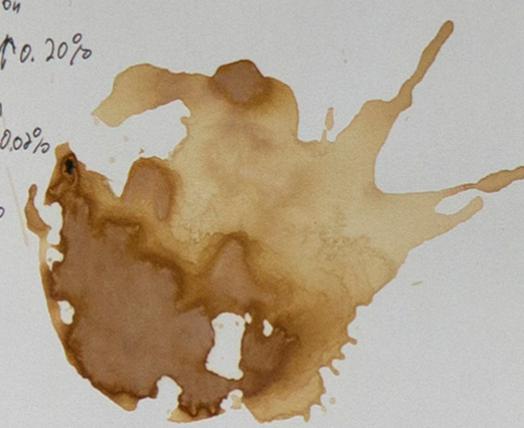13/3/2017: + 0.17 %

Pre-Processed Image   Processed Image

Tea Reading Predicts DJIA

Today's Date: 23/2/2017

Number of Points
in Neural Network: 246

Prediction for DJIA
24/2/2017: + 0.123 %

Pre-Processed Image   Processed Image
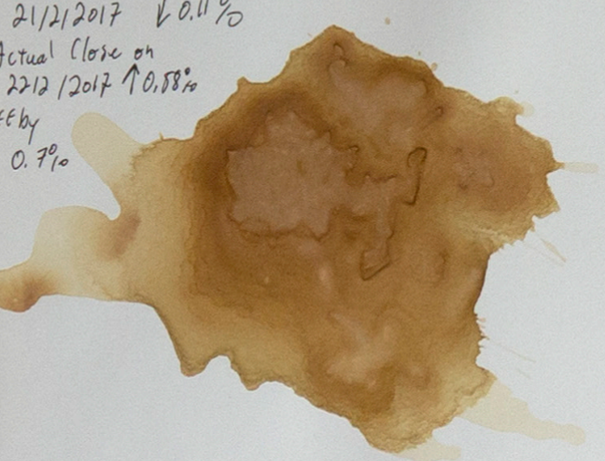
DJIA
Prediction made on
12/3/2017 ↑0.17%
Actual close on
13/3/2017 ↓0.1%
Off by 0.27%

DJIA
Prediction made on
19/2/2017 ↑0.20%
Actual close on
20/2/2017 ↑0.02%
Off by 0.18%
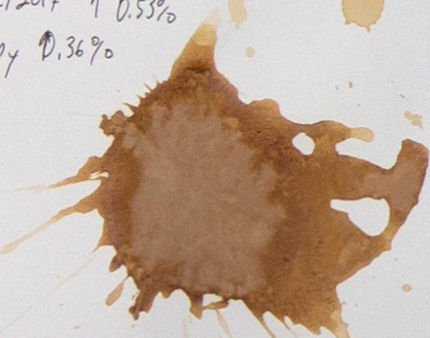
DJIA
Prediction made on
21/2/2017 ↓0.11%
Actual close on
22/2/2017 ↑0.58%
Off by 0.7%

DJIA
Prediction made on
31/1/2017 ↑0.17%
Actual close on
1/2/2017 ↓0.16%
Off by 0.01%
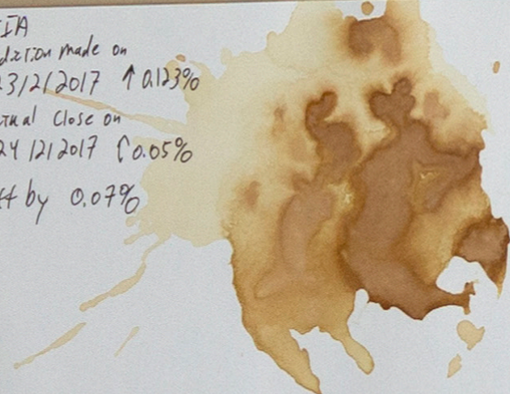
DJIA
Prediction made on
2/2/2017 ↑0.16%
Actual close on
3/2/2017 ↑0.53%
Off by 0.36%

DJIA
Prediction made on
21/2/2017 ↓0.07%
Actual close on
22/2/2017 ↑0.29%
Off by 0.22%
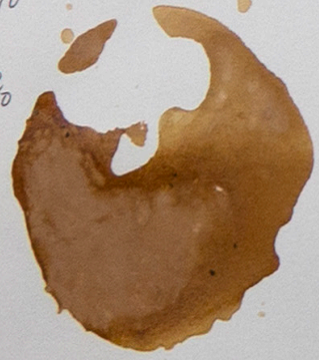
DJIA
Prediction made on
23/2/2017 ↑0.123%
Actual close on
24/2/2017 ↓0.05%
Off by 0.07%

DJIA
Prediction made on
26/2/2017 ↑0.20%
Actual close on
27/2/2017 ↑0.15%
Off by 0.05%

DJIA
Prediction made on
6/2/2017 ↑0.17%
Actual close on
7/2/2017 ↑0.18%
Off by 0.01%

DJIA
Prediction made on
19/1/2017 ↑0.162%
Actual close on
20/1/2017 ↑0.48%
Off by 0.318%

DJIA
Prediction made on
22/1/2017 ↓0.08%
Actual close on
23/1/2017 ↓0.14%
Off by 0.056%

DJIA
Prediction made on
23/1/2017 ↓0.04%
Actual close on
24/1/2017 ↑0.57%
Off by 0.614%

DJIA
Prediction made on
24/11/2017 ↓0.186%
Actual Close on
25/11/2017 ↑0.78
Off by 0.966%

DJIA
Prediction made on
25/11/2017 ↑0.482%
Actual Close on
26/11/2017 ↑0.13%
Off by 0.35%
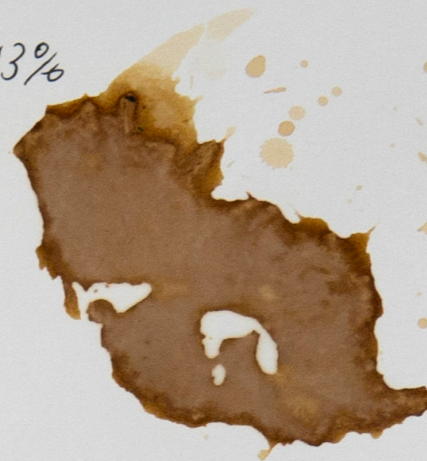
DJIA
Prediction made on
13/3/2017 ↓0.231%
Actual close on
14/3/2017 ↓0.001%
Off by 0.23%

DJIA
Prediction made on
29/11/2017 ↑0.351%
Actual close on
30/11/2017 ↓0.61%
Off by 0.961%

TeaLeaves

I start every day with a cup of tea. It is part of my everyday life as it is for millions of people and, for millions of people, it is an act that is frequently overlooked. I set the tea up the night before. In the morning, I make the tea, I drink the tea, I throw out the tea, I clean up and I leave. However, in terms of everyday activities that have a tendency to be overlooked, tea has a long history in multiple cultures of providing the exact opposite cultural use. The Japanese Tea ceremony specifically functions as a mechanism that allows for inspection of the "daily life of its practitioners". (Chikamatsu, Mori, & Mori 1982, 10) The Japanese Tea ceremony originated in Zen Buddhism as a practice where the act of preparing and sharing tea in a social circle allowed for a spiritual transformation. (Ali, Anwar, Hassan, & Kamarun 2013, 2) In this way, the tea ceremony can be seen as an example of the sacred in the quotidian, where the act of making tea sits both within and outside of everyday life simultaneously.

What are the affects involved in drinking tea and how

do they impact the rest of my everyday life? How can I quantify these affects and then quantify their impact? To analyse these questions, I have made some art/algorithms.

For *Tea Leaves Predict DJIA* seen in "Figure 44: Tea Leaves Predict DJIA, code, 2017" on page 326, I have created an affective network that uses Twitter's API and traditional tasseography to predict the Dow Jones Industrial Average. The program reads the highest volume of real-time tweets that contain emotional statements like "I'm so happy!" and creates a network with pattern recognition software that reads my tea leaves in the morning to predict the movement of DJIA. The prediction is then Tweeted and I invest $100 based on the prediction either buying the stock or shorting the stock according to the algorithm's prediction. If I make more than $100 based on the prediction, then I remove the profit and leave the $100. If lose money based on the prediction, then I increase my investment by the amount of the loss, so the total investment every day is always $100.

The network algorithm includes variables based on

traditional tasseography that predict the future by interpreting the pattern of tea leaves. Using pattern recognition software, the algorithm looks for 10 traditional tea reading symbols in the leaves and assigns them positive, negative or stable affect values.[80] Examples of the symbols include the symbol "x", which is a warning and assigned a negative affect; or an anchor, which is assigned a stable affect. The symbols are also weighted based on their placement because the location of the symbols dictates the time frame for the predictions. These values are then totalled to make a prediction for the DJIA. Based on historic data, the algorithm learns which symbols are the most accurate at determining the correct prediction and then re-weights their values for subsequent predictions.

The act of writing the affective network code is considered as much part of the art as is the code itself as seen in "Figure 44: Tea Leaves Predict DJIA, code, 2017" on page 326. "Figure 45: Image 19/1/2017 from "Tea Leaves Predict DJIA, JPEG, 2017" on page 327 displays an example prediction where on 19/1/2017, the algorithm

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80   There are many books that list tea reading symbols like *Tea Cup Reading* (2002) by Susan Felton. I have used the ones that I have found easiest for the computer to identify which are anchor, car, cross, kite, pear, ring, stars, triangles, trees, and worms.

predicted the DJIA would close +0.162% on 20/1/2017. On 20/1/2017, the DJIA closed +0.48%, so the algorithm was off by 0.318%. Over the previous ten days, the algorithm predicted the close of the DJIA for the following day within 1% every day and I have profited $0.21. I then save the paper I placed the tea on to make the prediction and write on the paper how well the prediction did as seen in "Figure 46: Stain 20/1/2017 from Tea Leaves Predict DJIA, Tea stain on paper with text, 2017" on page 327.

The purpose of this section was to describe how I simultaneously constructed a lens to view everyday life, social media sites, and economic data as a network connected by affect and *Tea Leaves Predict DJIA*. The art reflects the frame I was viewing it through as I modelled the network. The end result is not robust, nor was it intended to be robust due to the subjective nature of the affective network that I created.[81] However, the predictions have been within 1% for 10 days in a row. The end conclusion is that the subjective nature of affect in everyday

life appears correlated to the DJIA. I have no explanation for this, nor do I want to try to make one in a robust manner. Perhaps how we feel has more of an impact on the world around us than can be explained with direct causality. Perhaps marginalized modes of knowledge hold more power than currently attributed to them.

It is entirely possible that the "accuracy" of the artwork to predict the movements in the DJIA is actually based in a simple analysis of how affect and everyday life intersect. My algorithm treats the average emotion stated on Twitter as a variable. So it is possible that when people are happy, they buy stocks the next day. So the market goes up slightly after people tweet how happy they are. Similarly, when people tweet they are sad, the market goes down the next day. In this case, while my algorithm may appear simplistic, perhaps it reveals the otherwise occult intersection of affect and everyday life in a manner that can be observed through digital technology.

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81   When I say "robust," I am using it in a statistical way where a "robust" system can handle variability and remain effective. Robust systems should be able to handle data from a wide variety of distributions, especially non-normal distributions and still provide effective solutions. My system falls apart with any change. If I use a different cup or a different type of tea, the system might not function at all.
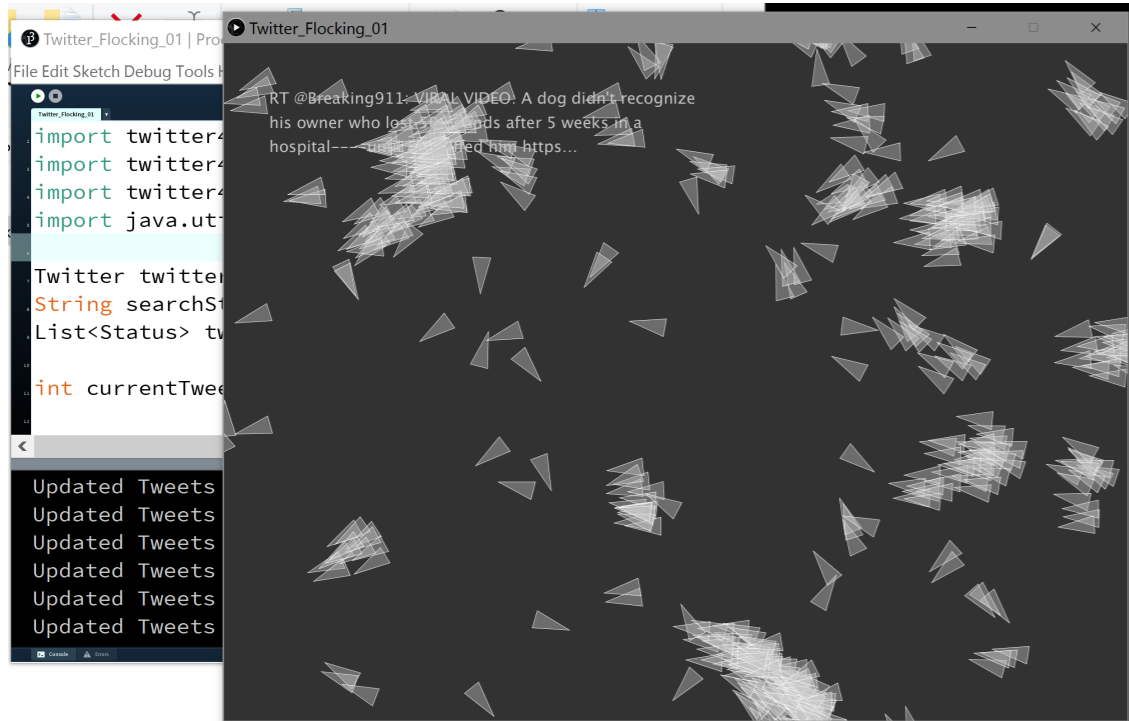
Figure 50:   *Twitter Flocking*, Code and Robot, 2017

Figure 52:   *Twitter Flocking*, Paint Brushes, 2017

Figure 51:   (opposite) *Twitter Flocking*, Code and Robot, 2017
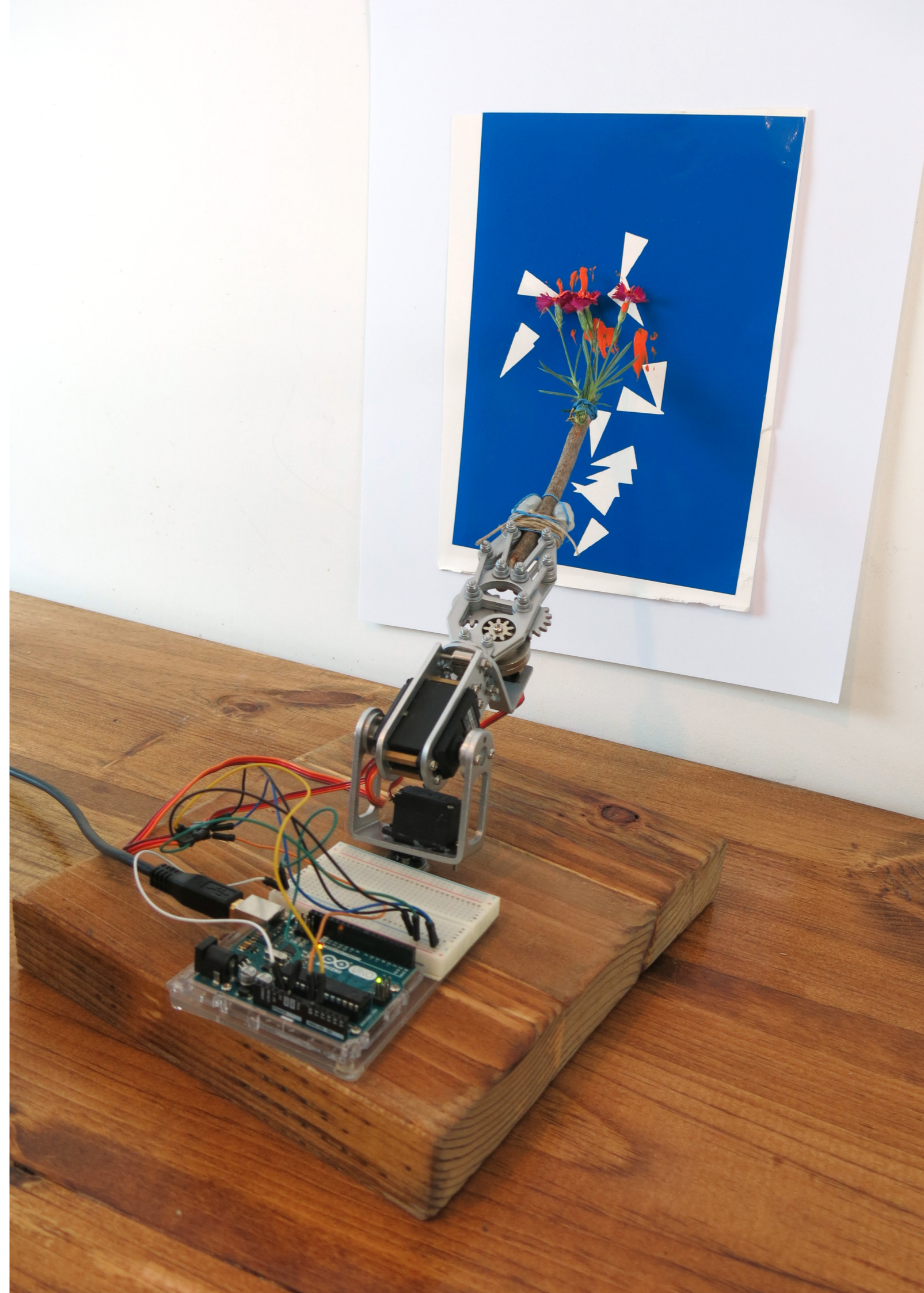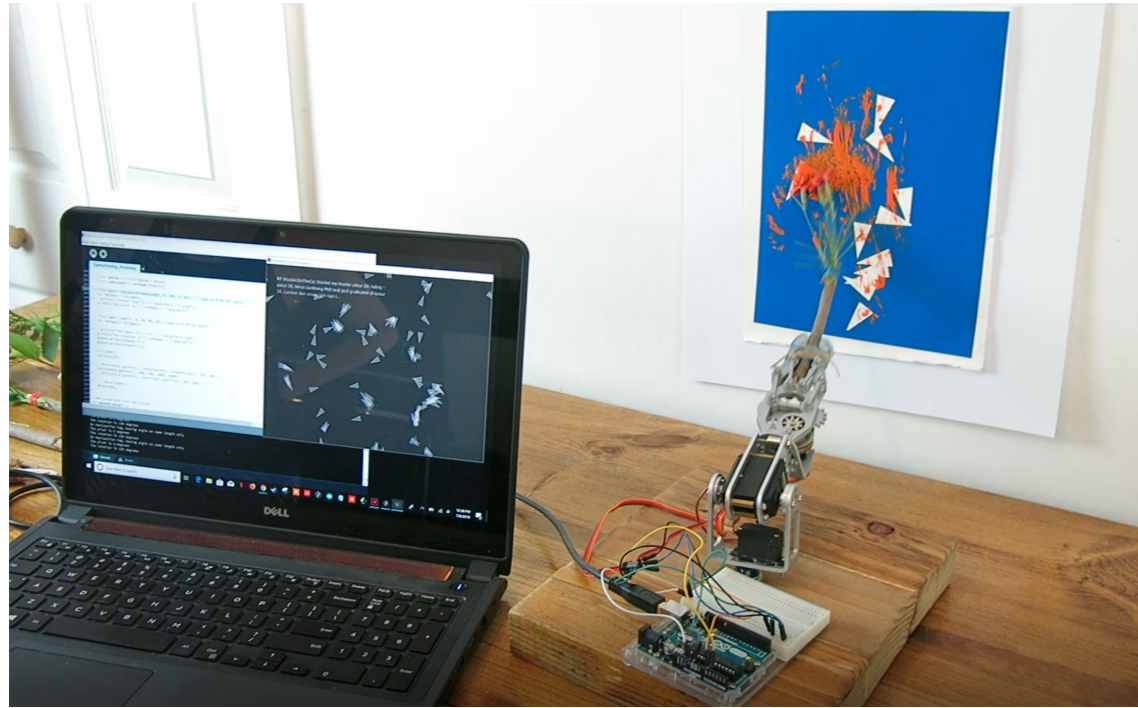
Figure 53:   *Twitter Flocking*, Code and Robot, 2017
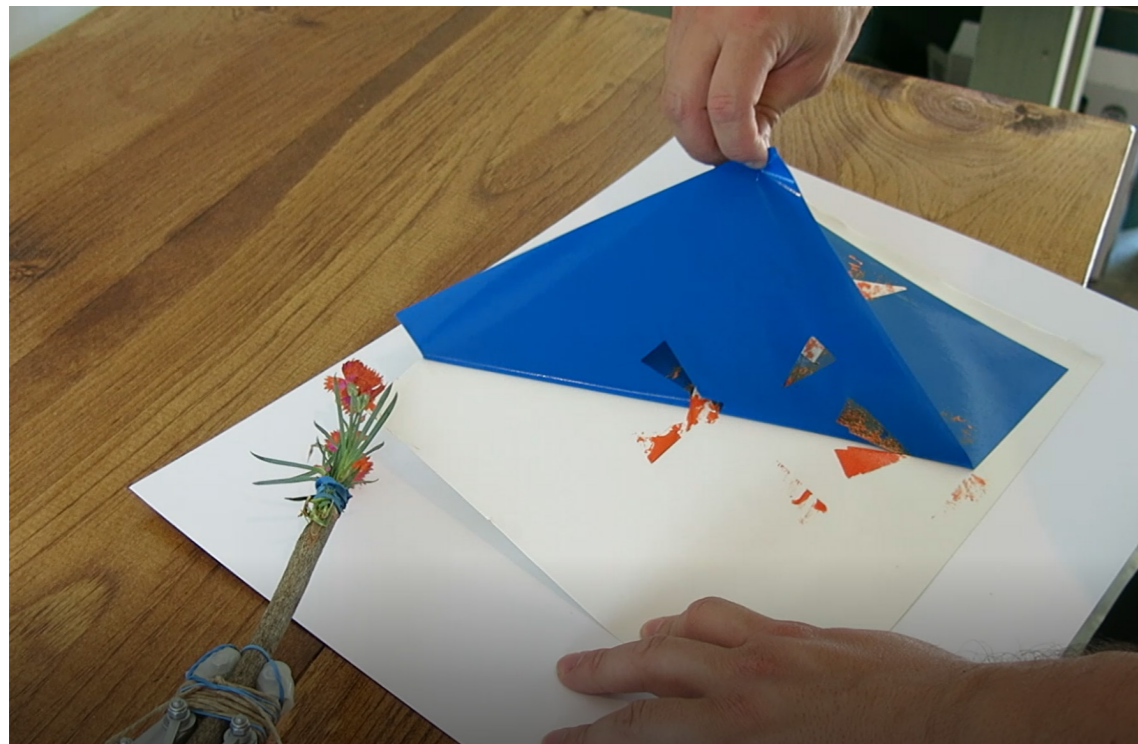
Figure 54:   *Twitter Flocking*, Code and Robot, 2017

Figure 55:   (opposite) *Twitter Flocking*, Paint on Paper, 2017

TwitterFlocking

Twitter Flocking is a series of robotic actions that analyses the meta-behaviour of tweets. Using the Twitter API, the robot first collects real time meta-data about tweets from around the globe that are exhibiting flocking behaviour. As stated in the previous section, researchers have "evidence of massive-scale emotional contagion through social networks". (Kramer, Guillory, & Hancock 2014, 1) In my *Twitter Flocking* algorithm, I have attempted to visually map how the emotional contagion spreads. I believe the emotions expressed on social media may follow a pattern that can be represented in the same way that flocking patterns can be modelled. Craig Reynold's simulation program, Boids, was originally designed to model "the aggregate motion of a flock of birds, a herd of land animals, or a school of fish." (Reynolds 1987, 1) I have used similar calculations to try and model the behaviour of emotions on social media, effectively attempting to produce a contact zone with the otherwise occult assemblage of affects on social media.

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"Figure 50: Twitter Flocking, Code and Robot, 2017" on page 340 displays a screen shot of both the code of the algorithm and the algorithm running. In this case, the algorithm is following the flocking behaviour of people tweeting about sad stories of their pets. I have adapted Craig Reynold's Boids program to display the tweets as triangular "boids".[82] I then cut vinyl stencils according to various elements of the flocking behaviour exhibited by the meta-data of the tweets that can only be "known" through this aggregated meta-data. The robot then uses ink to draw on paper using current tweets and the vinyl cut-out of the flocking behaviour as seen in "Figure 52: Twitter Flocking, Paint Brushes, 2017" on page 340. Meta-data cannot be seen and the interaction between various pieces of meta-data is non-representational as it exists only as a flow. This practice is a contact point with a non-representational flow of "data" that arises from the affective assemblage of Twitter.

I view *Twitter Flocking* as an instance that may display a contact zone with a non-representational flow, like that of an affective assemblage that may not be readily available to the human senses. Perhaps, digital practices can thus reveal "the being of the sensible" (Deleuze, 2014, p. 68) of meta-data through contact zones.

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82   It is a program about flocking that looks for tweets about people's pets (such as birds) and displays them as "boids" (sounds like "birds").

Figure 56:   *Oulipo Tweet #01*, variable size, computer code on left, compiled code on right, 2017
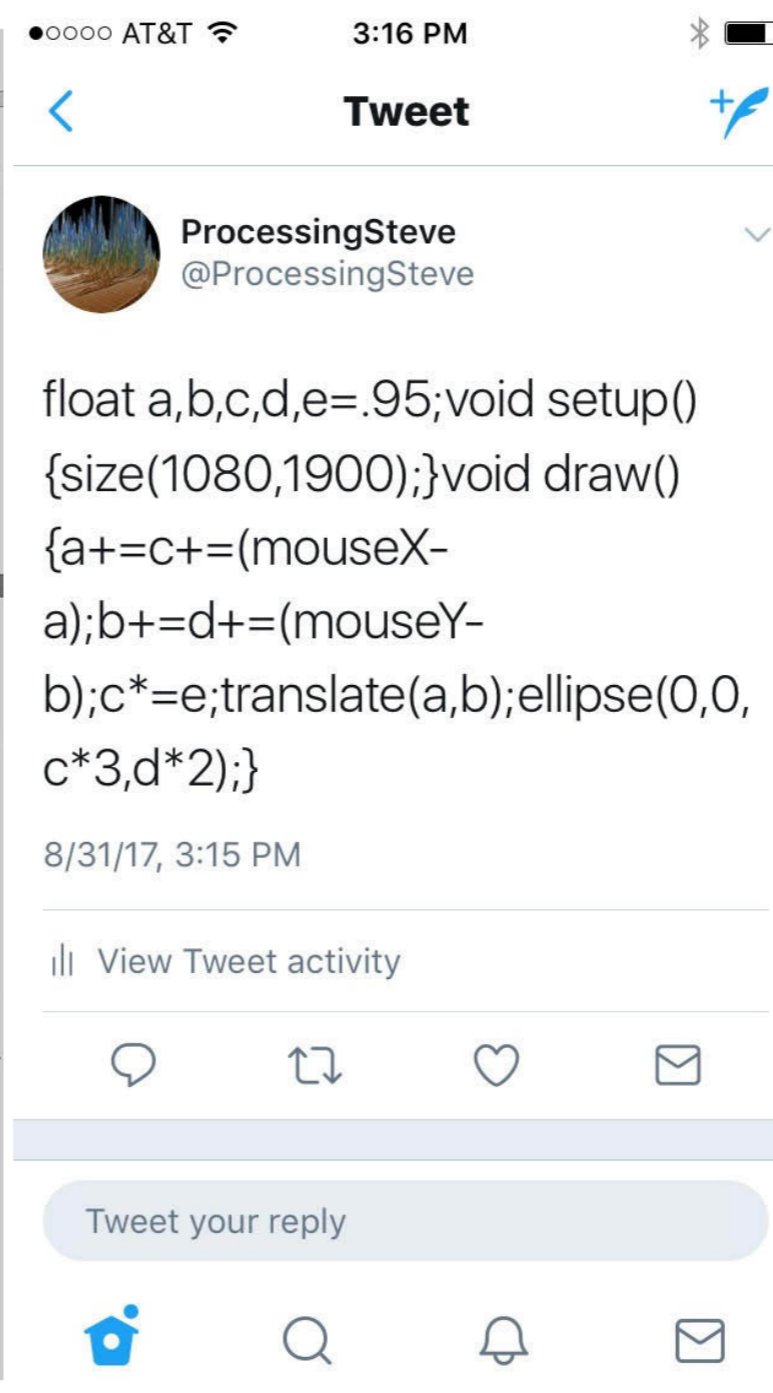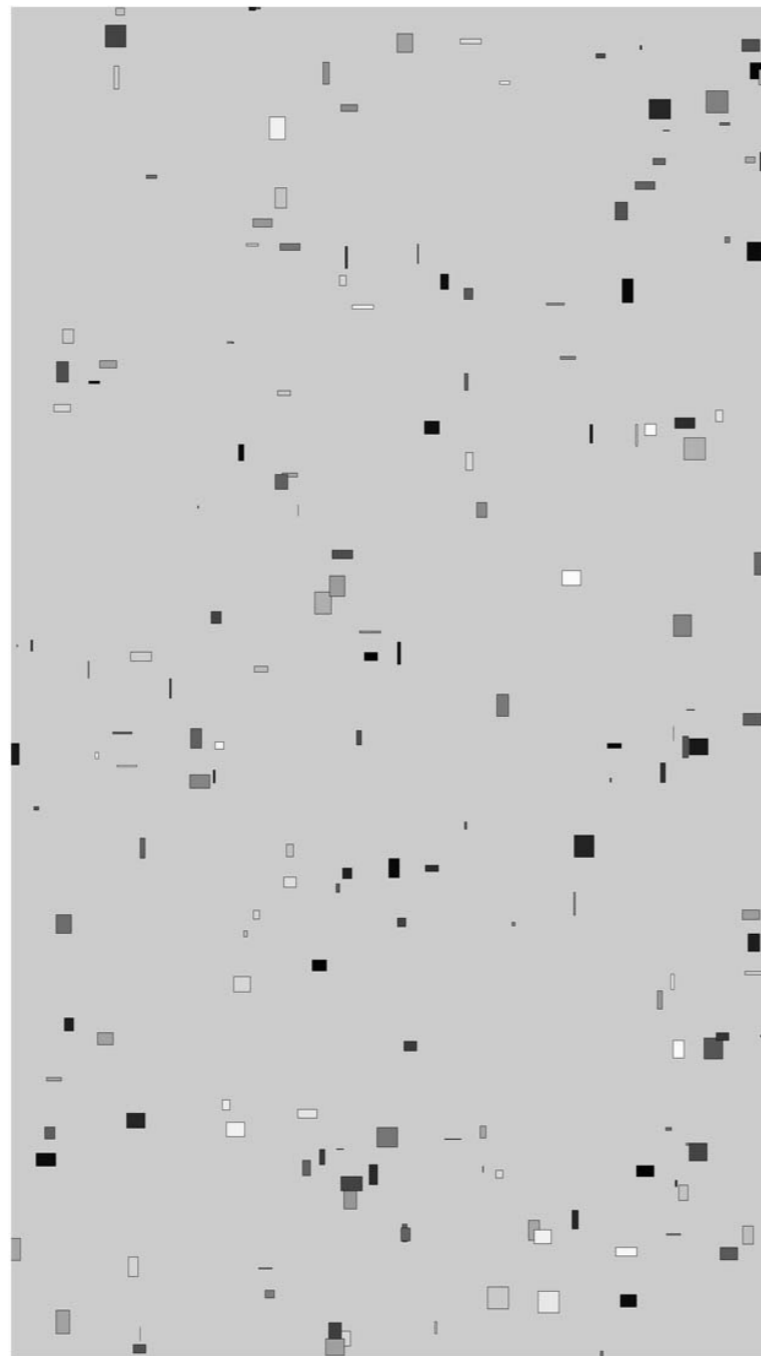
Figure 57:   *Oulipo Tweet #02*, variable size, computer code on left, compiled code on right, 2017

Figure 58:   *Oulipo Tweet #03*, variable size, computer code on left, compiled code on right, 2017

Figure 59:   *Oulipo Tweet #04*, variable size, computer code on left, compiled code on right, 2017

●oooo AT&T 📶   3:54 PM   ❄ ✳ ▮

Tweet

ProcessingSteve
@ProcessingSteve

int p=999;void setup()
{size(1080,1900);}void draw()
{float
g=random(9);bezier(p,p,sin(g)*p,
cos(g),p,p,9,8);}

Translate from Haitian Creole

8/31/17, 3:53 PM

View Tweet activity

Tweet your reply

●oooo AT&T 📶 ✳   4:18 PM   ➤ ✳ ▮

Tweet

ProcessingSteve
@ProcessingSteve

int h,j;void setup()
{size(999,999);}void draw()
{h=height;translate(h/2,h/
2);for(j=0;j<9;j++)
{rotate(frameCount/
9);bezier(0,0,0,h,h,h,h,h);}}

Translate from German

8/31/17, 4:18 PM

View Tweet activity

Tweet your reply
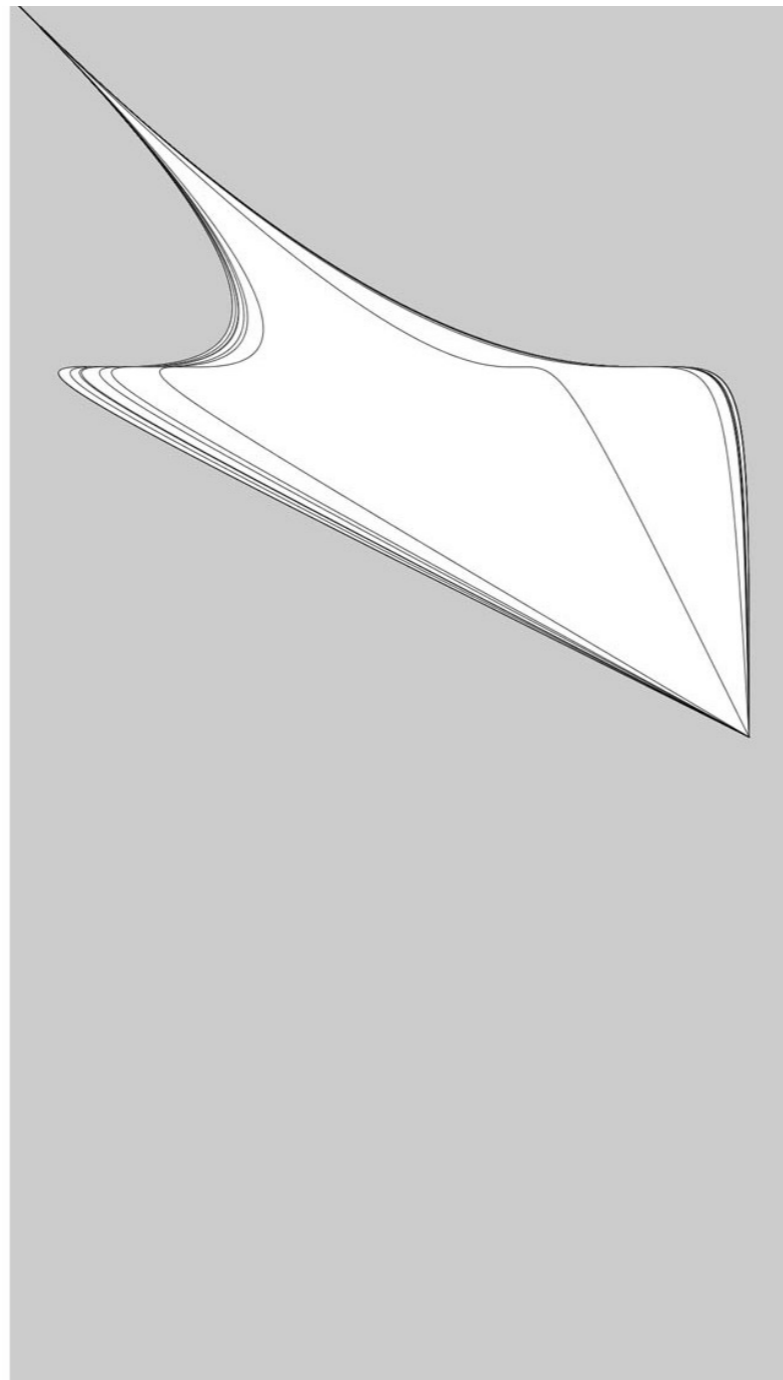
Figure 60:   *Oulipo Tweet #05*, variable size, computer code on left, compiled code on right, 2017
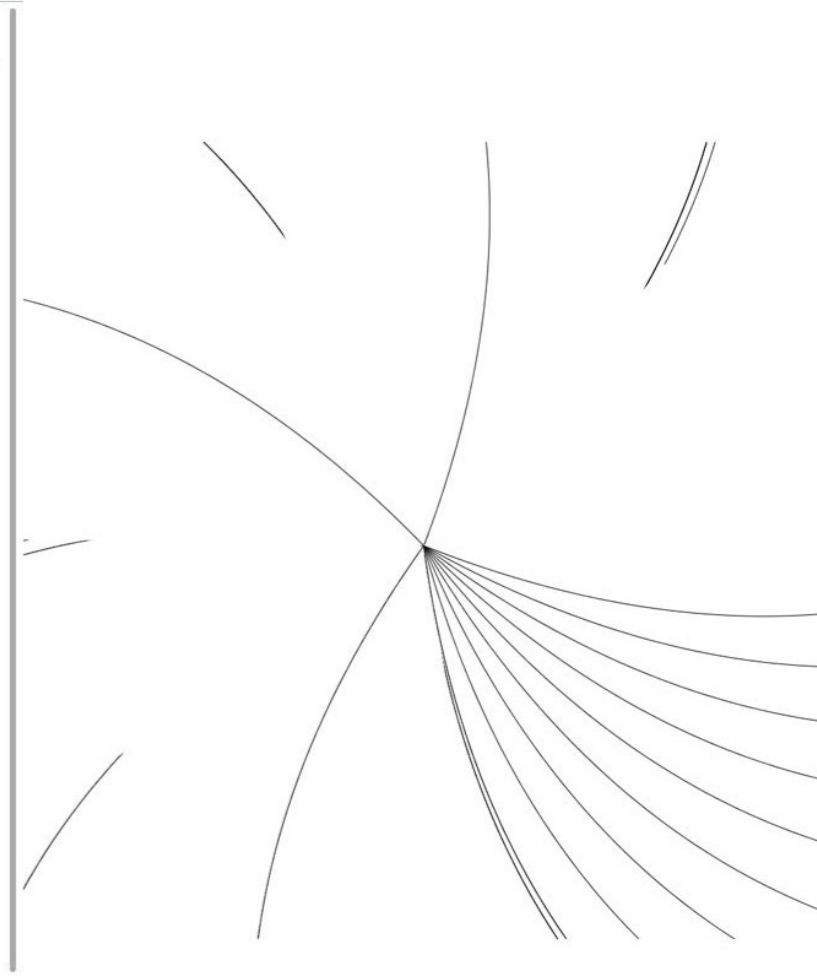
Figure 61:   *Oulipo Tweet #06*, variable size, computer code on left, compiled code on right, 2017
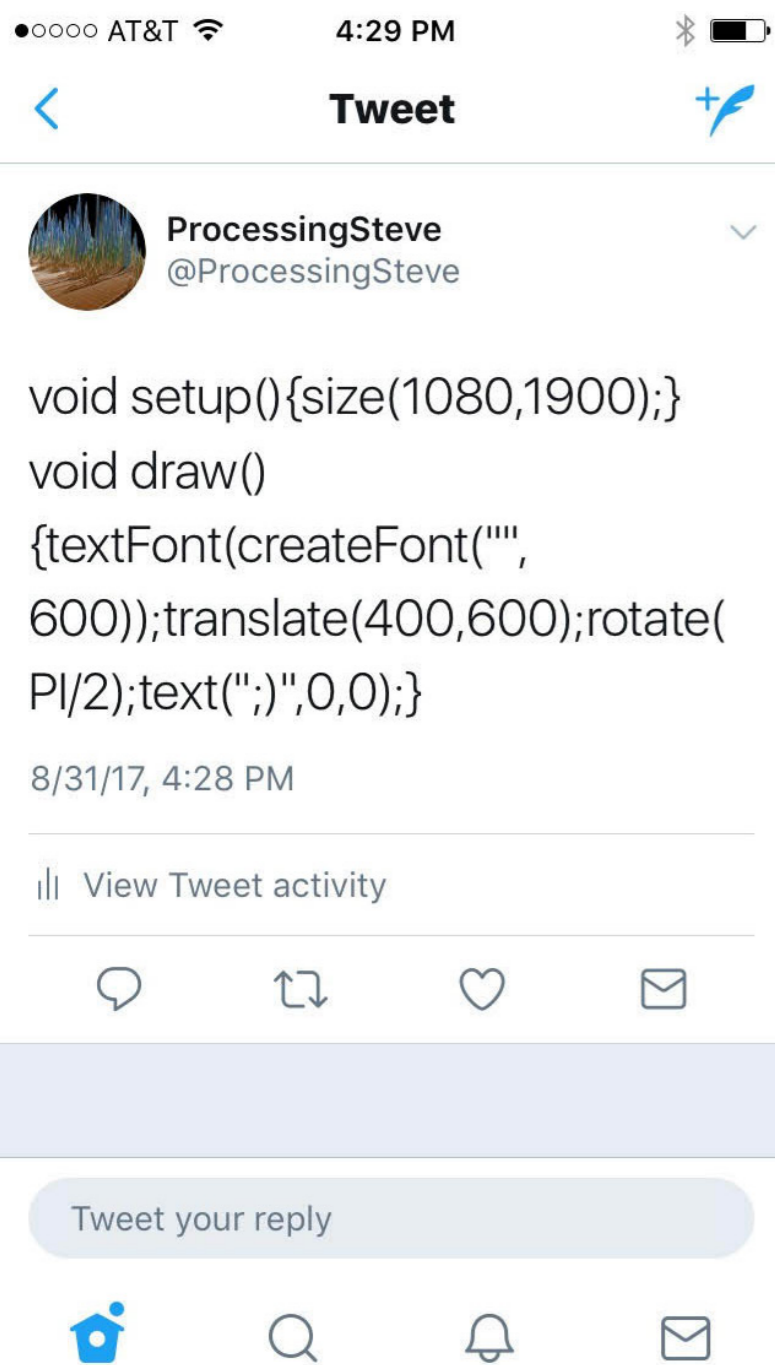
Figure 62:   *Oulipo Tweet #07*, variable size, computer code on left, compiled code on right, 2017

Figure 63:   *Oulipo Tweet #08*, variable size, computer code on left, compiled code on right, 2017

●○○○○ AT&T 🛜 4:53 PM ⚹ 🔋

< **Tweet** +🖋

ProcessingSteve
@ProcessingSteve ⌄

void setup(){size(1080,1900);}
void draw(){loadPixels();}void
mouseDragged()
{fill(random(99));rect(mouseX,mo
useY,random(99),random(99));}

8/31/17, 4:51 PM

View Tweet activity

💬 🔁 ♡ ✉

Tweet your reply

🏠 🔍 🔔 ✉
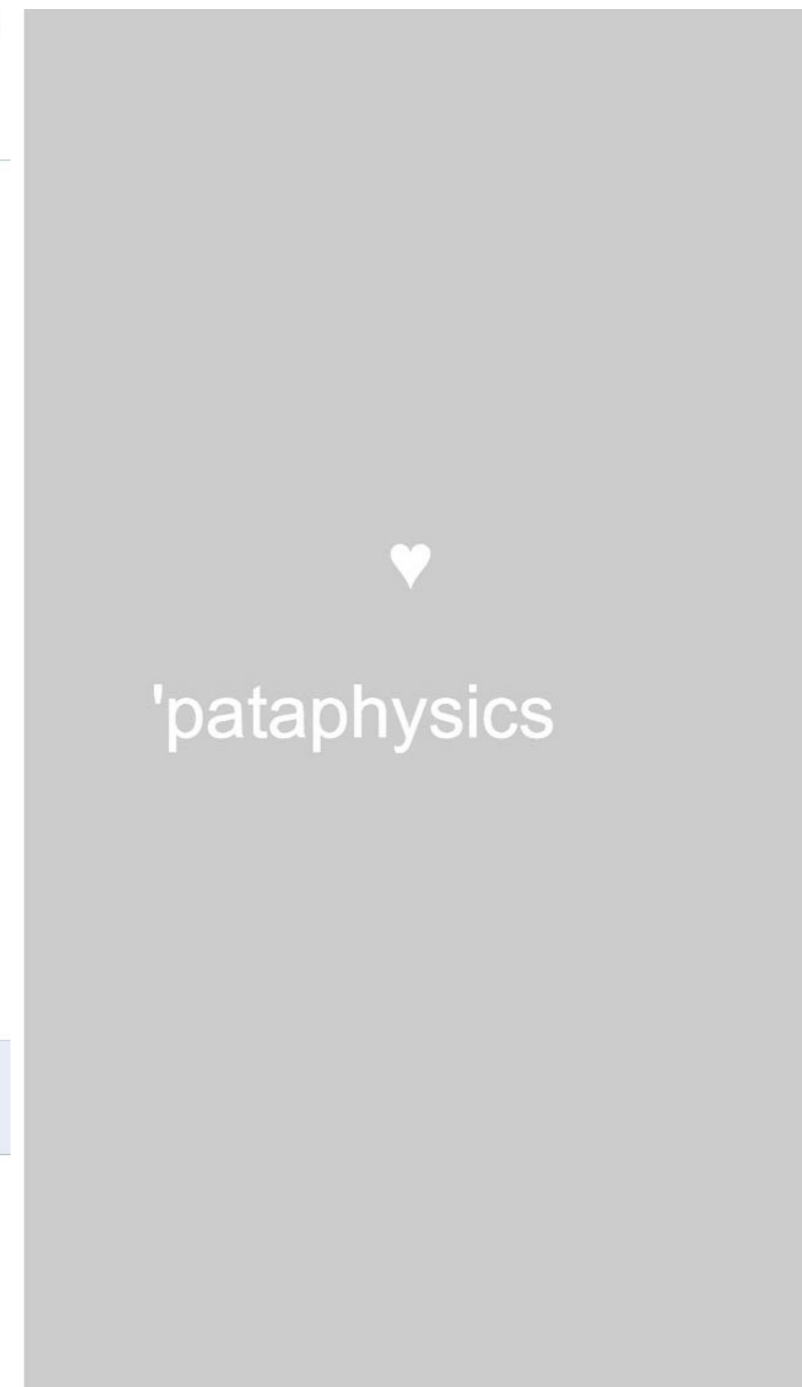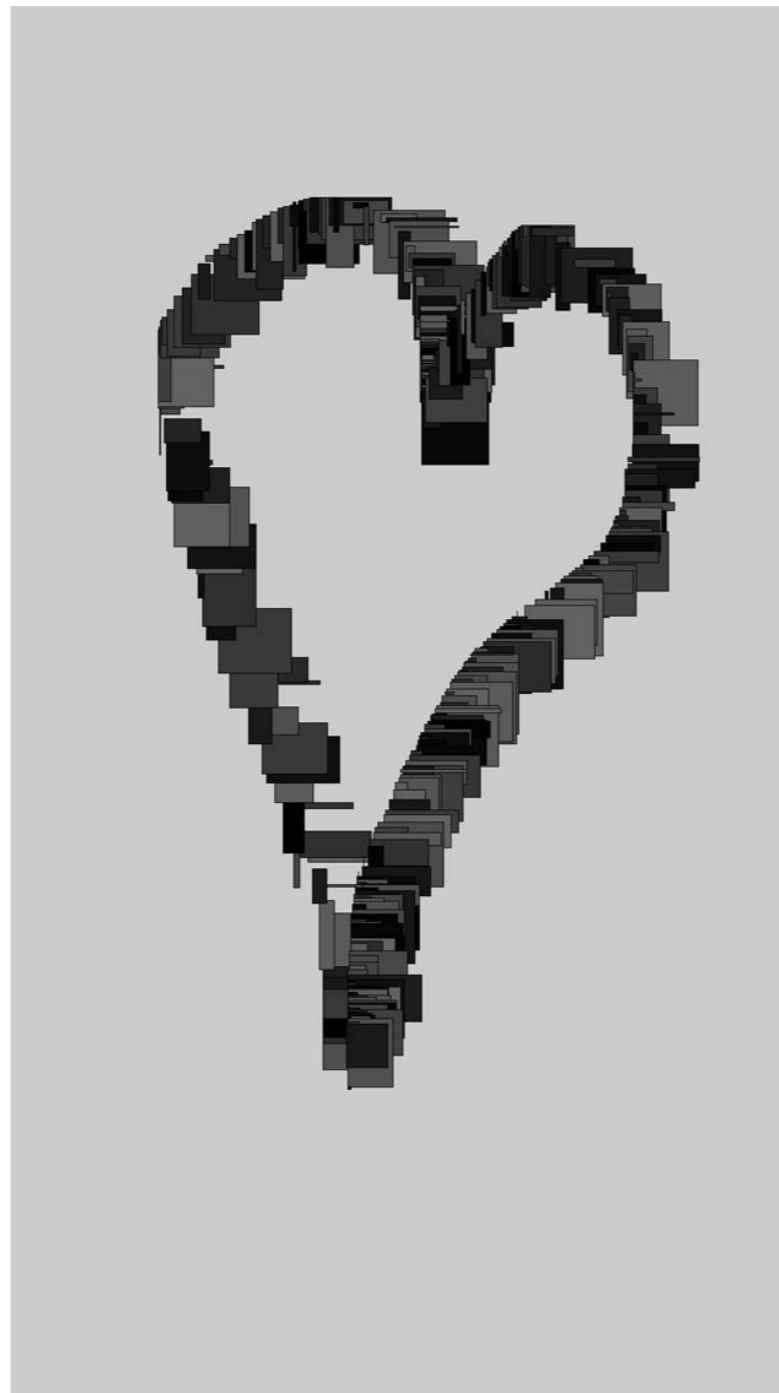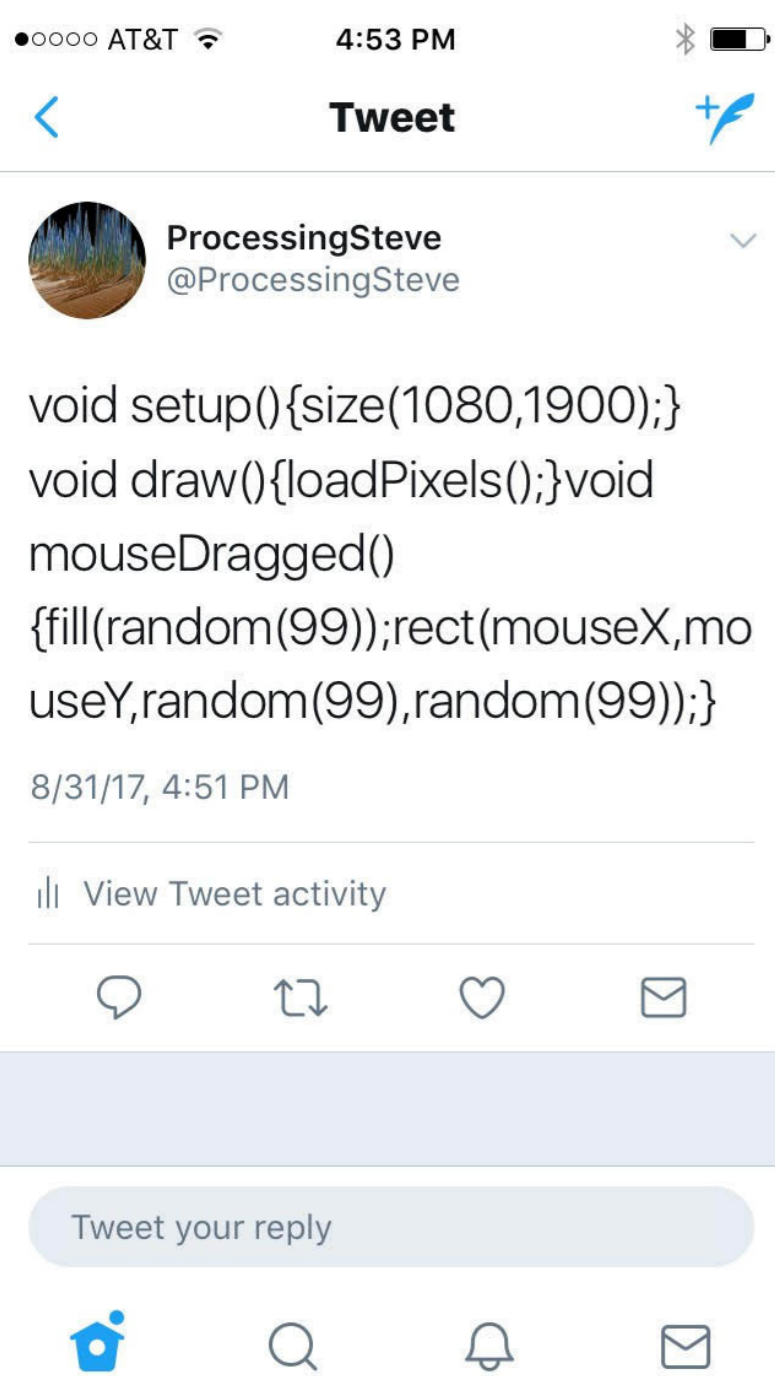
Figure 64: *Oulipo Tweet #09*, variable size, computer code on left, compiled code on right, 2017

●○○○○ AT&T 🛜 5:11 PM ⚹ 🔋

< **Tweet** +🖋

ProcessingSteve
@ProcessingSteve ⌄

int d=999;
float a=0;
void setup()
{size(1080,1900,P3D);}
void draw()
{translate(d*noise(a),d*noise(a,a)
,-
d*noise(a,a,a));sphere(50);a+=0.
7;}

8/31/17, 5:08 PM

Tweet your reply

🏠 🔍 🔔 ✉
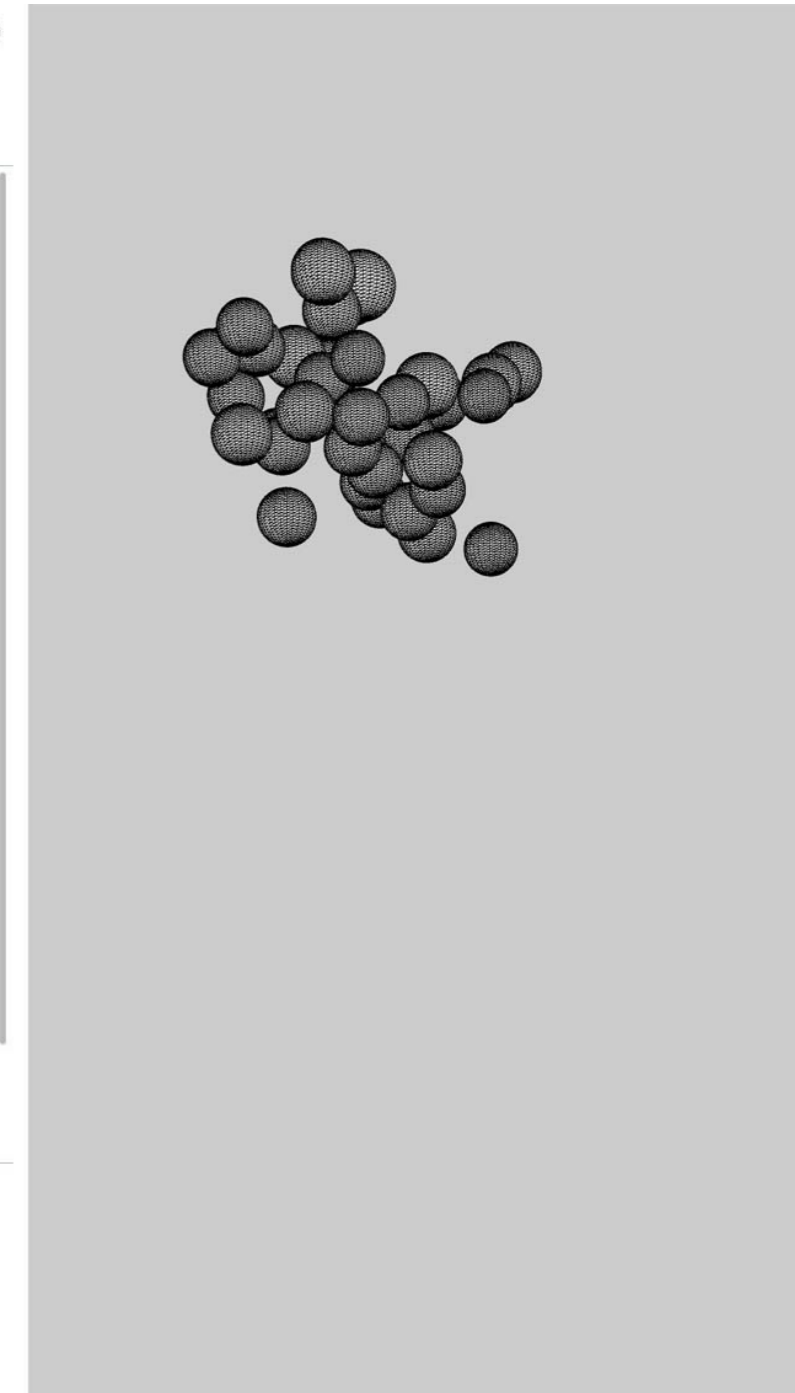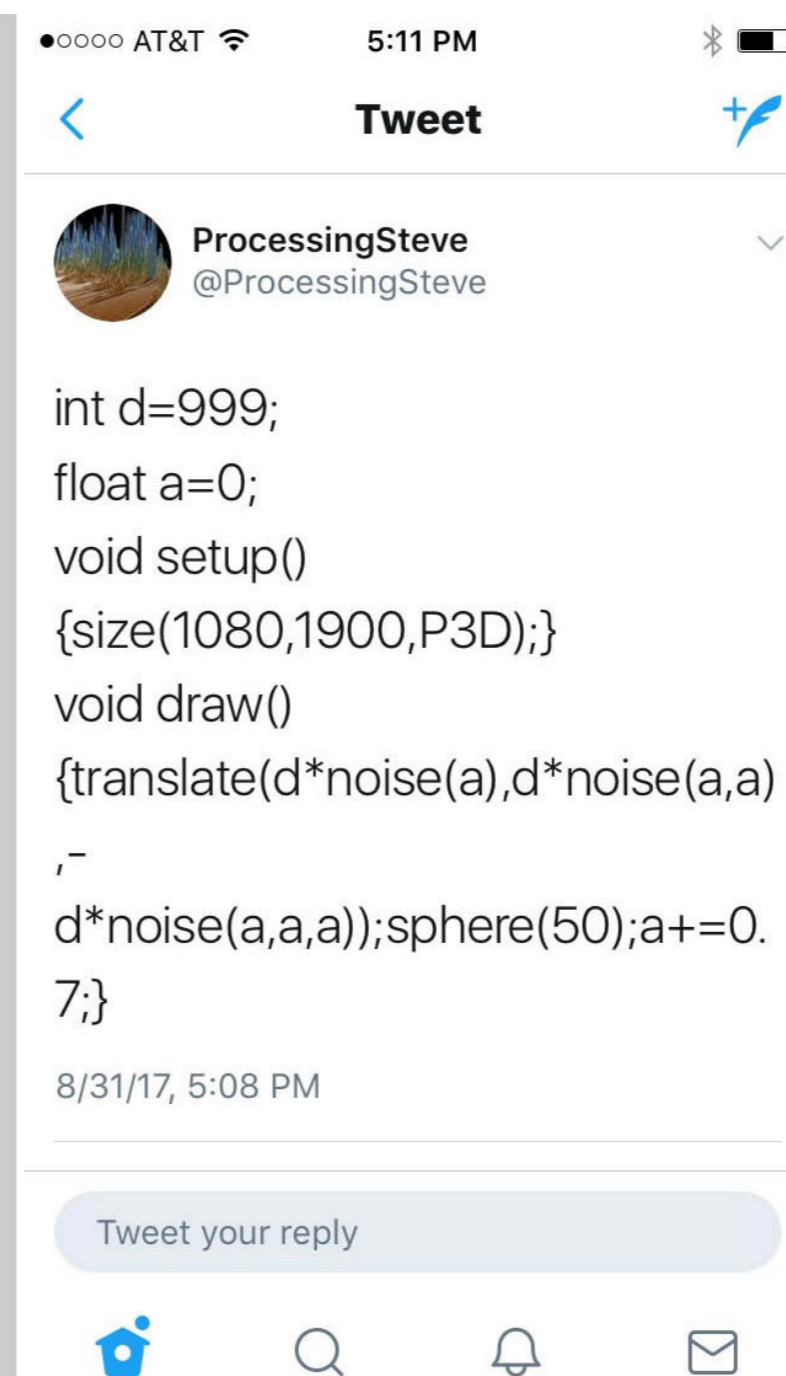
Figure 65: *Oulipo Tweet #10*, variable size, computer code on left, compiled code on right, 2017

OulipoTweets

Can Twitter can be viewed as Oulipian and 'pataphysical in nature? Twitter assigns a set of literary constraints that generate a universe with internal logics that can only be understood from within the universe. The 140 character limit, incorporation of other symbols, the fact that most tweets are composed on a phone and typed by thumbs, the fact that certain symbols such as "@" cause visible action on other user's accounts, the notion of re-tweets as well as a host of other factors have led to the development of twitter as a set of universes. Orthodox writing does not function very well on twitter and use of twitter speak is expected on the platform. This is a typical example of a tweet, "RT @saishman It's v diff to read tweets that incl lots of #abbrev, 😊 You foll? #ringmeup ow.ly/aBqtW". This sentence is illogical in a different setting and more importantly, the text does not function unless on the platform. It is not that it does not translate; it actually does not function because what is typed in twitter is a combination of scripting code that performs a function and linguistic information. The "@" and "#" perform functions

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on the platform that do more than convey linguistic information and the shortened hyperlink also performs a function. The emoji is part of Unicode, which is a script (a program written for a special run-time environment) that dictates how scripts (distinctive writing systems, based on a repertoire of specific elements or symbols) are displayed. The use of Unicode on Twitter is significant because it means that Borges' concept of the "Library" in *The Library of Babel* is now under represented.[83] We now have writing that is not just a combination of "twenty-five orthographic symbols" (Borges 2000, 113) because writing is no longer created with scripts (distinctive writing systems) but rather programs that generate scripts. If the "Library" in *The Library of Babel* was 'pataphysical in its ability to generate universes of exceptions, Twitter is even more so.

Twitter also continues to generate additional universes as specific groups utilize the constraints to their

own advantage. Prof Vincent Jansen has noted that, "Interestingly, just as people have varying regional accents, we also found that communities would misspell words in different ways. The Justin Bieber fans have a habit of ending words in 'ee', as in 'pleasee'." (Rodrigues 2013, 1) In this way, I hold that Twitter can be viewed as a 'pataphysical universe that allows more 'pataphysical universes to spawn within it. Twitter is a Library of Babel #nowatimean?

For *Oulipo Tweets*, I used a process that has found resonance with a 'pataphysical method of constraint to generate a universe that adheres to its own logic and may not be accessible to an observer outside the universe. The specific constraints I am using are the constraints of Twitter and Processing. On top of Twitter's scripting code, I am tweeting Processing code so that if the observer knows how to use the code, they can compile the code to perform a specific function on their computer. To any user not inside this particular universe, the tweet will probably not be considered orthodox twitter speak.

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83   While Borges' work does not seem to directly reference 'pataphysics, works such as *The Library of Babel* appear to have resonance with 'pataphysics creation of universes that contain irrationalities or impossibilities. *The Library of Babel*, begins with, "The universe (which others call the Library) is composed of an indefinite, perhaps infinite number of hexagonal galleries." (Borges, 2000, p. 112) Borges goes on to describe how the Library contains every possible combination of 25 symbols, and thus contains everything ever written or will be written. While most of the books are considered gibberish by the librarians, I view the Library itself as a 'pataphysical universe where the books that follow rules are an exception and randomized creativity is the norm.

"Figure 56: Oulipo Tweet #01, variable size, computer code on left, compiled code on right, 2017" on page 348 through "Figure 65: Ouli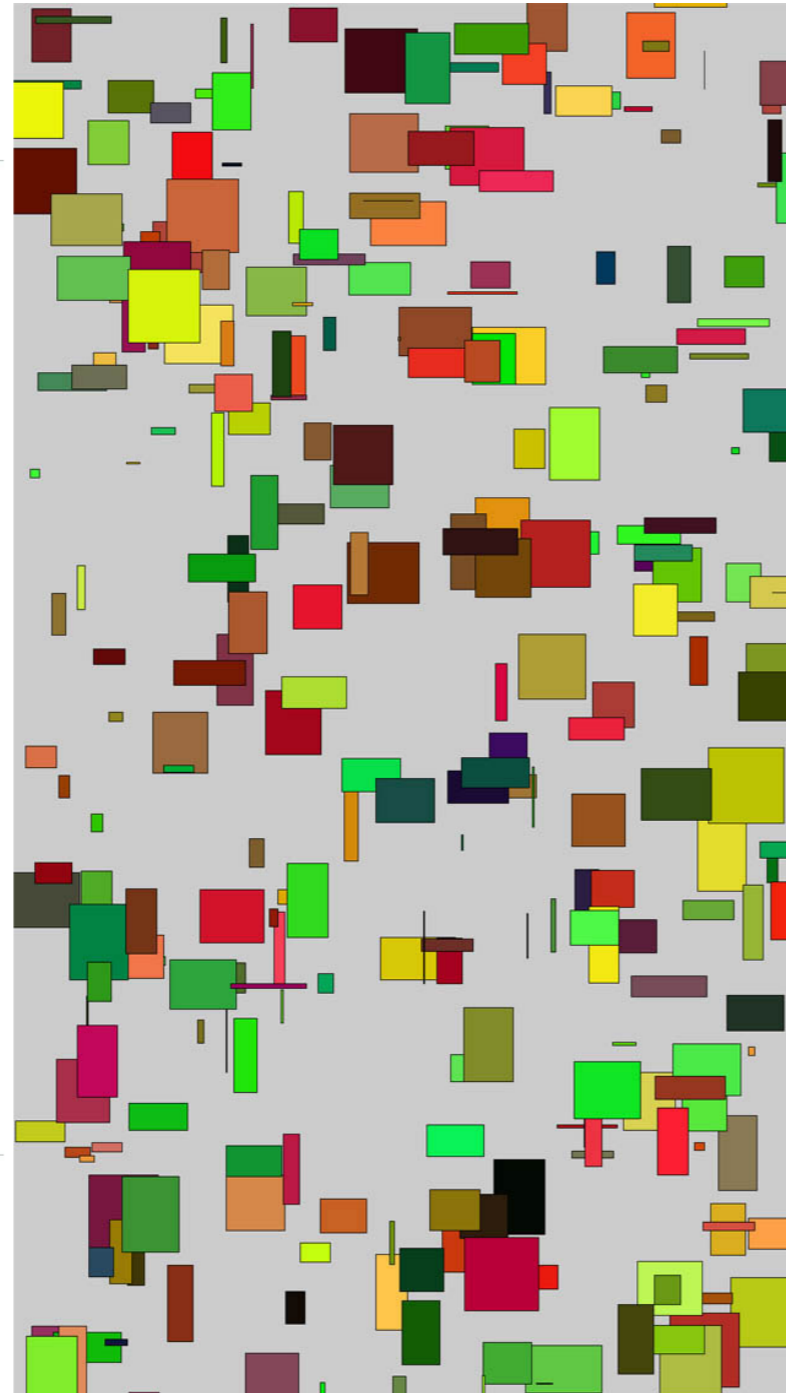po Tweet #10, variable size, computer code on left, compiled code on right, 2017" on page 357 are a series of Oulipian tweets that I posted to Twitter. On the left is the processing code and on the right is a still of what would happen if a user took the code and compiled it in Processing. However, users on Twitter do not see the potential image, they only see the posted code. Also, due to the nature of the code, it never manifests exactly the same image or video because most of the pieces of code contain randomizers or require direct user input. In this way, the code only represents potential universes that do not exist until the code is actuated (which I suspect it never is). The code sits forever in Twitter, always containing the potential to create a new universe.
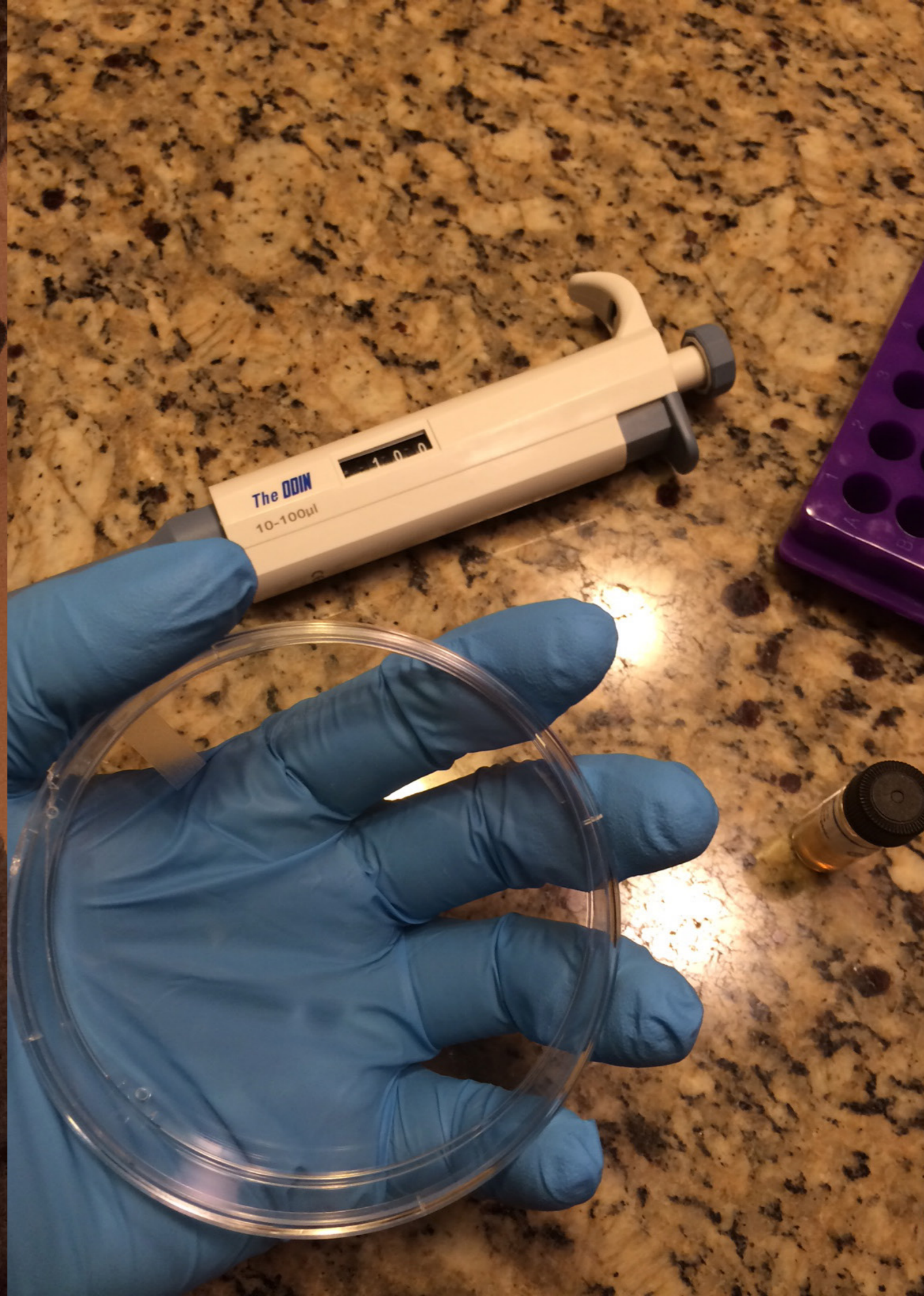
DNAandFarts[84]

THE FUTURE OF TEXT HAS NOT BEEN WRITTEN.

The future of writing is DNA.[85] DNA is our past, present and our future. DNA holds knowledge. DNA is knowledge. We are the knowledge held by DNA. We are the archive of DNA. We can now write in DNA.

The writer/scientist/artist/etc. of the future will be writing with combinations of ATCG.

This is what this sentence looks like coded in DNA:[86]

TAGCGTCTGTGAAGCCTGTGAAGCATGCGTACT
TA-GAGCTAGCGTCTGTGAAGCTGACTACTCTA
GCTACTCTCAC-TAAGCATCTGTTGT
TCGTGAAGCATCCTGTCGCTAAGCTCATGTTAC

Note for the next section

The next section is not expository text.

84	"Now, for Pataphysics, all phenomena are absolutely gaseous. Even the recognition of this state, even the knowledge of farting and purity." (Baudrillard, 2005, p. 10)

85	Microsoft believes the future of archiving is in "DNA Data Storage" and is already storing data in strands of DNA. (Regalado, 2017)

86	To write this sentence, I used a table where each letter of the alphabet is given a three- letter code. So, "a" is ACT, "b" is "CAT", etc. (Urbano, 2013, p. 1)

CTATA-CAGCCTGCTCAGCTACCTCACT

In the future, this thesis will not be written in a book that sits on a shelf.

It will be encoded in the DNA of E.Coli and consumed by a cockroach.
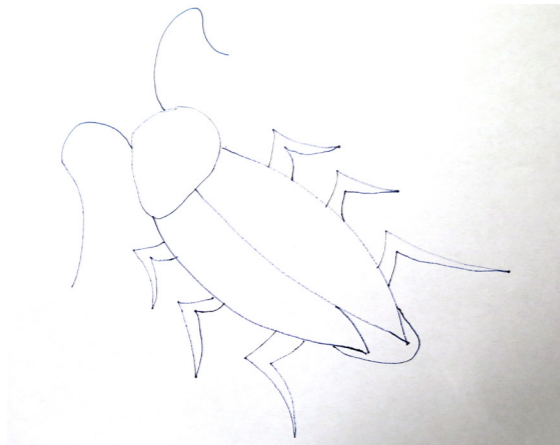
Figure 66: *Cockroach Archive*, Artist rendering of a cockroach after potentially ingesting E. Coli with encoded DNA, Marker on paper, 2017

One cockroach can house all of the books ever written, encoded on the DNA of the E. Coli that will live in its guts. We will add books to this archive by feeding the cockroach bacteria whose DNA has been encoded. To access the archive, we will have to wait and harvest the farts of the cockroach. In the fart will be millions of E. Coli

bacteria, each one holding the data of a book, just waiting to be read. No more waiting in line at the library. No more waiting for books to download from the net. The next wait for knowledge will be waiting for a cockroach to fart.

Borges' *Library of Babel* will be a community of bacteria that live together and keep their archive alive in a symbiotic relationship. When the archive dies, its body will be fed to new cockroaches (empty archives) that by consuming the flesh of the dead will become infected with the contents of the library. In this way, the library of the future will pass from one archive to the next like a plague of knowledge.

My thesis will live in the guts of a cockroach. To read my thesis, future readers will have to collect my cockroach's farts and read the DNA of the bacteria contained in it. My thesis will become part of the evolution of the bacteria. Maybe my thesis will encode a protein that allows the bacteria to become a super-bacteria that will wipe out life on Earth. Evolutionary pressures will cause my thesis to mutate, eventually transforming it into a completely different text. Maybe my cockroach archive will get eaten

by a lizard and the coded E. Coli will become part of the lizard's guts. Maybe I will eat the lizard and become the archive for my own thesis. Maybe to read my own thesis, I will have to read my own farts. Eating tacos will become as venerated and valid a research method to explore an archive as much as a visit to the Vatican archives. Both research methods are equally valid. Both research methods are 'pataphysical exceptions. Both research methods are equally absurd. Both research methods are equally jokes.

However, the fact that this method of archiving writing in cockroach farts is an absurd joke does not mean that it does not generate new knowledge. The Library of Congress does not have a system for archiving DNA, because they follow the Federal Agencies Digital Guidelines Initiative (FADGI). FADGI was passed in 2007 and does not include DNA archiving. (FADGI 2007, 1) In order for DNA archiving to be included, I would have to petition FADGI. If I want my cockroach be added to the Library of Congress' current research system, I can have my cockroach considered as a donation to the library. (Library of

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Congress 2017, 1) Then people can request my cockroach's farts to read, like checking out a book. I can also request a Library of Congress Control Number (LCCN)[87] for my cockroach's farts. (Library of Congress 2017, 1)

"Figure 74: (next page) Me with E.Coli potentially encoded with this thesis" on page 381 displays me with a CRISPR Kit I bought and with which I could potentially encode part of my thesis in the DNA of E.Coli.[88] "CRISPR" stands for Clustered Regularly Interspaced Short Palindromic Repeats and it allows for editing of DNA at precise locations. (Broad Institute 2017) With a CRISPR kit, my thesis can be encoded into the DNA of E. Coli bacteria. (Yong 2017, 1) I would probably only encode part of my thesis because the method I use is currently limited to being able to encode only a few lines of text. However, scientists have encoded all 154 of Shakespeare's sonnets in DNA, costing them $12,400 to encode one megabyte of data. (Yong 2013, 1) Soon, huge amounts of data will be archived in DNA.

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87   "Library of Congress Control Number (LCCN) is a unique identification number that the Library of Congress assigns to the catalogue record created for each book in its catalogued collections."

88   I say that I could potentially encode my thesis on the DNA of E.Coli as a theoretical part of my research.

"Figure 66: Cockroach Archive, Artist rendering of a cockroach after potentially ingesting E. Coli with encoded DNA, Marker on paper, 2017" on page 368 is an image of a cockroach that could potentially have eaten E. Coli that had part of my thesis encoded into its DNA. The cockroach could be an archive of my thesis.

My thesis can be a collision of this writing and E. Coli DNA. The result can be viewed as a 'pataphysical exception and it is absurd. If the Futurists believed that "from any havoc wreaked by technology, there appears a route charted for aesthetics," (Bok 2002, 98) then the route charted by this collision has led to the aesthetics of a cockroach archiving my thesis in the DNA of bacteria in its stomach. Other artists have begun using DNA in their artwork, such as Charlotte Jarvis who encoded musical DNA into soap bubbles and then blew the bubbles onto visitors to Dilston Grove Gallery. (Eisinger 2015, 1) There are also many artists who use the archive as their artwork, such as Fred Wilson's *Mining the Museum* exhibition at the Maryland Historical Society in 1992, where his artwork re-arranged

the objects in the archive of the museum. (Houston 2017, 1) However, this method potentially represents new knowledge as I have not heard of an artist whose artwork is re-arranging bacteria DNA and feeding the bacteria to a cockroach to produce an archive.
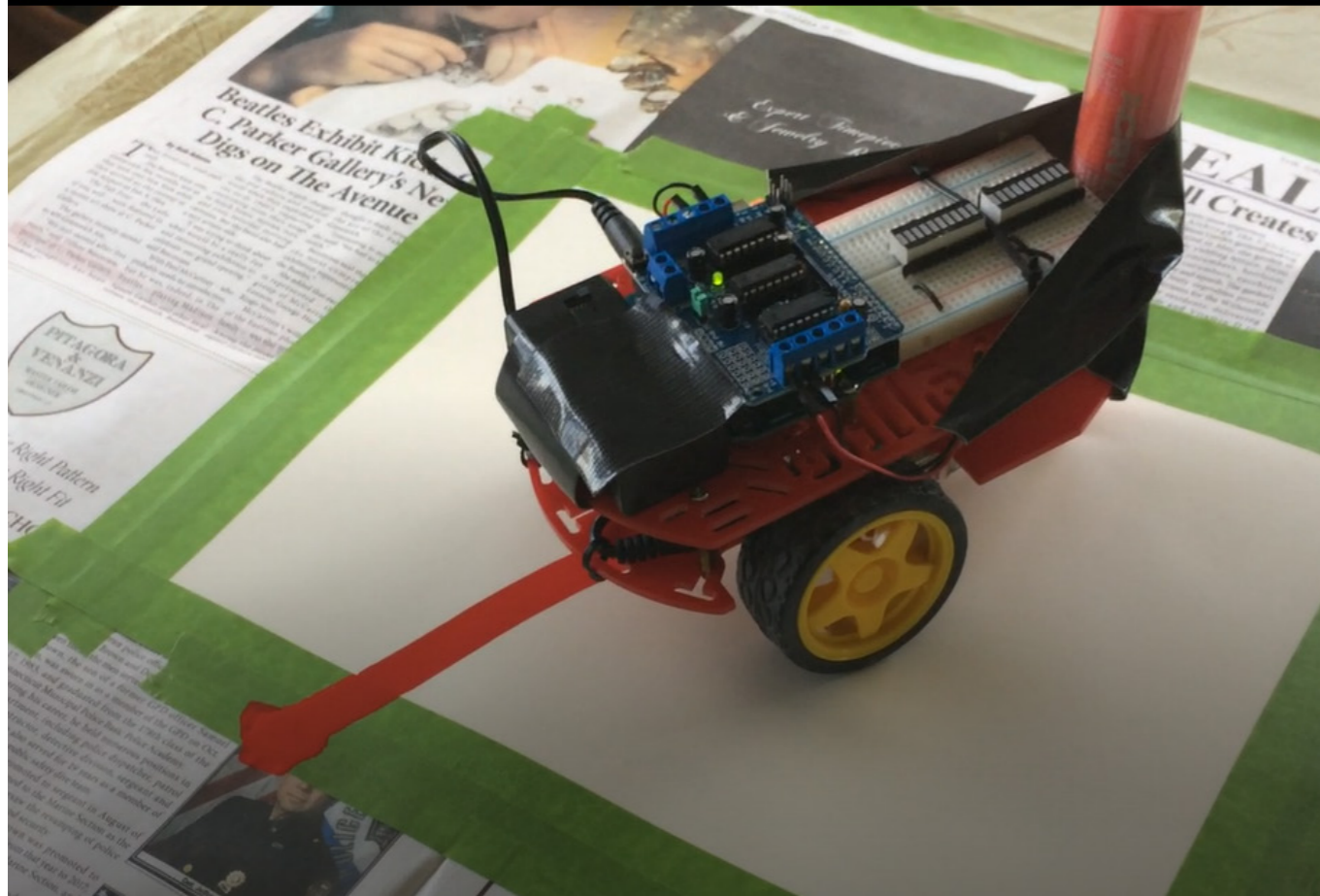
Figure 67: Video still of potentially virus infected robot
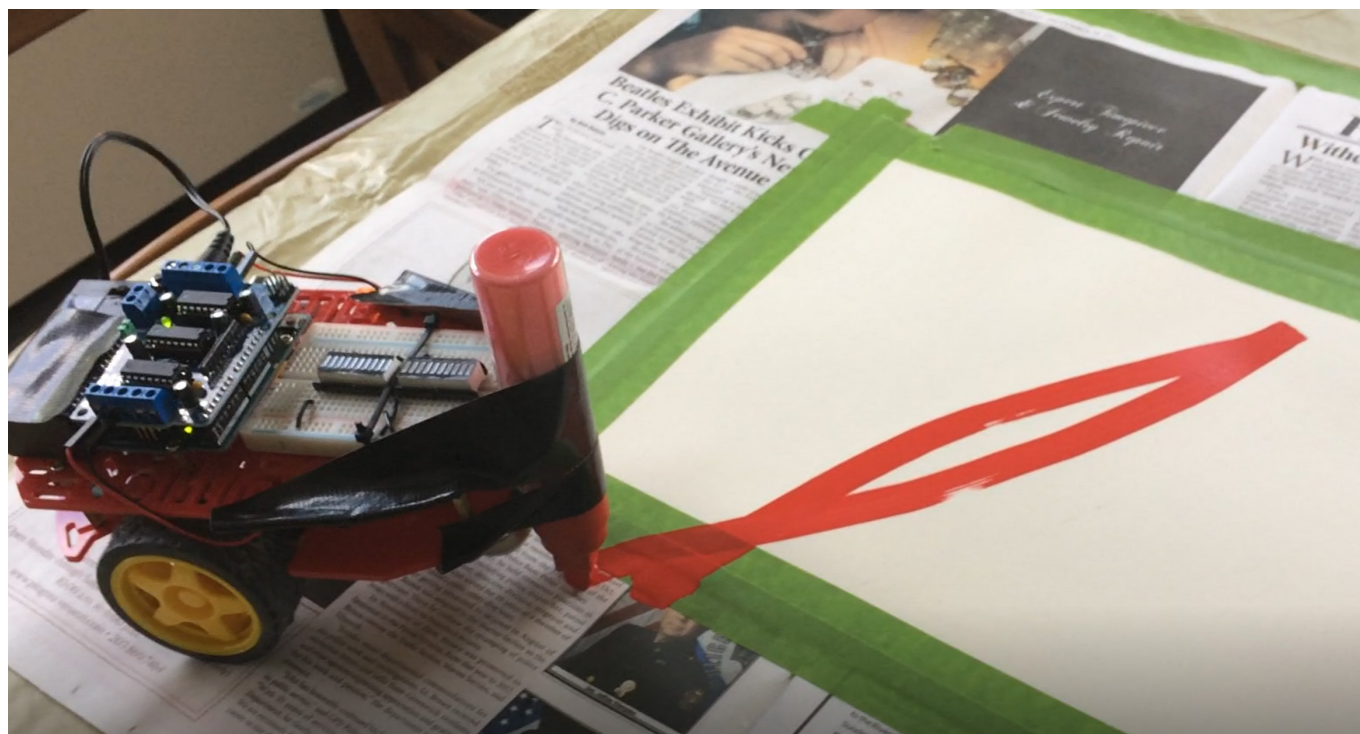
Figure 68: Video still of potentially virus infected robot
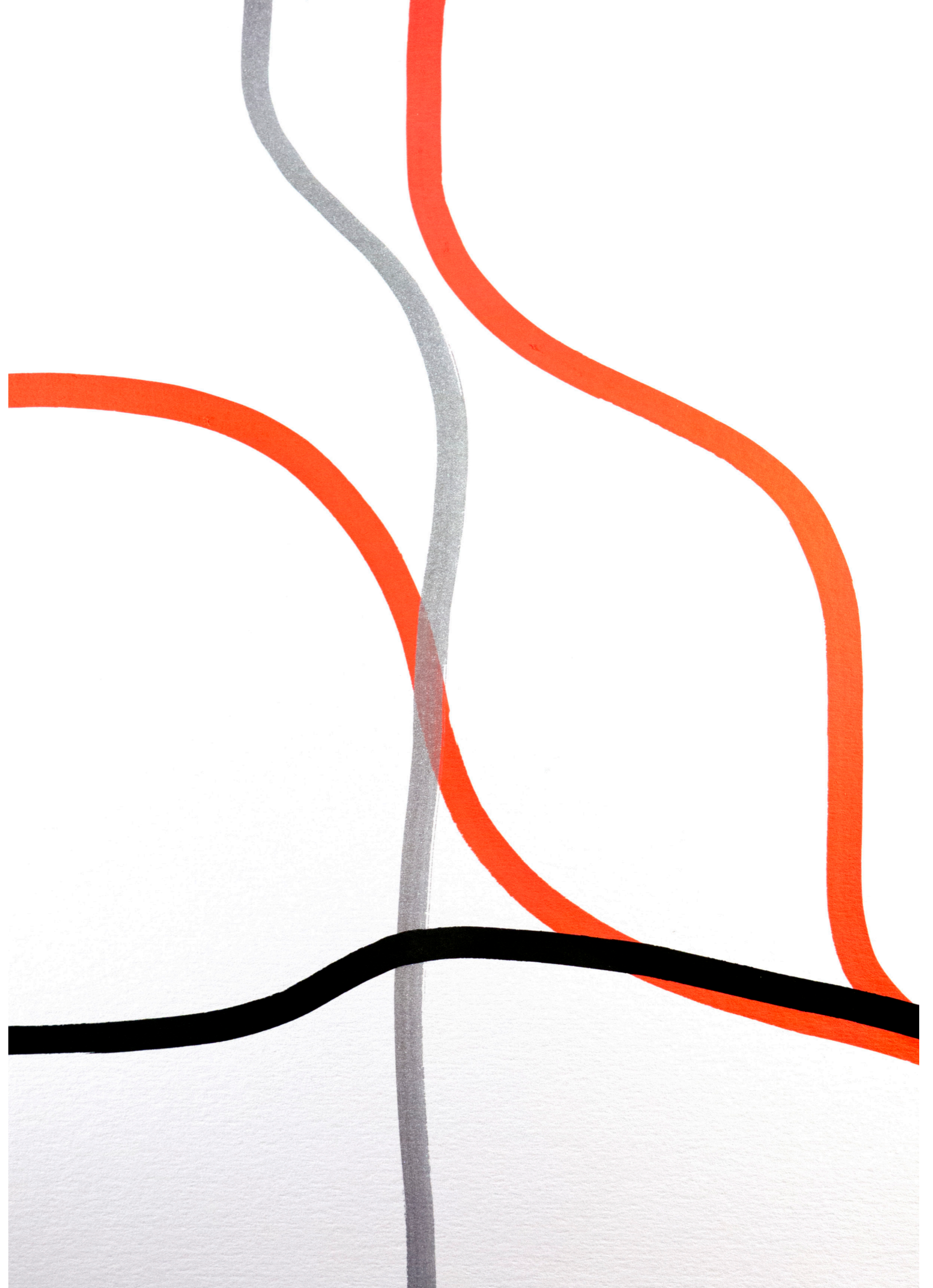
Figure 69: (opposite) *Virus Assisted Drawing 01*, Paint on Paper, 11 inches x 14 inches, 2017
Figure 70: (next page) *Virus Assisted Drawing 02*, Paint on Paper, 11 inches x 14 inches, 2017
Figure 71: (two pages on) *Virus Assisted Drawing 03*, Paint on Paper, 11 inches x 14 inches, 2017
Figure 72: (three pages on) *Virus Assisted Drawing 04*, Paint on Paper, 11 inches x 14 inches, 2017
Figure 73: (four pages on) *Virus Assisted Drawing 05*, Paint on Paper, 11 inches x 14 inches, 2017
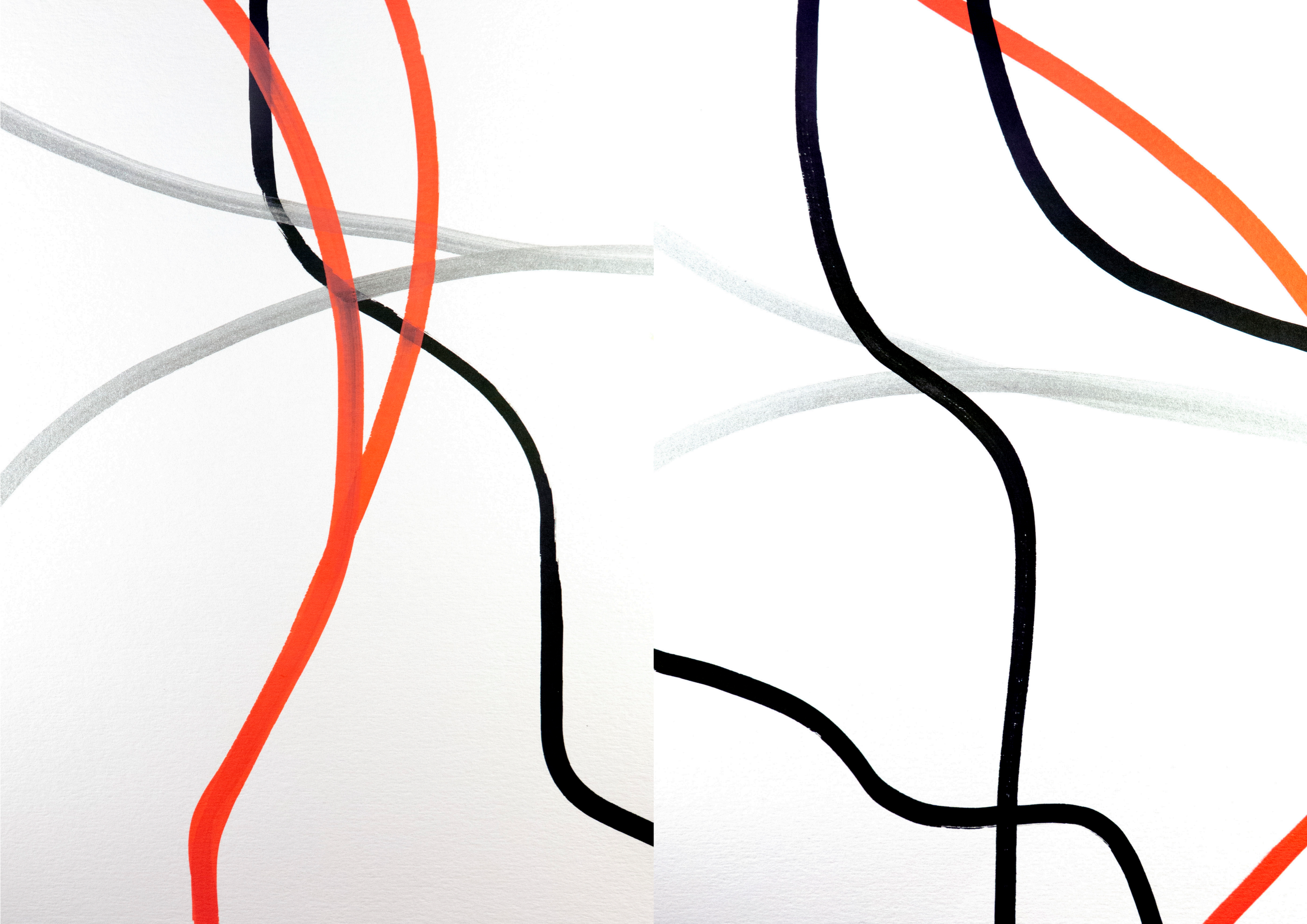
VirusAssistedDrawing

Virus Assisted Drawing is a hypothetical artwork. For *Virus Assisted Drawing,* I can potentially build a robot to make drawings and then infect the robot with the Dragonfly 2.0 computer virus. The Dragonfly 2.0 virus is specifically designed to infect and then attack North American nuclear energy facilities. (Symantec Security Response 2017, 1) The code for Dragonfly 2.0 is available for download from GitHub. (Nativ, Ludar & 5fingers 2017, 1) Based on the code, it appears that the original makers of the virus appear

> to be interested in both learning how energy facilities operate and also gaining access to operational systems themselves, to the extent that the group now potential-ly has the ability to sabotage or gain control of these systems should it decide to do so. (Symantec Security Response 2017, 1)

Rather than giving their code access to the control systems of a nuclear facility, I altered the virus so it would control the systems of a drawing robot.

If the robot were not infected, it would drive in a straight line. When the robot is infected with the virus, the virus begins to function as if it were attacking the network of a

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Figure 74:   (next page) *Me with E.Coli potentially encoded with this thesis*

Figure 75:   (two pages on) *Me with E.Coli potentially encoded with this thesis*

nuclear facility. When infected with the virus, anytime the virus would attack a system, instead, the robot turns left, right, reverses or a combination of left, right and reverse. So the motion of the robot embodies the virus' attempts to attack nuclear power facilities. If this artwork was not hypothetical, I would have co-opted a piece of code designed for illegal and potentially dangerous actions and turned those actions into a drawing.

"Figure 75: (two pages on) Me with E.Coli potentially encoded with this thesis" on page 381 and "Figure 67: Video still of potentially virus infected robot" on page 374 display a video stills of the potentially virus-infected robot making a drawing. Most of the virus' functions do not manifest themselves physically, until they take over the functions of a nuclear energy facility. So far, it appears the virus has not actually ever taken control over a nuclear facility, so it is unclear how the virus actually functions physically. This artwork manifests in the functioning of the infected drawing robot, displays new knowledge by physically displaying the actions of the virus in a way that otherwise cannot be seen except in a manner that implies

the ability to cause a nuclear meltdown.

The robot would also become an archive for the virus. If the robot were to be connected to a networked computer, it would have the potential to continue its infection path to its eventual destination: a nuclear energy facility. In this way, I would have created a carrier and archive of a potentially dangerous virus that has only recently been contained.

"Figure 68: Video still of potentially virus infected robot" on page 374 through "Figure 73: (four pages on) Virus Assisted Drawing 05, Paint on Paper, 11 inches x 14 inches, 2017" on page 374 display the drawings that could have potentially been made by the infected robot if this was not hypothetical.

Using Phrenology and BitCoins to Predict Your Future

x: 280px
y: 80px

x: 216px
y: 120px

Your Personal Phrenology
and Lucky Number: 280

Current BitCoin prices:
13924.62 US Dollar/ 1 BitCoin

Neural Network Value of Your Phrenology
Combined with BitCoin prices:
15

Your Prediction:
Why not take some time to meditate on
the answers. When doing this you can
find what you seek. Beware of unfamiliar
places.
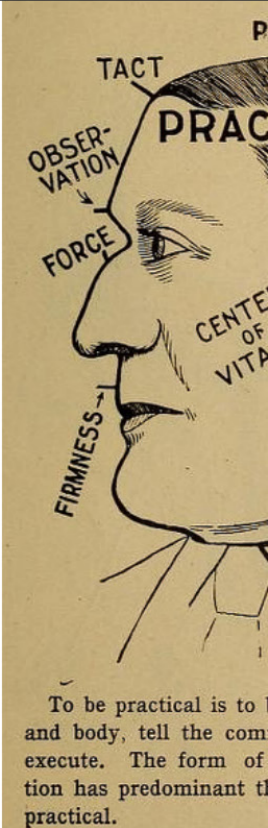
Phrenology algorithms f
Vaught, L. A. (1902).
Vaught's practical chara
Chicago: L.A. Vaught.

Figure 76:   Still frame from *Phrenology and BitCoins Predict Your Future*, Facial Recognition Neural

Network, 2017

PhrenologyAndBitCoins

My artwork, *Phrenology and BitCoins Predict Your Future*, (2018) uses the facial recognition algorithms used by the US Department of Homeland Security to identify people on the no fly list in airports. These are also the same algorithms used by Snapchat to put dog faces on celebrities.

The data from the facial recognition algorithms is then correlated with Phrenology Diagrams from Vaught's *Practical Character Reader* (1902). The resulting data set is then used to construct part of a network that includes data from trending tweets and the current value of BitCoins. The data from this network is then used to make a prediction for the future.

I believe that the fundamental assumption of facial recognition algorithms is that they can predict the future. Nextgov.com, which reports on American federal technology issues, reported that US Customs and Border Protection put out a solicitation for contractors to develop airport facial recognition software with the primary

goal to identify individuals in order to prevent crimes by identifying potential threats and then stopping or detaining them. (Ravindranath, 2016) In airport security, if an individual's facial features look similar enough to someone on the no fly list, they may get "special" security. This special security can include extra judicial detainment, search, seizure and more based solely on the external facial measurements of an individual and before any crime has been committed. In this way, the primary assumption of facial recognition software is that it can predict the future. Without belief in this assumption, the US and other governments would not be rolling "out a multibillion dollar surveillance system that will equip US airports with facial recognition software." (Sternstein, 2017) They exist to predict and prevent crimes that have not yet occurred. However, the apparent prescient power of facial recognition algorithms is flawed as the basic assumption that any human metric can be used as a reliable indicator of future behaviour is based in biased correlations. Faith in a prescient power is mutually exclusive with the legal precedent of habeas corpus, which has been a base of

government since the Magna Carta was signed in 1215.[89] Detaining an individual before a crime has been committed is a gross violation of habeas corpus as the state is detaining individuals with full knowledge that no crime has been committed.

Faith in the precognitive abilities of these algorithms is on the rise as more security systems have come to rely on facial recognition algorithms. President Trump has specifically stated that he wants to create a biometric "database on the people coming in from Syria" and biometric "surveillance of certain mosques." (Johnson, 2015) The implication of these measures is that the people under this biometric surveillance will commit crimes and the algorithms can help prevent them before they occur.

I believe that the use of these algorithms is similar (and similarly flawed) to Francis Galton's use of anthropometric studies in the 1800s to correlate physical features to human behaviour. An example of this is how Galton "retained the

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89   "No freeman shall be taken or imprisoned or disseised or exiled or in any way destroyed, nor will we go upon him nor will we send upon him except upon the lawful judgement of his peers or the law of the land." - Magna Carta, 1215 (Harrison & Breay, 2014)

belief in the high intelligence of those like himself with large heads." (Forrest, 1974, p. 37) Specifically, Galton believed that people with larger heads and therefore higher intelligence should breed in order to further develop the intelligence of humans. Galton coined the term "eugenics" based on the notion that humans should breed in order to artificially select superior humans. In most cases, his measurements placed him and his family in the highest ranking of measurable traits for selection. Traits that he did not possess were not considered for criteria of eugenical evaluation. Galton's concept of eugenics was readily used by Nazis such as Josef Mengele who worked for the Kaiser Wilhelm Institute for Anthropology, Human Genetics, and Eugenics in 1943. (United States Holocaust Memorial Museum, 2014) The Nazis based some of their justification for the holocaust and other atrocities in the belief that they could predict the future based on the external, measurable and quantifiable data of individuals. (United States Holocaust Memorial Museum, 2014) In this way can be seen the potentially destructive outcomes of faith in the ability for interpretations of data to predict the future.

Galton's use of anthropometric studies to predict human behaviours was also further developed by criminologists such as Alphonse Bertillon. His system was used to identify criminal features such as what a criminal's nose or ears were more likely to look like. "Bertillon made it possible to visualize criminality in a ploddingly bureaucratic yet devastatingly effective way." (Cole, 2002, pp. 58-59) His system led to "the idea that a 'born criminal' could be identified by anthropometry before any crimes were committed." (Cellania, 2014)

The measurements used by Bertillon to identify criminals differ only slightly from the algorithms used in facial recognition software in airports. Agamben addressed the relationship between contemporary biometrics, Galton and Bertillon in an article he wrote for *Le Monde*, 5 December 2005. Agamben wrote, "Galton in England began his research into fingerprinting and when Bertillon in France invented judicial photography … Today, one sees the beginnings of a society in which one proposes to apply to every citizen the devices that had only been destined for

delinquents." (Agamben, 2005, p. 1) He goes on to state, "I will refuse to be a party to all biometric supervision." (Agamben, 2005, p. 1) However, Agamben did not directly address the fact that the application of biometric supervision through facial recognition algorithms does not require active participation. Biometric supervision can be passively applied in all public locations as seen in the UK cities such as Newham that has a system that matches "faces on Newham's cameras to a 'watch list' of between 100 and 150 active criminals, chosen by a Metropolitan Police committee." (Mathieson, 2001, p. 1) In the case of the artwork *Phrenology and BitCoins Predict Your Future,* anyone walking in front of the camera will automatically have their future predicted, whether or not they asked for it.

The Bertillon system and airport facial recognition algorithms are both based in the assumptions that criminality can be visualized and that human behaviours can be predicted by external, measurable attributes. In the case of airport security, the implication is that based on an individual's external attributes, crime can be prevented by taking action before criminal behaviour manifests. In

this case, by detaining and applying extra judicial measures on individuals who match the external measurements determined by the algorithms.

In *Phrenology and BitCoins Predict Your Future,* the anthropometric data processed by facial recognition algorithms is then correlated with Phrenology Diagrams from Vaught's *Practical Character Reader* (1902). Phrenology focuses on measuring the human skull to determine parts of a person's personality. In this way, phrenology functions in a similar way that personality tests that match answers to Jung Typologies (Jung, 1990) or the Myers–Briggs Type Indicator (Myers & Myers, 2002) function. In both cases, the person who is being evaluated is told by an evaluating expert how external conditions (mental or physical) map to internal functions. Phrenology also functions in a manner similar to astrology in that measurable elements of an individual such as date of birth or skull bumps indicate personality traits. In all of these types of measurements, the data collected is then correlated to predict future behaviour of the individual. Astrology, phrenology, Myers–Briggs Type Indicator tests, IQ tests,

etc. can be used to predict the future of an individual based on evaluation of particular measurements by correlating those measurements to particular measurable outcomes. The expert at reading the measurements then makes recommendations to the individual on how to behave in the future. The only difference between the outcome of a Myers–Briggs Type Indicator informing an individual that they were born an ISTJ and will therefore form a good relationship with an ESFP or an astrology chart saying a person who is born a Cancer will therefore have a good relationship with a Scorpio, is the metric that is being evaluated. One measures when an individual was born and has been correlated to personality traits over centuries; the other measures responses to a test and has not been correlated to anything.[90]

The artwork *Phrenology and BitCoins Predict Your Future* uses the measurements determined by the facial

recognition algorithms to create a phrenological profile of the individual. This profile is then entered into a network with trending tweets and the price of BitCoins to make a prediction about the individual's future.

Decisions about how to predict outcomes in a network are determined by a learning algorithm that does not follow a particular path to a conclusion, but alters the path based on a weighted algorithm that responds to real-time data to constantly learn how to make the most efficient decisions. Most phrenological predictions are made in a linear manner, so if a person has more bumps on the back-lower-right side of their head, they should display aptitude in concentration. (Vaught, 1902, p. 173.) In the case of *Phrenology and BitCoins Predict Your Future,* rather than just make a linear phrenological prediction, the prediction for an individual functions in a network with other pieces of real-time data, such as the price of BitCoins. In so doing, the future of an individual is predicted based on their current phrenology and elements of the current environment they are in.

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90   Dr. Pittenger from Indian University has said, " In summary, it appears that the MBTI does not conform to many of the basic standards expected of psychological tests. Many very specific predictions about the MBTI have not been confirmed or have been proved wrong. There is no obvious evidence that there are 16 unique categories in which all people can be placed. There is no evidence that scores generated by the MBTI reflect the stable and unchanging personality traits that are claimed to be measured. Finally, there is no evidence that the MBTI measures anything of value." (Eveleth, 2013)

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MigraineAssistedDrawing

Pain is an everyday element of the lives of millions of people around the world. The American National Health Institute (NIH) reports that "25.3 million people have experienced some form of pain every day for the past three months." (Bushak 2015, p. 1) However, visualizing and communicating pain remains complex because pain is by definition subjective and non-representational. Subsequently, "[m]any patients with chronic pain believe that others do not understand their pain or even consider their pain condition to be legitimate." (Edmond & Keefe 2015, p. 1)

Recent discoveries in neuroscience have shown that "EEG frequency analysis and topographic brain mapping, are promising tools" (Sand 1991, abstract) for understanding migraine pathophysiology. All of the medical research begins by treating altered brainwave activity as pathological and therefore the research is accompanied by the presumption that the altered brainwave activity is a disease that requires treatment. For this 'pataphysical collision, I

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designed a drawing implement that reads a person's EEG brainwave activity and only functions if the person is currently having a migraine. When having a migraine, the person can make drawings using the drawing implement. As soon as the migraine stops, the device ceases working and the user must stop drawing. The result is a series of migraine-assisted drawings that make visible the otherwise non-visible brainwave activities that occur during a migraine.

I have used this device whenever I have migraine-like symptoms to make drawings. During the times of migraine activity, I have attempted to draw the patterns displayed by the EEG data. These drawings are the archive of the contact zone with the flow of pain through my brain. "Figure 78: (two pages on) Migraine Assisted Drawing 02, Paint on Paper, 11 inches x 14 inches, 2017" on page 397 through "Figure 82: (five pages on) Migraine Assisted Drawing 05, Paint on Paper, 11 inches x 14 inches, 2017" on page 397 display some of the drawings created during the migraine activity.

Figure 83:   (next page) *Allergy Assisted Drawing 01*, Nail Polish on Paper, 8 inches x 10 inches, 2017

Figure 84:   (two pages on) *Allergy Assisted Drawing 02*, Nail Polish on Paper, 8 inches x 10 inches, 2017

Figure 85:   (three pages on) *Allergy Assisted Drawing 03*, Nail Polish on Paper, 8 inches x 10 inches, 2017

Figure 86:   (four pages on) *Allergy Assisted Drawing 04*, Nail Polish on Paper, 8 inches x 10 inches, 2017

Figure 87:   (five pages on) *Allergy Assisted Drawing 05*, Nail Polish on Paper, 8 inches x 10 inches, 2017

Figure 88:   (six pages on) Still of Making *Allergy Assisted Artwork*, Nail Polish, Paper, and Robot, 2017

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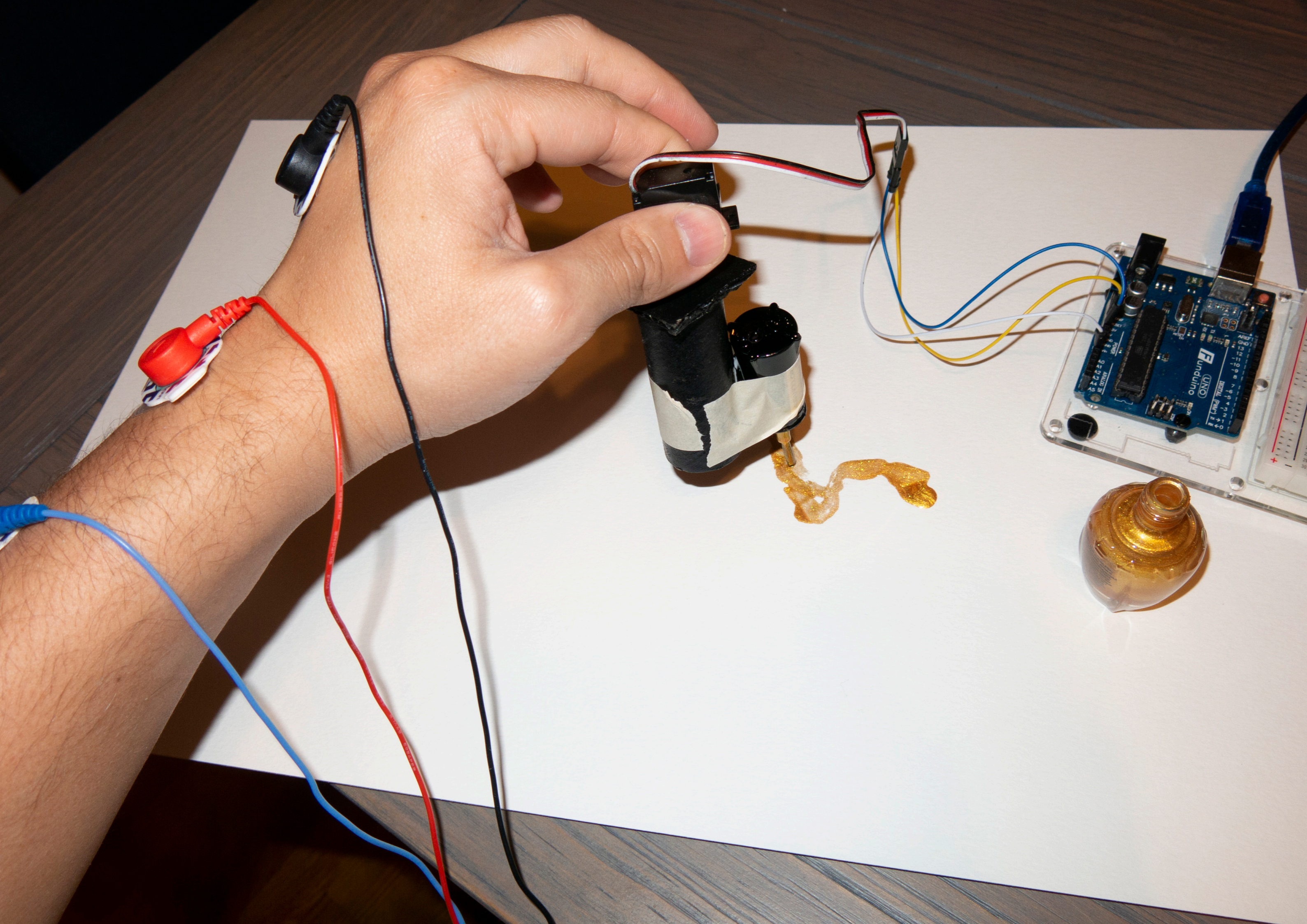
AllergyAssistedArtwork

Allergies effect millions of people in the world on a daily basis. The WAO White Book on Allergy says that "200 to 250 million people suffer from food allergies." (Pawankar 2014, 1) Due to the nature of allergies, an activity that may not even register to some people, like eating at a restaurant that may have nuts in the kitchen, can prove fatal to others.

I am allergic to nail polish. Specifically, I am allergic to toluene, which can cause asthma attacks and is toxic. (Meininger 2017, 1) For this artwork, I made a drawing device that responds to the histamine response of my allergy by monitoring my skin conductance. As my allergic reaction increases, my skin conductance increases which alters the drawing tool I am using. If I am not having an allergic reaction, the tool functions just like a standard drawing tool. Based on this, I have made a series of drawings with nail polish. As I continued to have an allergic reaction, the drawing tool responded with larger and larger vibrations. I tried to draw what my skin looks like at the site of a reaction during the reaction.

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"Figure 84: (two pages on) Allergy Assisted Drawing 02, Nail Polish on Paper, 8 inches x 10 inches, 2017" on page 407 through "Figure 87: (five pages on) Allergy Assisted Drawing 05, Nail Polish on Paper, 8 inches x 10 inches, 2017" on page 407 display some of the drawings created during the allergic reaction to the material I was using to make the drawing.

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mic. responsiveness ↑↓ 3
info
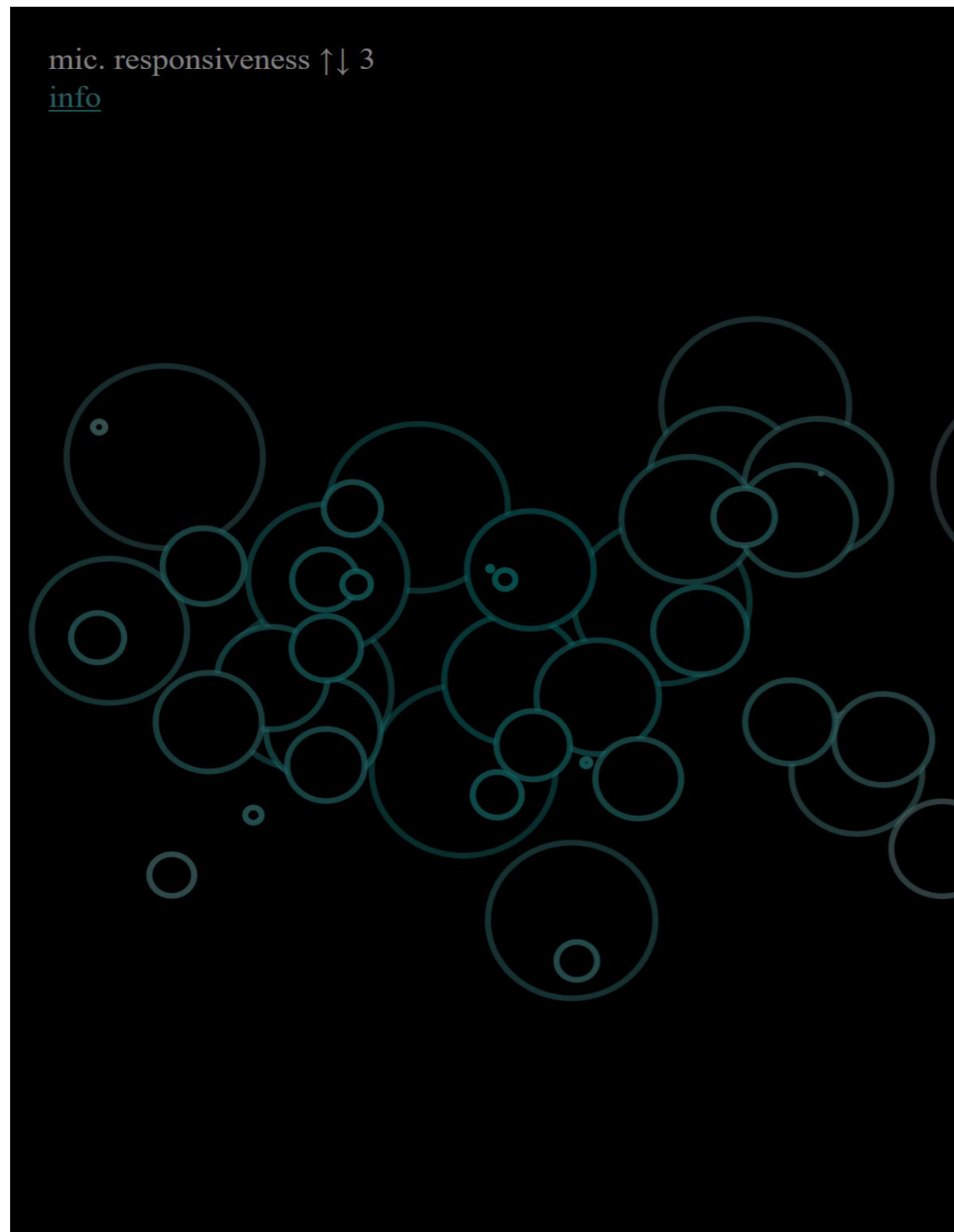
Figure 89:   *Ripples,* Computer Program, 2019

Ripples

For *Ripples*, (2019) I was interested in exploring embodied knowledge and asking how an artwork can be emphatically provisional and insistently hesitant. The theoretical base of this artwork is Karen Barad's agential realism. Barad states,

> "'Agential realism' as an epistemological-ontological-ethical framework that provides an understanding of the role of human and nonhuman, material and discursive, and natural and cultural factors in scientific and other social-material practices, thereby moving such considerations beyond the well-worn debates that pit constructivism against realism, agency against structure, and idealism against materialism." (Barad 2007, 26)

Agential realism describes matter as a phenomenon that comes into being when elements of an assemblage such as physical materials, digital code, discourse, language, political forces, etc. provisionally intra-act in an entangled manner. Matter is viewed through the lens of a relational ontology where the assemblage that comprises matter is constantly coming into being, disappearing and reconfiguring depending on the intra-actions of the elements. Agential realism's use of the term "intra-action"

instead of "interaction" emphasizes the perspective that within any phenomenon, the agencies of the elements of the assemblage are entangled and are mutually co-constituted. In agential realism, the smallest unit of research analysis is a provisional phenomenon due to specific intra-actions. Barad states, "A phenomenon is a specific intra-action of an 'object'; and the 'measuring agencies'; the object and the measuring agencies emerge from, rather than precede, the intra-action that produces them." (Barad 2007, 128). Framed within agential realism, "the object" of research analysis is an enactment that is entangled with "the way" that it is analyzed. Barad goes on to say, "Practices of knowing and being are not isolable; they are mutually implicated. We don't obtain knowledge by standing outside the world; we know because we are of the world." (Barad 2007, 185)

The artwork *Ripples* is based in Barad's agential realism and asks how a participant can gain provisional, embodied knowledge by being part of the entangled intra-actions that constitute an artwork. The artwork is created when a participant intra-acts with a computer program that makes

a drawing using a viewer's microphone. It is available here: http://bit.ly/Aishman_ripples. The participant's breath, words, whispers, ambient sound in the room, etc. make a digital drawing. As Barad describes, "the object" of the research is a phenomenon that occurs when a participant, computer code, a microphone, a space, language, and many other elements in an assemblage all intra-act in a provisional manner.

I tried to highlight issues with agency in the artwork *Ripples*, because the human participant only has a certain amount of agency in making the digital drawing. Barad says,

> "I want to say that I try to stay away from using the term "agent," or even "actant," because these terms work against the relational ontology I am proposing. Also the notion that there are agents who have agency, or who grant agency, say, to non-humans (the granting of agency is an ironic notion, no?), pulls us back into the same old humanist orbits over and over again. And it is not easy to resist the gravitational force of humanism, especially when it comes to the question of 'agency.' But agency for me is not something that someone or something has to varying degrees, since I am trying to displace the very notion of independently existing individuals … Agency is not held, it is not a property of persons or things; rather, agency is an enactment, a matter of possibilities for reconfiguring entanglements. So agency is not about choice in any liberal humanist

sense; rather, it is about the possibilities and account-
ability entailed in reconfiguring material-discursive ap-
paratuses of bodily production, including the boundary
articulations and exclusions that are marked by those
practices." (Barad in Dolphijn & Tuin, 2012, 50)

There are many agencies, human and non-human, in
the artwork *Ripples*. For example, the program requires
a specific web browser, the ambient noise in the room
impacts the drawing, the microphone impacts the reaction
of the program, etc. Because the entangled intra-acting
agencies within a phenomenon have real effects that
become the elements in new assemblages of intra-active
agencies, the framing of this artwork is called agential
"realism."

Barad's agential realism has been included in books like
New Materialism: Interviews & Cartographies (Dolphijn
& van der Tuin, 2012) When describing new materialism
Patti Lather said,

> "This is a return to materialism AFTER Derrida, NOT
> old school Marxist materialism with its identity politics
> and economics in the last instance. In feminist terms, it
> is more about biology and the body than Marxist con-
> tests between base and superstructure." (Lather 2018,
> 345)

From the frame of new materialism, the matter of this
research is concerned with the body. For the participant,
the knowledge of the artwork is an embodied sensation.
As the participant uses their body to make sounds like
whispering or blowing, the body knows how much to blow
to make specific digital mark. The body of the viewer
begins to understand how much sound they need to make
to get a particular response as they intra-act with the other
elements of the artwork. It is within the framework of
agential realism that I view *Ripples*.

Figure 90:   (next p) *Every Word of This Thesis With Some Connections Between the Words "Deleuze,
affect, Quantum, 'pataphysics, occult,"* Digital Drawing, 2018

Figure 91:   *Every Word of This Thesis With Some Connections Between the Words "Deleuze, affect,*
Quantum, 'pataphysics, occult" (detail) Digital Drawing, 2018

Figure 92:   *Every Word of This Thesis With Some Connections Between the Words "Deleuze, affect,*
Quantum, 'pataphysics, occult" (detail) Digital Drawing, 2018

LineamentsAndLeyLines

My thesis research into the intersection of everyday life and digital practice has come to an end, but not a conclusion. I began this research to create new knowledge and share it with others. My primarily method of research has been to engage with occult knowledges as fields of infinite virtual potential with no preconceived notion of the outcome and embrace mistakes that occurred along the way. This method frequently lead to absurd (and sometimes humorous) results. However, as I have reached the terminus of this research, I have realized that I have no final judgment or decision reached through thoughtful reasoning to articulate. I am left only with hesitant questions. Can questions be a significant advancement of knowledge in my field? Is the act of sharing questions of particular interest valuable to the wider context of my discipline? My conclusion is a series of final reflections I have on my research that take the form of unanswered questions. These questions are my contribution to new knowledge and the final aspect of my research that I would like to share with others.

Research methods as contribution

Is my research method characterized by its own unique sense of the absurd, humour and seriousness? Can this uniqueness constitute its own form of new knowledge? Can sharing these research methods be seen as a contribution to knowledge?

I have viewed my research method as a Deleuzian assemblage constituted by the relationships between many disparate practices. They are all linked through hesitancy, provisionality and inquiry into the occult intersections of everyday life and digital practices. All of my research methods begin as genuine inquiries asking questions like, "Is there a link between my morning tea and the Dow Jones Industrial Average?" Then once my modes of inquiry are established, I have followed 'pataphysical methods like Oulipian restraint. My research methods frequently lead to absurdity and the creation of universes that are not beholden to any forms of logic and can contain contradictions.

Are these research methods their own form of new

knowledge? Does sharing these methods offer a new way of thinking about the intersection of everyday life and digital practice? Have I shared a new set of research methods that may be able to address other arts research issues and can be used by others to open up more possibilities for producing new knowledge?

Artworks as contribution

Can artworks like *Table of Contents, Resonance in Sleep, Organic Editor, Embodying Flusser's Voice, Happy Happy, Tea Leaves, Post-Its, Twitter Flocking, Oulipo Tweets, Phrenology and BitCoins Predict Your Future, Virus Assisted Drawing, Migraine Assisted Drawing,* or *Allergy Assisted Artwork* be considered contributions of new knowledge to my field of arts research?

These artworks may appear to be completely disconnected, independent objects, but they are connected through occult knowledges like ley lines that trace occult knowledges in physical geometry. These heterogeneous artworks are connected through their reliance on everyday occult connections that constitute a network of embodied affect

accessed through digital practice. Each artwork asks its own questions about this occult network.

Table of Contents attempts to connect data from Twitter users using #PhD to the potential organization of this thesis. Is there a connection between outside influences and how my thesis is read/written? Can the everyday activity of reading a traditionally arborescent organizational tool like a table of contents be re-imagined rhizomatically by digital practices?

Can the boundary surrounding the occult knowledges of the sleep be penetrated by digital practice? *Resonance in Sleep* is an attempt to access the knowledge of the everyday activity of sleep while sleeping through digital practice. If so, what are the results of such penetrations and how will they be used?

Organic Editor attempted to expand the everyday use of a digital editor like a spell checker to include the otherwise occult influence that an environment may have on writing. Can the unseen but felt influence of our environment be

made visible through digital practice?

What are the limits of digital embodiment? Is an embedded, bluetooth and internet connected hearing aid part of my body? If so, is the entire internet now part of my body through my phone? In *Embodying Flusser's Voice*, I attempt to embody Flusser's voice through coding. Is the code part of my body like a dance or performance?

What does an affective assemblage with a robot feel like? How does digital practice intersect with affect? *Happy Happy* is robot that emulates a human affective network. Does it matter if a robot dies?

How are affective networks created through bits of data in everyday life? *Post-Its* researches the flow of everyday affect through bits of data on post-its. Can affect be transmitted in quanta?

Tea Leaves is an attempt to digital practices to determine if there is an affective network between my everyday activities and the Dow Jones Industrial average. If so, can this

network be used to predict the future? What other occult networks might exist between my everyday life and my environment?

Twitter Flocking is an attempt to visualize how affect moves in digital system. Does affect behave with flocking behaviour in a digital system comprised of everyday verbalizations?

Has digital practice had an impact on everyday activities like writing? If people are already increasing their code literacy by incorporating scripts in their everyday life like #'s, can more robust computer code be read on a larger scale? *Oulipo Tweets* attempts to use coding to research the intersection of everyday practices like reading, writing and coding.

Can digital practice predict the future? *Phrenology and BitCoins Predict Your Future* is an attempt to use the digital practice of facial recognition to predict an individual's future.

How do computer viruses impact our everyday life?

Can this impact be positive? *Virus Assisted Drawing* is a hypothetical attempt at harnessing the everyday impact of a digital practice that holds a negative connotation.

Can my body's sympathetic nervous system reactions to the environment manifested in the form of migraines or allergies be revealed through digital practices? *Migraine Assisted Drawing* and *Allergy Assisted Artwork* are both attempts at using digital practice to make artwork with everyday, occult, embodied processes.

Other elements as potential contributions

During my research, I did not differentiate between the various elements of my thesis. However, I also recognize that the written elements of my thesis and the visual elements may function differently.

Can my various diagrams such as "Figure 14: Diagram of Desire Oriented Programming, Drawing on Starbucks napkin, 2018" on page 153 or "Figure 9: Still of Making Mind-map in Invisible Ink, Paper and Invisible Ink, 2018" on page 59 be considered as contributions to knowledge?

Do my diagrams function as humorous hesitancies characterized by 'pataphysically serious playfulness?

Can my written artworks like function as contributions to knowledge?

is an attempt to create an artwork out of my material of writing practice that highlighted some of the possibilities of writing. Can research art writing examine if the possibilities of digital writing that includes hyperlinks constituted their own category of aesthetics?

What does the intersection of digital practice in the form of DNA (the digital encoding of life) and everyday life look like? is an attempt to look into the future of the intersection of digital practice in the form of DNA and everyday life.

Continuing research

Most of the new knowledge I have generated in my research has not be expected, but all of it has pointed to the notion that the intersection between everyday life and digital practice will continue to expand in the future. How it will expand remains uncertain. While I may not be able to predict the what the intersection of digital practice and everyday life will look like in the future, I can describe some potential paths my research seems compelled to follow at the moment.

I am interested in continuing to research how digital practices can harness elements of everyday life that have historically carry a negative connotation, like migraines, allergies, computer viruses, and turn them into methods of producing new knowledges. My method for harnessing these "negative" aspects of everyday life is to examine a potential negativity, collide it with digital practice and see what happens.

For example, I am working on using an algorithm that is similar to *Tea Leaves* to observe a colony of fruit flies and use their motion to predict global weather patterns. Humans have used animal behaviours as predictors for cataclysmic environmental changes like earthquakes and

tidal waves in an occult manner for centuries. Killing fruit flies is part of everyday life, but perhaps if digital practice can interpret the motions of fruit flies and reveal their occult knowledge, our everyday relationship to fruit flies can change. Instead of killing them, perhaps we will incorporate observing our fruit fly colony with digital practices as part of everyday life. So far, I have been unable to correlate the motions of the fruit flies to anything. [91]

I am also particularly interested in continuing to research aspects of digital embodiment. I am interested in how the concept of the human body continues to evolve to now include prosthetic devices and the digital code that is contained within them. I am interested in how gene editing appears to be on a trajectory to become part of everyday life. Already, genetically modified foods are part of the everyday diet of many people.

For my research, I am working on a prosthetic attachment that makes paintings based on individual genetic information. It functions like an additional hand, but

the code that controls it is based on DNA data, not biofeedback data. Many people are having their genes mapped by companies like 23andMe or AncestryDNA. Ostensibly, these companies are used to reveal previously occult knowledges. The DNA data revealed and analyzed by companies was previously used to construct human beings or other living creatures. The companies imply that by analyzing the DNA data, occult knowledges about ancestry, links to other living creatures and health can be revealed through their processes. (23andMe 2018, 1) Maybe other occult knowledges can be revealed through different processes. I am interested in researching if the DNA data revealed through digital practices can be used to produce other new knowledges, like a painting.

The intersection of digital practice and everyday life is an ever expanding set of relationships. As new digital practices are developed, the concept of everyday life will continue to change. This intersection is perpetually fertile ground for research because it exists as a limitless field of potential. As such, research in this area is never fixed, is perpetually changing, and will never come to an immutable conclusion.

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91   I have decided that perhaps I need to spend more time with the fruit flies, so I have been bringing them with me throughout my day. I have found that the cafe I frequent to write says they are pet friendly and allow dogs, but they seem to frown on my jar of fruit flies, so I have to keep them in my bag.

Appendix 1: Frames

This section is intended to be read more like an annotated index. I have provided these frames as potential entry points into my thesis as I have not always provided an explanation for why certain elements are inserted into my thesis. I do not believe the elements of my research are as reductive or straightforward as these frames may reflect. I am not attempting to 'explain' these elements nor am I suggesting that there is only one particular way to approach them. My goal in providing these frames is to provide you with some orientation for reading my thesis.

"Figure 4: (opposite) Mind Map of Dynamic Research Assemblage, Drawing with random watercolour, 2018" on page 32 is a mind map of some of the concepts I use in my thesis. I am presenting it because it demonstrates how I feel the concepts of my thesis bleed into one another and do not have clear lines of separation.

"Figure 5: (opposite) Robot Mistakes, Detail of a pile of non-functioning robots filled with mistake codes, 2018"

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is a photograph of some of the robots I have built that did not function in a manner that fit with this thesis. In some cases, the code did not work while in others, there was a problem with the physical robot. Most of the time I have no idea what went wrong. They are all mistakes, but mistakes that were edited out.

In the UserGuide, I am attempting to reframe the notion of an "introduction" into the concept of a user manual. As a user manual, I feel I have the freedom to explain how I use terms and how I believe the objects of the thesis function. It is also a place where I can explicitly state where in the thesis I am attempting to convey implicit knowledges. It is in the user manual that I can make statements such as, "This diagram is presented with no supporting text." Personally, I never read user manuals until I don't understand how something works. So, please refer back to this section if something does not make sense.

This object describes how I have organized the various

elements of this thesis such as objects in object oriented programming. In writing this section, I have relied heavily on Deleuze and Guattari to describe how my research does not follow any linear progression from an origin to a conclusion. I view my thesis as being comprised of the dynamic connections between heterogeneous elements and hence can be read rhizomatically. In order to frame the analogy between my thesis and object oriented programming, I introduce a concept of "desire oriented programming" to describe the relationship between a programmer and digital materials such as software objects.

is a Processing program hand written on a piece of found ledger paper. I am using it as punctuation between two other objects. I also feel it highlights the nature of code that can be easily copied, pasted and compiled versus code written on a piece of paper that becomes an aesthetic object. I am also interested in the literacy of code. For code literate readers, hand written code can become more like a modernist poem, evoking imaginative images and movement. But for

the code illiterate, it can even become more like concrete poetry, where the visual aesthetics of the symbols on the page dominate.

"Exceptions" on page 165

This is an image of a typed letter to an unknown person who is not you. I am not calling it a figure because I consider it text, as is this text. It references a line from Dickens about reading in different voices. In this object, I am attempting to address how I use many voices in this thesis. The letter contains a poem that includes modernist verse, computer code and prose. This poem contains some implicit knowledge that I do not wish to ruin by making explicit. It does contain some explicit knowledge as well. The poem is about the notion of the "exception." I am interested in systems that are designed to handle exceptions rather than failing or excluding the exception. I view my thesis as a system that can handle exception. Subsequently, heterogeneous elements that may not appear to go together in any sort of logical or rationality can be assembled together in one thesis. To me, new knowledge is, by definition, an exception and therefore, if a thesis is able

to contain new knowledge, it must be designed to handle exceptions.

"Exceptions" on page 163

This next object is an image of the same letter/poem from the previous object, but I have changed the words into a visualization of my voice reading the words. I am not calling it a figure because I consider it text, as is this text. I think the knowledge of the letter/poem is divided between the words on the page and the knowledge held in my breath speaking the words. As I cannot submit my breath as part of this thesis, I am including a visualization of the air pressure changes that occur when I speak the words of the letter/poem. Perhaps there is knowledge in this form as well?

"Figure 17: (next page) Some Artistic Mediums, Digital Image of Melring Ice with Text, 208" on page 171 is a

mind map of some artistic mediums. I tried to include mediums that I feel most people would identify as the canonized art mediums such as sculpture, printmaking, painting, and drawing, but I have included methods as a

medium which is the point I that attempt to address in the preceding object. I also included the method I used for making the mind map.

"Figure 18: (opposite) Mythical Mind Mapping (M3), String and Map Pins, 2018" on page 175 is an image of a mind map of myths constructed from string and map pins. The words in the mapping are combinations of current digital marketing terms and notions of myths as described by Barthes. For example, the term "Eat your own dog food" is a digital industry term for a business using its own technology. (Yager, 2003, p. 1) I am using this image as a visual introduction to the next section where I discuss my view of myths.

"MoreModelsAndResonance" on page 181, "Myths" on page 175, "MoreNomadicThinking" on page 179. These objects are expository writings where I am attempting to explain my perspective on my process of writing this thesis. They rely on specific theoretical lenses constructed by Barthes, Deleuze and Guattari. I explain how I treat methods as an artistic medium. I explain how I use terms

that I know are myths throughout this thesis and how I plan on addressing those myths. I explain my view on nomadic thinking and how I use it instead of a more traditional method of research that attempts to code the world. I also explain my use of models in this thesis.

"Figure 19: (opposite) Mind Map of Coffee While Writing Thesis, Coffee on Paper, 2018" on page 179 is a mind map comprised of coffee circles from coffee I have consumed while writing this thesis. The circles are all empty, as if it is an unfilled in mind map. I show this because for most of my work the connections between objects that are what is important, rather than the objects themselves. This is a mind map of connections, with nothing to connect. This mind map is a virtual field of potentials.

"Pataphysics" on page 203 is a piece of expositional writing that delineates my understanding of 'pataphysics and its application to artwork. My research has found a strong resonance with 'pataphysics, but 'pataphysics' elusive nature requires a specific explanation to understand my

perspective.

"Figure 13: (next page) Telephone Pole Map of Stroll in Suburbs, Map pins and string, 2018" on page 139 is a map I made on a telephone pole while on stroll. I find strolling aimlessly to be a method of creativity. I don't mean going for a walk to "clear my mind" or any other notion of walking that attempts to subsume the notion of strolling into contemporary culture's need to attribute every action as a means of increasing productivity.[92] An article in the *New York Times* is titled, 'Relax! You'll Be More Productive.' (Schwartz 2013, 1) I don't relax to be more productive and I generally don't appreciate people yelling "Relax!" at me. I don't go for a walk to consume miles, I go for a stroll and frequently have to call someone to come pick me up and bring me home because the stroll does not bring me home. Strolling is a lived contact zone with geography, distance, time, home, mental maps, getting lost, running from dogs, not planning for rain, getting rained on, getting thirsty, realizing I have not prepared anything for

92   I feel pressure to constantly improve productivity through all of my actions. I should apparently get more sleep so I can work more, get exercise so I can work more, eat better so I can work more, take vacations so I come back relaxed and can then work more.

this stroll, removing pebbles from shoes, and many other tacit knowledges that can not be transferred explicitly in a written form as the text you are currently reading is in. Guy Debord wrote, "Everything that was directly lived has receded into a representation." (Debord 2014, 10) An image of string map is a representation of a stroll and it is a failure at transferring the knowledge of the stroll. Self-described walking artist Hamish Fulton has said, "A walk has a life of its own and does not need to be materialized into a work of art. An artwork cannot re-present the experience of a walk…I attempt to 'leave no trace." (Fulton in Schneider 2012, 1) The image of the string map is a trace of an experience. Unlike Fulton, I don't believe that my stroll is an artwork, because that is just another way of forcing my strolls to be a form of productivity. In this case, a stroll would be in service of the production of artwork. Perhaps it is valid to do things that are not productive. Perhaps everything in "Figure 13: (next page) Telephone Pole Map of Stroll in Suburbs, Map pins and string, 2018" on page 139 is a failure. It is a failure at transferring the knowledge of the stroll and the stroll itself fails at being productive. Going for a stroll is a method of creative failure

that resists the notion that everything in a Ph.D. should be productive. I go for a stroll almost everyday and "Figure 13: (next page) Telephone Pole Map of Stroll in Suburbs, Map pins and string, 2018" on page 139 is a failed representation of a failure to be constantly productive.

"ResonanceInSleep" on page 521

Following on from the previous three objects, this object is expository writing about my research process. Sleep is an everyday activity that is intersecting with digital practice more frequently every day. However, this particular object is extremely hesitant as I attempt to verbalize how I question if research is the sole domain of conscious thought. Perhaps research can be conducted in non-explicit locations such as sleep, the unconscious, the space in-between explicit conscious thoughts, insensible psychic vibrations, inside the structure of DNA, outside of time, inside of holes, or any of the other virtual potential spaces that exclude explicit conscious thought. Or maybe research does not occur in a location at all. This object attempts to display my attempt to determine if I can explicitly test how research can be conducted in my sleep.

"Figure 34: (opposite) Questions to Ask My Thesis, Marker and Fake Wood Paper, 2018" on page 263 is part of a list of questions to ask my thesis written on a piece of fake wood.[93] My thesis is not a list of answers, it is a space to ask questions. Sometimes my questions sound as if they are statements and this figure is shown to emphasize my process of posing questions to my thesis.

"OrganicEditor" on page 521

My everyday activity of writing has been intersecting more frequently with a digital editor. This can be seen in my everyday use of spell checker and now grammar checker that seems to be expanding. This object researches the intersection of everyday writing and digital practices, but asks if all of my research actually overlaps everyday life and digital practice.

Also, it is impossible to include all my research in its original form in this thesis because some of the research exists in forms that are not digital. I have attempted to

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93   *Questions to Ask My Thesis* was inspired by "Questions to Ask a City" by Matthew Fuller in *Cybermoholla Hub* (2012) Retrieved July 09, 2018, from http://fuller.spc.org/fuller/matthew-fuller-questions-to-ask-a-city/.

represent the elements of my research——that exist as physical objects——as best I can in this thesis, using images. This, however, does not represent how I feel the elements of my research relate. To me, the physical artwork lectures, demonstrations and the written thesis exist as one integrated research object. This section frames my research within an integrated context by presenting one example of how my physical artwork and the text of this thesis constitute a single research object.

These objects are all expository writings explaining various frames I use in my research. These include the occult, quantum mechanics, and Deleuze.

is a mapping of some of the chemistry in my brain while working on this thesis. The map includes dopamine for love, serotonin for happy, epinephrine for energy, cortisol for stress, norepinephrine for infatuation, testosterone and oestrogen

for lust, and adrenocorticotropic hormones for tears. For me, this is an example of where research and my body intersect.

I have included this object in my thesis to demonstrate how I can use the previous frames I have constructed to analyse a specific artwork. I have attempted to frame Lawrence Weiner's 1968 artwork "Declaration of Intent" as an artwork that is concerned with exploring the possibilities of being in the world.

depicts a mind map drawn by a tree that watches me write. The tree and I made this collaborative artwork while writing about Man Ray's *Object to Be Destroyed* (1923), about which he said, "A painter needs an audience, so I also clipped a photo of an eye to the metronome's swinging arm to create the illusion of being watched as I painted." (Schwarz 1977, 206) I'm not a painter, but I appreciated the idea of the influence of a non-human observer in the creative process. The photos

and the tree's mind map are explicit knowledges about the non-explicit knowledges that we share. They are documents about non-representational knowledges. I am not sure if there is any knowledge in representations of non-representational knowledge. The tree was mildly harmed when I forced it to make a mind map for me as a few of its needle fell off.

"ThePossibleAsAestheticCategory" on page 273 is written in a different voice than the other objects. Reading used to be a fundamentally linear process, but hypertext has altered how text is read. The digital practice of hypertext has altered the everyday activity of reading. This is a non-expository piece of writing where I am attempting to use the notion of "the possible as aesthetic category" by exploring the boundary of what is possible with digital writing.

"EmbodyingFlusser'sVoice" on page 287
Digital practice has altered how people view embodiment. Already digital prosthetics are considered part of the body. People actively discuss how they feel their phones are

"part of them." How far can the notion of embodiment be pushed? Can coding be considered a form of embodiment? These objects are expository descriptions of a research artwork and the frame of how I view it.

"Figure 32: (opposite) Words Connected by The Blue Boy, Paint and Sharpie in Overdue Library Book, 2018" on page 259 is an image of some words that appear in my thesis painted over an image in an overdue library book. Rauschenberg reportedly said that Gainsborough's 'The Blue Boy' inspired him to become an artist when he realized that "someone actually MADE those paintings." (Kotz, 2004, p. 60) I am more interested in artwork that was not made by someone.

"Figure 38: (opposite) Knowledge of My Hand Drawing A Circle, Tissue Paper and Paint, 2018" on page 299 is an image of a circle I drew on some tissue paper. I am using it as punctuation and an introduction to the following expository objects that concern themselves with tacit and non-representational knowledges such as the knowledge that my arms hold for drawing a circle.

"NonrepresentationalTheory-AndBody" on page 299, and "MoreOnAffect" on page 303

These objects are expositional writings where I describe how I understand non-representational theory and affect.

"HappyHappy" on page 522, "Post-its" on page 319, "TeaLeaves" on page 522, "TwitterFlocking" on page 522

These objects describe research artworks that investigate the intersection of everyday life and digital technologies. *Happy Happy* researches the everyday affective network between humans and digital technology. *Post-its* researches affect in the everyday. *Tea Leaves* examines the impact of digital affective networks on real world everyday items such as the stock market. Twitter Flocking researches the movements of affect across social networks.

In "Oulipo Tweets" on page 35, I have researched the intersection of code and everyday use of Twitter.

"DNAandFarts" on page 367

This section is not an expositional writing. It is an attempt to look into the future of the intersection of digital practice in the form of DNA and everyday life. It is experimental writing that is intended to be humorous, but also very serious.

"VirusAssistedDrawing" on page 522, "MigraineAssistedDrawing" on page 405, "AllergyAssistedArtwork" on page 417

These objects all describe research artworks that investigate the intersection of everyday life and digital technologies. *Phrenology And Bit Coins Predict Your Future* researches how digital practice such as airport facial recognition scanner can predict your future. For example, facial recognition software can predict if you are about to be arrested for having the "wrong" appearance. *Virus Assisted Drawing* potentially researches the intersection of computer viruses and everyday life. *Migraine and Allergy Assisted Drawing* researches how biofeedback technologies intersect with everyday life.

"Figure 92: Every Word of This Thesis With Some Connections Between the Words "Deleuze, affect,

Quantum, 'pataphysics, occult" (detail) Digital Drawing, 2018" on page 428 is a map of all of the words in this thesis with some of the words Deleuze, affect, Quantum, 'pataphysics, and occult highlighted and connected. This image is an introduction to the next section on ley lines and it represents to me the infinite number of ways of connecting elements of a thesis. The elements and connections that I have chosen to highlight are just one of the potential ways my research can be connected and manifested. In this way, my thesis is actually an infinite, virtual field of potentials and this current form is just one provisional form.

"LineamentsAndLeyLines" on page 429

I am interested in concluding my thesis by tracing some lineaments and ley lines that connect various parts of my thesis. This section traces some of those ley lines.

"References" on page 489

This section is my list of references. I have used Chicago Style Citations (Author-Date Style).

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Appendix 2: Venn Diagrams

Throughout the process of this thesis research, I often found myself drawn to explore any number of potentially interesting subjects. For example, my research overlapped with care labor, micro biology, gift exchange value systems, magic, video games, and many more topics that are each worthy of their own PhD research. I found one of the hardest part of the thesis writing process for me was making sure that my research continually remained within my stated scope. To stay on task, I continually asked myself, "How does this research relate to the intersection of digital practice and everyday life?" I am presenting these Venn diagrams to demonstrate my thought processes about how I would answer that question for myself in a reductive, arborescent, explicit manner. I do not believe the sections of my research are as reductive or straightforward as these diagrams reflect. I am not attempting to 'explain' my sections or suggest a particular way to approach them. However, I did use these diagrams to make sure I remained on task, so I am presenting them as I used them.

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Some Venn diagrams of how I view some
of my research as the intersection of everday life and digital practice.

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Everyday Life — Digital Practice

Reading a table of contents

Table of contents affected by Twitter

Reading on Twitter

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Everyday Life — Digital Practice

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Using a digital editor

ResonanceInSleep

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Sleeping

Drawing from data from sleep

Data from sleep

"ThePossibleAsAestheticCategory"

Everyday Life — Digital Practice

Reading a "permenant" text

Reading a "permenant" text with failed hyperlinks

Hypertext reading

FlusserAndEmbodiment

Everyday Life

Digital Practice

Embodiment

Using code to embody

Writing code

Post-its

Everyday Life

Digital Practice

Affective networks

Sending physical notes as an affective network

Sending digital notes like texting, Facebook and Twitter to make an affective

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Neural networks

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Using phrenology to make pedictions

Facial Recogntion

DNAandFarts

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Using DNA as digital practice

DNA

Twitter

Everyday Life
Digital Practice

Speaking in codes

Writing in code on Twitter

Twitter

VirusAssistedDrawing

Everyday Life   Digital Practice

Computer viruses

Re-coding a virus to draw

Coding

AllergyAssistedDrawing

Everyday Life   Digital Practice

Allergies

Using biofeedback data to draw

Biofeedback data from allergies

MigraineAssistedDrawing

Everyday Life   Digital Practice

Migraines

Using brainwave data to draw

Brainwave data from migraines
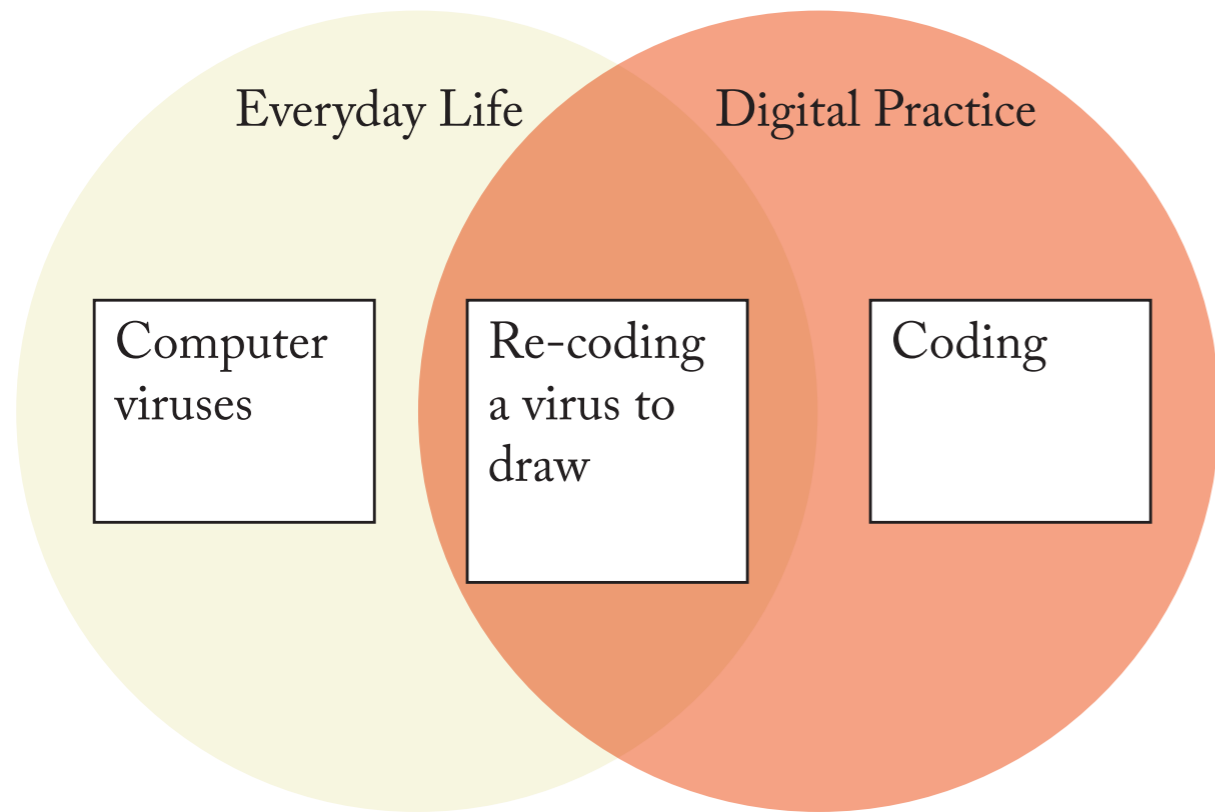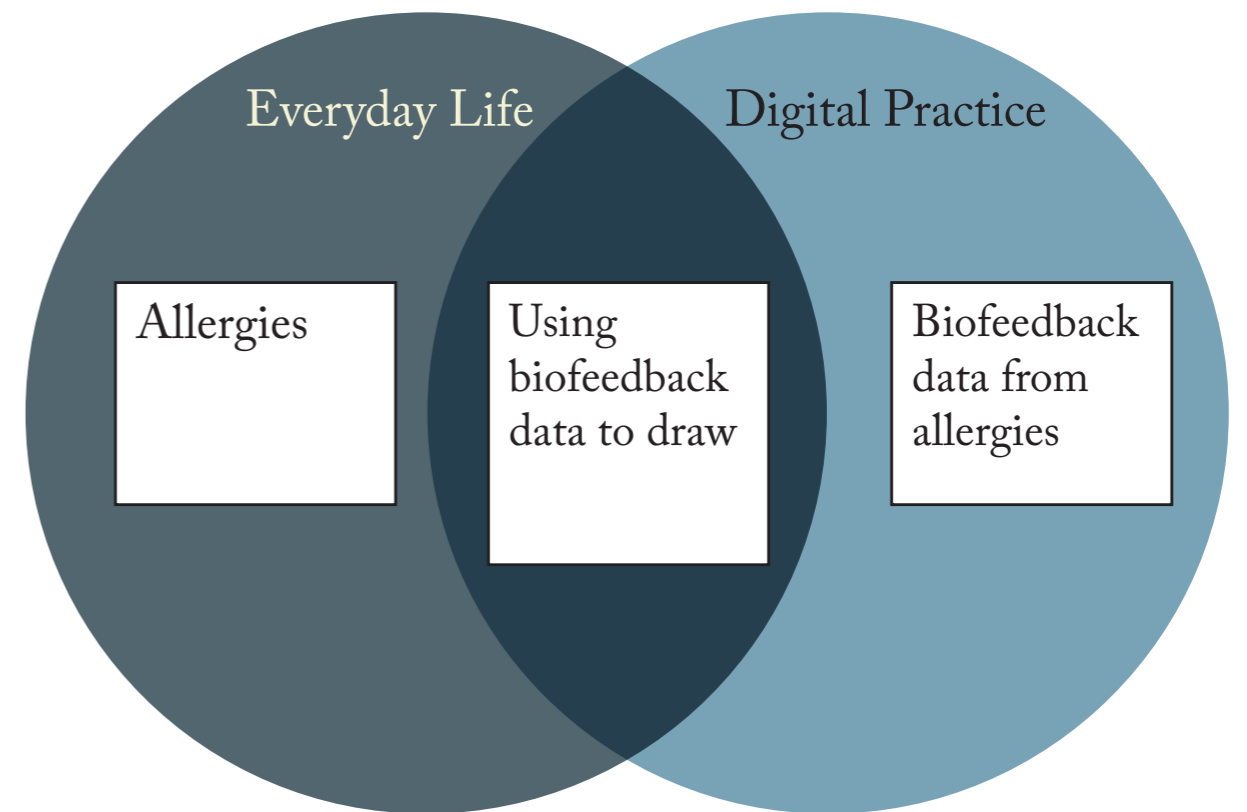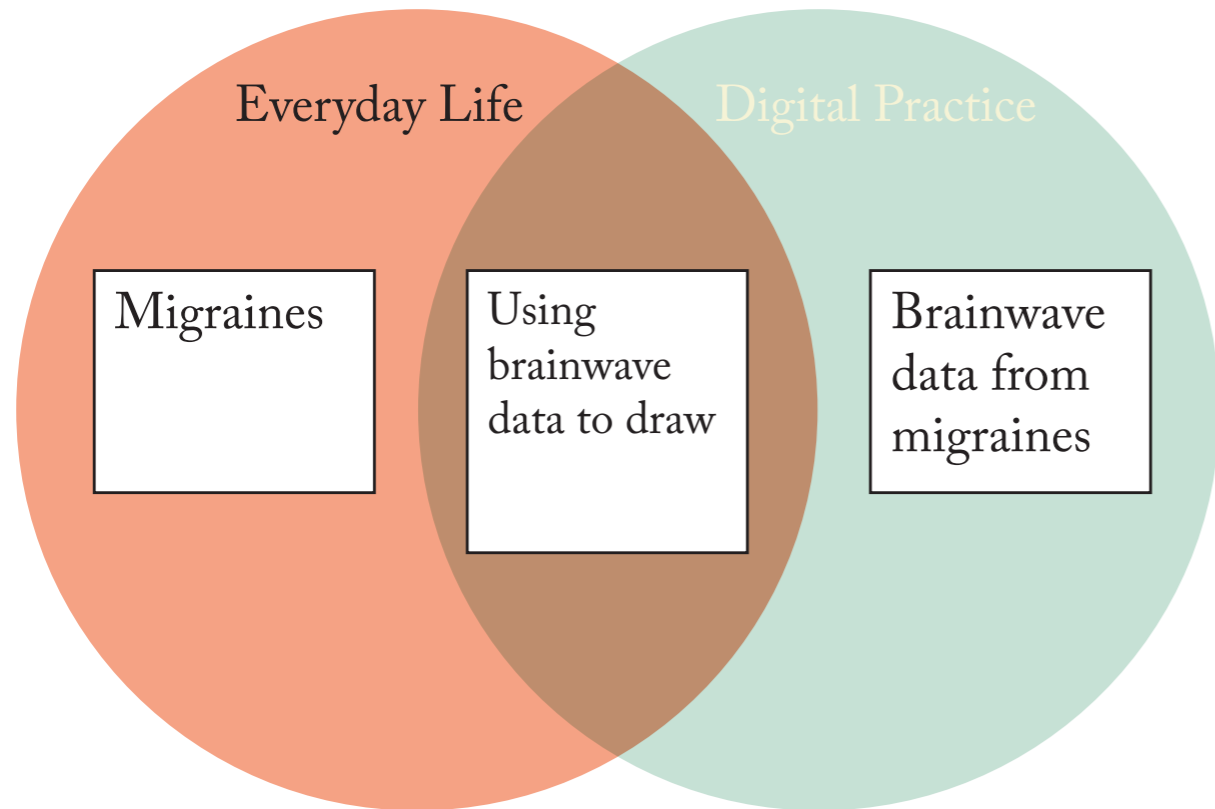
Appendix 3: Some Art References

My research has found resonance with many thinkers from many different time periods. I do not want to privileged one mode of thinking or one time period over another. The landscape of contemporary art is, by definition, comprised of knowledges that can be represented in a form that has been validated as art. However, there are many artworks, artists and exhibitions that have greatly resonated with research and I feel they should be correctly referenced for role they play.

I also feel there is some utility in sketching some of the topology of thinkers whose work resonants with mine in order to examine the context in which my research is producing new knowledge. This is not meant to be a an exhaustive list of every artist or thinker currently working in digital practice, but rather, it is a partial tracing of a boundary of contemporary knowledge.
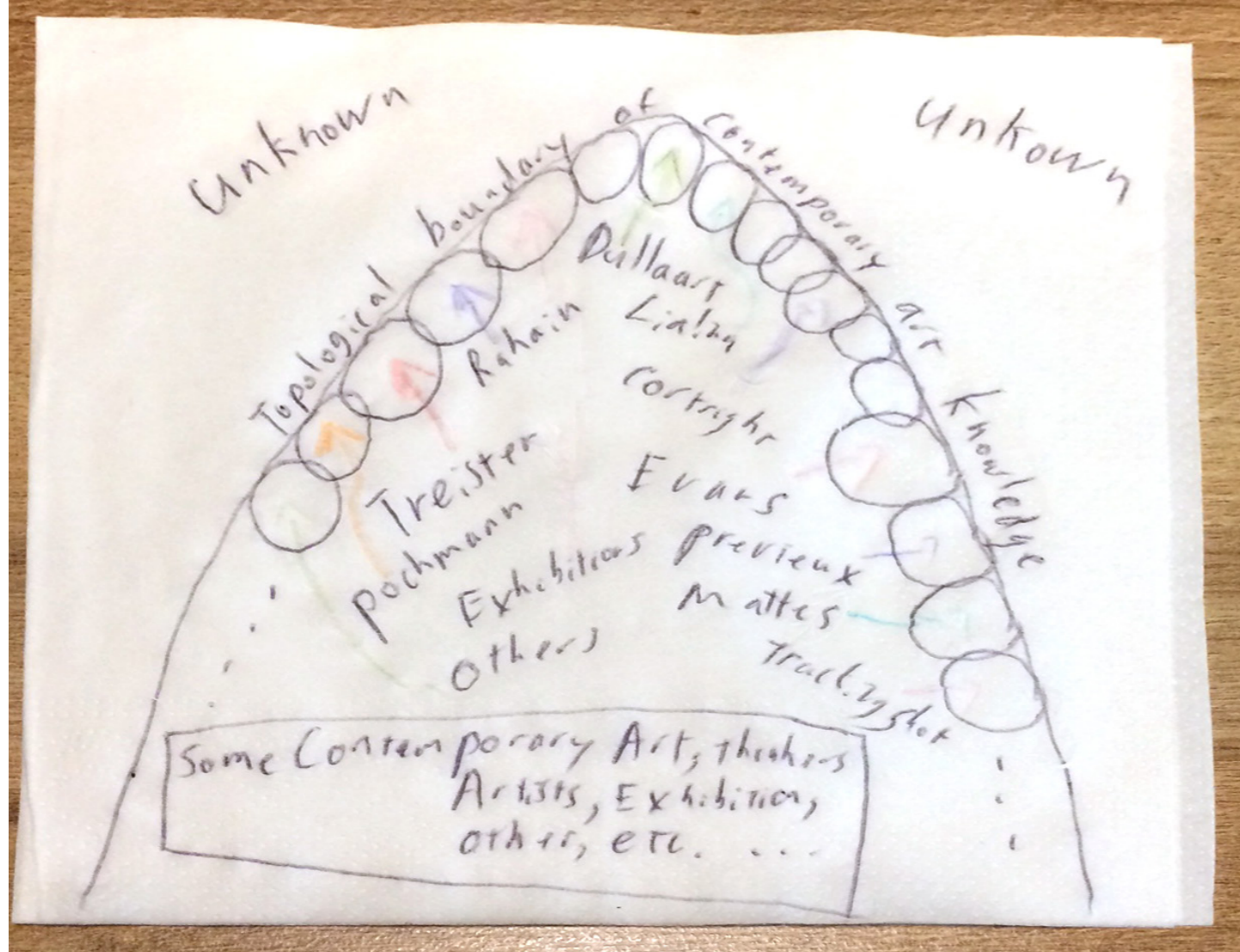
Figure 97:   *Diagram of Some Contemporary Art Resonances,* Pen and coloured pencil on napkin, 2018

Some Researchers:

1. Hans Jeorg-Pochmann's MPhil research at the Royal College of Art concerned itself with the "body of digital media." (Jeorg-Pochmann 2016, 1) Jeorg-Pochmann's thesis was written with multiple materializations that included printed materials and digital materials. His research has resonated with mine as I have also examined the boundaries of digital materials.

2. Meg Rahaim's PhD research at the Royal College of Art dealt with, "the ways in which digital, networked technologies shape the contemporary everyday." (Rahaim 2014, 1) Rahaim's research was primarily concerned with concepts of visibility and how networked technologies render everyday life visible. Rahaim's research developed a frame of resistance to "to the dehumanising functionalism of technological progress." (Rahaim 2014, 1) While the topics of her research and my research (ostensibly digital practice and everyday life) are similar, our approaches and perspectives are drastically different. I do not believe that "digital, networked technologies shape the contemporary everyday." (Rahaim 2014, 1) This frame creates the very power structure that Rahaim then resists. I believe that everyday life and digital practices have an intersection, but one does not shape the other.

Some Artists:

1. Suzanne Treister

For the exhibit *HFT: The Gardener*, which was presented at the LJMU Exhibition Research Lab on 16th October 2016 as part of the Liverpool Biennial 2016, Suzanne

Treister created a persona, Hillel Fischer Traumberg who is a stock trader who begins to confuse realities due to his entanglement with high-frequency trading algorithms. I frame her work as dealing with the impact of revealing the nature of a digital practice assemblage that includes the heterogeneous elements of algorithms, the human mind, etc. The stock trader determines that there are links between psychotropic plants and the FTSE Global 500 companies. He does this by translating the names of the plants into Gematria charts.

Treister's work deals with assemblages where, "one thing affects another without practical outcome." (Treister 2016, 1) I view Treister's work as resonating with similar concepts to my *Tea Leaves* and *Phrenology And Bit Coins Predict Your Future*.

2. Constant Dullaart

Constant Dullaart's work deals with many issues of digital practice. I have been particularly drawn to his work that deals with meta-data and what is not seen in digital practice. For his artwork *Jennifer_in_Paradise* (2013), he distributed a version of the first photoshopped file with a steganographically encrypted payload. The hidden image in the file is only available to people with the password. (Future Gallery 2013, 1) His 2012 piece *http://untitledinternet.com/* leads to a search engine with an overlay that masks certain information. In this way, I view his work as dealing with how meaning changes when meta-data is revealed. I have used his work as a reference for digital media analysis.

3. Olia Lialina

Olia Lialina's artwork *Summer* (2013) is a gif that constantly re-directs the user's browser from one URL to the next, which causes the gif to not play smoothly. (Lialina 2013, 1) The work is relevant to my research because the artwork resides in the network and is contingent on internet speeds. The fast the internet can re-direct for the viewer, the faster and more smoothly the gif moves. Also, the piece cannot exist off-line. I am interested in this art work because I feel it highlights how digital artwork does not occur on the screen, it occurs in the network between things. I have found this artwork resonates with my

thinking about where digital artwork exists.

4. Petra Cortright

Cortright's 2011 artwork *Video Catalog* determines the monetary value of her videos is by an algorithm based on YouTube views. (Glover 2011, 1) Here work directly address the contingency of meaning in her YouTube videos based on the meta-data of views and then monetizes them. Her work relates to my research as it deals with contingency based on meta-data in digital practice.

5. Cecile B. Evans

Evans describes her working technique as "assemblage." Her artwork, *How happy a Thing can be* (2014) focuses on how contemporary society values emotion. (McLean 2015, 1) The work asks how emotions are liminal and if we can create a link between physical and digital realms. In my research, I explore similar ideas in "Happy Happy."

6. Julien Previeux

> "In 2014, I was doing a residency in Los Angeles and I used a telephoto lens to photograph Google's offices in the Venice area. The whiteboard in the corridor on the second floor of Frank Gehry's Binoculars Building caught my attention. On it were notes left by Google

staff: their latest ideas, fragments of algorithms, diagrams, humorous sketches. I produced a series of Indian ink drawings from details in the photograph. It was a question of role-reversal using low-tech hacking techniques. If the giants of the web capture our data, it is up to us to retake control of it; indeed, to track the trackers. I was also interested in the early stages of thoughts of Google employees when the first uncertain glimmers of an idea sometimes take strange forms." (Previeux in Brown 2016, 1)

I am interested in the relationship between digital and physical materials that Previeux' work provokes. I like the idea of photographic white boards or diagrams that have algorithms or code written on them with a digital camera.

7. Eva and Franco Mattes

The Mattes' create co-present "real" and "virtual" spaces that emphasize the multiplicity of personalities that construct our identity. (Mattes 2018, 1) "Dark Content" (2015-ongoing) is a video of interviewing the moderators of social media forums. These moderators are a hidden labor force that work for companies that want to appear free and transparent. Their artwork exposes elements of hidden labor that occurs with digital practice. I am interested in work that displays how the surface of digital practice can be penetrated in different ways.

8. TRACKINGSHOT

Trackingshot artists are Rebecca Birch, Leah Capaldi, George Charman and Adam Knight. Trackingshot is an app that turns on when they are broadcasting. (Charman 2017, 1) The artwork speaks directly to the notion of making work that is contingent. The artwork exists in the space of connection between a place and the viewer's device. I downloaded the app and was connected to the internet a significant amount of time, but nothing happened. I don't know if this was intentional, but it speaks to provisionality.

Some Exhibitions

1. Online/Offline Encoding Everyday Life

22nd - 28th of January 2014

Altes Finanzamt, as part of Vorspeil Transmediale.

Curated by Lorenzo Sandoval

In the proposal for this project, Sandoval writes that life's spaces,

> "can be observed in the areas of use, which exceed the

personal and the work space: email, social networks, desktop in the cloud, pornography, dating sites, maps, video servers and a large etcetera that amplifies, dominates and codifies the spheres of communication, emotion and action … This set of techniques composes a digital skin over the space and the body, constituting a virtual and physical infrastructure of control, but also of affect, an emotional bureaucracy built of technological prostheses … This project proposes an analysis of how those technologies are introduced in the everyday life, change the configuration of relationships and encode our perception of the world." (Sandoval, 2014, p. 1)

This exhibition framed the notion that digital practices can create a continued extension of internet in a way that colonizes life's space. In this way, the exhibition frames affect within the technical apparatus of digital practice. I do not feel this frame functions for my research as it does not provide any escape from being subsumed within the technical apparatus. Also the statement of the exhibition is declarative of multiple dialectics, like those between home and work, between digital and physical, etc. My research uses an assemblage instead of a series of dialectics.

2. Online Mythologies, curated by Ekaterina Sinitsina and Nadezhda Suslikova, Polytechnic Museum, Moscow (2012);

This exhibition presented viewers with an opportunity to immerse themselves in a space where the boundaries were erased, "real" and "virtual" plunge into the world of interfaces, new characters and features that form our understanding of reality. (Meixner 2013, 1) The exhibition explored the notion that myths for users on-line were created to be short and constantly changing. My research is also based in the notion of creating new myths that are designed to be contingent.

3. Casting a Wide Net

November 30, 2013 - January 18, 2014

Postmasters, NYC

This exhibition frames net based digital practice in the same manner as all historical mediums.

In their statement, Postmasters says,

> "Postmasters has a rich history of showing works in all media from watercolors to software art. We are medium-neutral but have always tried to champion artists who seek new forms of creative expression and works that are reflective of their time. It can be argued that today all artists engage technology in one way or another. It is time to integrate and leave behind the labels of media artist, new media artist, digital artist, internet artist, post-internet artist, and such. Just ARTIST will do.

We will leave the historic media-based retrospectives to institutions." (Postmasters 2014, 1)

I have used this to frame my work as no longer media specific, but simply art practice.

4. You Might Be a Dog

17 May - 07 June 2014

LEAP, Berlin

Curated by Teresa Dillon

This exhibition includes 16 artists working with the construction of on-line identities including selfies. Curator Teresa Dillon has said,

> "In this way, I don't see the selfie as a form of vanity but as a contemporary artifact of our techno-worlds, which enables us to immediately capture our image and broadcast it online. This action itself is less to do with vanity and much more a snapshot of our current state of play." (Dillon 2014, 1)

I view this exhibition as framing a sense of play within a technical apparatus as Flusser stated.

5. Then They Form Us

August 8, 2015 - October 25, 2015

MCA, Santa Barbara

Curated by Brooke Kellaway

This exhibition deals with how, "emotions are stored and processed in often unseen or recondite behind-the-screen operations." (Museum of Contemporary Art Santa Barbara (MCASB) 2015, 1) I frame this exhibition within my art practice that deals with the way affect is processed by the behind-the-screen operations of digital practice.

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Barad, Karen. Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning. Duke Univ. Press, 2007.

This book provides an onto-epistemological frame for Bohr's philosophical views. Barad's perspective on the relationship between the philosophy of science and other fields is clear and powerful. I have used this frame in much of my research.

Bohr, Niels. Collected Works / Mainly 1924-1926 / Ed. by Klaus Stolzenburg. Translated by Klaus Stolzenburg. North-Holland, 1984.

This book outlines much of Bohr's philosophy including his perspective on the apparent contradictions in Quantum Mechanics and notions of potentials within superimposed wave states. The notions expressed by Bohr are the base philosophy of how I believe the interactions between the elements of my research can be modelled as superimposed wave states.

Certeau, Michel De. The Practice of Everyday Life. Univ. of California Press, 2013.

This book presents de Certeau's model of walking in the city as an analogy to outline how individuals use tactics in everyday life to subvert the rituals and representations that institutions use as strategies to control culture. I have found his frame of everyday life as a cite that should be analysed.

Deleuze, Gilles, and Felix Guattari. A Thousand Plateaus. Translated by Brian Massumi. University of Minnesota Press, 2007.

This book contains many influential frames including a Body without Organs, assemblages, deterritorialization/reterritorialization, rhizomes, and nomadic thinking, among others. I have used this book as a model for my thesis structure.

Flusser, Vilam. Into the Universe of Technical Images. University of Minnesota Press, 2011.

In this book, Flusser covers many topics, including the difference between

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traditional images and technical images. Flusser defines traditional images as first-degree abstractions that are abstracted from the world. Flusser describes technical images as third-degree abstractions that are abstracted from texts that are abstracted from the world. This book presents many frames regarding the history and development of communication technology. I found the descriptions of technical images and universes to be extremely useful in framing the technical parts of my research.

Highmore, Ben. Ordinary Lives: Studies in the Everyday. Routledge, 2011.

This book constructs frames and methods for working in the field of everyday life studies. Ben Highmore's definition of everyday life as activities that "tend towards the unnoticed." I have used Highmore's definitions of everyday life through-out my thesis.

Hugill, Andrew. 'Pataphysics: A Useless Guide. MIT Press, 2015.

Andrew Hugill states in 'Pataphysics: A Useless Guide (2015) that 'pataphysics "lies around the roots of many key artistic and cultural developments of the twentieth century, including absurdism, Dada, futurism, surrealism, situationism, and others." (Hugill, 2015, preamble) Hugill describes the history of 'pataphysics and the methods employed by 'pataphysics. I have used Hugill's book as a guide for my own understanding of 'pataphysics.

Perec, Georges. An Attempt at Exhausting a Place in Paris. Translated by Marc Lowenthal. Wakefield Press, 2010.

This book is an example of Oulipo member Perec's 'pataphysical methods. This book is an attempt to represent the everyday as "what happens when nothing happens." I have used this book as a reference for all of my examinations of the everyday.

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