

Exploring Noise as Information

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ABSTRACT

My art practice is based on the study of machines. Instead of focusing on how machines usually work, I discover and explore the noise of machines – both visually and aurally. In my work, I use a photocopier to scan and print the same image repeatedly, which results in the original image becoming distorted and abstracted with noise. This work was initially influenced by the distorted homework paper handouts I regularly received at the school in China as a child – many of which were nearly illegible. In my practice, I explore the idea of noise as information. To help provide background to this work, I discuss three main aspects: glitch art, the actor-network theory, and how it connects to my work. Through my studio projects I have explored how noise, which is often viewed as an unwanted by product, can be used as the main content of a piece of work. Each form of communication technology has its own types of noise, which has its own aesthetic and style – and my hope is that my projects highlight the beauty and texture of noise that is usually only considered in a negative way.

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Background: A Child in School in China

I was first introduced to computers at the age of six. Like my classmates, I didn't think much about the future role of computer technology in my life, much less consider that my generation would be addicted to it. As a student with a traditional Chinese education, I was assigned homework that seemed endless. The exercise books we were given included examples such as old college entrance exams. Over the years, different teachers shared their same handouts and made us do the assignments. After being passed around year after year, the copies of the handouts were usually deformed or distorted in some way. Photocopies of the text were almost illegible, and I was mesmerized by the markings on the page. This memory has informed my interest in photocopies, repetition, and the deformation and distortion of texts through constant duplication. I became intrigued with the idea of taking this duplication to its logical extremes and wondered what a page of words would look like after many, many copies. Would the text become an image? Was there an end to copies and distortion?

It wasn't until college that I realized my interest in the failures or glitches of technology. In one digital media assignment, I was asked to make artwork and found myself focused on how the repetition of a page distorts words and turns them into images. I found these things beautiful because they possessed their own poetic aesthetic.

Part I: Studio Works

The works with photocopy machines that I created during my study at Emily Carr University of Art and Design all employed the same approach: changing and extending the normal function of the photocopy machine. Although everything has a default setting for use, I believe many possibilities can be discovered through this method. Grounded in this philosophy, my approach continues to focus on exploring the potential of the photocopy machine as an artistic medium. Additionally, the text no longer functions as a language. It has become an abstract image that can no longer be read—it has become neither a picture nor a word that people would recognize.

Studio Project 1: Broken Elements

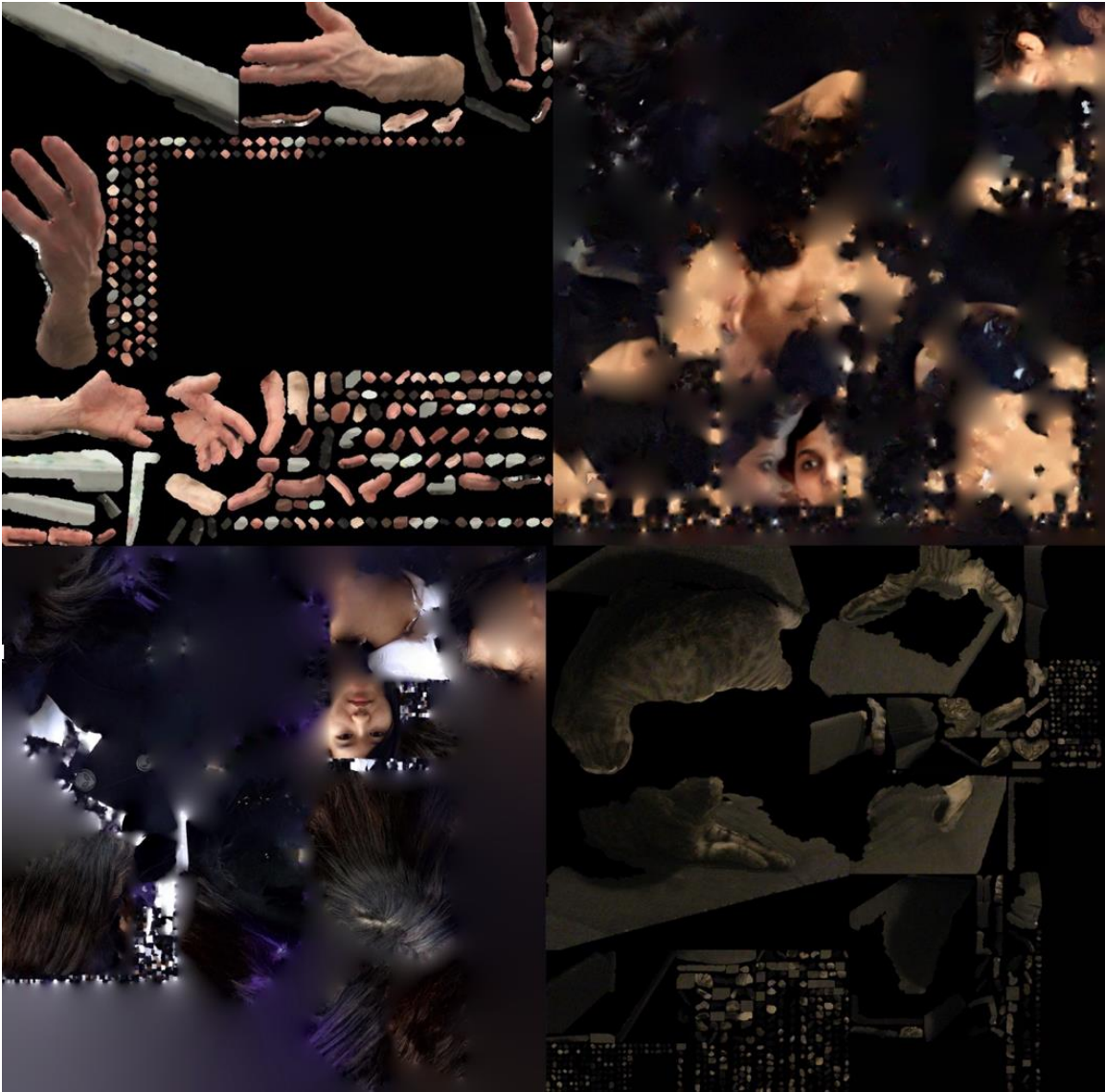


Figure 1. *Broken Elements*, 3D scan from handheld 3D scanner, Ruiyang Ding, 2016.

This project consists of a square image with a black background with pieces of photographic elements organized in strange, grid-like patterns. The image is split into four quadrants, and each section has imagery that is based on its own separate three-dimensional (3D) scan, which I did in January 2017 using an Occipital Structure Sensor on an iPad mini 4. Each

section constitutes a “texture map” of the scan, which can be defined as the method for wrapping a two-dimensional (2D) image around a 3D object (Catmull, 1974). In other words, the 3D scanner captures both 3D shape information and 2D image information: the images I used are the 2D image texture that is wrapped around the 3D shape. The texture map images are organized in a machine-readable format, with facets of objects divided into sections and organized by size.

The top left section of the image was made by scanning the hand of Ben Reeves, a faculty member at Emily Carr University. The image shows a hand from many different perspectives and directions and includes parts of the table on which Reeves’ hand was resting. This image has many fragments. It almost looks as if there were a colored sculpture of a hand that fell on the ground and shattered, with the broken pieces then taken and organized into rows and columns. There are approximately two hundred small, skin-colored and table-colored irregular ovals. The second section on the top right is based on a 3D scan of the head of my female classmate, Adiba Muzaffar. Instead of being split into several hundred pieces like the first quadrant, this image is more “complete” and more blob-like. Some details are clear, like the eyes, nose, and an ear, but the machine has put them together as a blended whole, like a melted face. Unlike the first section with facets that have hard edges, this scan has edges that blend into each other.

The third quadrant is based on a 3D scan of my face, which was done with the help of my graduate supervisor, Dr. Garnet Hertz. In this image, my full face is clearly visible as a single piece, while fragments of my purple and black hair and the collar of my white dress are scattered around the image. The fourth and last section is a 3D scan of my cat. The scan

shows his dark brown, black, and tan fur, along with chunks of the sofa on which he was sitting in my home.

After I created this piece, I started to think about the connections between mistakes and information. For example, in 3D scanning, the machine organizes the texture image in its own slightly surreal organization and format—it does not look like a normal picture. In these images, the message is difficult to recognize. However, this does not mean that the image has no information: even though people may interpret the image as being full of noise, it still makes sense to the machine. In other words, this project gave me a new perspective on noise—perhaps noise is information that we do not yet understand. Therefore, we should not ignore things that seem wrong at first—maybe we just need more time to understand and digest the information underneath. From this project, I learned that although humans and machines may be able to “remember” 3D images, the ways in which they store information are radically different.

Studio Project 2: Cones

This project consisted of taking a single 3D printed shape—a cone—and using a 3D scanner to re-scan and then re-print the shape. The process was then recursively repeated, and the shape gradually became distorted through each successive generation.



Figure 2. *Cones, Ruiyang Ding, PLA 3D printing of 11 objects, 2017.*

The original cone at the front of the picture (Figure 2) was a 3D printed model exactly 15 centimeters tall and 10 centimeters in diameter at its base. I scanned and reprinted the shape 10 times, resulting in a total of 11 objects. From a technical perspective, all the cones were made with polylactic acid (PLA) filament and printed on a re:3D Gigabot 2.0 3D printer, which produced a horizontal texture because of the layer-by-layer printing process of the machine. I scanned the first cone by using an Occipital Structure handheld 3D scanner with an iPad mini 4.

Through this recursive process, the cones gradually became smaller and smaller through each generation, and the top and bottom parts became distorted and less sharp than their

parents. The tops became rounded, and the bottoms became distorted—the cones started to look somewhat like a crushed soda can. In this project, I wanted to discover and play with the differences between 2D and 3D repetition and to explore the influence that recursively scanning a 3D object had on its shape and aesthetics.

Thesis Project

Photocopied Book Background: Shadow of a Machine

In 2015, I started working with photocopier machines by taking a single page and continually re-copying it. As a result, the text on the pages became increasingly blurry and abstract before totally disappearing. For my very first copier-based work, titled *Shadow of a Machine* (Figure 3), I used a blank paper to start and copied it repeatedly. Finally, dust and enlarged mistakes covered the whole paper.



Figure 3. *Shadow of a Machine*, Ruiyang Ding, black and white inkjet print on paper (2015).

Photocopied Bookwork 1: “Emotion: Despair, Happiness, Sadness and Delight”

Emotions: Despair, Happiness, Sadness, and Delight is a project that consists of four custom-produced hardcover books (Figure 4). Each book has a single Mandarin Chinese character on the cover, hand-cut into a white dustjacket wrapped around a plain black synthetic leather hardcover. When opening the books, the first few pages show the same Chinese character as the cover, but as the viewer flips through the book, the images become increasingly distorted. By the end of each book, the original Chinese character has been completely degraded by photocopy noise and is unrecognizable (Figure 5).



Figure 4. *Emotion: Despair, Happiness, Sadness and Delight*, Ruiyang Ding, series of four custom books with digital images (2017).

The content of the project consists of four Chinese characters that represent the four primary emotions in Chinese culture—delight, anger, sadness, and happiness. In Chinese culture, all emotions are seen as an extension of these four fundamental variables. For

example, higher-level emotions, like anxiety, can start with the core emotion of sadness. In addition, the four Mandarin characters for delight, anger, sadness, and happiness as a whole are simply translated as the single word “emotions.” The four characters together are also used as a phrase in Mandarin: saying “happiness, anger, sadness, and delight” can be translated as “that’s the way life goes” or “life has many emotions.” People use this saying after finishing a period of work (like completing a degree or project) and giving a recap of all the different emotions that they experienced during the process.



Figure 5. *Emotions (sadness), black and white print on paper, Ruiyang Ding, (2017).*

In this work, I continued to explore the process of “collaborating” with a tool like a photocopier and to define the influence of the technology, which has its own bias, on the image, which is magnified through a recursive copying process. Additionally, the topic of emotions was chosen to highlight how emotions and memories can shift, fade, or warp over time. In other words, the grainy noise of a photocopier is a bit like human memory: emotions and memories can be distorted over time by continually thinking, rethinking, and re-remembering an event.

Photocopied Bookwork 1: Viewers, Culture and Interpretations

During the fall 2017 semester, at the critique of my work *Emotions*, the most interesting feedback I received from a professor was the importance of understanding the work's viewers. I chose words from my own cultural background that I understood well. However, I ignored the fact that the viewers of my work would not necessarily read and comprehend Chinese characters. As a result, the work was not accessible to part of its audience because the Canadian viewers generally lacked the background language knowledge of Chinese. In a gallery space, it is essential to have an awareness of the audience and whether they—as people who may be from various cultures—can understand the content of the work.

Using Chinese characters in an English-speaking context is not a new phenomenon, however: there are other artists who make English-oriented artworks with Chinese characters. For someone like Xu Bing, the concept is to unite English and Chinese letters. For example, in his work *New English Calligraphy*, Bing reorganized and transformed English letters to make an English word look like a Chinese calligraphy character. The characters on figure 6 mean “friends of peace.” In this example, both Chinese and English speakers can understand a part of the language, but not all of it. In contrast, my piece *Emotions: Despair, Happiness, Sadness and Delight* (2017) works exclusively with Chinese characters as images rather than text. I do offer the viewer some understanding of the words, but this is not the core idea of the work. It is about machine repetition and what is gained when legibility is lost.

The image has been removed because of copyright restrictions.
This image contains a picture of Bing Xu's calligraphy writing.

Figure 6. Bing Xu, New English Calligraphy, ink and paper (2001).

Photocopied Bookwork 2: “Timeline”

The project *Timeline* is a continuation and expansion of the working process implemented in *Emotions* and also consists of a custom-made book with the interior pages comprising recursively photocopied images. This project has one key difference in terms of the process, however: each successive copy has new content added to it, thus producing an additional layer of chronology to the image.

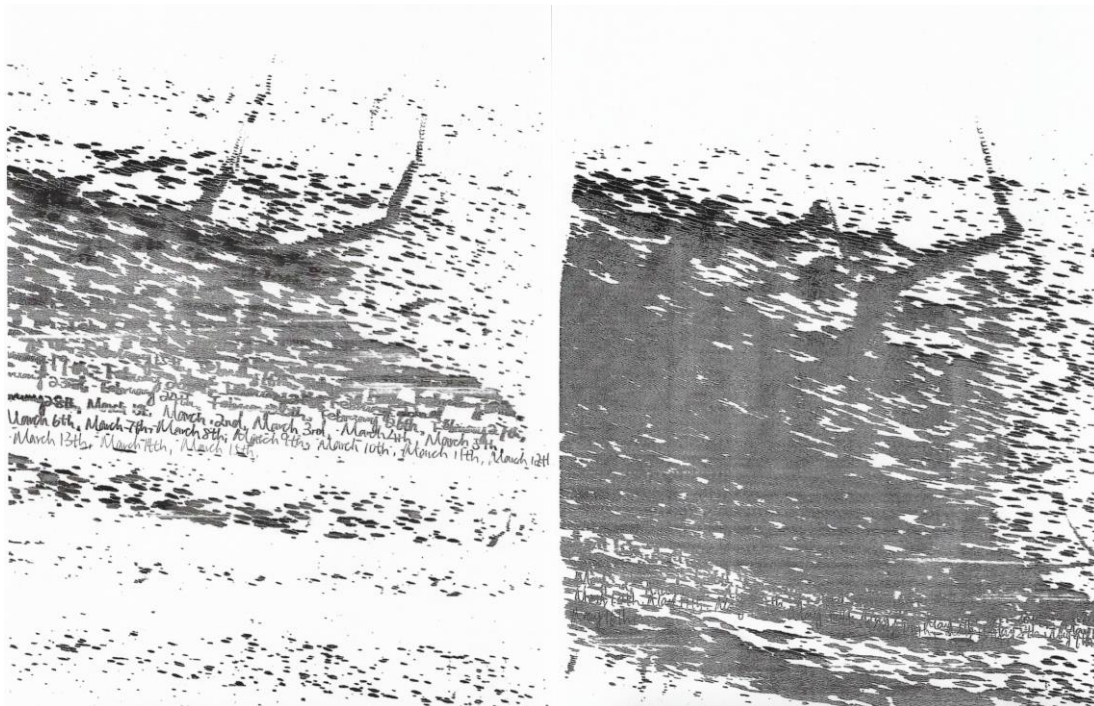


Figure 7-8. Timeline, Ruiyang Ding, black and white inkjet print on paper (2018).

In *Timeline*, a date was written on a piece of paper—the first page consisted of simply a handwritten “January 1st.” The page was then scanned and re-printed, and then “January 2nd” was printed to the right of the first date. This process of printing, writing a new date, and re-scanning was continually repeated. By recursively repeating this process, the page gradually filled with dates—although most of them are severely distorted. The book shows the gradual progress of the distortion step-by-step from January 1st until June 30th, when the page became fully filled with dates. As a result, there are 186 pages in total in the book.

I started the first page with the date of January 1st because it is the first day of a year, and I thought it would be interesting to let the paper and my size of writing decide the stopping point – that the book would be done when the page was full. I chose letter-size paper as my primary material because it is the most common size of paper in daily life.

Using handwritten text on each page allowed me to have more interaction with the photocopier and made my project more like something created by two artists: the machine and myself. For example, the photocopier tended to distort the images in a downward-left orientation: writing the dates by hand allowed me to follow and interact with the distortions introduced by the machine.

Also, there were some decisions I had to manage in working with the photocopier. I allowed myself to make mistakes just as my co-worker (the copier) did. While creating the piece, the dust in the machine became a larger and larger ink spot, and I just kept the dot on top of the photocopier and watched the dot generate more ink spots repeatedly. During the process of

copying, I felt as if I had become a photocopier, too, because of my mechanical and repetitive working method.

From a studio process perspective, the piece took one week of scanning and printing to create. I spent approximately three hours per day to write down a date, put the paper on the scanner of my HP DeskJet 3630 All-in-One Printer, press the photocopy button, and reload the paper tray again and again. In total, I spent approximately 20 hours of scanning and copying to finish this piece. One might imagine the whole process to have been boring and dull, but its organization and efficiency made me feel happy, as if I were a kind of high-technology robot completing the work quickly and professionally. Photocopying made me think less, and I felt relaxed in this situation. On the other hand, the machine and I sometimes experienced fatigue. Both my mind and my body needed a break after one hour of the repetitive activity, and the machine also needed a break after nearly overheating from its continuous operation: after continuous use, the machine would print out a factory-programmed warning message that it was at risk of **overheating and that it needed a break**. Just as humans need to rest, eat and drink, the machine also needed to cool down, “drink” ink and “eat” paper to continue working.

In this work, I expanded on the idea of collaborating with a photocopier, and saw the distortion as a metaphor for human memory. This project used dates to bring the concept of time into focus and highlighted how time shifts and manipulates memories and experiences. Things can be forgotten over time, and doing things repeatedly over time can result in a “shape” of time.

Part II: CONTEXTS

Context: Noise & Information

“However noise is defined, its negative definition also has a positive consequence: it helps to (re)define its opposite, which is the world of meaning, the norm, regulation, goodness, beauty and so on.”¹

In a general context, “noise” is often defined as an unpleasant and unwanted artifact that is created by mistake—it is an error. Although noise is usually a derogatory term, I see it as something neutral that has the potential to be developed. Individuals identify noise in a derogatory way primarily because it is psychologically inconvenient for them. In other words, the identification of noise seems to be quite subjective. A normal sound can become a noise if it is continually repeated or if it is played at a loud volume. In my practice, which works with the photocopier, the noise of this machine has been enlarged or exaggerated by each successive copy, and the noise in this process makes every copy different and unique. Different from noise, repetition is a conscious action that I perform to create the result of “noise.” Therefore, I am using repetition as a method to achieve the goal of highlighting visual patterns that are challenging and perhaps difficult to consume.

As a result, the enlarged noise becomes a kind of information that viewers can read and understand. Information is defined in the *Oxford English Dictionary* as “facts provided or

¹ Hegarty, Paul. *Noise/Music*. P.3. 2007.

learned about something or someone,” which represents the main way that people understand it: information is usually understood as a useful fact transmitted between people. However, the *Oxford English Dictionary* also has a lesser-used definition of information as “what is conveyed or represented by a particular arrangement or sequence of things.” This definition is considerably more complex and represents a more nuanced understanding of how information works in my studio projects. Information is not just a fact: it is constantly transformed, distorted, and manipulated through communication technologies and our memories. Consequently, noise is a kind of information that depends on how human brains receive it. For example, in experimental sciences noise can refer to any random fluctuation of data that hinders perception of an expected signal.²

Based on this identification, I started to think about the connection between information and my work. A fact is an objective thing, but information is not. Information is the product of facts after they are understood and digested. What this means is that facts mean different things for different people. In my practise, I compare the methods and results with how humans and machines receive and output information.

Context: The Medium is the Message

Different from a message, information is a source for people (and machines, in this case) to understand, while a message could be already digested. I want to suggest other ways in which

² Merriam Webster Dictionary, <https://www.merriam-webster.com/dictionary/noise>. Retrieved 2018-05-03.

my work might be understood. In addition to the importance of noise, noise as information, repetition, and glitches, I am also interested in where meaning resides in my practice.

Marshall McLuhan's dictum "the medium is the message" provides some insight into my work. In his book *Understanding Media*, McLuhan writes that people focus on the message itself but ignore how other messages can be carried by the medium. He states,

The light bulb is a clear demonstration of the concept of "the medium is the message." A light bulb does not have content in the way that a newspaper has articles or a television has programs, yet it is a medium that has a social effect; that is, a light bulb enables people to create spaces during nighttime that would otherwise be enveloped by darkness. (McLuhan, p.8)

He describes the light bulb as a medium without any content, something that "creates an environment by its mere presence" (McLuhan, p.8). In my work, the text itself is not the most important point I want to communicate to the audience; rather, the point is to highlight the distortion and auto-correction the machine does on its own. The method of enlarging the medium itself—not the message—is the main point.

In my Emily Carr MFA studio practice, the "noise" is both the medium and the message – I want to highlight to compare and contrast human and machine. In daily life, machines are considered more logical and dependable than humans. When I ask a human to copy a word one hundred times, the handwriting will never be identical, no matter how careful the writer is; however, the meaning of the word will stay constant. This is because the human typically perceives the meaning of a word as the crucial information to be gained by reading or conveyed by writing. In comparison, when a photocopier makes one hundred copies of a

document with one word printed on a page, the most critical information for the machine is the shape of the word. The scanning function of the photocopier, as a primary daily life tool, is intended to accurately record and transmit the information on the page; the meaning of the shape being scanned and printed is extraneous information to the machine. Therefore, the position of “noise” and the “information” could be exchanged, depending on the angle and methods to filter and identify desired information.

Context: Glitches in Art

The term “glitch,” a relatively new word in the English language, is believed to have originated as a result of the Space Race during the 1960s in America. Some of the earliest references to the term include John Daly discussing the concept on the CBS television panel show *What's My Line*, where he refers to it as a term used by the American Air Force at Cape Kennedy. During the launching of rockets, Daly claimed that “it means something’s gone wrong and you can’t figure out what it is so you call it a ‘glitch.’”³

The idea of glitches and noise being used in art predates this, however. Len Lye’s 1935 film *A Colour Box* (Figure 9) can be viewed as initiating the history of using glitches in art—although the work was produced by directly painting on film, not using electronics.⁴ By showing abstract shapes, colors, and ‘glitches’ as experimental artwork, a new direction was demonstrated for artists—errors, noise, and random shapes could all be part of artmaking.

³ Zimmer, Ben. "The Hidden History of Glitch." 2013.

⁴ Echo, East. <https://indienova.com/indie-game-development/glitch-art/> 2017.

The image has been removed because of copyright restrictions.

This image contains a picture of a capture in the film "colour box", which shows a directly painting on film and play it in a film player.

Figure 9. A Colour Box, Len Lye, film still (1935).

Many contemporary artists explore glitches through digital technologies, and this is sometimes referred to as “Glitch Art”.⁵ The Dutch artist Rosa Menkman serves as a good example of this contemporary style of work. It is often by artists/designers manipulating their digital files, software or hardware to intentionally produce these ‘mistakes.’ “Glitch art is the practice of using digital or analog errors for aesthetic purposes by either corrupting digital data or physically manipulating electronic devices. In a technical sense, a glitch is the unexpected result of a malfunction, especially occurring in software, video games, images, videos, audio, and other digital artefacts.”⁶ Aesthetics and deliberateness are the biggest differences between glitch art and glitches. In Menkman’s works, she makes images appear broken by deleting the source code, which is sometimes referred to as ‘data bending’.⁷

The most obvious connection between glitch art and my research and artistic practice is the abstract results that a machine creates. In my work, I do not attempt to create an intentional glitch; rather, I simply try to enlarge the existing mistakes that tools make. I do not force the

⁵ Echo, East. <https://indienova.com/indie-game-development/glitch-art/> 2017.

⁶ HiSoUR (Hi So You Are). Glitch Art. <https://hisour.com/glitch-art-21221/>. Accessed May 3rd 2018.

⁷ See <https://docpop.org/2014/01/a-glitch-primer-editing-image-files-with-text-editors/> for more information on databending.

mistakes to happen, and this is the main reason why I don't consider my work as fitting within the category of "Glitch Art". Also, my mistakes are created by both the photocopier and myself, and the mistakes relate more to repetition and time than coding or directly manipulating the digital data.

Context: Repetition

Repetition causes and enlarges the noise made by glitches in my work. It is a common theme throughout my studio projects, whether words, shapes, or images. To create these pieces, I typically repeated my actions with the machine. The repeated action appeared the same, but each iteration produced tiny differences. After many copies, the small mistakes were enlarged and became an entirely different and new thing. Repetition is used extensively in art practice, and it is useful to look at a well-known historical example, such as Andy Warhol's *Campbell Soup Cans* from 1962 as a point of comparison. Repetition was an important factor in Warhol's printmaking process. In Dawei Wang's article "Repetition Is Not Simple," he notes that "the charm of repetition is the slight differences between each piece."⁸ Each of Warhol's cans looks similar, but the differences between them are essential and make each can unique. It is ironic that a mechanically produced image is producing uniqueness.

In my work, the role of repetition and the differences that are generated in each object or image are based on the previous generation. Although my work and Warhol's work are both

⁸Dawei Wang, *Repetition Is Not Simple*. p.101, 2011.

primarily formed out of repeated components, Warhol's series is more like variations around a single theme, while my work is a recursive copy that continually copies itself: in my work, repetition is a symbol and representation of the passing of time and the distorting of memory, and in Warhol's work copying is used as a symbol of mass culture. In my thesis project, the changes are often difficult to see after only one or two copies and are only evident after many generations. As a result, my work is more focused on memory and time. Every repetition is like a memory of the previous generation. When the dates written on paper has passed, the time of me working with machine is also passing: the two reflect each other.

During my childhood, the glitchy noise I got from my photocopied school examination sheets made me think about the reliability of machines. This curiosity motivated me to start my discovery about the noise that a photocopier makes. In this way, the introduction of noise over time is similar to how memories work in the human mind: "Memory is the faculty of the mind by which information is encoded, stored, and retrieved"⁹ – and as time progresses, memories become less like facts and more like blurred feelings.

In my practice, I consider an individual's memory to be like his or her personal database. When we are doing things we have done before, our experience helps us to make decisions. However, memory is subjective and changes over time. I believe the action of every photocopy builds up the machine's memory. Humans generally think that machines are

⁹ Lauralee Sherwood, *Human Physiology: From Cells to Systems*. P.157, 2015.

more reliable than humans, but the distortion in my work shows that a machine's memory can be distorted after many recursive repetitions.

During my childhood, I learned how to write Chinese characters by copying the same word again and again, which reinforced my memory of what the character looked like, how it sounded, and what it meant. The action was mechanical, but my understanding of the word was gained in increments.

My work can be used as a method to reflect on how language and communication technologies work. When humans copy a sentence by using a pen, they reproduce the meaning of the words, so the shape of the words can be changed in many ways without changing the meaning. However, when the photocopier is copying a sentence, it only copies the shape of the word, and it does not care if it retains the meaning of the word. Therefore, after many generations of photocopies, the meaning becomes lost. With photocopying, which is a relatively old-fashioned technology, this resembles an elegant type of film grain or static noise, but with new computing technologies that understand words and meanings, this is fundamentally different. In many ways, a photocopier is a more innocent and neutral type of thing than a computer system. I think part of these projects is about me remembering my childhood and a time when communication technologies were simpler.

Sometimes I feel as if I am a photocopier when I repeat an English sentence I do not understand. As a foreigner, when I first came to Canada, most of the words in a sentence were just noises, and the meaning only became clearer after many repetitions.

In addition, the differences between the repetition of each copy's generations can be seen from two angles: from the machine's aspect, the distortion is "noise" created and enlarged by each duplicate; on the other hand, from the human perspective, the difference between each piece of work is the root cause of the value of the work. In the thesis project, the development and distortion of each page is the noise, and the information that makes each page unique and valuable. Nowadays, the communication technologies is the most interactive object faced by humans. In my thesis project, I want to show that even a photocopier, an apparatus that does not seem necessary for everyone in life, could have information that we do not know. Much information in other devices has been treated as noise that is ignored.

Context: Object Oriented Ontology

Object Oriented Ontology is also useful in understanding some of the motivations behind my work. In essence, it argues that humans are not the center of the world and that every object has its own point of view.¹⁰ Ian Bogost explains it as follows: "Ontology is the philosophical study of existence. Object-oriented ontology ("OOO" for short) puts *things* at the center of this study. Its proponents contend that nothing has special status, but that everything exists equally—plumbers, DVD players, cotton, bonobos, sandstone, and Harry Potter, for example. In particular, OOO rejects the claims that human experience rests at the center of philosophy, and that things can be understood by how they appear to us. In place of science alone, OOO uses speculation to characterize how objects exist and interact."¹¹ In

¹⁰ Harman, Graham., 2002, p. 1

¹¹ Ian Bogost (2009). What is Object-Oriented Ontology? A definition for ordinary folk.

my work, it is essential to start from the machine's point of view—to listen to the alien voice of the machine. Artist Pati Hill works in this area, and she has valuable experience in building artwork oriented around the biased perspectives of devices. Hill chooses certain things to put on top of a photocopier and scan. Thus, this work presents objects from the perspective of a machine. In my own work, I try to use the machine's perspective to “forget” the text by copying over it again and again. The machine devotes time and labor to “forget” things, and this process of forgetting is unique in that humans cannot study or copy it. While using the photocopier, I tried to treat the machine as a “co-worker.” Instead of using it as a tool and dictating its operations, I allowed the machine to make some decisions so that we co-created the work together. I tried to use minimal personal preferences to create the artwork, so the abnormal elements created by repetition were mostly caused by the machine. In other words, I wanted the machine to “think” independently. As a result, I made myself more like a machine and made the machine more like a human. Hence, the work that “we” created together is a hybrid form based on a compromise between a machine and a human being: it reflects the creativity of a machine and the mechanical repetition of a human.

On the other hand, to treat the machine as a co-worker I needed to communicate and collaborate with it. For example, in my photocopier pieces, I tried different photocopiers to determine the differences between machines: each machine has its own **“personality” of noise**. The concept of machines having personalities is important for my research, because I want to argue the point that machines are not just tools but can create something new based

on the input humans give them. For example, contemporary artificial intelligent can run programs by themselves and even fix bugs automatically.¹²

Therefore, the glitches that humans see as “noise” while machines produce something could be valuable information, such as a tool they use, a language they talk, even the art they create and enjoy. For example, the appearance of a printout could be influenced by many factors: the temperature, the quality and quantity of the ink, the speed of the nozzle, etc. Accordingly, I put myself as a part of the system too, such as positioning the paper and keeping the scanner clean. All of the elements form the result of the printout, and no one is in the dominant position that controls everything.

As a result, my work is also about control. With most technologies, we think that we have control over them: we use technology to do things for us. In my work, I partially give up my control to the machine by letting its voice be multiplied until it is louder than mine. I also push and control the machine to do things that technologies normally would not be forced to do. We push and pull against each other; we move together in a strange and slow dance. It is important to understand that control is a big part of technology.

Conclusion

In conclusion, I started my research about the information hidden behind a photocopier’s “noise” based on my childhood experiences and memories of degraded school handouts. First, I experimented with both 2D and 3D printers, scanners and copiers. In my work, I

¹² Yingfei, Xiong et al. (2017). Precise Condition Synthesis for Program Repair. ICSE '17: Proceedings of the 39th International Conference on Software Engineering. Pages 416-426.

have found McLuhan and Object Oriented Ontology to be helpful in providing frameworks to better understand how the medium of photocopying can communicate a message, and how we can consider the perspective of objects when developing artwork. Also, I have come to understand that my work has specific differences from most work that is categorized as ‘Glitch Art’ since my work does not actively introduce errors – it is more about repetition as a symbol of time and memory.

In the future, I plan on continuing to develop the idea of using the machine as a co-worker and collaborator: I feel this has been a productive method for my studio work. In my practice, machines are more than just a tool because I attempt to amplify the “personality” within each communication medium – I am interested in exploring noise as information and producing more studio work to help others listen to the poetic voice of communication bias.

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