Whimsical Bodies: Agency and Playfulness in Robotic Art

by

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A thesis paper presented to OCAD University
in partial fulfillment of the requirements
for the degree of
Master of Arts
in
Contemporary Art, Design and New Media Art Histories

Toronto, Ontario, Canada, April 2016

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Abstract

This thesis examines issues related to agency, playfulness, and behavioral design in robotic art. Using the term 'whimsical bodies' (inspired by artist Steve Daniels', *Whimsy*, 2008) as an evocative metaphor for the playful ecology and creations of robotic art, I take up historical and contemporary case studies as entry points to a multi-faceted discussion of human-machine engagements considering the lenses of philosophical, art historical and curatorial methodological research. Robotic art's whimsical bodies are also explored through references to new media scholarship, object-oriented-philosophy, metaphysics and speculative theory. In assessing characteristic features of the art form, such as its playfulness, use of humor, and critique/reconfiguration of wonder as a mode of critical engagement, this thesis aims to move robotic art from the periphery to the center of new media art as a lively and unique field of research.

Keywords: art, robot, agency, play, nonhuman, wonder, enchantment, curate, whimsy, media

Acknowledgments

I would like to thank Nell Tenhaaf and Kathy Kiloh for their words of wisdom during my defense and for inspiring me with new directions for ‘whimsical bodies’. I would also like to thank my Program Director Andrea Fatona for her calming support and encouraging words as well as everyone in the Graduate Studies Office - especially Brian Desrosiers-Tam for laughing at my jokes and solving my problems - and the CADN and CCP cohorts for all the drinks, long office hours, and loving hugs.

I would especially like to thank my Secondary Advisor Dr. Caroline Langill for inspiring my research. Thank you Caroline for your investment in the project, your incredible advice, smart comments, and for celebrating my accomplishments.

Lastly, I want to thank my Principal Advisor Selmin Kara. Selmin, thank you for your countless hours drinking coffee and musing over whimsical bodies. Thank you for your thorough edits, inspiring comments and advice, your kind support and for always filling up my ‘must watch’ movie list. You are an incredible researcher, inspiring woman, and a great friend and mentor.

to Lora-Lee and Nolan

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When they choose to take material form they will resemble
Dragonflies, not machines. Their wings will shimmer.

Like the chorus of Greek drama they will speak
As many, but in the first person singular.

Their colors in the sky will canopy the surface of the earth.
In varying unison and diapason they will dance the forgotten.

Their judgment in its pure accuracy will resemble grace and in
Their circuits the one form of action will be understanding.

Their exquisite sensors will comprehend our very dust
And re-create the best and the worst of us, as though in art.

-Robert Pinsky
The Robots[1]

Robotic art is playful, witty, and whimsical. The bodies that it brings to bear shimmer with evocative potential. They teeter on the balance of mechanical/ technological mastery and the fleshy liveliness of biological creatures. They perform. They are theatrical and engaging and call to us to interact. They can resemble organisms in their self-regulating, autopoietic existence. Where can we find these capricious creatures? Perhaps at a contemporary art gallery, located on the fringe of fringes as marginalized bodies within the new media field. Although there is much to be written about robotic art, which has been an under-explored field of study so far, the focus of this text will be on the questions of agency and playfulness, as they present a vivid entry point into characterizing this quirky art form. In order to help the reader to think through these questions, I'll be using the

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[1] Pinsky, Robert. "The Robots." *The New Yorker* 21 Dec. 2015. Web.

phrase “whimsical bodies” to refer to both the specific works invoked in this thesis and the type of embodiment they point to in the broader ecology of the art. The phrase draws its origins from the lively, behavioral, playful qualities expressed by robotic creatures, as encapsulated by the work of Toronto-based artist Steve Daniels, specifically *Whimsy*, 2008, a set of eight behaving bots “developed to explore simple behavioral rule systems in an embodied context” (“Spinning the Web”). These beings connote the active, odd, fanciful, humorous, behavioral qualities of robotics that often seem to characterize the medium and modes of production presented throughout the history of the field.

Whimsical objects, pointing to a blurring of ontological categories in Daniels’s work, are playful, mischievous, and quizzical things that seem to evade our full understanding or cognition. Whimsicality is a state of being or quality that is hard to describe, and perhaps this is part of its appeal, at least to the human mind. Whimsical objects are odd, unusual, and perhaps even fantastical.

What is robotic art? Wading through the multitude of definitions for the term robot there seems to be repeated references to a behavioral essence. They are mechanical (or virtual) artificial agents; actors that are constructed of technological and mechanical components that can behave in the absence of a biological body. Looking back in history, we find accounts of fantastical, synthetic-yet-seemingly-living creatures in various mythological traditions. Contemporary artist and professor of Art and Technology Studies Eduardo Kac draws our attention to a number of these myths, such as “the Greek story of

Galatea - a statue brought to life by the goddess Aphrodite - or the Jewish legend of the Golem, a speechless anthropoid made of clay by humans" (Kac 2001; 76). Kac also identifies a number of more recent narratives in literature, such as Mary Shelly's *Frankenstein* (1818), Karel Capek's robots in *R.U.R.* (1922), Robert Heinlein's *Waldo* (1940), and Isaac Asimov's *Cutie* (1941) (Kac 2001). Cinema has its own share of (mis)behaving robotic creatures, populating such iconic films as George Lucas' *Star Wars* (1977), Ridley Scott's *Blade Runner* (1982), Paul Verhoeven's *RoboCop* (1987) and José Padilha's 2014 reboot, Steven Spielberg's *A.I. Artificial Intelligence* (2001), Alex Proyas' *I, Robot* (2004), Andrew Stanton's *WALL-E* (2008), Neil Blomkamp's *Chappie* (2015) and Alex Garland's *Ex Machina* (2015) to name a few. In regards to the production of actual functional robots (as found in scientific research) the first commercially available bots appeared in the early 1960s in the United States and were programmed to perform a specific task (or tasks) in industrial production and manufacturing (Kac 2001). Robotics entered the art world shortly after with the development of the non-profit arts and engineering organization E.A.T. (Experiments in Art and Technology) founded in 1967. I will provide a more extensive historical review of robotic art in Chapter 1 but a little more contextualization might be useful before that.

Robots are interactive and communicative (Kac 2001). They often prompt reciprocal relationships between machines and humans (such as Norman White's *Helpless Robot*, 1987-96, Edward Ihnatowicz's *The Senster*, 1969-70, Jim Pallas' *Nose Wazoo*, 1990; all of such I will expand upon in the following chapter). The

robot is a designed object that is powered by its technological components and programming. Its actions and experiences are computationally controlled. Most generally, robots function based upon electronic programing; they processes data by virtue of a sensual reading of their environment (for example, light sensors triggering a programmed response) and operate autonomously to some degree. They are mobile in some form or other and they exhibit behaviors that may be understood as intelligent. Robotic art does not stray away from these categories. What it does do is expand upon the lively nature of robotics to create social, engaging, playful, and agentic creatures that are able to comment on the culturally coded understandings of the organic-synthetic divide.

The aim of this thesis is to contextualize (and distinguish) this type of playful, evocative and whimsical art within the canon of new media art. 'Whimsy' (as a characteristic that encompasses robotic art's behavioral qualities – liveliness, cuteness, and evocations of humor, magic and trickery, [which I will explore in the subsequent chapters]) as well as play (as an activity performed for pleasure or enjoyment) – are oft dismissed as superficial and thus potentially less deserving of the criticality of scholarship or canonization within the field. Though scholarship may be less visible in the field (due to the marginalization of new media and electronic media arts writing and scholarship in the larger discourse of art criticism - specifically the fact that such scholarship, as it does exist, is often hidden in the recesses of the larger art historical canon), robotic art remains a

vehicle to enter into a critical discourse around the lively, humorous and tricky nature oft present in media art production.

This research has been born out of a fascination with lively new media art, as well as my own bias towards the enchanting liveliness of robotic creatures (that may point to the hidden ontologies of nonhumans). This bias often plays out in my own desire to evaluate and interpret lively robotic beings as sentient to some degree. Perhaps it is their lively and whimsical qualities that gesture towards this reading and, for me, make such objects so compelling.

Initially I was introduced to the works of Toronto-based artists (all of whom are/were OCAD U present and past faculty members and students) Doug Back, Judith Doyle, Kate Hartman, Layne Hinton, Michael Page and Norman White due to a collaborative curatorial project culminating in an exhibition titled *Influenc(Ed.) Machines*, 2014. As a co-curator of the exhibition I became enthralled with the audience experiences of the work. The exhibition, inspired by curator and media art historian Caroline Langill's research into the burgeoning new media scene of Toronto and the liveliness of machinic objects, created an atmosphere that enchanted, tricked, played with, and haunted the spectator. My research for the project emerged out of an interest in the Toronto art scene of the 1970s, more specifically centered around OCA (Ontario College of Art) and the development of a curriculum focused on the production of technologically based work at the hands of British cybernetic artist and then president Roy Ascott. Ascott's short tenure as OCA's president from 1971-1972 marked a radical change

in the pedagogy and structures of the institution. Though many of his changes were amended shortly after Ascott left the institution, the interest in new media technologies and its advocating faculty members such as Canadian electronic media artist Norman White remained. *Influenc(Ed.) Machines*, inspired by the radical changes at OCA in the 1970s and the adoption of technological methods in institutional artistic production, created a site for interactivity and reciprocal, playful engagements between humans and machines. The whimsical ecology of the exhibition inspired my further probing into the experiential and theoretical underpinning of such work as a method of engaging with and understanding the liveliness of new media art.

The questions that developed from this research and curatorial-based inquiry into the liveliness of new media objects were plentiful, although my main focus remained on their potential for engagement - perhaps stemming from my background as a curator. An issue related to this potential was the robotic art objects' capacity for action, raising questions about intentionality. Notably, the possibility of robotic art having agentic capacities - with robots acting upon and interacting with the spectator - presented a problem for gallery viewership as it challenged traditional viewership protocols inhibiting touching, moving with, and speaking to the art object. Another challenge that comes with addressing robotic art is the lack of a framework or reference point for evaluating its perceived liveliness and living potential. Since we do not inhabit mechanical robot bodies, it

may be hard to understand these non-human objects' particular experience of the world.

Methodology

The methodological approach to this research has been shaped by a desire to account for my own fascination with expressive and whimsical objects, and my bias towards these types of interactive, behaving and lively creatures. I am interested in the ways in which robotic art stimulates a powerful engagement for myself as a viewer as well as in the powerful affective and expressive characteristics communicated through individual works. To draw out the similarities presented in robotic work - mainly their lively behavioral and agentic qualities (framed by the umbrella concept of whimsy) - this thesis uses a combination of historical review (surveying the characteristics of robotic artistic production between 1970s and today) and artistic analysis. This mode of art criticism allows me to explore the behavioral aspects of robotic art through descriptive readings and explorations of the works' physical characteristics and actions. The descriptions provided are meant to be visual and evocative in that they may transport the reader to a one on one (or possibly group) experience of the work. They are also informed by curatorial methodologies in that they consider the implications of factors like the environment, (spaces and ecologies in which these objects reside, enter into playful engagements with one another and the world, and are given access to experience) and interactivity.

The theoretical framework underpinning the following text is invested in object analysis as it relates to ontological and metaphysical understanding of things. Borrowing from a canon of new media scholarship (Kac, Munster, Paul, Shanken) as well as contemporary object-oriented theories, this thesis explores the complex relationships between humans, things, technology, and the environment, as well as the object's existence apart from the human domain. In regards to object theory, I take up the process philosophy of late 20th century philosopher Alfred North Whitehead, who inspired the scholarship of Object Oriented Ontology figurehead Graham Harman and English Professor and Speculative Realist philosopher Steven Shaviro, as well as feminist engagements with the world of objects, based in new materialist and vital materialist readings presented by scholars such as professor of Political Science Jane Bennett. My consideration of object and human experiences is also indebted to affect theory in the vein of Canadian social theorist and philosopher Brian Massumi as well as the writings of 20th century French philosophers Gilles Deleuze and Felix Guattari.

Additionally, the thesis applies an art historical lens to robotic art in order to track legacies of such production and pinpoint the lineage of whimsicality; drawing behavioral comparisons between humans, animals and machines owing to analysis based in studies of play in order to attribute liveliness to robotic art. By calling for attention to whimsicality as an overarching characteristic of the art form, my aim is to give the behavioral qualities of robotic art due analysis. Lastly, by paying special attention to the reciprocity of playful actions, I highlight the

sociological implications of robotic art, with reference to 20th century French philosopher Michel Foucault's interest in enchantment and contemporary French philosopher/sociologist Bruno Latour's actor-network-theory.

'Whimsical Bodies' is a speculative theoretical research project, which considers the aspects of agency, liveliness and play in the robotic bodies of artists such as Steve Daniels, Erin Gee, Nam June Paik and Norman White with special attention to the robots' capacity to act upon and interact with their environments, influence others, and create change in a gallery context. Whimsical robots demand attention in their playfulness due to their actions as quizzical, curious and animate beings. While this thesis is cemented in philosophical inquiry and critical theory, it holds potential for application to the production and curation of other whimsical robot-like bodies.

In the earliest developments of robotics these creatures were not considered art. Robots were developed to serve. They were created to perform necessary functions and often replace human labour in order to speed productivity / increase efficiency and later make way for a societal model driven by intellectual-capital. So how did robots become art? From where do these 'living' sculptures stem? And how do we define the robotic creature today as the boundaries of artistic production and the abilities of the electronic medium continue to expand? It is important that we start from the beginning in order to delve deeper into the contemporary status and characteristics of robotic art.

Chapter 1: The 'Living' Sculpture

> If artists working with or interested in robotics cannot ignore mythological, literary or industrial definitions of robots..., it is also true that these definitions do not directly apply to any given robotic artwork...As artists continue to push the very limits of art...they introduce robotics as a new media at the same time that they challenge our understandings of robots - questioning therefore our premises in conceiving, building, and employing these electronic creatures.
>
> -Eduardo Kac[2]

> As the cybernetic art of this generation grows more intelligent and sensitive, the Greek obsession with 'living' sculpture will take on an undreamed reality.
>
> -Jack Burnham[3]

New media art as a mode of artistic production or type of work is one that has become hard to pin down. Drawing its origins from the creative and curatorial engagements with new media technologies of the late 20th century, specifically video art, the term qualifies a broad range of practices and works today that require a constant rethinking of the ever-shifting definition of what is truly 'new.' The term new media itself applies to different objects according to different genealogies; a vast array of technologies that emerged after the industrial revolution as outlined by the field of media archaeology (Huhtamo 2011) and the sound and image-based vehicles of 20th century media spectacles such as film, television, and video as in the writings of influential media theorists like Marshall McLuhan (McLuhan 1994). One could also consider French philosopher Henri Bergson's commentary on cinema in *Matter and Memory* as making a similar

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[2] Kac, Eduardo. "Foundations and Development of Robotic Art," Art Journal, 56.3, Fall 1997: 60.

[3] Burnham, Jack. *Beyond Modern Sculpture; the Effects of Science and Technology on the Sculpture of This Century*. New York: G. Braziller, 1968: 77.

argument by exploring how new modes of the moving, as opposed to still, image (including film) can be conceptualized. That was later taken up by Gilles Deleuze to explore the semiotics of film, extending the genealogy of philosophers and putting cinema under the rubric of new media. Today, in the 21st century, an earlier focus on film, television, and video as new media has expanded to primarily consider "computer based artistic activities" (Manovich 2003) and electronic media (Shanken 2009), which continue to place emphasis on movement and temporality, as opposed to static art. We now consider most of the objects foregrounded by these models well-established and no longer in the domain of 'new' modes of artistic production. In the second decade of the 21st century, new media has come to be understood as a category that comprises mainly digital art in its various forms (Paul 2002). This might sound like a narrowing down of the term's scope, making it more manageable; however, the proliferation of digital art itself, especially through cross-pollinations with science, engineering, and biology, opens it up to further dispersion. Manifesto Blanco, written in 1946 by artists and students in Buenos Aires under the direction of Italian artist and theorist Lucio Fontana, advocated for integrating art and science and moving towards "synthetic art". The manifesto was one of the early celebrations of such expansion. As the manifesto argued, the importance of technology is clear in that "we are abandoning the use of known forms of art and we are initiating the development of an art based on the unity of time and space...matter, color and sound in motion are the new phenomena whose simultaneous development is an

integral part of the new art," moving beyond the stasis of painting and sculpture and into new realms of production, beginning with the moving image and today characterized by various forms of moving and participatory digital art (Fontana 1946).

In many ways, robotic art has been viewed as one of the most challenging and hard-to-contextualize products of this shift. Where does this place robotics in the history of new media art - as a mode of artistic production that implies the use of technology and thus becomes subsumed under the umbrella of new media? Robotic art has oft been pushed to the outer recesses of the new media canon. Perhaps this is due to the fact that robotics may be viewed predominantly as a product of engineering and mechanical/industrial design, as opposed to art; for Eduardo Kac "the problem is the operational definition of robots as found in scientific research and industrial applications" (Kac 2001; 76). Or maybe it is robotic art's perceived lack of 'seriousness,' and critical depth due to its emphasis on modeling behavior as the artist values the actions and reactions of the robot in response to it's environment as opposed to an valuation of concepts or form (Kac 2001; 77). New media art's definition remains elusive due to the fact that, according to curator and professor of Media Studies Christiane Paul, it is a "continuously evolving field, [the fact that new media art] evades definitions is one of its greatest assets and attractions, but at times the art seems to be more alive than its practitioners want it to be" (Paul 2012; 168). Maybe it is the lively and unpredictable nature of these objects that has made them hard to categorize.

Aside from the canonized literature that surrounds robotic work, including seminal texts by Eduardo Kac (2001) and art historian Edward Shanken (2009), discussions on the field have mostly been undertaken by makers and thus have been somewhat marginalized, resulting in a lack of diverse critical lenses through which contemporary works can be evaluated.

I would like to argue that the whimsical nature of robotic art, and its potential lack of 'seriousness' could be one cause for the stranding of such work onto the periphery of the accepted modes of new media. However, it is precisely this lack of seriousness that can contribute to the work's criticality - of culture, art, and technology itself (as well as the subsequent interactivity that it necessitates) - that can call for the legitimization of robotics as art within the new media canon. For Eduardo Kac the motivation behind robotic art is to present the behavioral qualities of technological beings (Kac 2001); causing such work to be viewed as theatrical and performative. This behavioral aspect of robotic art also requires some form of interactivity between human and machine or between machine and other machines. While all robots may denote an essence of interactivity - owing to the fact that they are objects not only to be perceived but are also able to perceive, in some capacity, the world around them - the specificity of robotic *art* must be noted. We can differentiate art robots from pragmatic robots according to the broader scope of their functions; "expanding the narrow definition of robots in science, engineering, and industry, art robots make room for social criticism, personal concerns, and the free play of imagination and fantasy" (Kac and Roca

1997). Robots are not fixed. They may break, malfunction, evolve, move, and prompt new responses each time they interact with another being. In this sense robotic art may be hard to classify. Such work demands new forms of engagement and viewership, which differ from pre-established conditions of art spectatorship such as those presented by a sculpture or painting. In regards to the human's role in this shifting engagement, digital art historian Katja Kwastek notes that spectators are no longer spectators but rather have become 'recipients' whose engagement becomes interactive as the recipient is tasked, to some extent, with realizing the work of art (Kwastek 2013). New media theorist Lev Manovich also points to the phenomenon of interactivity. For Manovich, interactive new media creates a shift from representation to manipulation, which, in effect, places the subject in an entirely new structure of viewership similar to the setup of an experimental psychology lab (Manovich 1996). In this new mode of art production the art object and the recipient both appear to possess autonomy and the capacity to engage with one another - the resulting affective network assigns a new role to the curator in regards to their relationship with the artist and their work. For Christiane Paul "the standards for presenting, collecting and preserving art have been tailored to objects for the longest time and few of them are applicable to new media works, which constitute a shift from objects to process" (Paul 2012; 167). These art objects provide curators, artists and spectators with a new set of rules for navigating the gallery or museum;

> The potentially interactive and participatory nature of new media projects - which allow people to navigate, assemble or contribute to an artwork in a way that goes beyond the interactive, mental event of experiencing it - runs counter to the basic rule of museums, 'Please do not touch the art'. For the longest time, visitors of museums and galleries have entered art spaces with the expectations to contemplate objects. Many works of new media art do not only require active engagement but a certain familiarity with interfaces and navigation paradigms. While visitors of new media art festivals draw a more specialized audience that is largely knowledgeable in 'interface culture', one cannot presume that the broader museum audience consist of new media experts (Paul 2012; 167).

This new mode of viewership, requiring a more interactive experience, creates opportunities for reciprocal engagements between audience and work. This may also introduce new potential barriers to reciprocal engagements, however, the focus of this analysis is on the potentials of interactive play that become activated thanks to robotics.

Robotic art is often based in humorous play as we can see in the example of contemporary Canadian new media artist Norman White's *Helpless Robot*, 1985, which features an electronically synthesized voice that seeks physical assistance from human participants only to mock them later as they make futile attempts to follow its increasingly domineering commands. Robotic art also depends on interactivity - whether this be with other robots, people or things - and thus connotes an aspect of reciprocal play that is not as present in other forms of new media work. The historical legacies of new media art cement robotics' qualities as playful and whimsical. If, for Kac, robots' key characteristic is their prioritizing of behaviors over form, the notion of 'whimsy' can be introduced as one way (a suggestive metaphor perhaps) of characterizing the behavioral aspect

of robotic beings. Whimsical things are not stagnant, nor are they mundane or inanimate. Whimsical things are evocative, they are lively, and they are vibrant.

A Brief History

Regarding this notion of whimsy in relation to robotic art I would like to explore the genealogy of such work, with references to what I consider to be some of the most vibrant, behavioral and playful robotic works that have come from the field. Robotic art saw its origins in the 1960s though the movement did not appear from thin air. It was rather inspired by pioneering movements such as Dada and Fluxus that saw a merger with technology owing to the foundation of E.A.T. (Experiments in Art and Technology). E.A.T. was founded by Bell Telephone Laboratories' electrical engineers Billy Klüver and Fred Waldhauer in order to "develop an effective collaboration between engineer and artist. The raison d'être of E.A.T. is the possibility of a work which is not the preconception of either the engineer or the artist, but is the result of the exploration of the human interaction between them" (Paul 2002; 472). The non-profit organization was developed out of a performative event held in 1966 called *9 Evenings: Theatre and Engineering*; it was realized by a massive team of 40 engineers and 10 contemporary artists who worked together on performance art works that incorporated the use of new technologies. Engineers including founders Klüver and Waldhauer worked collaboratively with artists such as Robert Rauschenberg, Robert Whitman, and John Cage. The development of this organization marks the beginning of a

collaborative experimentation in art and technology, and cements the influence of the Dada and Fluxus movements onto the production of technology based work.

The Fluxus and Dada movements - from which robotics gain much of their inspiration - presented a spirit of chaos, irrationality, performativity, playfulness and a strong resistance to institutional establishments (Kac 1999; Paul 2002). Swiss sculptor Jean Tinguely, influenced by Dada and best known for his kinetic sculptures, was one of the earliest sculptors to create "robotlike" mechanical structures including his "Machines à Peindre", developed between the mid to late 1950s ("Painting Machines") (Encyclopedia Britannica). His kinetic sculptures, which he termed *métaméchaniques* or metamechanicals, were robotic in essence as they spun and moved in order to perform for viewers by, for example, painting a picture for the cost of a coin. In conjunction with a critical dadaist approach, recalling the earlier art historical movement, "his whimsical machines deftly satirized the mindless overproduction of material goods typical of advanced industrial society," while also "express[ing] his conviction that the essence of both life and art consists of continuous change, movement, instability...refut[ing] the static art of the past" (Encyclopedia Britannica). As satire and humor were key aspects of Tinguely's work - as well as for many other artists discussed in this chapter - it is important to note the importance of humor for dada artists, mainly influenced by the revolutionary work of Marcel Duchamp who would later inform Tinguely's practice. Duchamp famously noted: "humor is very important in my life, as you know. The only reason for living, in fact" (1985). Duchamp's

infamous *Fountain,* 1917 and Tinguely's painting machines share a sense of "meta-irony" as their irony is, in itself, ironic. The irony of Duchamp's *Fountain* lies in the contextualization of the object - a urinal - within the space of a gallery, while suspending it from context (Cook 1986; 268). The work is thus simultaneously urinal, art object and fountain through the lens of "R. Mutt". The irony of Tinguely's painting machines perhaps lies in the fact that the machines create abstract expressionist style paintings reminiscent of the works of Jackson Pollock and Vassily Kandinsky by means of a mechanical object created to eliminate the need for an artist, at the hand of an artist. What is also ironic about the machines is the fact that the abstract expressionist style they emulate celebrates the influence and spontaneity of the human hand and the subconscious creation of the artist. The automation of the machine may be viewed as contradictory to the potential for 'chance' celebrated by the abstract expressionists. The humor of these particular machines lies in their irony. In accord with the humorous nature of the work the objects themselves are aesthetically whimsical. The weird and fantastical objects appear like they are characters from a steam-punk cartoon. Mechanical cogs twist and turn as long thin metal 'arms' reach out towards paper. Long thin pieces of metal twist and turn in curly shapes beside circles of black material. The objects themselves look like Kandinsky's musical paintings constructed out of mechanical metal pieces that have come to life in a mobile symphony of shapes. Tinguely's early sculptures were lively, whimsical, kinetic and robotic. Perhaps we can view his work as

marking a paradigm shift away from static or stationary art towards the vivid, engaging and variable moving work of E.A.T.'s collaborative experiments in art and technology.

The projects of E.A.T. were the first complex collaborations between artists, engineers, programmers, researchers, and scientists that would become characteristic of the genre (Paul 2002). The exhibition *Cybernetic Serendipity,* 1968 at the ICA in London curated by Jasia Reichardt is another example of such collaborative exhibitions, which presented early light and sound environments, participatory electronic art and sensing robotics. While the engineers were likely interested in the liveliness of robotic art - its behaviors, movements, and actions - the influence of figures such as Fluxus founder John Cage (whose father was an engineer and inventor) and iconic media artist Nam June Paik, focused the production of lively robotic art around more specific themes like performativity, humor, and play. These may have been perceived as 'humble' beginnings; however, "they still show characteristics and narratives of the medium today" (Paul 2002). In retrospect, postwar movements such as Fluxus presented an avant-garde sensibility towards art making that was revolutionary and subverted canonical understandings of Art; in the case of Fluxus, the subversion came in the form of introducing play as an integral element. As digital art and interactivity theorist Katja Kwastek observes:

> The disruption of traditional conceptions of the work in postwar art and its reflection in scholarly texts thus revealed new parallels between aesthetics and theories of play. In particular, the increasing...consideration given to

> the recipient in the concept of art lead to new parallels between art and play (Kwastek 2013; 73).

The anti-commercial, anti-art sensibility of the Fluxus artists were supported by their modes of production focused on creating work that was oft interactive and began with no conception of a foreseeable end. With an emphasis placed on the processes of creation rather than a finished product, the work explored notions of freedom which, like 20th century Dutch historian Johan Huizinga's theory of play, placed emphasis on free activity that was not associated with material interest or profit. Play, like Fluxus art, is more about experiential interactions than outcomes.

Johan Huizinga's study of play, *Homo Ludens* (1938), is oft considered to be the fundamental text on play theory today. Huizinga unpacks the characteristics of play; which I would like to pinpoint in the robots' behavioral tendencies. For Huizinga, play is carried out as a means to its own end - 'for its own sake' - and is thus segregated from the requirements of practical life both spatially and temporally; "Play is not 'ordinary' or 'real' life. It is rather a stepping out of the 'real' life into a temporary sphere of activity with a disposition all of its own" (Huizinga 1980; 8). This fact does not negate the meaningfulness or importance of play; it remains an essential activity for the human experience. This formulation of play enables us to draw links to the characteristics of whimsical robotic art objects and their playful nature. Firstly, for Huizinga, play is not a serious activity; it is not solemn or necessarily thoughtful but rather can be humorous, lowbrow, trivial and superficial; "the [perceived] inferiority of play is

continually being offset by the corresponding superiority of its seriousness. Play turns to seriousness and seriousness to play. Play may rise to heights of beauty and sublimity that leave seriousness far beneath" (Huizinga 1980; 8). A lack of seriousness does not discredit the importance of play. Secondly, where there is play there is also inherently meaning - play is meaningful for the players involved. Thirdly play is 'free' in that it does not need to fulfill a practical task to be satisfying; "the reality of play extends beyond the sphere of human life, it cannot have its foundations in any rational nexus, because this would limit it to mankind" (Huizinga 1980; 3). The motive of play is the experience that it affords - an experience that cannot be quantified. Play is not undertaken to acquire some extrinsic benefit; its essential function is the modulation of experience. Lastly, play involves a dynamic and reciprocal interaction. There is always an 'other' that is present; play is seldom a radically subjective experience but is rather constituted by the moment of otherness - the mystery and whimsy of the counter-move. The act of 'waiting to see' and anticipating a response is an essential aspect to the activity of playing. Regarding these key characteristics of play we can also understand that the actions involved in play resist quantitative measure; the fact that they are essentially meaningful makes the experiences and feelings of play subjective and immeasurable. Play will remain, in some sense, an irrational activity.

In contrast to the perceived irrationality of play stands the notion of structured rational thinking; such as that imposed by law and rule making. This

binary creates a problem within the scholarship and study of play due to the fact that play is characteristically defined by rules (Scheuerl; Huizinga). These rule systems are set out at the beginning of a playful interaction. The rules may be concrete, such as those set out by boardgames, or abstract, such as those presented by art viewership and engagement (don't touch the object, don't yell, etc.). On the other hand play also denotes freedom (Caillois; Scheuerl), voluntariness of participation and unproductiveness contrary to the constructs, limitations and perceived productivity of rule-regulated engagements. This tension between rule and freedom is emblematic of the simultaneous purposeless fun and rule boundedness of play. For Katja Kwastek "the free nature of play is comparable to the concept of autonomy in art and vacillates, like the latter, between the poles of cognitive and material independence" (Kwastek 74). The act of entering into a rule system of play is both voluntary and unmotivated by an interest in producing or attaining material goods.

An early robotic work, which came out of the Fluxus movement prior to the development of E.A.T., Nam June Paik's Robot *K-456,* presents a spirit of humorous play by focusing more on the behavioral spectacle of the object than the technical or engineering skills showcased in robotics. The humanoid robot's construction began in 1963 and was completed by Paik and engineer Shuya Abe in 1964. *Robot K-456* was a 20-channel radio controlled anthropomorphic bot, named after Mozart's piano concerto, and an ode to the Fluxus admiration for music. The robot performed simplistic tasks such as moving its limbs, rotating its

head and eyes, and doffing its aluminum foil pie plate hat. The spectacle of the object is odd and fanciful. As the human-like bot was paraded down a New York street for the Second Annual New York Avant-Garde Festival it played a recording of John F. Kennedy's inaugural address and excreted beans as a humorous act of performance. Although there is little written about the critical function of this performance, *Robot K-456* provided a highly contested critique of gender normativity due to its monstrous hybrid body. Initially the bot was built with two mock breasts and a penis attached to its metal frame. However, after it generated negative reactions amongst critics Paik opted to remove the robot's male genitals transforming the gender-bending creature into a 'her'. Paik's choice to assign a gender to the mechanical being humanized the creature while simultaneously making the robot more accessible to a public that was unable to relate to the robot's gender fluidity. The public's reaction to the work can be read as a failure to recognize the type of social commentary that Paik wanted to make, resonating with contemporary American philosopher and gender theorist Judith Butler and feminist science and technology theorist Donna Haraway's arguments about the performativity of gender and how the figure of the cyborg bent gender normativity in the age of new media. Similarly, one can criticize Paik's submission to public demands transforming the monstrous robot/male/female hybrid body into a lady bot; however, his initial design and subsequent comments on the revisions contextualize Paik's point-of-view. Although the bot was censored, the lingering

images of its original hybrid body stand as a critical and subversive act on the part of Paik.

In a later work of performance art starring *Robot K-456* titled *The First Catastrophe of the Twenty-First Century*, 1982, the bot was removed from the Whitney Museum of American Art and guided by Paik down the street on a casual stroll before being 'accidentally' struck by the passing vehicle of artist Bill Anastasi in the intersection of 75th street and Madison Avenue in New York City. This social commentary on technology and its envisioned future movement outside of human control was performed in a whimsical and playful manner. The quirky and intriguing image of Paik strolling down the road with a robot companion stolen from the Whitney is quite provocative as a choreographed catastrophe.

The spectacle of this object is inherently whimsical; the confusion generated by the sight of an anthropocentric robotic object ("creature" as Kac would put it) strolling down the street before being hit by a car is both amusing and memorable. There is a sense of awe and wonder presented by the machine - through its human-like attributes and seemingly autonomous life – and in the disinterested horror of witnessing the "death" of such a creature (I use the word disinterested because we are aware that it is a mechanical rather than a sentient being that is destroyed, which undermines the sense of dread experienced by the spectator, due to the fact that mechanical things can be fixed - making this performance more of an act of trickery on the part of Paik and his robot). Perhaps

the trickery involved here can be thought of as a form of vaudeville style attraction or magic trick, also recalling British science fiction author Arthur C. Clarke's famous statement that any sufficiently advanced technology is indistinguishable from magic (Clarke, 1962). For some of the performance's spectators, it may have been perceived as an exciting spectacle, in a similar vein to turn-of-the-century new media technologies or cinema of attractions (Gunning 2006) resorted to practical magic for their affective import. There comes a sense of awe and wonderment instilled by a device that we cannot fully understand. This phenomenon has been described as *karakuri* - a Japanese term meaning either 'mechanism' or 'trick'. Karakuri describes a specific category of object, which has some form of concealed mechanism that allows the object to function, perform, act, and interact (Shea 2014).

Initially karakuri objects were puppets developed in Japan between the 17th and 19th centuries. The mechanical dolls were created as a form of entertainment and would perform simplistic movements that were conducted by mechanical components hidden within the objects' outer shell. They were used as both home and theatre entertainment, and would also be employed to perform reenactments of traditional myths and legends. The puppets represented both liveliness and concealment. They were active, mystical and enchanting by virtue of their alien inner lives. The concept of karakuri can be reinvigorated as a tool to interpret the display strategies for novel technologies in a gallery/museum context. We can understand that there exists "fluid, analogous relationships among

automata, puppets and robots – as well as magic, technology and craftsmanship" (Shea 2014; 46). The affective import of automata such as Paik's *Robot K-456* (electronic instead of mechanical in this case), and other such anthropomorphic lively objects, often depends on a sense of enchantment in the audience, and on what anthropologist Michael Shea points out as the 'odd trick', performed in Paik's work by the staged car accident. While such work oft instills a sense of awe, there is also an underlying truth to the functioning of the machine, which is likely not reported. For Shea "it does not matter whether or not the technology on display is genuine; so long as the audience does not understand the mechanisms behind the performance, the impact is the same. Karakuri ningyō, robots and puppets can all convince us, at least temporarily, that they are living. This is the trick" (Shea 2014; 46). He offers the example of iconic autonomous robot ASIMO to illustrate that the hidden qualities, or 'tricks', of the machine may be under a greater human influence than we would suspect. In the case of ASIMO, a humanoid robot and multi-functional mobile assistant developed by Honda and introduced in October of 2000, Shea describes the bot as "effectively-remote controlled by staff behind the scenes" while, "to the audience ASIMO is presented as sentient" (Shea 2014; 45). ASIMO and *Robot K-456* are both performative automata that are controlled, in some aspect, by humans. ASIMO presents us with a more typical karakuri object as it is magical and lively while maintaining the mystery of its inner working; the technology, which supports its human-controlled functioning. *Robot K-456*, on the other hand, presents an interesting dichotomy in

relationship to the karakuri method of producing performative automata. Paik's robot is obviously lively - because of its ability to move, perform and engage with others – and it is also anthropomorphic, like ASIMO; however, it presents us with an aesthetic that celebrates the inner functions and mechanical nature of the bot as opposed to the tradition of karakuri, which makes these aspects hidden.

Robot K-456 is an assemblage of things. Its frame is composed of thin lengths of metal that are wrapped with coloured wires spinning like weeds around its body. A single speaker forms the robot's mouth. Its mechanical hands dangle tenuously from haphazardly constructed arms. A small fan spins in the center of the bot's body while a mess of intricately tangled wires pool around its right leg and foot. All of the robot's wiring and circuitry are exposed to the viewer. *Robot-K-456* is neither sleek nor sturdy with its inner workings presented as a mass of messy mechanical parts.

The spectacle of *Robot K-456* with its guts exposed calls to a new type of enchantment that is not fueled by the mystery of the machine's inner workings and its ability to act like a human. The robot takes on a life of its own, outside of a humanizing framework. It does not seek to model humans exactly, but rather presents us with an entirely new image of the body that is hybrid (of human and machine, art and technology). The robot lays bare its own body as an object of study (reminiscent of Duchamp's "The Bride Stripped Bare By Her Bachelors" and artist and Digital Humanities professor Mary Flanagan's re-reading of that work in "The Bride Stripped Bare to Her Data"). These bodies are both alien and

familiar. They present us with an image that registers humanness while simultaneously bastardizing our own notions of the human body. The karakuri's porcelain painted body – presenting us with an image of human 'perfection': soft lips, almond eyes and rosy pink cheeks – is opened up to reveal a horde of mechanical parts. Like body-modifying contemporary French artist Orlan's surgical performance - in which the body is stripped bare of its skin, displaying the inner workings of ourselves as an image of abject horror (Carlson 2011) - the robot body, such as that of karakuri with its inner working exposed or *Robot K-456,* which has already been stripped bare with its insides made visible to us, presents a new type of horror. This horror is presented in the form of flaying a lively body; but to a new type of abject fear we are presented with a technological body. The inner workings that control the movements of the body are not of a human nature; they are machinic. This body, while lively and formally mimicking human anatomy, induces terror in the way it pits life against mechanics, as we are exposed to the inner workings of a thing that is lively on the surface. Simultaneously, the presentation of "the in-between, the ambiguous, the composite" (Kristeva 4) provokes a feeling of wonder - this may be a horrified wonder - when viewing the robot body.

Programmed Behavior & Sensing Bots

Edward Ihnatowicz's *The Senster*, 1969-70 is another example of a performative human-modeled and enchanting robot that expresses its inner workings and reflects a new direction in the development and aesthetic in robotic

art of the period. *The Senster,* arguably the most iconic work of the Polish cybernetic sculptor, was a large hydraulically actuated robot that sensed and responded to its environment. The fifteen-foot lumbering bot was built to resemble a massive mechanical lobster claw and occupied a space of 1000 cubic feet. Built into the structure of the head were sensitive microphones and motion-detectors that allowed the creature to sense its environment. Environmental stimuli were processed by a digital Philips minicomputer in real time allowing it to playfully engage with those around it. *The Senster*'s body was formed of six independent electro-hydraulic servomechanisms with six degrees of freedom in their movement. According to Kac, this interactive playful robot was the first instance of behavioral autonomy in art (Kac 2001). The massive metal claw was given a programmed personality through which the bot responded to humans and its changing environment. *The Senster* would slowly and laboriously shift its head away from areas of activity towards quieter and more subdued viewers. Those who were loud and mobile saw the gentle giant shy away and protect itself from perceived threats or aggressors. This marks the beginning of a shifting mentality amongst robotic artists towards the exploration of programmed behavior and the assignment of autonomy and some type of agency to robots.

The massive mechanical structure can elicit a sense of recognition from viewers as they watch its self-protective and shy behaviors. Or one might feel sympathetic to the creature on display as it attempts to escape from the loud and noisy crowd that it simultaneously draws in through the spectacle of its massive

mobile mechanical body. *The Senster* performs as an animalistic being, with its behaviors mimicking the way prey animals act in nature and made visible to the human viewers positioned as predator. While the robot is large and lumbering and aesthetically fear inducing upon first glance, its behavioral qualities - making reference to animal instincts - expose the robot's fear and inability to defend and protect its body. The frightened creature senses and responds to its environment in a way that creates empathy in its predatory audience while some may seek to exploit their power or "prey drive" over the massive machine by taunting and teasing it to further incapacitate the bot. I will unpack this notion of animal behavior in the next section, but a little more elaboration on the sensory potentials of robotic art as it relates to user engagement and reciprocal interactions between human and machine might be relevant here.

Norman White has created a number of robotic works, which call for user engagement precipitated by their sensory data cues. White began working in manual electronics but moved towards the immaterial languages of programming software in 1976. His first machine built according to the logic of computer programming and displaying robotic characteristics was *Facing Out Laying Low (FOLL)*, 1977. Though the work was not autonomous it manifested a simulated mode of independence as a result of its programmed behaviors and ability to react in real-time. The bot looked for substantial deviations and fluctuations in its surrounding light patterns, likely caused by the movements of humans, and would begin to 'ignore' areas of the room with stagnant light. The Motorola D-1

computer that controlled the robot also registered and stored environmental data based on present and past experiences of the machine. As a result, *FOLL*'s actions were highly unpredictable as its coded responses would draw stimuli from its current and past data. For Norman White, this element of chance and unpredictability is essential to his practice, in the same way that it was to the predecessors of robotic art such as John Cage who believed that art requires the maker to "give yourself up" in some capacity to find the "sweet spot" between constraints and freedom. When building and exhibiting a work White asserts, "I think things are more interesting when I am not in complete control, when I am as much surprised as anybody else as to what takes place" (White 2006). He wants to make things that have a life of their own, that act in a whimsical and playful way, which is expressed by objects that are both biological in function and mechanical in construction. A key concept for White is the 'living effect' represented in his work's whimsical behavioral outbursts, temperamental qualities and the non-cooperative essence of *FOLL*. The robot "talks when it feels like talking" or it may 'sulk'; regardless, the bot "requires the same patience that you would give to a living creature" (White, 2006). The spontaneous and unpredictable nature of the machine expresses its living qualities to us. The lively capricious creature presents an engaging mode of behavior that is still a point of reference for the work of robotic artists today.

The robot's behaviors are regulated by its programming, its own physical abilities and its surrounding environment. Norman White creates work that

embraces both constraint and freedom. The robot is constrained by the characteristics imposed upon it by the artist's hand while it also maintains some autonomy owing to its programming that allows it to act towards, and adapt to, its random and ever changing environmental stimuli. This is where a third party may enter the scene; the human spectator. The third party or participant of the scene has the ability to influence the robot's performance as the bot senses a new being with which to engage in play and interact. The ensuing interaction between human and machine resembles the process of any gameplay, in that the realization of the work's performance will depend (though not entirely) on the viewer/participant/ player: "it is in the playing that a chessboard comes alive, and the game object becomes a catalyst for play" (Pearce 70). In sensing their environment, the human and robot become intertwined in an act of performative play. While human interactivity remains an important aspect of much of the robotic work in this manner, I would like, for a moment, to broaden the scope of this analysis and turn to animals as a counterpoint from which to study robotic behaviors and interactions.

Modeling Animals

The lure of animal instinct appears to be an important consideration for the development of artificially intelligent (or semi-autonomous) robotic creatures. Studying the behaviors and playful engagements of animals (like humans) provides artists with an alternative model for the development of whimsical robot bodies. Animals, which constitute the biological 'Other' for humans, present us

with a different configuration of embodiment, through which we can establish and study robots as lively entities. As with the predator/prey scenario presented earlier by Edward Ihnatowicz's *The Senster,* we can program and detect varying types and degrees of animal behavior in robots. The work of Norman White provides a strong entry point to discussion in this context too. *Ménage*, 1974, which was an installation of five interactive robots that engaged with one another, combines the artist's interest in spontaneous chance interactions and the behavioral study of the animal kingdom. The work was inspired by neurophysiologist and robotician Grey Walter's experimental tortoises, which were some of the first electronic autonomous robots. Walter's first set of robots, constructed between 1948 and 1949, were named Elmer and Elsie. The robots were oft described as tortoises due to their aesthetic appearance as tortoise-like animals as well as their slow pace of movement. The tortoises were developed to participate in a number of experiments that Walter conducted in order to study the ways in which the brain worked - through mechanical beings (Pickering 2010). One such experiment involving Elmer and Elsie tested the robots' ability to become self-aware. Walter attached a light to the 'nose' of the tortoise and watched the robot as it observed itself in a mirror. The bot flickered, jiggled and twitched like a 'clumsy Narcissus' according to Walter as he argued that the tortoise had displayed some evidence of self-awareness. The interest in creating artificial life echoes far beyond Walter's tortoises as, according to Edward Shanken's study of the historical legacy of new media art, "in many cases, artists have attempted to bridge the apparent divide

between carbon-based organisms and silicon forms of intelligence and life, between the real and the artificial, suggesting that these distinctions are becoming increasingly blurry and permeable" (Shanken 38). White's *Ménage* follows in the footsteps of Walter's intelligent robotic creatures as he creates experimental works that explore the potential of animal behavior in autonomous machines. Animal behavior, like that of human, is expressed by way of their actions. Anthropologist Robert Fagen's canonical text on animal play divides these actions into five unique, though fuzzy, categories of play engagement in which animals participate. The five types of play are; (1) isolated play presented through repetitive and brief movements, (2) non-contact solo play/social play of moving bodies through space, (3) social play (with or without contact) that involves chasing or sparring/ wrestling, (4) complex social play that involves the inclusion of objects and features of the landscape, and finally (5) mother-infant games such as peekaboo or building and breaking structures composed of smaller objects (Fagen 1981; Sutton-Smith 1997). He also asserts that only a small number of animal species have the capacity for play, "mammals and birds, and perhaps a few fish and reptiles are the only kinds of animals known to play" (Fagen 1995; 24). Their ability to play is expressed by "specific movement qualities and signal patterns" (Fagen 1995; 24), which enable us to see that they are playing. It is interesting to note that the line of robotics presented in this section as modeling animals does in fact conform to Fagen's assertion that play is reserved to mammals, birds and a few fish and reptiles. None of the robotic creatures fall

outside of these categories of play according to their programmed behaviors and interactions.

Let us turn back to the work of art in order to more fully understand Fagen's modes of animal play as they relate to bot behaviors. *Ménage*'s five light-sensing robots engaged with one another due to their sensory perceptions and programmed desires to interact. Four of the robots were mounted to ceiling tracks on which they could move back and forth around the room, across paths limited by them. The fifth robot was positioned on the floor and could move around more freely. Each of the five creatures was equipped with a scanner that was able to sense strong light-sources and communicate the sense perceptions to a computer controlling the bots' behaviors. Each robot was also equipped with a spotlight mounted to its centre body. The robots would lock onto each other's gazes as their spotlights would intersect and compel the mechanical bodies to move together. The autonomy of the ceiling robots was somewhat compromised in that they could be controlled and pulled apart by non-responsive track-motors. The simplistic response and control systems of the robots created unique and complex behaviors amongst the creatures as they locked 'eyes', connected for a brief moment before being pulled apart and beginning their search again for a new light source. The robots had a lively quality that pushed and pulled them to act, behave and play with one another.

Fagen's third form of animal behavior, that of social play, is echoed in the behaviors of the *Ménage* robots. As the robots chase one another around the room,

they seem to be modeling the behaviors of most primates and carnivores, pinnipeds, marsupials and some birds, through their participation in the social play of chasing (Sutton-Smith 1997; 23). According to Fagen, the characteristics of animal play, related to the social play interaction involved in chasing, are: repetition, reversal, fragmentation, exaggeration, inhibition and unpredictability. For Norman White the unpredictability of the robots' playful interactions would likely be the most important feature of the work; however, the bots also participate in an engagement that is repetitive (through their ongoing quest to move towards one another), reversed (as their actions to draw together are denied by the track's integrated programming to pull them apart), fragmented (as their playful engagement may be interrupted by human interlopers), exaggerated (by their mechanical bodies as they whizz and whur around the gallery space), inhibited (by their programming to play above all else), and of course unpredictable as the multiplicity of their possible movements and interactions highlight the randomness of their performance. It is by virtue of the narrative of animal interaction that *Ménage*'s performance is born. This is only one example of robotic art modelling animal behavior, along with the earlier example of *The Senster*. Animal influence can also be explored through the reoccurring theme of 'cuteness.'

The Little Pygmalion: Cuteness as Critique

Following the legacy of Norman White's lively and interactive robotic beings, Jim Pallas's *Nose Wazoo*, 1990, resembles an object pulled from a

children's novel. As American electro-kinetic sculptor Pallas describes the motivation behind the work on his webpage, "in the Frankenstein myth, man created a being that destroys him. While the myth is often associated with technology, I'm more interested in Pygmalia who creates something to fall in love with" ("jpallas.com"). The *Nose Wazoo* is equipped with four photocell eyes and an infrared sensor enabling it to observe its surrounding environment. The creature seeks out and responds to humans as it flexes its long neck and extends its nose up to 20 inches towards the viewers as it attempts to nudge them to get some attention. Its lower body is covered in sisal fibers, beads and wires while its head, though also furry, is much more mechanical looking with the exception of a molded human nose at the tip of an extendable metal pole. The *Nose Wazoo* gathers viewers due to its silly performances as it flings its body around with "back flips" and "floorscrapes". Once it has gathered a crowd with its enchanting performance the creature will try to nudge humans around it with its extendable nose. The *Nose Wazoo* is unexpectedly temperamental and can easily retreat from its peacocking display to sulk if a viewer teases it with an excess of stimuli. The *Nose Wazoo* is playful and engaging, and can enthrall viewers through its seemingly human-like and lively behaviors. However, the creature is furry and fuzzy and in some way cute, looking more like an animal than a human. According to zoologist Konrad Lorenz, infantile or cute features trigger a nurturing response in adults; smallness and furriness are especially among the stereotypes of cuteness that play into this cross-cultural phenomenon. Alongside

the animal behaviors discussed in the last section as informing robotic art, it is important to note that robotic creatures often take on the role of not only prey versus predator but also cute versus monstrous or threatening animals. Works such as the *Nose Wazoo*, *Ménage* and *The Senster* are non-confrontational, cute and even cowardly (as in the case of *The Senster*). These bots do not impose themselves on the viewer but are rather friendly, non-threatening bodies that enter into the sphere of liveliness in such a way as not to create fear. Robotic art, in the survey presented thus far and to come, is allowed to become lively, behavioral, playful and agentic on account of its non-confrontational status. These bots are not menacing or scary like the vengeful and humanesque robots in films such as *I, Robot* (2004) and *Ex Machina* (2015). In looking to cultural examples of robotics in film it is evident that there exists a dichotomy between representations in the virtual animated world and the physical development of bots. The monstrous and threatening bodies presented through film do exist in the art world. Rather, robot bodies are made small, cute, quaint, amusing and above-all non-threatening to a human spectator. While the humanoid robot army in *I, Robot* and the intelligent Ava from *Ex Machina*, who appears to have a mind and will of her own, present us with an image of robots as technological substitutes for humans and a threat to the continuation of our species, the cute and animalistic robotic art objects present us with a more palatable - though potentially as critical and subversive (see *Little Brother*) - form of artificial life and intelligence.

The smallness, cuteness and quaintness – in other words, whimsicality – of robots are represented in the aesthetic and performative behaviors of the *Nose Wazoo*. Its mischievous movements draw the focus to endearing attempts to gain attention. The creature is lovable and sweet as it compels the viewer to acknowledge, engage with, and even nurture the misbehaving machine. Even the name *Nose Wazoo* triggers a sense of silliness for the human viewer.

Cuteness can also function as a mode of subversive activism in robotic art. *Pamphleteer* aka "*Little Brother*" was a propaganda robot developed in 1998 by the Institute for Applied Autonomy (IAA); an activist group founded in 1998 and dedicated to the dissemination of knowledge, autonomy, and methods of self-determination by way of technological means. The adorable and small robot is a simplified creature constructed of metal with claw shaped 'hands' and large oval shaped 'eyes' that cover nearly the whole head of the bot. The *Little Brother*'s limited features and solid square body make the robot appear as an even more streamline version of ASIMO. The robot's massive sad eyes instill empathy in the viewer as they watch the cute robot distribute flyers to passersby. *Little Brother* capitalizes on its cute aesthetic in order to distribute various subversive propaganda literature to the public. Automating the oft-dangerous act of activist campaigning and making the distributer adorable allows the bot to infiltrate spaces that would likely be inaccessible to humans. The robot has been sent out in various field tests and the viewer responses have nearly unanimously attributed the robot's cuteness to its ability to act in a subversive and critical matter without

a negative response. The bot, who has also been adopted as the IAA's spokesman, is able to veil its cultural and social criticism underneath its nonthreatening aesthetic. In this case the cuteness of the bot enables it to stealthily enter into a minefield of social relations relatively unscathed.

How are cute robots such as *Little Brother* able to navigate social spheres and interface with humans while enabling us to more easily adopt autonomous machines? Here, I would like to explore another Japanese phenomenon, that of *Kawaii*, as a tool used to soften the advanced features of Japanese technological culture with the cuteness of kitties, bears and puppies and their large heart-melting eyes and rosy cheeks. The Japanese style of 'Kawaii' embodies a special kind of cute design that could be used to inform designers of leisure and pleasure objects - and more specifically in the case of my research: interactive media - how to engage users in a way which reduces fear and makes dreary information more acceptable and appealing. An analogy could be thought of as the bitter pill with a flavored layer that makes the consumption of the medicine more agreeable" (Cheok 2010; 299). The analogy of a bitter pill can also be applied to the 'cute' robotic works I have previously mentioned. For example, *Little Brother* is a confrontational activist, who assaults humans with controversial views on the contemporary social and cultural climate by offering them informational pamphlets. Although his socio-political criticism remains veiled underneath the sweet 'flavored layer' of the bot's cute aesthetic. Professor of Pervasive Computing Adrian Cheok expands upon this analogy to address a parallel between

the "cold, digital, electronic, and unsettling internal components of a system and the bitter pill;" notably, "the 'flavored coating' is the cute user interface, which is made more agreeable by establishing a relationship with the user and delivering the content of a system in a more friendly and attractive way" (Cheok 2010; 299). Therefore the content, or message, communicated by the work of art is softened and made more agreeable for the human spectator. By reducing fear and apprehension towards new technologies and the insinuated terror of autonomous robots or artificial life, these bots use cuteness as a gateway to enter the human realm.

Robotic art may also fall under the category of Kawaii due to the fact that the viewer is oft presented with a 'trick' (as discussed earlier in relationship to karakuri objects) and surprise. The user or viewer is meant to be surprised or caught off guard. Interactivity is essential to Kawaii as the surprise presented "to the user plants the initial emotion through which the continuing experience is colored;" that in turn begins the 'micro-relationship' between user and object. (Cheok 2010; 300). Creatures such as the *Nose Wazoo* present the viewer with an interactive surprise in the form of the object's performativity and its quest to reach out and tap humans with its extendable nose. This micro-relationship is a short-lived superficial relationship between the cute object or creature and the human. It is likely not lasting, and may lack critical depth; however, it may be extremely impactful as a memory, a mode of provoking thought or a highly emotional and possibly even endearing engagement. According to the logic of Kawaii, the

defining characteristic of cute creatures is evoking "the feelings and emotions that are caused by experiencing something that is charming, cheerful, happy, funny, or something that is very sweet innocent or pure. It can stimulate a feeling of adoration, sympathy, or stimulating the care response" (Cheok 2010; 301). Keeping this framing in mind, I would like to talk about cuteness in relationship to one more example of robotic art.

Nose Wazoo and *Pamphleteer* were not the first whimsical or cute interactive artworks to be produced in the field. Contemporary electronic artist Simon Penny's *Petit Mal*, 1989-93 is an earlier and less anthropomorphic bot; however, it presents a mischievous quaintness similar to that of the *Nose Wazoo*. For Penny, the aim of *Petit Mal* was to develop a charming and truly autonomous robotic art object. *Petit Mal*, like *Nose Wazoo,* senses and explores its surroundings, specifically architectural space, while also pursuing and reacting to humans. *Petit Mal* does not bear an anthropomorphic or zoomorphic physical appearance; the robot is meant to foreground and celebrate its electronic nature, placing the emphasis on artificial intelligence (as opposed to an automaton-like configuration or simulation of a biological being). It appears curious and reactive – on a 'voyage of discovery' – as it explores the surrounding environment and responds in real time. In neurological terminology 'petit mal' is a momentary loss off consciousness experienced by humans. This name appeals to the slightly chaotic and unpredictable nature of the bot, which Penny purposefully constructed to be a little out of control. The mechanical structure of the bot is stable; however

it has an in-built chaotic motion generator that makes it an 'emblem of unpredictability,' in the same way that the works of Norman White function (as this chapter explored earlier). This behavioral aspect of the robot gives it both an intelligent quality and a unique personality. Although the object is neither anthropocentric nor zoomorphic its flowery coating (in the form of a flower printed table cloth-esque fabric covering the metal exterior of the bot) renders it less technological and more humanized (inviting associations of domesticity and intimacy). Perhaps the pattern is meant to make the subject more relatable, quaint and friendly. Penny's interest in humor would keep affect at the surface, drawing attention to the immediacy of its trans-corporeal flows rather than the robot's evocation of intelligence and ability to store memories or map its surroundings. The bot is reactive and experiences only its realtime embodiment while interacting with humans. *Petit Mal*'s apparent lack of mindfulness or a strong memory makes the bot friendly, accessible and unthreatening. The cutesy flowers present a sensibility of comfort that allows the bot to intrude into the spaces of humans and enable it to play freely with others.

Though structured by the limitations of their physical bodies, exhibitionary structures, and programming, these robots display some autonomy through their ability to act freely - oft outside or in excess of the constructed limitations of their exhibition as in the case of Norman White's interest in the unmediated potential of his work outside of his interference. Thus whimsical robotic art carries the

potential to have autonomy that is not cemented in rules and regulation due to its engagement in play.

Bringing Bots to Life

In attempting to contextualize robotics within the larger field of new media art, I propose establishing an aesthetic and ontological framework that pays attention to the unique characteristics or signifying qualities of the medium. As I mentioned earlier, robotic art has been pushed to the outer recesses of the canon, perhaps due to its playful and lighthearted nature, which is interpreted as overwriting its criticality or content driven value. Viewers may marvel at the novel nature of robotic creatures without considering the greater critical ecologies in which such work is brought to life (pun intended) or the motivations of the artist. In exploring the dada and fluxus lineages of robotics, we can implicate these movements in robotic art's playful, humorous and participatory nature. The emphasis on both engineering and art in the establishment of E.A.T., and by its affiliated artists, may have cautioned the field against exclusively anthropomorphic aestheticization of robots. Considering animal modeling (both aesthetically and behaviorally) and explorations of cuteness as a critical lens, artists such as Nam June Paik, Norman White, and Simon Penny have lead the field towards emphasizing behavioral qualities (human and nonhuman), playfulness and interactivity.

Robotic art, and new media art more generally, face an inherent problem of exhibition, as exemplified in the stranding of such work onto the peripheral

spaces of the gallery and in the separation of 'Art' from 'new media art'. As Christiane Paul notes, the segregation of new media art to exterior zones such as 'new media spaces' or 'lounges' oft provokes a "'ghettoization' - contributing to the separation of the art form from more traditional media and epitomizing the uneasy relationship that institutions tend to have with the medium at this point in time" (Paul 2012; 170). We can continue to question the space for new media as the field grows ever-more expansive with the introduction of new work, which continues the legacies of participatory, evocative, playful and behaving robots that are literally and figuratively hard to pin down. In doing so, perhaps artists and the curators of such objects may develop alternative venues for robots that are inherently lively and engaging; they may be cute, sweet, human or animal-like but they consistently appear as vivacious, engaging and animated. Considering their behavioral features might allow us to better comprehend their nature and make room (or create new spaces) for their proliferation.

Chapter 2:
Robot Behaviors: Outbreaks, Testimonies and Propositions

> We need to be able to consult nonhumans more closely, to listen and respond to their outbreaks, testimonies and propositions.
>
> -Jane Bennett[4]

Imagine a small autonomous robot with light sensors - symbolizing 'eyes' - attached to gangly protruding wires that bobble around atop its body. The creature zooms around the hardwood floor of the Art Gallery of Peterborough; it is part of an experimental test project, which features a set of eight autonomous interactive sensing robots with the ability to "explore simple behavioral rule systems in an embodied context" ("Spinning the Web"). In a lecture given at Ryerson University about the project, evocatively titled as *Whimsy* (2007) (Fig. 1), Steve Daniels describes the vision behind the robots' design as one that situates it on the periphery of distinct knowledge systems, resisting characterization either as an 'art' object or a scientific experiment (Daniels 2015). Though Daniels identifies himself as an artist, his robotic objects were never intended for public viewing or exhibited publicly as works of art. Rather, they were implemented in a handful of trials at his studio and in one of the Art Gallery of Peterborough's exhibition spaces as a 'non-scientific' experiment (for the purpose of informing later gallery-exhibited art works such as *Sessile,* which I will discuss later in this chapter). The understanding was that they would be observed and studied only by a small group of people including Daniels himself

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[4] Bennett, Jane. *Vibrant Matter: A Political Ecology of Things*. Durham: Duke UP, 2010: 108.

and a number of his friends/colleagues. The robotic creatures' essence lies somewhere between art and experiment, by way of observations that are both aesthetic and scientific. According to Daniels *Whimsy* acts as "a kind of behavioral maquette;" he confirms their liminal essence as creatures that linger on the cusp between art and science, claiming that "they are art objects -- they were my first attempt as locomotive agents" (Daniels 2016).

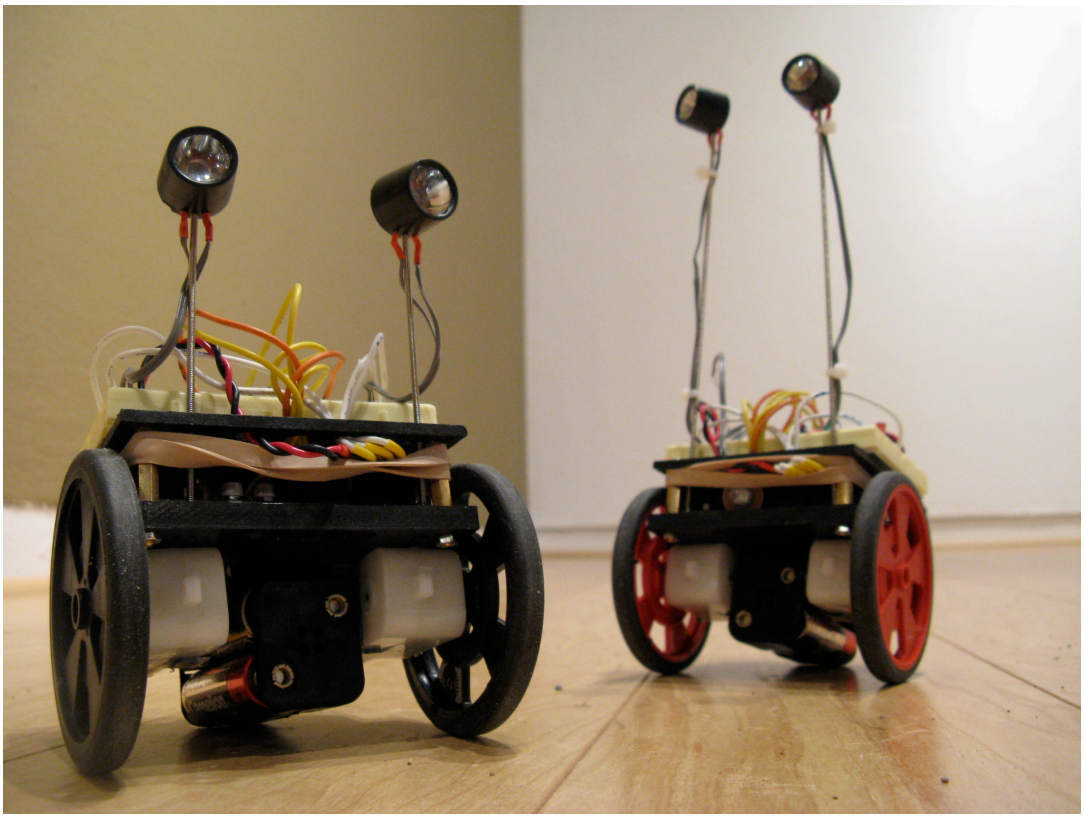

Figure 1. Steve Daniels, *Whimsy*, 2007. Image courtesy of the artist.

The material and electronic set-up of the project is as follows: the robots, or '*whimsies'*, are equipped with sensory-actuator routing rules and real-time feedback systems controlled by visual sensors attached to the body of the machine using wobbly lengths of metal - different heights on each individual bot - that

extend the visual sensors, or *'eyes'*, out above the bots. Aesthetically the whimsies can be regarded as simplistic DIY[5] constructions in that they celebrate the hand-made nature of the machine through exposed hardware components such as circuitry and a heaping bunch of multicolored wires housed inside a wooden construction. The scale of the robots is friendly; reaching only slightly higher than the viewers' ankles (Fig. 2). During the experiment they are unleashed into a large open space where they are able to move around and interact with one another as their sensual data is transformed into real-time action. Their movements, controlled by sensory motivated routing rules, can be interrupted or rerouted based upon their relations.

The foregrounding of the *Whimsy* bots' eyes draws attention to the fact that Daniels's robots are programmed to *see*. To what extent the objects are able to see and access phenomenological experience can only be speculated; though their behaviors - informed by sensory data acquired by visual sensors - tell us that they have some ability to act in an agentic capacity. The '*whimsies*' - as Daniels refers to the bots – have been created as "hardware agents" to try out neuroscientist Valentino Braitenberg's conception of artificially intelligent and autonomous vehicle types. In his 1984 study, Braitenberg describes potential behavioral

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[5] Do-it-yourself. As opposed to a more streamlined futuristic presentation of autonomous robots as solid sleek metal constructions that conceal the inner workings of the machine. The method of production draws its origins from the DIY movement; a movement that is primarily associated with the late 19th early 20th century Arts and Crafts movement. Synonymous with at home improvement and craft production, the DIY movement was offered as an alternative to modern consumer culture's emphasis on mass production and the reliance on others to satisfy one's material needs.

patterns, which can be programmed internally into vehicular machines, using simple hardware systems: a collection of environmental sensors, wheel-driving motors, various threshold devices and a few fictional components with special properties that are nonetheless logically and technologically plausible. Moving from programmable behavioral patterns to the idea of behaving machines, he proposes fourteen hypothetical types of autonomous vehicles, including robots whose light sensors control movements of attached wheels (on one or both sides of their bodies). In this manner, the *Whimsy* robots follow Braitenberg's hypothesis for the development of artificial intelligence, though, according to Daniels, were not entirely successful in their behavioral outcome at the time of their development as he notes; "at the time I think I

Figure 2. Steve Daniels, *Whimsy*, 2007. Image courtesy of the artist.

perceived them as failures -- they seemed too clinical or proscribed, perhaps. But they have come to occupy a different space for me. They were a very important stepping stone. They opened the door to *Sessile* and a current work tentatively called *Trace* (working title). I think they reflect where I was and embody a sort of naive curiosity that I have come to really like" (Daniels 2016).

In order to comply with Braitenberg's[6] vehicle designs, Daniels had to create two distinct behavioral forms across the eight whimsies, categorized as *a* and *b* (Fig. 3). The two sets of behaviors were developed to evoke two different reactionary impulses in the bots as they physically approach an object, which in the case of the project is established as a predominant source of light. Behavioral forms *a* and *b* are visibly distinguishable to the potential viewer based upon the robots' wheel colour; red or black.

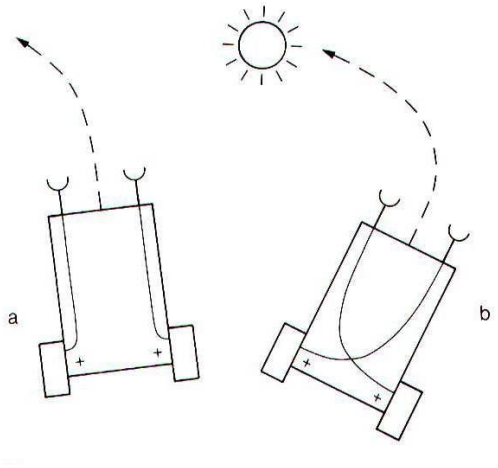

Figure 3. Valentino Braitenberg, Behavioral forms *a* and *b*.

When the visual sensors pick up light and communicate this sensory input to the robots' actuators, they will send the information to the robots' central brain,

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[6] Though Braitenberg is a primary source for such of Daniels' work he also takes inspiration, like his predecessor Norman White, from Grey Walter's tortoises Elmer and Elsie. Daniels asserts that "Grey Walter's work lives at the deep core of most of my experiments. I really admire the analog solution and the animated space he created -- Elmer and Elsie burn with agency. Obviously, *Whimsy* is a quite literal take on Braitenberg -- so the connection is simpler to draw" (Daniels 2016).

prompting them to behave. In the *Whimsy* experiment vehicle *a*'s visual sensors are connected to parallel actuators while vehicle *b*'s sensors are connected to opposing ones. Similar to the function of an eye, which flips images upon the retina to be inverted by the brain, vehicle *b* moves towards its visually targeted object - because it perceives its location correctly. Vehicle *a*'s parallel actuators obscure the bots' perception, driving it to the left and away from the object that was initially caught in its field of vision. Therefore, half of the whimsies will be able to perceive and target a light source while the other half will perceive a light source, which their skewed perception will drive them away from. The behavioral patterns of the *Whimsy* bots, their interactions, and the various environmental data entered to manipulate them create unique relationships in each iteration of the experimental performance.

Grasping Prehension

In a room of small autonomous robots whizzing and whirring around bumping into one another, hitting walls, and stopping unexpectedly before returning to action, one cannot avoid the sense of amusement and being caught up in a strange ecology. How does a *Whimsy* robot creature come into being? And of what importance does this being have in a sea of ever changing interactions between entities? How is a thing, a robot, - such as a one of the whimsies - formed through its experience of the world and what does it learn by way of an artificial sense of sight? In Alfred North Whitehead's process philosophy, all matter has equal ontological standing in the world as the fundamental elements of the

universe are “occasions of experience” that when overlapped together form a concrete entity such as a book, flower, pencil, a human being or a robot. The evocative temperamental aspects of each entity are influential to the collective interactions that form all beings. Everything is always in the process of becoming and more importantly “*how* an actual entity *becomes* constitutes *what* that actual entity *is*... Its ‘being’ is constituted by its ‘becoming’” (Whitehead 1978; 23). For Whitehead “the ultimate metaphysical truth is atomism” (Whitehead 1978; 35), suggesting that each individual entity is both unique and separate from any other, while each and every atom is also a “drop of experience, complex and interdependent” (Whitehead 1978; 18). Occasions of experience - or the processual formation of actual entities - point to an interconnectedness of all beings whose varying interactions will continually lead to new and unforeseen encounters. *Whimsy* robots’ phenomenological experience can be viewed in this light too. As one bot is flipped on and propelled into the wide-open space of the Peterborough Art Gallery, there exists a significant number of possible outcomes for the way it will move and interact in the space.

Imagine the visual sensors of a robot detecting a bright light to the left corner of the wide-open room. It begins to move forward towards the light. What separates this behavior from light-sensitive behavior of certain plants or animals? The machine takes in its environment causing it to *act* differently. One could imaging a *Whimsy* robot passing nearby the first, skewing the beam of light that it was following, impacting its experience of the world. Distracted, the robot may

stop momentarily before registering a new stronger beam of light streaming from an open door to its' right. The individual entity is unique in its construction, action and time of entrance into the gallery though it remains dependent on the interconnected forces within the gallery that influence and contribute to the machines' constant becoming. The whimsical experience - and all experience according to Whitehead's metaphor of *drops* - is imbedded in an interdependent ecological structure. Therefore, one could argue that the network of *Whimsy* bots and other interloping factors present an ecological model that shapes and informs the robots' becoming.

The *Whimsy* robots are complex beings, whose material aspects have been determined by Daniels while their behaviors are *occasioned*[7] by each new environment that informs their becoming in the world. Whitehead's ontology can be applied to an understanding of the *Whimsy* bots' capacity to accumulate and be influenced by occasioning, as in process philosophy there is no special ontological condition that can distinguish experience as it is known to humans, from experience as a mode of becoming that applies to "the most trivial puff of existence in far-off empty space..."; once again, there is no human-matter hierarchy and "in the principles which actuality exemplifies all are on the same

[7] The term occasioned is being employed in this context to illustrate the fact that the whimsies are both programmed robots developed by Daniels as well as autonomous entities that are able to evolve and change through their 'experiences' of the world around them. While these experiences are limited by the robots' capacities (programming and physical components), the cybernetic creature is still able to change beyond its initial state and evolve over time as it exists, experiences and behaves in the world around it. For example, the Daniels' *Sessile* pods - to be discussed later in this chapter - accumulate sensory data over time which will continuously affect their interactions with and interpretations of their environment.

level" (Whitehead 1978; 18). In the case of this positionality, experience can be understood as fleeting and momentary as it is based in each unique instance of existence for an entity. An entity's experience will also accumulate over time; every new experience altering and informing the next. All matter, regardless of its scale or ontological weight[8] can be argued to have an experience through its ability to *prehend*. Prehension refers to "any process – causal, perceptual, or of another nature entirely – in which an entity grasps, registers the presence of, responds to, or is affected by another entity" (Shaviro 2011; 29). Thus, prehension is the process by which entities become occasions of experience; a multitude of prehensions, which overlap, appear as relations or "drops of experience, complex and interdependent" (Whitehead 1978; 18). Prehension implies an active and therefore agentic assertion of an object's being onto another (here the object applies to both objects and subjects in the traditional sense that Continental philosophy uses them). In Steven Shaviro's reading of Whitehead, "there is no hierarchy of being. No particular entity - not even the human subject - can claim metaphysical preeminence or serve as a favored mediator. All entities, of all sizes and scales, have the same degree of reality. They all interact with each other in the same ways, and they all exhibit the same sorts of properties" (Shaviro 2011; 29). As a consequence of the dismantling of subject-object hierarchies, each

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[8] This term, ontological weight, makes reference to Continental philosophy's prioritizing the ontological status of organisms based on their levels of complexity. According to this model, the 'ontological weight' of a human is viewed greater than the ontological weight of animals, plants, inorganic matter, and subsequently robots, which may have access to experience, yet in a way that is simplified due to its more limited capacities of perception and action.

interaction within an ecology becomes equally important to the ontological sphere as a whole.

The *Whimsy* robots, as their prehended environment is transformed by way of the physical components of their sensory-actuator rerouting rules, are able to act and perform with/against one another similar to the ways in which sentient beings perform in the world around them. Their programming causes the *Whimsy* bots to experience the world in a particular way. Therefore the bots are transforming their own environment through experience; an experience that is unique to each individual entity. The objects possess lifelike qualities to which we can relate as human beings. This is not to say that *Whimsy* bots' ability to intake and respond to phenomenological cues cannot be differentiated from human phenomenological experience. The human agent and nonhuman agent do not necessarily experience the world equally; what the Whiteheadian model proposes is the possibility that they equally have access to an experience.

The Lure of Feelings

Daniels describes the functions of the machines - envisioned by their programmed behaviors - as following two types of patterns. In the first group, a bot is programmed to act according to Braitenberg's behavioral pattern *a*; with its sensors connected to parallel actuators. The bot programmed to follow behavioral pattern *a* intakes the visual data, which is processed through parallel actuators that skew its perception, causing the bot to veer off in the wrong direction away from the light source. The whimsy's target is never reached; it sees another light and the

cycle of failed perception continues (Daniels 2015). The lure of the bots's programming draws the bot towards the light and propels it to action but never the correct kind. This robot's parallel actuators will never allow it to achieve its goal of reaching the source. The *Whimsy* robot is attracted to the light which it prehends and seeks to engage with - or at least move toward - however it is unable to actualize its desire. The light presents itself and then is drawn away from the robot, evading fulfillment or closure. For Graham Harman, contemporary philosopher and co-founder of the object-oriented ontology branch of Speculative Realism, this evasion, or what he refers to as withdrawal, is a quality inherent to matter. According to Harman entities do not act or decide to enter into clear relations. Rather, he offers a radical rethinking of ontology by focusing on the way that objects simply *are,* arguing that all entities *withdraw* from being fully present to one another. The thing is like an iceberg in that the majority of its qualities - physical, theoretical, historical, material, etc. - are hidden or withdrawn. Only a *first-object-perspective* can be apparent to a thing. I offer the term first-object-perspective as a counterpoint to the first-*person*-perspective, in order to suggest that an experience - though not homogenous in its essence - is accessible to different forms of human and nonhuman matter. The perspective of a human of thing refers to a particular attitude towards, or way of regarding, something; a point of view that differs across ontologies. An entity can only fully prehend its own existence and subjective *primary* experience.

For Harman, the access to *agency* - which I will unpack further in the next section - is granted by the things' inaccessibility to one another and ability to withdraw from full comprehension. Whitehead's agency, I believe, similarly lies in the things' ability to prehend. Prehension is assertive; though the prehend*ed* entity can never be fully apparent or accessed by another being, a notion that Whitehead and Harman share. This understanding of a mystified or opaque exchange between entities is negotiated by the "lure of feelings" (Whitehead 1978; 25, 184) characterized by an attraction, allure and metamorphosis. Perhaps what the Whiteheadian model suggests is that the thing's agency lies in its ability to draw in as well as to withdraw. I can posit that, for Harman, the agency of a whimsical object lies in its unknown qualities, the mystery inherent to that playful and mischievous thing, whereas Whitehead may insist that whimsical things' agency is manifested in its ability to lure in another being without fully engaging with it. When approaching the thing from these two angles we may arrive at the same conclusion from two alternative perspectives. Both philosophers highlight that mercurial essence of the thing, which bubbles deep below the surface. One from the perspective of the object as it withdraws its molten core, the other from the perspective of the outsider pulling and grasping at the seeping lava as it melts away. What does this mean for robots, cats, ice cream cones, Judith Butler, paper clips and churros (to make a playful reference to OOO philosophers' tendency to make quirky lists - specifically Ian Bogost's use of the Latourian Litany [coined in his book *Alien Phenomenology*] to flatten the world of things and emphasize the

"bestiaries of things" (Bogost 2009))? This understanding of the underlying essence of objects can be used to grant them agency within the flattened ontological sphere. So, how do we begin? Let us attempt to rewrite the grammar of agency.

An Alternate Grammar of Agency

According to anthropologist Alfred Gell, enchanted objects are imbued with agency due to their social relations. Social agency is not restricted to human beings or even to animate matter, "it does not matter, in ascribing 'social agent' status, what a thing (or person) 'is' in itself; what matters is where it stands in a network of social relations" (Suchman 2007; 239). The robots, or any other human/nonhuman actor "never really acts alone. Its efficacy or agency always depends on collaboration, cooperation, or interactive interferences of many bodies and forces" (Bennett 2010; 21). The *Whimsy* robots' performative interactions are choreographed through each affective installation in which they take part. Each iteration of their performance is unique as it is construed and influenced by the agential aspects of the whimsies' environment. The robots' being depends not only on its material and programmed configuration but also on its interaction with other acting entities. The interactive interferences depend on the coming together of a set of elements. These elements can include the robot's environment, the number of bots deployed in a given space, and/or the human-machine interactions that may or may not take place during the course of the *Whimsy* bots' actions. Each

aspect of the scene of performing entities is influential and important to the durational outcome of such an event.

The constellation of theoretical frameworks that has helped me in formulating my argument is notably situated on the de-politicized end of the philosophical spectrum - here I am mainly speaking to the speculative realists and more specifically object oriented philosophers such as Ian Bogost and the anti-political Graham Harman; who is often critiqued for his liberal bourgeois positionality as he calls for the theory based in ontology that should not be politicized. I find particular interest in the development of critical and political lens that can be applied to theories of object liveliness and agency. While Whitehead, Ian Bogost and mainly Harman remain on the periphery of political commentary, feminist theorist Jane Bennett asserts herself into a larger more critical discourse around object agency and 'vibrant matter'. I find it essential to include Bennett's framing of objects and their agency as she positions herself in the center of a critical and politicized discourse to which the figureheads of object oriented philosophy - Graham Harman, Ian Bogost, Timothy Morton and Levi Bryant (frequently described by critics of the movement as a problematic 'boys club') – often only subtly allude.

Jane Bennett, in her turn towards vibrant materiality posits that we must "rewrite the default grammar of agency, a grammar that assigns activity to people and passivity to things" (Bennett 2010; 119). I agree with Bennett in her position and seek to ascribe a new understanding of agency to both human and nonhuman,

animate and inanimate things. Bennett coalesces affect with materiality, as two inseparable aspects of every *thing* in the world. For Bennett, affective capacity is established through the constant interactions between temperamental actants, – or matter - which can be described as their *distributive* agency. Distributive agency refers to an "agentic assemblage" or "confederation of human and nonhuman elements" (Bennett 2010; 21). In other words it represents a constellation of forces which act upon one another to create a larger effect. Bennett's example of the quirky 'federation of actants' is the famous blackout that occurred in North America in 2003, affecting 50 million people. Bennett proposes the electrical power outage as an illustration of this distribution through the ways in which agency "extrudes from multiple sites or many loci—from a quirky electron flow and a spontaneous fire to members of Congress who have a neoliberal faith in market self-regulation" (Bennett 2010; 28). The scale and affective ability of the blackout was made possible by the scale and distribution of electricity across Canada and the United States and the infinitesimal number, and multiple scales of, actants which influence the grid's function or malfunction. Thus a failure in the massive grid resulted in a crippling blackout distributed across a vast territory. In this analogy, all of the actors were responsible for, and essential to, the grid's collapse. Thus agency is distributed across singular elements of matter that also form a collective whole, making reciprocity a key function to asserting oneself and being affected by agentic matter: "The vital materialist must admit that different materialities, composed of different sets of protobodies, will express

different powers… Humanity and nonhumanity have always performed an intricate dance with each other. There was never a time when human agency was anything other than an interfolding network of humanity and nonhumanity; today this mingling has become harder to ignore" (Bennett 2010; 31). We can consider the inclusion of objects in larger networks of social human and nonhuman relations through the lens of Bruno Latour's Actor-Network-Theory, which I will return to later in this chapter. This interfolding of humanity and nonhumanity presents us with a larger framework from which to study and interpret social relations and events - one that includes all 'actors' regardless of their status as 'human', 'object' or 'other'.

This method of theorizing the network is represented in much of the robotic work to which I have referred. Works such as *Ménage*, *Whimsy* and the works included in the exhibition *Cybernetic Serendipity* present us with networks of technological beings that also respond to and interact with larger distributed networks around them, such as human interferences. Another such work is David Rokeby's *n-Cha(n)t*, 2001, which is a community of interconnected computer monitors, which respond to, and augment, one another's chatter. The viewer may enter into this community, becoming subsumed into a dark room of interactive computer screens, each presenting the viewer with the image of an ear, ready and waiting to listen and be heard. The large room-filling installation has been exhibited in a number of different locations and iterations as technology is adapted to ever changing contemporary standards. The version that I would like to

address is the 2001 installation of the work at the Walter Phillips Gallery, Banff Centre for the Arts (Rokeby 2010). In this edition, like the others, a community of computers were suspended from the ceiling as they spoke together in unison, speaking amongst themselves while awaiting a human interloper to enter the scene and activate the community in a new way, allowing for a human/machine engagement. The seven suspended computers ran voice recognition software that allowed for free-association and language generation by the machines. This software was run off of Mac Computers that were floating in the air - also suspended - above the monitor screens. Speaker sets and small microphones hung amongst the constellation of monitors and machines. The disembodied floating technological creatures appeared as haunting human figures represented only by images of ears and the sounds of programmed vocal responses, which were improvised by the computers.

In describing the work, Rokeby claims to have felt an aspect of loneliness, which he admits to have likely projected onto the machine (Rokeby 2010). This affect inspired the artist to create a massive network of interactive 'listening' computers and allow them to act and interact in a social group while responding to and interacting with one another. *n-Cha(n)t* became a community, which communicated and, if left uninterrupted, would eventually sync up; chanting a shared stream of communication due to their continuous reading of and responses toward one another. Visitors had the opportunity to interrupt the synchronized chanting of the beings disrupting their flow of communication. The objects were

both agentic and submissive in that regard. Like a human in the networked system of the exhibition, the computers themselves had some capacity to act and change the interactions of that system while constrained by their physical being and programming capacities.

The relationship between human and machine may be solitary. When observing video documentation of Rokeby's 2001 installation one can observe the dark room filled with lively machines depicting disembodied ears; their human essence divorced from the body, representing the abstracted form of a 'creature' that was solely created for the purpose of listening. The machines may be comforting in their receptive depiction of the auditory sense, at the ready to embrace the human's speech. *n-Cha(n)t* is a community of computational 'bodies'; an ecology of computers functioning in unison or being disrupted by new relations of human interference.

n-Cha(n)t presents a unique relationship that is developed between human and nonhuman. The human, in this instance, holds the ability to manipulate and influence technology. The computers act in a way that is passive to the active human subject. The relation does not create a response that mimics human-to-human interaction. Rather, as Rokeby observes, the computers offer a cold solitary feeling that alienates subject from object and perhaps visa versa. In this interactive exhibition the human remains a subject in that they control and manipulate their computational counterpart; the social relations, though they may exist, are perpetuated by the human.

In contrast to the interwoven community engagement presented by *n-Cha(n)t*, Rokeby's *Giver of Names*, 1991, presents a singular relationship between object and machine. *Giver of Names* is a computer system that is able to understand and respond to language in a limited capacity (compared to that of humans). The system is able to detect and respond to material objects, asserting some capacity for lively intelligence without consciousness. The installation includes an empty pedestal, a video camera, computer, and a video projection. As the camera observes the empty pedestal, an assemblage of objects is placed upon it. An assortment of things is observed by the machine and read through image processing that includes outline analysis, division of objects into separate things or parts, colour analysis, and texture analysis. These processes are made visible on a large-scale video projection, abstracting the objects to their analytic parts. This analytic process is linked to a database of terms describing known objects, ideas and sensations from which the *Giver of Names* will collect and display a series of words offered as a description for the grouping of things. This description is not literal but rather metaphorical (Rokeby 2010). The relationship between object and machine - both observing and being observed from a first-object-perspective - allows them to interact in an isolated and singular fashion. The machine as namer and the objects as recipients of a name act in a system of engagement that is solitary.

In contrast to the human subject controlled *n-Cha(n)t*, *Giver of Names* calls on the computational device to take on the role of subject. According to 20th

century cultural critic and sociologist Theodor Adorno 'subject' and 'object' are not given categories but rather abstracted products of conceptual thought (Kiloh 2007; 104). The classification of subject and object comes from the relations of power and control (closely linked to modern disenchantment which I will discuss in Chapter 3). Rokeby's *Giver of Names* subverts this relationship as technology takes on the role of the subject by classifying and naming assortments of objects.

When exploring the interactive assemblages created by machinic and ecological agents, and more specifically the assemblage surrounding the *Whimsy* robots, I feel it important to consider the human element(s) (not as actors holding the most ontological weight in the scene, but as participants/agents in the ecology) as they align most closely with my perspective of the world.

Resonances and Resemblances between Human and Machine

As the *Whimsy* robots scoot about the wooden floor modifying one another's actions while their software routes and reroutes their movements, they appear as cute and accessible robots; more similar to the titular character of *WALL-E*, 2008, a cute and lovable robot, which fumbles about a deserted planet without posing any threat to a human observer, than the sublimely monstrous Decepticons from the *Transformers* series or mechas, known as Jaegers, from *Pacific Rim,* 2013, whose solid metal bodies stand taller than most skyscrapers and are outfitted with weapons that impose a lingering feeling or helplessness in the human viewer. The small unimposing *Whimsy* bots were built and

programmed by Daniels as an experiment in artificial intelligence, as I mentioned earlier.

On the surface, the robots appear as objects developed for the viewers' amusement with their accessible scale and anthropomorphic attributes, such as eyes. Daniels proposes that this anthropomorphization of his robotic creations is motivated by a quest to uncover a nonhuman agency. Daniels mounts eyes atop the machine because "[they] are strong triggers of emotional response for humans" (Daniels 2016). The aesthetic of giving the work 'eyes' is only one aspect of Daniels' play with humanizing the nonhuman. He is also interested in the the behavioral space of anthropomorphizing objects. The actions and lively behaviors of his bots "present a crack into an inner world that people fill very fast," Daniels "set[s] the stage so that the audience can't help but start projecting (anthropomorphizing) -- once that happens the language around a work can become very open and fluid". When responding to human interactions with his work, Daniels observes that "people come to speak about their relationship with the work that they would not use if it was "just" technology. They speak in terms that are intimate and empathetic...I think it is the basis of human communication and it sets up a site to really think about ways we connect" (Daniels 2016). Thus both the aesthetic and behavioral anthropomorphizing of robotic creatures creates deeper, more intimate and complex relationships between human and machine. As such - and as we will see later in the chapter in the case of *Sessile* - we may feel

empathy towards, and a connection with, the cold, hard, mechanical body of the machine.

However, while the *Whimsy* bots can act for human observers in a way that is intimate, whimsical and exciting for the viewer, their action and interaction need not be perceived and mediated by humans to validate their ontological capacity. The anthropomorphic attributes of the machines, and the cute and quaint nature of their scale and design may call into question their autonomy apart from a human observer but these have little effect on the experiences of the robots themselves, in the same way that the look of an animal that appears cute to human perception has little anthropomorphic significance for the animal itself.

I am aware of the problematic aspects of assessing these objects by way of both anthropomorphic and object-oriented lenses, due to the two frameworks' overplaying and ignoring of the significance of human actors respectively at times. At this point I would like to propose that the speculative evaluation of one entity by another requires that each thing consider the other from its first-person/ object-perspective with the knowledge that the perspectives of others may never be fully present to one's epistemological reach (yet still exist). Moreover, these perspectives require that the entity which perceives another and assesses that thing through its own lens of existence, including evaluation based upon prior experience, embodied knowledge, etc. which will differ amongst individual entities. It is possible that anthropocentrism may be an entrance point, from a first-*person*-perspective, to understanding similarities and differences between subjects

and objects while granting all entities agency. Vital materialist Jane Bennett claims that: "a touch of anthropocentrism can catalyze a sensibility that finds a world filled not with ontologically distinct categories of beings (subjects and objects) but with variously composed materialities that form confederations. In revealing similarities across categorical divides and lighting up structural parallels between material forms 'in nature' and those in 'culture,' anthropomorphism can reveal isomorphisms" (Bennett 2010; 99). Thus drawing resonances between beings can simultaneously reveal their distinctions. We can assert that anthropomorphizing nonhuman entities does not negate their agency but rather can act as an entrance point to imagining their experience of the world. In a collective of human and nonhuman entities "an anthropomorphic element in perception can uncover a whole world of resonances and resemblances...We at first may see only a world in our own image, but what appears next is a swarm of 'talented' and vibrant materialities (including the seeing self)" (Bennett 2010; 99). In speaking of talented vibrant materialities, the collective or swarm of beings becomes a crucial aspect of thing being. The whimsical entity draws its vitality from the multiplicity of actions and interactions into which it may enter. This living and engaging swarm seems to be a point of departure for many theorists regarding the agency of objects and becomes crucial to understanding Daniels' conceptualization of the whimsies.

The Swarm

One of Daniels' primary motivations when developing his work is fostering an aspect of 'togetherness' and 'sociality'. His fascination with swarms (ants, fish, flocks, bacteria) stems from his background in biology. For Daniels "the swarms of robots I imagine are not cold -- they seek one another, not to dominate, but to be sustained. As Braitenberg would say, they are in love" (Daniels 2016). He describes *Whimsy* as a buzzing hive of small mechanical creatures that swarms around an empty room, with nothing but flashes of light to guide them (Daniels 2015). These things form a whimsical constellation, a collective unit composed of individual entities. The multitude moves in melodic swipes to-and-fro. A meditative quality emerges from the pulsating throng of robotic beings. One could just sit and watch as they move about crashing into one another, joining together on a similar path before diverging, though we know they will return together again as they flock towards an interaction that is necessary of the swarm.

The swarm is a collective gathering of a mass number of entities of a similar type. When we understand that collectivity and interaction is an essential aspect of the swarm, "the task becomes to identify the contours of the swarm and the kind of relations that obtain between its bits" (Bennett 2010; 32). The *Whimsy* bots do not function as alienated individual things but rather, as interwoven and connected entities, which form and inform one another.

The swarm appears as a reoccurring theme in contemporary robotic art. Montreal based robotic artist Erin Gee offers a feminist reading of robots, which

puts a greater emphasis on the emotional qualities that technological beings may convey. Her performative installation *Swarming Emotional Pianos*, 2012-ongoing, is a collective of biosensing robots that performs in a cybernetic constellation of musical mechanical bodies (Gee 2014). They create a swarming body of robots that buzz and hum around a human body, reading its biological data and responding through sound. The robots create a cybernetic musical performance controlled by the emotions of a human at their center. The swarm buzzes around a human body, lying still on a simple white platform. The human body exudes biodata in the form of respiration, heart rate, and galvanic skin response (sweat) which, in turn, is read by the robots and transformed into harmonic chamber music corresponding to the emotional status of the human. The swarm moves collectively back and forth surrounding and reading the body, dancing in unison to the beat of the body's emotional drum; a collective relationship between human and machines, woman and objects.

Graham Harman opposes the collective relationality of objects, viewing them as separate and withdrawn characters in the world. I prefer to offer a feminist new materialist methodology to the reading of objects in relationship to reciprocity, as opposed to withdrawal, that necessitates the objects' creation and being. Matter is dynamic, as Shaviro asserts "no amount of information can ever exhaust the thing" (Shaviro 2011; 117). We could posit the existence of fully withdrawn and inaccessible objects (I explore this in the next chapter in relation to Leibniz's monads); however, this does not negate the possibility for collective and

interdependent action (the *reciprocity* within causal relations beyond the metaphysical). Harman concedes, perhaps unknowingly, to the connected nature of objects as he states; "the world swarms with individuals" (Shaviro 2011; 104). The individual non-relational element remains, however; Harman's use of the term *swarm* implies a connectivity between things that are withdrawn, such as a swarm of bees that buzz about together.

My understanding of the importance of relationality resonates more with feminist new materialist approaches to object oriented ontology. Though new materialism and object oriented philosophy share a critique of representation, they emerge from very different histories as OOO takes root in the rejection of correlationism while new materialism borrows from a lineage of feminist discourse. Rebekah Sheldon addresses the points of diversion between feminist new materialism and OOO through their unique treatments of knowledge. For object-oriented ontologists, epistemology is "epiphenomenal, a second-order representation whose range of effects is limited to human knowers" (Sheldon 2015; 196). As an alternative, the feminist new materialist understanding of epistemology views it as something "with direct material consequences" (Sheldon 2015; 196). New materialists expand the ascription of agency, as understood by OOO, to include non-material forces, which are equally able to change and influence relations in the world. Thus, for new materialists, "ideas and things do not occupy separate ontological orders but instead are co-constituted in the production of the real" (Sheldon 2015; 196). When gathered together in a

collective ecology, how can these material and immaterial bodies or 'forces' commingle to constitute one another's experiences? It is through an interactive assemblage of biologically functioning mechanical creatures that we may seek to understand the experience of the nonhuman within a collective of autonomous pods?

Mechanical Biology

Sessile, 2008-2011 (Fig. 4), by artist Steve Daniels, is a collective of sensing robotic pods, which are affected by environmental stimuli and more specifically, changes in their perception of ambient light. The objects function in a way that mimics the organisms from which they take their name. Sessiles are organic things, which are fixed in one place; such as barnacles, flowers and coral. Daniels reference to ecology in the naming of his work is reflected in its functioning. Like organic beings such as barnacles, the actors of *Sessile* form an interactive colony whose members respond not only to changes in ambient light but also to changes in the emotional status of other *Sessile* pods around them. The apparatuses of *Sessile*, though their function reflects a biological logic or bio-logic, are aesthetically mechanical and robotic. Wires and the controlling "*brain"*[9] of the machine, a small micro-controller based hardware board, are deliberately exposed, making the *Sessile* pods appear vulnerable. The objects are obviously synthetic while, in contrast, their living experience and exchange of affect elicit

[9] In this context I am not referring to a literal brain but rather a metaphor for the software and hardware components that control and regulate the mechanical body of the robotic creature.

sympathy, which is something that is often reserved to interactions between humans. *Sessile* expresses emotions of pain and anxiety, which are tangible and able to affect the human viewers' emotional responses towards the mechanized objects.

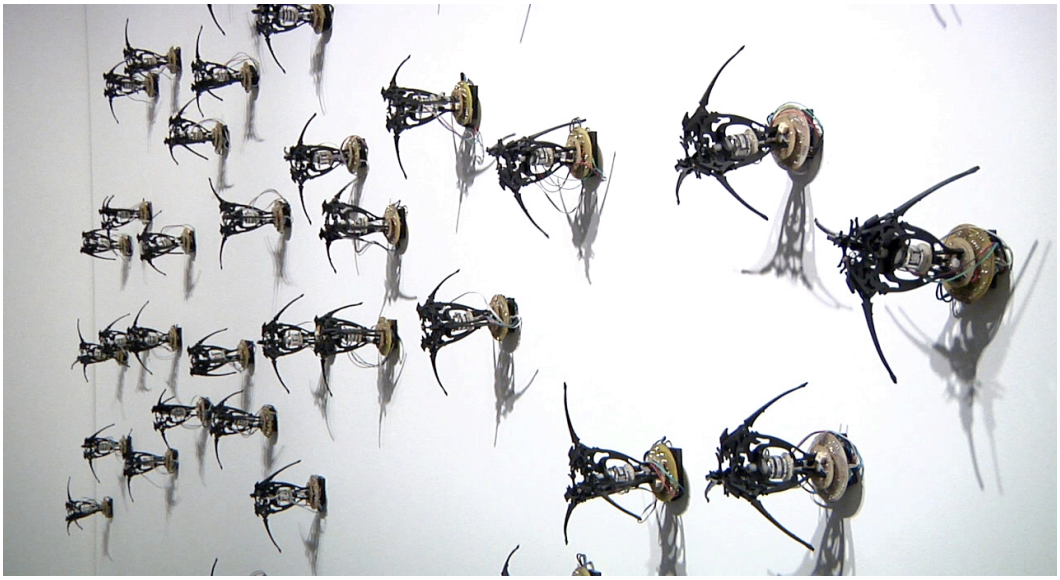

Figure 4. Steve Daniels, *Sessile*, 2008-11. Image courtesy of the artist.

Sessile pods share the common ability to act and react based upon their intake of environmental data by way of light sensors and interconnected wiring, which bonds all of the pods in the colony together. However, each pod will react uniquely to its environment. Such differences arise from a multitude of factors, which vary between mechanical creatures. These factors include variations in the objects' data intake and experience, their orientation to the ground or height on the wall, as well as their internal emotional state, which is influenced by their accumulated responses to light.

The pods are controlled by linear actuator motors, which move the armatures in and out, rather than a traditional rotating motor. The motor is controlled by a photocell sensor mounted to the front of the pod, which responds to light. Infrared sensors and infrared LED bulbs are mounted to the slides of the pods, which allow *Sessile* colony members to communicate their levels of stress amongst one another through the reception of connotative infrared light displays. The behavioral patterns coded into them consider the biological function of other sessile creatures in nature. Given that the pods are fixed to the wall - unlike outwardly mobile animate beings, such as dogs, birds, slugs and humans - Daniels thought it important to consider the formal and functional implications of stationary biological entities. In structuring the objects Daniels gave them radial symmetry, locating the arms around the object and making them move and contract in a radial fashion. Sessile entities in nature do not posses a back and front - unlike humans - but are rather radially symmetrical. This means *Sessile* pods sense data all around them and respond using their radial armatures (Fig. 5).

The sessiles perform biology. They are dispersed, dynamic, performative and topographical. Their material components are not biological (living organisms) but their functioning is. Each pod within the network of embodied performers is a unique agentic actant, which contributes to a particular outcome of their relations. Each of the *Sessile* pods has a body and brain, with the body composed of hardware components that have been complied into an new thing by the artist. The brain is a particular interpretation of hardware, which houses the

majority of the software program that communicates with and responsively controls the entire body of the machine. The body and 'brain' constitute one another through their reciprocal engagements and interactions with those around them, shaping the object's embodied actions.

Figure 5. Steve Daniels, *Sessile*, 2008-11. Image courtesy of the artist.

Inorganic Embodiment

When turned on for the first time - in each iteration of the object's installation - all of the *Sessile* pods' '*brains'* – or the machines' software systems - are the same. They have the same programming and level of data information. Their physical components are also identical. It is due to 'lived' experience that the *Sessile* pods begin to differentiate themselves from one another. Their

accumulated sensory data is stored in each pod's brain and will inform the object's present and future actions, based on embodied past experience. Each pod will have a unique and individualized first-object-perspective during its exhibition life. The *Sessile* pod's ability to intake information from its environment and be uniquely influenced by it over a period of time presents an element of autonomy and processual development within the machine. The sessile's AI allows it to be ever evolving like Stanley Kubrick's intelligent computer HAL from *2001: A Space Odyssey*, likely with a much less violent outcome.

When one *Sessile* pod perceives a shift in ambient light, it will register this information (though its frontally located photocell sensors) and communicate the data to its internal brain system. The machine will simultaneously store the information it receives and respond to it through real time action. As the *Sessile* pods get more and more agitated due to changes in ambient lighting, their response will be informed by both past and present experience of their environment. As their sensory perception data builds up and the *Sessile* pods become more anxious, their embodied experience will be reflected through their responsive action - the movement of the metal armatures surrounding the *Sessile* pods' bodies and brains. The pods will also communicate their anxiety to the colony through a mode imperceptible to human vision. Their unique experience of vision, conducted by infrared sensors, allows the colony members to communicate their emotions and affective states amongst themselves. Their collective

experience also influences and compounds each individual object's anxieties as the sessiles warn one another about changes in their environment.

The sessiles bodies occupy space. For Jason Farman, an embodied experience is always a 'spacial practice' as he notes; "trying to imagine a body without space is impossible. Bodies always take up space, and, as Henri Lefebvre argued, are spacial in and of themselves" (Farman 2012; 19). Embodied experience is also associated with a body's sensory registers of the world around it. I am aware that embodied experience is processed through cognitive means - but this is not the only mode of sensing or experiencing one's own body. I would like to explore the sensory nature of embodiment (proprioception as some scholars call it) as it relates to the *Sessile* pods' ability to sense and then respond to their environment. Perhaps cognition need not be the primary mode of experiencing embodiment. Maybe the pods' ability to respond to the world based on their affective encounters with their surroundings grants them access to embodiment. Though we cannot be sure of the robots' embodied experience or any embodied experience outside of our own we can posit that perhaps, one some level, their programmed responses to sensory stimuli insinuate a connection between the 'brain' and the body of the machine.

The *Sessile* pods' embodied experience of their environment is of an affective nature. The pods perform their experience of anxiety through the movement of their clamp like arms. The sessiles' arms open and close at different rates depending on their levels of anxiety until the pods become so overwhelmed

with emotion that they go dormant or 'play dead' as many biological creatures will do in order to trick their predators into thinking they are no longer alive. After they recover from the experience of trauma, the pods will begin to slowly move and return to life.

Pre-Sensuality and the Micro-Perception

Imagine a colony of *Sessile* pods lined up against a white wall of a room in an undistinguishable and unknowable space (Fig. 6). The space, place, and time do not matter to us. These are not the elements of the scene that affect us. Something is making us sad at the precognitive level (which bubbles up and turns into emotion) and then we feel pain. There is a lingering sense of unease and the tension in the room is palpable. Someone or something is experiencing deep levels of anxiety, which is obvious as it passes from thing to thing all across the room until it reaches us. We look at the wall of mechanical beings: an ecology of agents acting and interacting with one another and now us. Some of the pods are moving and some lay dormant. Some twitch and flutter with nervousness. They flash infrared light towards one another, a mode of communication, which we are not privy to; however, we do understand that they must be able to communicate in some way as the tension within each builds and then seems to expand like a wave crashing into the neighboring pods (Daniels 2015). Daniels built and programmed these creatures to insinuate the experience of anxiety at a collective, transcorporeal level. It is the viewer, the one who is interacting and moving around the machine, that causes (what may appear to us as symbolic reactions to)

anxiety and pain. We are meant to feel sympathy for the mechanical creatures in return (Daniels 2015). Each time a person passes before a section of *Sessile* pods they will see them begin to move and twitch spastically, expressing their anxiety caused by our presence. One may wonder what the pods are 'feeling'.

Figure 6. Steve Daniels, *Sessile*, 2008-11. Image courtesy of the artist.

Sessile pods' experience of affect is perceptible to humans through their responsive behaviors. Affective experience is often related to emotional experience although it does differ in its essence. Affect, according to philosopher Baruch Spinoza and his successors Henri Bergson, Gilles Deleuze and Félix Guattari, is characterized by embodied experience that is realized through different states - which, according Spinoza, exist in three primary types: pleasure or joy (laetitia), pain or sorrow (tristitia) and desire or appetite (cupiditas)

(Spinoza 2001; 141). Brian Massumi moves beyond this classification to further distinguish between affect and emotion. He similarly characterizes affective experience as a state of the body; however, he expands this framing to suggest that affect is a pre-emotional and precognitive bodily experience: a type of *micro-perception* that alters the body's capacity to act - either enhancing or diminishing - for a moment, which rests between the individual's perceptible and imperceptible experience of embodiment (Massumi 2015). *Micro-perception* lies within the slippery ether of pre-cognitive experience prior to full perception and a fully actualized realization of emotion. Affective experience is not a personal or biographical feeling that is recognized by the embodied individual but is rather *prepersonal* (Massumi 1987; xvi). It is prepersonal in that it is not informed by the embodied individual's personality or social experience of the world. Affect is a mode of preparation that is inherent to the body - it prepares an entity for the necessary reaction to the affecting stimulus. The body's micro-perception cannot be fully captured by language because it "doesn't just absorb pulses or discrete stimulations; it unfolds contexts" (Massumi 2002; 30). The affective response cannot be captured through language, as it is preconscious and prelinguistic. Rather, it is expressed through physical actions such as facial expressions, posture, respiration, etc. In other words, access to affective experience is not restricted to bodies with the ability to exert language to communicate.

Massumi's theorization of affect also highlights reciprocal interactions between the affected and the affecting body. The body does not experience affect

without the assertion of external forces onto it. Affect can also be transmitted between bodies: "When [a] body infolds a context and another body (real or virtual) is expressing intensity in that context, one intensity is infolded into another" (Shouse 2005). The micro-perception in this context can be compounded through resonating experiences of affect between bodies: "By resonating with the intensity of the contexts it infolds, the body attempts to ensure that it is prepared to respond appropriately to a given circumstance" (Shouse 2015). Thus affect, though it is an individual precognitive embodied experience, depends on reciprocal interaction between bodies.

The *Sessile* pods encounter an affective experience through their precognitive physical response determined by their sensory perception of the environment around them. The micro-perceptions registered by the pods (specifically light variations determine the pods' physical reaction and an inherent action based in their coded performativity of 'biological' function), and the subsequent responses caused by stimuli, appear to us as a simulated act of self-preservation. The mechanical creatures may close their arms, for example, making reference to animal behavior – or as prey hiding from a human 'predator'. They are programmed to communicate to other pods around them by sending out alert signals through their infrared displays; in order to prepare the rest of the colony for an impending threat. According to affect theorist Patricia T. Clough "the turn to affect points to a dynamism immanent to bodily matter and matter generally - matter's capacity for self-organization in being informational - which, [Clough]

want[s] to argue, may be the most provocative and enduring contribution of the affective turn" (Clough 2010; 207). Thus affect, as an inert prepersonal experience, is expressed through the coded precognitive reactions of the pods' responsive bodies. Affect precedes thought and is a stable function that is necessitated by the *Sessile* pods' development. The pods cannot stop or alter their actions - determined by changes in their environment - as their response is intertwined with their expression of, and mode of, being.

The *Sessile* pods can be considered actors within a network of reciprocal interactivity. French Philosopher Bruno Latour theorizes actor interactivity in his popular actor-network-theory, which emerged during the mid-1980s and was also influenced by the works of Latour's contemporaries Michel Callon and John Law. Actor-network-theory, also known as ANT, is a conceptual framework for exploring the collective sociotechnical processes, particularly in the field of Science and Technology Studies (Ritzer 2004). ANT is interested in the dismantling of binary structures such as the differentiation between science (knowledge) and technology (artifact) as well as between society and nature, truth and falsehood, agency and structure, context and content, human and nonhuman, and microlevel and macrolevel phenomenon (Ritzer 2004). Reciprocal interactions are key to the formation of actors. ANT supports *relational materiality,* which is the material extension of semiotics that suggests all entities achieve their essence through their relations with others. Associations, or reciprocal interactions, within networks provide the actor's definition and naming,

granting them substance, action, intention and subjectivity (Ritzer 2004). A priori to the actor's reciprocal engagement, it does not have any substance or essence; this is only achieved by its involvement in a network. ANT depends on the shifting signs and symbols, which emerge from the actor in its different networks. An actor may enter into multiple networks depending on its time, location, scale, and relationally.

The macro and micro scales are important to consider in these networks as multiple networks may intersect or overlap around and within entities. The *Sessile* pods are functioning in a multitude of relational engagements of different scales. At the most easily identifiable level, at least for human viewers of the work, the pods are incorporated into a network of interactions amongst themselves. At a less apparent level each pod has its own internal mechanical network, which includes - and controls - its ability to prehend other *sessiles* and become incorporated into the aforementioned larger network: "An actant never acts alone, its efficacy or agency depends on collaboration, cooperation or interactive interference of many bodies and forces" (Bennett 2010; 21). Similarly, "bodies enhance their power in or as a heterogeneous assemblage" (Bennett 2010; 23). Agency is distributed across an ontologically heterogeneous field, rather than being localized in a human body or in a collective produced only by human efforts. This distribution represented in Latour's ANT is indebted to Deleuze and Guattari's understanding of *assemblages* (Deleuze & Guattari 1993). Assemblages are temporary groupings of diverse matter, which present different modes and capacities of living. The ad

hoc nature of the assemblage is present in the sessile's performativity due to its ever changing micro-perceptions and the 'brain' as well as the dynamic ecological network in the gallery, which is populated by human and nonhuman elements. It is in the assemblistic ecology of the gallery space (or any space that houses cybernetic bodies) that robots emerge as vessels capable of conveying emotion and behavior, as behaving entities that have a life of their own.

Chapter 3:
The Return of Wonder

> Enchantment is the rupture in the world that on the one side opens it up to asking and giving, on the other betrays it.
>
> -Stephen David Ross[10]

A slow, sedimentary meditation on measurement, data and documentation; this was the inspiration behind Steve Daniels' creation of the *Device for the Elimination of Wonder*, 2015, (Fig. 7) hereon referred to as *Device*. The object is mechanical. Its cogs twist and turn as it is driven back and forth across a wire tightrope held at roughly torso level. A length of paper folds and snakes out of the machine before puddling on the floor beneath the device. The object is meditative; the slow and monotonous movements of its measurements hypnotize the viewer. *Device*'s mechanical arm swings forward and back holding a pencil, which marks the paper spool with lines of varying densities that represent its measured distance from the ground. A mass of drawing begins to form under the machine.

Device collects data through its calculated movements and diligent measurements of the environment. The entire *Device* drives itself along two parallel wires that suspend its body. When it reaches a randomized location on the wires it stops and a bob is lowered to measure the distance between its frame and its environment. The metal bob attached to the trunk of *Device* descends toward the floor before being stopped by the detection of material. Initially this will be the floor. However, over time, as *Device*'s measurements are recorded and

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[10] Ross, Stephen David. *Enchanting: Beyond Disenchantment*. Albany: State U of New York, 2012: 12.

expelled by the machine, as paper accumulates on the floor, the distance between the ground and the machine will be gradually altered. Each new recording of data will transform the next. As paper rolls out of the machine's body and forms into a pile on the floor it will sense that its distance to the ground is diminished. This change will not be quick. It will occur slowly as the machine methodically draws and accumulates new data.

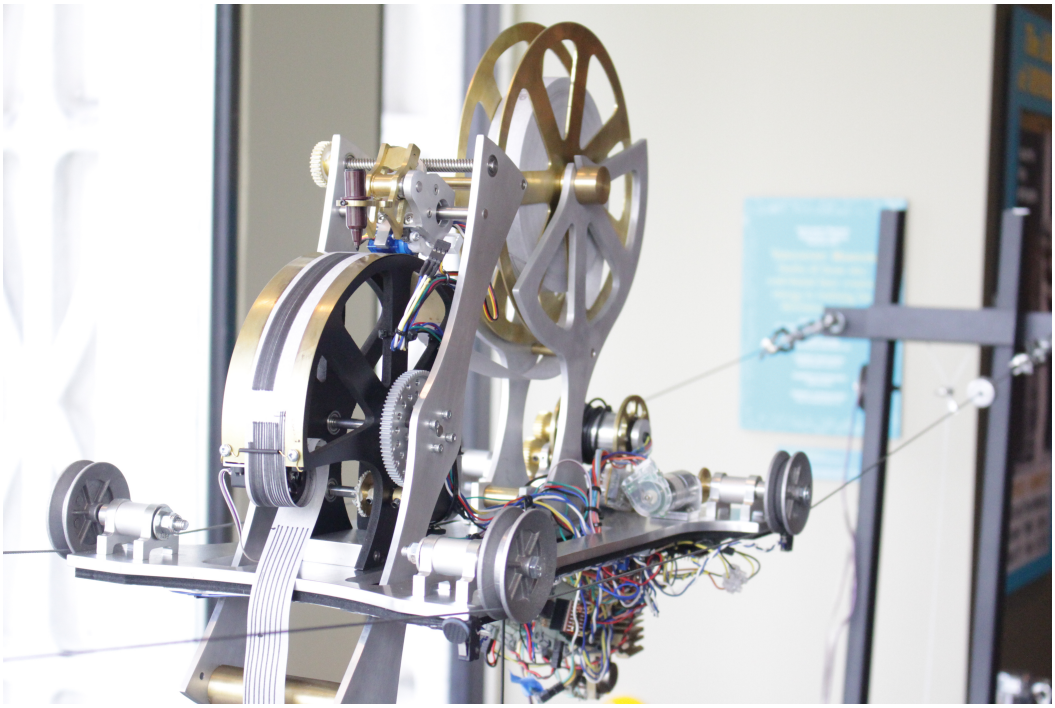

Figure 7. Steve Daniels, *Device for the Elimination of Wonder*, 2015. Image courtesy of the artist.

Device emulates the aesthetics of 19th century industrial machinery. The large metal structure and exposed cogs of both gold and silver hued material move and work together through onerous mechanical movements. The strain of the machine is apparent with each rotation of its drawing arm. The labored automatism invoked in the object's design is reminiscent of the Industrial

Revolution. *Device*'s turning mechanical wheels and process of continuous printing parallel the industrial printing press, an object synonymous with the Enlightenment era and the demystification of the medieval epistemology in favor of rational and critical thought. In a sense, one can see elements of Koenig's 1814 steam-powered printing press reflected in *Device*, with the metallic cogs, curving metal forms, and the long sensually curved gilded bob harkening to a 19th century-aesthetic. This allusion to the period is also indicated in the title of Daniel's work - '*The Elimination of Wonder'* -, referring to the kind of demystification or disenchantment often associated with the changes brought about by the mechanical revolution and mass production of the printing press. However, *Device* not only emulates but also seemingly critiques the 19th century elimination of wonder. As information became increasingly more accessible and the mechanical infrastructure began to regulate society, the medieval period's seal of mystique was broken and it is the sobering effects of this change that Daniels' work seems to point out.

The disenchantment that culminated in the 19th century is written about extensively. Much scholarship has been dedicated to understanding the processes that eliminated wonder during the period (Weber 1958; Foucault 1971; Bennett 2001). This body of writing also questions our current status as a society: are we maintaining the rigorous critical lens of modernity or is this framework slowly dissolving to make way for a re-enchantment that may still comply with modern rationality by celebrating a new type of 'secular magic' (Landy and Saler 2009)? I

will return to this question later but first it might help to address the drastic social and cultural paradigm shift that occurred between the medieval period and the Industrial Revolution. In *The Order of Things,* Michel Foucault traces the differences between the epistemological assumptions of the Western world prior to the Scientific Revolution and our modern modes of thought. For Foucault, the cultural climate of the 16th century was marked by intellectual and artistic investments in the resemblance and similitude among things (making illusion and metaphor central to expression) - as opposed to the post-revolutionary interests in difference, exactitude, measurement, and classification. Magic and metaphysics were valid lenses of inquiry into phenomena as were the influences believed to stem from (far-from-epistemological)

celestial bodies such as the planets and stars.[11] Sixteenth-century knowledge, for Foucault, "condemned itself to never knowing anything but the same thing, and to knowing that thing only at the unattainable end of an endless journey" (Foucault 1971; 34). While there was room for rational thought, it was seen at the same level of importance as the supernatural; and consequently, knowledge was not made concrete, defined, structurally sound, or classifiable: "sixteenth-century

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[11] Stars and planets were often used for analogy, one of the principle figures of similitude that Foucault maps in the book as being integral to the medieval episteme (the other three are *convenientia* referring to an understanding of things in relation to their resemblance to other things in spatial proximity; *aemulatio* referring to imitation by appearance; and *the play of sympathies* referring to presumed harmonius or hostile connection between matter): "For example, the relation of the stars to the sky in which they shine may also be found: between plants and the earth, between living beings and the globe they inhabit, between minerals such as diamonds and the rocks in which they are buried, between sense organs and the face they animate, between skin moles and the body of which they are the secret marks" (2005; 24).

learning was made up of an unstable mixture of rational knowledge, notions derived from magical practices, and a whole cultural heritage whose power and authority had been vastly increased by the rediscovery of Greek and Roman authors," (Foucault 1971; 35). The Scientific Revolution and "the Age of Reason" disrupted these more 'unstable' modes of thought in favor of systematic modes of organization,[12] leaving their charms and fantasies behind to prioritize difference over similitude.

The Medieval period is oft characterized by its interest in games, fables, magic and overall a sense of whimsical enchantment that was woven through the cultural essence. This particular quality was inherent due to the fact that Church and Nobility, whose word was taken as unquestioned truth, regulated society. This created a cultural climate that valued fable, mystery and superstition, and has therefore been often viewed as a period of ignorance amongst the greater public. While this description of the period might be myopic in certain aspects, it nevertheless serves as an entry point to understanding modernity (from the perspectives of its most common place critiques) as the highly rational and "disenchanted" period that followed. The Renaissance and Enlightenment period saw the movement towards rational scientific critique, which expanded into the

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[12] An example of this turn towards the ordering of things could be the Linnaean Classification system. Carl Linnaeus devised a system for classification, which would divide all things on earth into seven main categories (with a multitude of subcategories under each that provides detailed definitions and descriptions). This system of classification was one amongst a myriad of structures that emerged during the scientific revolution, which according to Foucault are responsible for the erasure of mystified forms of knowledge (in other words, the overarching mystery) that characterized earlier historical periods.

Industrial Revolution when disenchantment took full hold on society. Secularization and the decline of magic from the end of the medieval period were primary sources of this change. As scholar Max Weber has noted, secularization, rationalities of science, bureaucracy, and the law and policy-making all contributed to this decline of speculative mystical thinking.

This modernist movement towards disenchantment - debunking of myths, negation of magic and deflation of similitudes - is echoed in the monotonous and methodical operations performed by *Device*. Aesthetically, the object makes reference to the period of the industrial revolution; specifically equipment-heavy and cumbersome mechanics. As a performative self-regulating being *Device* is able to eliminate wonder through its painstaking rigorous measurements and, like the disenchanting modernist movement, emphasizes the notion that everything can and should be quantified. While the machine seeks to eliminate wonder, its own regulatory processes project the image of a self-sustained mechanical being that has a whimsical or perhaps even enchanted quality as it observes and responds to its reality. This quality is generated by the machine's evocation of being an intelligent robot, lost in its own thoughts, which frames its actions not as mechanical operations but as lively *traits of expression*; the expressive flow of matter (Deleuze & Guattari 1987).

Traits of Expression

If the goal of the machine is to eliminate wonder by methodically measuring its surroundings, does it succeed? And for whom is the wonder being

eliminated? We may believe that the machine's boundaries of existence are visible to us as humans; however, we do not know the perspective of a being other than our own. We can only speculate upon *Device*'s experience of the world around it, which it attempts to communicate through a stream of drawings cataloguing data in a language written by the machine. We may ask, what does the machine express to us? And how are these traits of expression constitutive of our own sense of self as we watch the self-sufficient machine perform the disenchanting and monotonous task of measuring and recording data?

Device takes on the quality of a sentient creature with its lively, responsive, self-sustaining mode of existence. It is fascinating to watch the machine's curious and quizzical behaviors. As it comes to life and then records its interactions, the machine becomes a cybernetic system. In comparison to a human body, which is controlled by a number of cybernetic regulatory systems that sustain breathing, cognition and movement, the *Device* is propelled and regulated by a simplified systemic form. The system that sustains *Device* begins with its initial measurement of the distance between its torso and the floor. As it measures and records this data through a minimalist line-based drawing and expels it towards the floor, *Device* begins to change its own surroundings. This requires a new measurement between its body and the floor as they grow closer together with the expanding pile of paper. Control and communication of the machine are regulated by its internal structures; its programmed desire to measure. It has been created to act as a quizzical and curious entity that observes and interacts with its

environment through a particular methodology of measuring and recording data. In other words, it acts and engages with the world through a specific type of access to being. The construction of its body and its software programming serve a specific purpose and circular logic.

The sound of the machine as it whirs slowly across the metal wires which support it, offer the sense that the machine is purposeful and determined. The clicking sounds of struggle expelled by the large cog that rotates the pencil across paper communicate the machine's commitment to the task of measuring its surroundings. With each new measurement it is as if the 'proud' machine expels its drawings before returning to check its data one more time, and then one more time as the growing pile of paper keeps altering the environment. The tedious process goes on until the machine is finally shut off.

The work invites the viewer to imagine the machine's motivation as it returns to the spot from which it initially recorded data to check its reading before retiring. *Device* methodically lowers its bob to check its measurement and to its surprise, the environment has shifted! This imagination animates the machine; increasingly, it looks like a bewildered scientist lost in her own calculations and questions: have I moved closer to the ground or has the ground moved closer to me? *Device*, perhaps not knowing how to respond, continues its cycle of recording in order to catalogue its experience of the world around it. Though the scope of the machine's observation is limited, its ambition to collect data and catalogue its

experience is strong. Its thirst for measurement will never be satiated as each measurement necessitates the next.

Figure 8. Metal bob and paper expelled from *Device*, 2015. Image courtesy of the artist.

The machine's body expels the long winding cable from a spool connected to the underbelly of *Device,* ever so slowly lowering a gilded bob towards the floor (Fig. 8). As the ground stops the bob, the measurement of its length is processed by the computer and expressed through a line drawing on paper. The length of paper - a physical recording of the machine's experience - is expelled from the machine; it lies gathered in a heap on the floor. As the length of paper is spit out of the machine's body and onto the floor it communicates its own *traits of expression*. For Gilles Deleuze and Felix Guattari, traits of expression describe the matter-flow that is not reducible to corporeality even if they are ascribed to a

physical body. A body may flow through different traits of expression dependent on its state thus, "matter-flow can only be *followed*" (Deleuze and Guattari 1987: 409). In order to explore the types of flowing undulating bodies that Deleuze and Guattari describe we can look to one of their oft-cited examples of lively transformations, metal. Many scholars have explored the vivid living qualities of matter (such as Karen Barad's agential realist exploration of matter that makes reference to rocks and crystals and Jane Bennett's interest in 'vibrant matter') presenting the vibrancy of both mobile and (seemingly) immobile bodies. Deleuze and Guattari find particular interest in expressiveness of metal in the "Nomadology" section of *A Thousand Plateaus* as they posit how the material expresses itself to the metallurgist through undulating bodies of liquid and solid metal. We can look to the material, in all of its potential forms (liquid, solid, etc.) as an expressive medium. Metal provides an example, in Jane Bennett's reading of Deleuze and Guattari, for establishing a theory of material vitalism:

> Let us return to the example of the saber, or rather of crucible steel. It implies the...melting of iron at high temperatures and...the successive decarbonations but corresponding to these singularities are traits of expression-not only the hardness, sharpness and finish, but also the undulations or designs traced by the crystallization and resulting from the internal structure of the cast steel...Each phylum has its own singularities and operations, its own qualities and traits, which determine the relation of desire to the technical element (the affects the saber 'has' are not the same as those of the sword)...At the limit, there is...a single machinic phylum, ideally continuous: the flow of matter-movement, the flow of matter in continuous variations, conveying singularities and traits of expression (Bennett 2015; 226).

Here, what Bennett wants to draw attention to is the uniqueness of the way metal responds to being heated by expressing operations that are specific to its internal structure. This formulation frees the concept of expression from the limitations of subjectivism (Massumi 2002). The endeavoring body of *Device* can be understood as expressing itself too, not only through the operations of its metallic and mechanical construction composed of cogs (referencing a 19th century aesthetic with exposed wiring celebrating the inner functions and technological construction of the machine), but also through the line drawings it traces. The mound of paper populated by them, as with the markings on crystallized cast steel, represent a visual sign of the active nature of the machine. The mass of paper is not dormant but rather presents a narrative of the machine's existence and its experience of the world; a gestural drawing that expresses the machine's experience.

On a macrocosmic scale we can understand the *Device* as expressing some form of agency through its traits of expression; Deleuze and Guattari's preoccupation with metal's expressive traits stem from their interest in Gottfried Wilhelm Leibniz's monadology and discussion of substances. Leibniz's theory of monads, his best-known contribution to metaphysics, offers a definition for substance. Monads are elementary particles, the fundamental elements of the universe, which are not fully apparent or accessible to one another. They are eternal, indecomposable, individual, subject to their own laws, and un-interacting; each reflects the entire universe in harmony. Leibniz asserts that monads are

centers of force - or substance - as opposed to space, matter, and motion, which are only phenomenal. The monads are not linked to or reserved for our sensory perception of the world around us. We cannot see, smell, taste, or touch monads - they exist without being perceptible to us. The monad is invisible and indivisible; it has no parts and is not located in a particular visible aspect of matter.

Unlike atoms, monads do not extend beyond themselves to create larger units. This is because for Leibniz space is an illusion. The monad is "pregnant with the future" and "laden" with the past (Leibniz 1898; 22). Like the autopoietic machine the monad is a closed entity that is self-informing, self-regulating and autonomous. Imagine the streaming folds of paper that lay beneath *Device*. Similar to the folds and entanglements of the lengths of paper, the monads become holders of folded streams of past and future. They are carriers of essences that are exposed and unfolded only when they have sufficient reason to do so, like the paper which can be unfolded when one wants to read *Device*'s recorded narrative of its surroundings. The monad is extremely complex. The properties of each monad, which becomes a metaphor for self-contained entities later in the writing of Deleuze, include all of its relations to every other monad in the universe. Thus the monad is self-sufficient, having all of its properties within itself. The monad does not depend on relations; it is discreet and has an aspect of transcendence from human knowledge.

Now let us return to Deleuze and the undulating flowing matter-body as it unfolds its traits of expression in order to explore the self-contained monad as the

fractal elements of the universe in all their complex relations. In his last major work *The Fold,* Deleuze foregrounds Leibniz's fractured universe of monads as they weave and fold amongst one another. This baroque conception of matter - characterized by the billowing layers and folds of baroque fabrics, and designs composed of smaller and smaller parts that spiral on infinitesimally - illustrates the flowing body as it changes states and traits of expression (Deleuze 1993). According to Deleuze's reading, "Leibniz's most famous proposition is that every soul or subject (monad) is completely closed, windowless and doorless, and contains the whole world in its darkest depths, while also illuminating some little portion of that world, each monad, a different portion. So the world is enfolded in each soul, but differently, because each illuminates only one little aspect of the overall folding" (Deleuze 1990; 157). While a monad may be pregnant with a multiplicity of expressive traits only a number of such traits may be actualized or 'illuminated' at a given time. Like the metal in its soft liquid state, compared to that same metal hardened and formed into a sword, the monad (that represents all things in itself) may only be actualized in a particular form at a time. The infinite unfolding of the monad and its complex wealth of traits spill out and hug in to the compressed bodies of time and space. Each holding a self-sustained universe. A single self-sustaining thing. A closed system that can open its self up at will.

Programmed Desires

In a sense, *Device* (Fig. 9) operates inside a closed system. It exists for, and is informed by, its own programmed desire to measure and record its

environment. While it measures it also shapes its own experience without the provocation or necessity of any outside forces to interfere upon it. *Device* participates in its own closed network, thus the machine is autopoietic. Autopoietic machines are generative. The machine is able to reproduce itself. Their reproduction - of their own conditions, expressions, and materiality - transcends their original construction at the hands of a human agent (or maker). Autopoietic machines are closed, self-regulating systems that continuously spawn and specify their own bodies in an endless loop of creation; such as a living cell that produces its own components, continuously using them to manufacture more. The piling paper, which influences *Device*'s operation, has a determining power on the next components that it will produce. For primary autopoiesis scholar

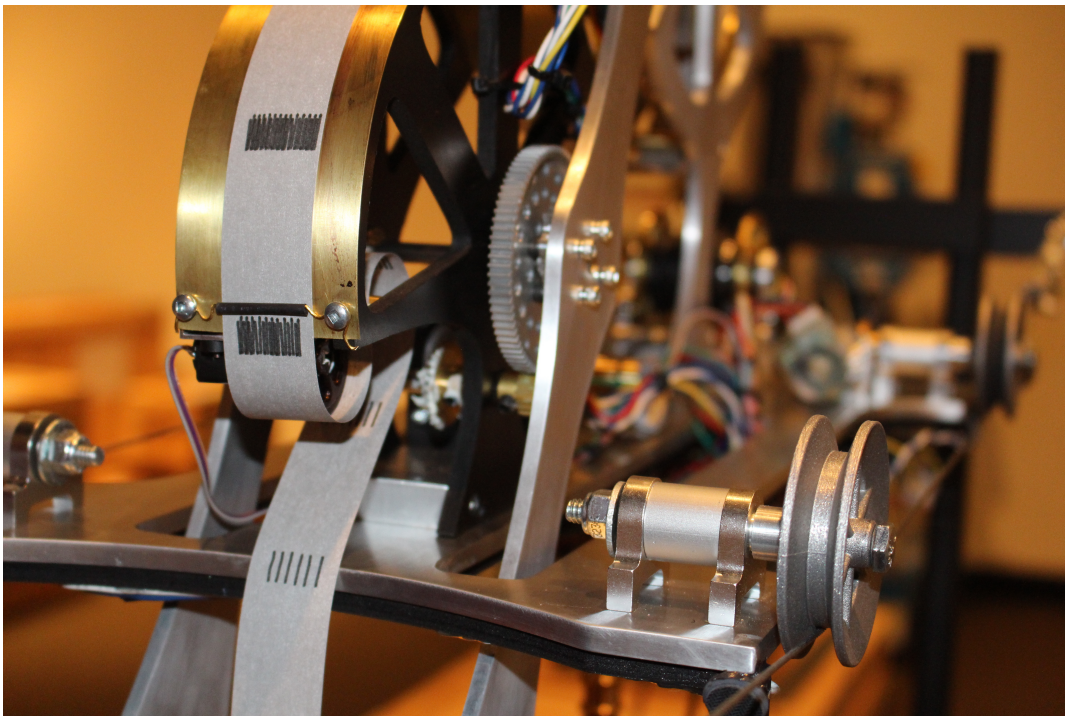

Figure 9. Steve Daniels, Close up of *Device*, 2015. Image courtesy of the artist.

Humberto R. Maturana and his collaborator Francisco J. Varela, an important characteristic of the autopoietic machine is that it produces and is affected by its construction. They also tell us that autopoietic machines are autonomous, as they function independently of intervening relations; they are self-contained and monadic yet they are unities, because they operate within their own constructed boundaries in a processes of self-reproduction, and finally they are constant in their self-regulating actions.

Device's physical being and the autopoietic system that self-regulates its actions limit the machine's engagements with its environment. It becomes bound and confined to its own impulse to measure and record. However, considering that its desires are programmed adds another element (a two-tier problem) to its construction. On one hand, the machine is a product of human design, in this case the artist Steve Daniels, which potentially implicates him in the system and troubles Device's self-contained appearance if not the word desire itself. On the other hand, the notion of desire is often characterized in ways that are specific to human emotive and cognitive capacities. As I have argued earlier, a machine may be able to experience precognitive and pre-emotional affect as this does not require human abilities. Therefore we can speculate that perhaps the machine is compelled by a desire, which we can define in this case as the motivation to perform a specific task - that of measuring and recording - that it will continue to follow until it is somehow stopped by interference in the closed system. To return to the question of the human programmed autopoietic machine, Maturana and

Varela assert that autopoietic machines can be thought of as living systems. This is in part due to their self-sufficient and autonomous nature. Their assertion is quite bold due to the fact that they claim both human and nonhuman systems can be living. While nonhuman systems, such as a self-sufficient bot, may appear as lively, we know that this liveliness does not prescribe to the philosophical perspectives that make a distinction between organic and inorganic matter when defining life. In Maturana and Varela's formulation, the machine - regardless of being manufactured by a human creator - remains dynamic and vibrant even if it is mechanical and technological (as opposed to biological). Liveliness is often associated with unpredictability and behavioral qualities reserved for autonomous biological beings - as Maturana and Varela identify: "living systems are *a priori* frequently viewed as autonomous, ultimately unpredictable systems with purposeful behavior similar to ours" - while the self-regulating autopoietic machine may be characterized by its "completely known deterministic properties which make [the machine] at least conceptually, perfectly predictable" (Maturana & Varela, 83). Maturana and Varela observe that machines do not need to be unpredictable in order to be vibrant and evocative as, "the beauty of life is not a gift of its inaccessibility to our understanding," but rather the living machine can be both predictable and dynamic (Maturana & Varela, 83). The predictability imposed by the machine's programming does not negate its individual modes of expression and whimsicality. It is still performative, engaging and lively in its pre-conceived autopoietic existence. The fact that *Device*'s desires have been

programmed by a human to perform a predictable and self-sufficient action does not negate its status as a kind of lively system. Rather, the fact that the programmed motivations of the machine create an autopoietic system makes the machine a living one. *Device*, controlled by its programming, registers a lively capacity within its own material and immaterial limitations. Let us now step outside of the autopoietic system of the living machine to consider our own role, as humans participating in the 'life' of the machine.

The Human Observer

A crowd begins to form in the outer rim of the Museum of Vancouver's labyrinth maze of rooms; a nearly empty room that looks like it is still under construction. Perhaps the museum is coordinating a new installation, but that we do not know. We approach the crowd with curiosity; whatever they are looking at must be thrilling. As we draw closer we begin to crane our necks in an attempt to see over top of the collective of individuals blocking our view. A couple steps away, and moving towards the next room, we take our chance to push forward into the crowd. From the crowd emerges a mechanical object (Fig. 10). The object moves slowly across a tight rope before lowering a bob towards an overflowing pile of paper on the floor. The pile of paper has accumulated over a period of six weeks in which the machine was on and functioning each day during the open hours of the Museum of Vancouver. Cogs creek and strain against the labour of the device moving its own heavy body back and fourth as though its performance may never stop. The exposed wiring of the machine, each click of its intricate

mechanics, and every turn of its wheels make apparent its struggle in completing the task of measuring and cataloguing its slowly changing ecology, now populated by human observers that it seems to ignore.

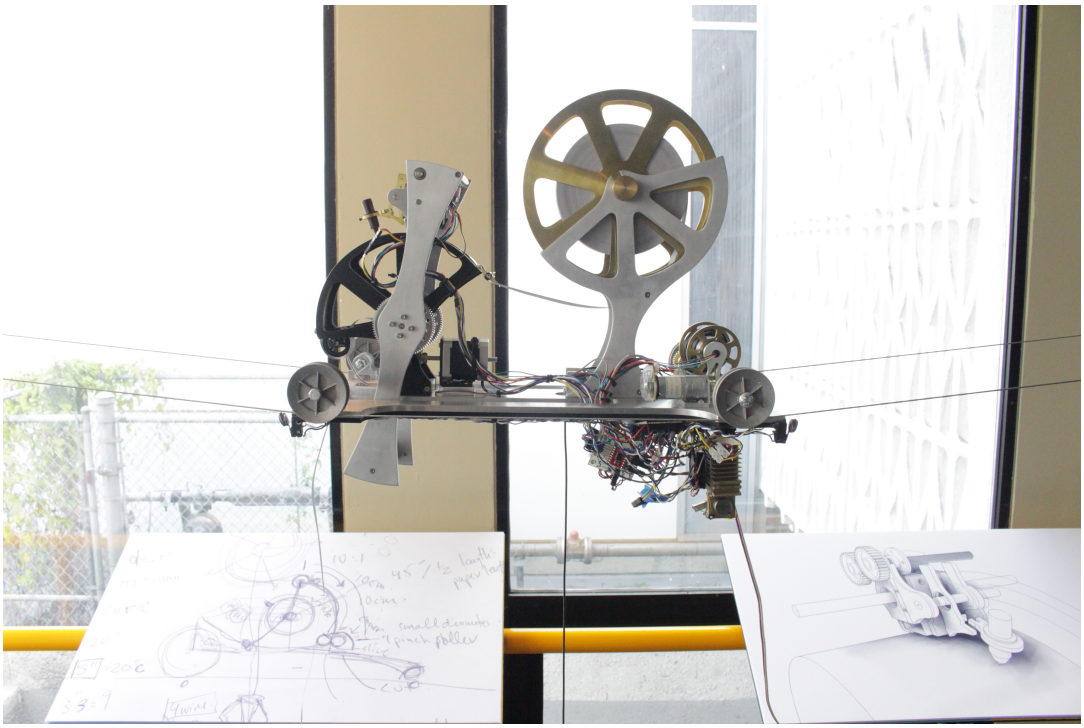

Figure 10. Steve Daniels, *Device* installed at the Museum of Vancouver, 2015. Image courtesy of the artist.

We see something on the floor. Thin reels of paper lay in a swirling entangled pile. It is hard to tell where the length of paper begins, which mark was the first mark made by *Device*? We can see the progression of time and the changing environment as it is catalogued in the thicker and thinner lines drawn on the page. Thick aggressive lines fill nearly an entire section with solid black markings. These sections lay near the bottom of the billowing pile of paper as they indicate a further distance between Device and the ground. Towards the top of pile we can see wispy, though completely straight and methodical, lines that are

thin and ever so lightly filled in. These lines indicate that the pile's height has grown and Device has catalogued the approaching mound as it grows nearer to its body. The actions of the machine are constant and unwavering. Its mission to catalogue is clear and its execution is single-minded.

According to Daniels, the machine was developed as an experiment in slow sedimentary meditation on measurement and data. A question emerges from this endeavor. Who is this meditative experience being conducted for and who is actually experiencing it? The machine has been developed to function in a closed system. It influences and acts for itself. Perhaps, for it, the experience of measuring the environment is somehow meditative in that it appeals to the robot's programmed software. We can only speculate that the action of measurement functions to satisfy the robot's engrained need to catalogue, that this does something for the machine - whether that offers some kind of satisfaction or reward we may not know.[13] We might also be able to assume that this meditative robot was developed with the experience of a human in mind.

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[13] We can look to the research of scientist George Musser who writes about the potential for self-awareness within machines and mechanical devices. He posits that machines could possibly already have developed minds; of which we may be unaware. He believes that minds perhaps exist outside of human corporeal experience in the realms of networks that can achieve a 'group-level consciousness'. It could be that - because A.I. is outside of the human experiential realm - machines have become self-aware without us knowing. What signs prove that a being is conscious? Musser points to the fact that, if machines have gained a mind, intelligence or consciousness, they "might not be able - or want - to participate in the classic appraisals of consciousness such as the Turing Test". This leaves us with many more questions regarding the machines access to life, knowledge, intelligence and feelings such as desire or satisfaction (Musser 2016).

Daniels embraces the consideration of a human viewer in the development of his robots. As an artist, he creates work that will appeal to human empathy in a way that draws us into the machine. In the case of *Device for the Elimination of Wonder* we might question Daniels' interest in developing such a pedantic machine. It is not clear if this machine is in fact eliminating wonder as its intricate wiring and mechanical body produce remarkably specific and, in my opinion, enthralling actions in and upon its surroundings. In contrast to his earlier works such as *Whimsy* and *Sessile*, *Device* seems to conduct an entirely new form of experience in the world around it; one that is solitary and autopoetic. Unlike *Whimsy*, robots that whirr around an open room bumping into one another and directing each other's actions and *Sessile*'s scared and shuddering pods, the *Device* may appear mundane in comparison.

Daniels is markedly empathetic in his approach to producing robots, from his small and cute *Whimsies* to the shy and struggling *Sessiles* and to *Device,* whose monotonous labour appeals to the human experience of, and sometimes hatred for, repetitive work. The viewer is able to adopt the perspective of *Device* by reflecting on the confined structures of labour as well as the monotonous act that is unceremoniously put on display. Empathy is known to increase humans' desire to help others, though *Device*'s autopoietic system does not allow for interference. The human interloper is relegated to the outer recesses of the scene as a spectator who cannot offer aid to the hard-working machine. While empathy is oft associated with an exchange of emotions - between humans - this exchange

between human and machine does not require a parallel experience to be affective. The spectator can be moved by the machine regardless of whether the machine has an emotive capacity or not. The robots ongoing labour can inadvertently affect the viewer. While this experience is more sympathetic, the viewer may also experience other emotions triggered by the machine; such as terror, fear, amusement, fascination, and admiration. etc.

The machine is relegated to the compliant performance of a small number of repetitive tasks. Its programming regulates the machine to compliant worker, securing the human's position as top of the ontological food chain. I would like to veer off on a tangent for a moment in order to consider the iconic film trope of the predictable and compliant programmed machine turned autonomous. In this trope, self-regulating machines appear at times humorous and friendly, and other times violent and volatile. Many science fiction films depict robots that produce a lingering sense of unease as they threaten to revoke their monotonous repetitive actions in order to turn on their human makers at any point. Even a nonviolent machine can present a threat when it becomes subsumed into its objective of carrying out a monotonous human programmed task like the machinery in the Geonosis droid foundries seen in *Star Wars: Episode II Attack of the Clones*. Though not intentionally menacing, the factory machines' processes of producing clone droids present a series of deathly obstacles for the characters Anakin Skywalker and Padme Amidala. The massive machines punch through metal as they threaten to perform the same actions on a human body. Perhaps the

programmed machine is able to instill a sense of fear or unease through its foreshadowed imposition of a potential to break from its imposed functioning and become free. This could perhaps be why one becomes so enthralled with the routine actions of *Device* as they await its departure from normal function. Robots in film may also allude to possibility that man-made technological assistants may acquire singularity; such as the adorable trash compactor bot *WALL-E* (2008) or the much more horrifying examples of *I, Robot*'s (2004) humanoid slaves who turn vengent upon their masters; Ex-*Machina*'s (2015) Ava, who turns deceptive and self-aware before completely adopting a fleshy body and blending seamlessly into the human world; or *Chappie* (2015), programmed mechanized police droid who is stolen and re-programmed to think and feel for himself.

I would like to consider another source for the viewers' enchantment with the routine functions of the machine. In his study of hyper-objects, object-oriented ontologist Timothy Morton mentions the way we "marvel at the way [things like]...syrup lugubriously slimes its way out of a bottle... But to a hypothetical four-dimensional sentient being, such an event would be an unremarkable static object, while to a neutrino the slow gobs of syrup are of no consequence whatsoever. There is no reason to elevate the lava lamp fluidity... into the archetypical thing" (Bennett 2015; 230). For Morton, the intricacies of things such as the slow slimy slithering of syrup may be exciting and important to some, while to other viewers of the gooey material the syrup has no importance whatsoever. In other words, human perception or interpretation of a thing's

meaning and significance is only one among many, characterized by our own programmed desire (genetic hardwiring) to make sense of the world.

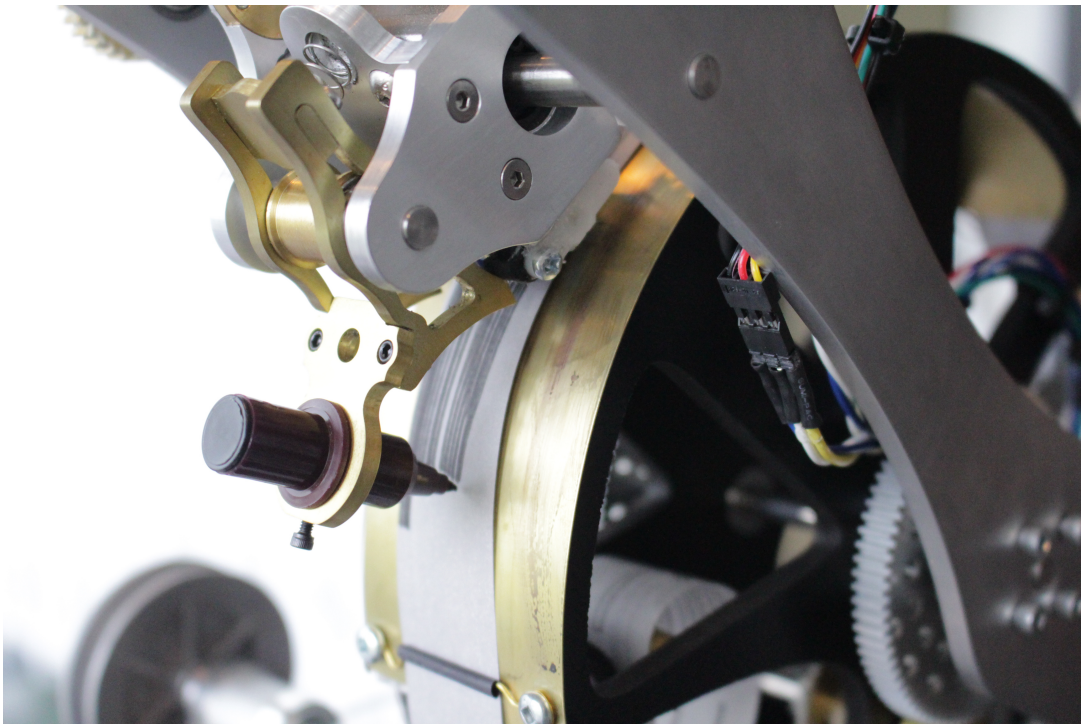

Figure 11. Steve Daniels, Close up of *Device*, 2015. Image courtesy of the artist.

In response to Morton's musing on beings' interests in syrup, Jane Bennett proposes that while "perhaps there is no reason to do so-if, that is, that we are in fact capable of transcending the provincial pro-human-conatus perspective from which we apprehend the world. If we are not, then a good tack might be to stretch and strain those modes to make room for the outlooks, rhythms and trajectories of a greater number of actants, to, that is, get a better sense of the 'operating system' upon which we humans rely" (Bennett 2015; 231). The syrup, like the slow unwavering and undulating measurements of *Device* (Fig. 11) present us with phenomena that can provoke our philosophical inquiry into being (human and

nonhuman). If we wish to understand humans in relation to multiple ontological starting points, we must try to depart from our wholly anthropocentric perspective and consider the entire 'operating system' of which we are a very small part. *Device*'s self sustaining actions that we can observe from outside of the closed loop in which it participates make one aware of the potential of vitality in all things. The system is never fully closed. *Device* depends on a multitude of forces which act with and upon it just as we humans depend on a great number of actants which Bennett draws our attention to as she explains;

> I find myself living in a world populated by materially diverse, lively bodies. In this materialism, things - what is special about them given their sensuous specificity, their particular material configuration, and their distinctive, idiosyncratic history - matter a lot. But so do the eccentric assemblages that they form. Earthly bodies, of various but always finite durations, affect and are affected by one another. And they forms noisy systems or temporary working assemblages that are, as much as any individuated thing, loci of effectivity and allure (Bennett 2015; 233).

Through this image of the world around us - presented through a system of all diverse matter - we can understand how object agency can play a vital role in shaping our understanding of interactions between human and nonhuman entities. The *Device,* which performs its mundane actions, lures us into its meditative state of measurement, while around it (and us) a host of system factors, or 'eccentric assemblages,' form and help to conduct its (and our) being. This opens Daniels' *Device* to interpretation as a work that gestures towards a re-enchantment of the world through engagements with object agency while critiquing the very modernist discourse of disenchantment itself.

The Beginning and End of Wonder

When looking at *Device for the Elimination of Wonder* we can understand its basic functions. We see that it moves back and forth across the length of wire until it stops in order to measure its distance from the floor or later from the top of a pile of measurement drawings. We also know that it is a work of art, which is communicated to us by its context. It is located in the Museum of Vancouver as a temporary installation, one work amongst a series of interventions, which have become interlopers in the museum. *Device* has been curated into the space by Caroline Langill and Lizzie Muller for the *Lively Objects* exhibition in conjunction with the International Symposium on Electronic Art (ISEA) 2015 in Vancouver, British Columbia. A didactic panel on the wall informs us of the name of the work and that it is a temporary intervention for the *Lively Objects* exhibition. We are also told that *Device* is a "simple kinetic system obsessed with quantification, it is ultimately a feedback-loop manifesting itself as a machine" (Langill and Muller 2015; 123). This much we know, however there is still much information about the object, its functioning, purpose, and design that is not apparent to us. Whether Daniels' motivation was to create an object that completely eliminated wonder or to bring wonder back to the 21st century psyche is left to the viewer.

In his reading of Whitehead's process philosophy, Steven Shaviro proposes that wonder is inherent to philosophical inquiry and even more essential to speculative realism. Wonder can be characterized in a multitude of ways;

however, I would like to be specific in categorizing my understanding of the phenomenon. Wonder is a feeling of uncertainty or questioning that is incurred when confronted by an engaging thing. For Whitehead "If philosophy begins in wonder and ends in wonder then...its aim should be not to deduce and impose cognitive norms, or concepts of understanding, but rather to make us more fully aware of how reality escapes and upsets these norms" (Shaviro 2011; 67). Whitehead's notion of philosophical inquiry frames his interest in process philosophy and the consideration of an existence outside of that employed by humans. As he proposes, we need not develop a theoretical framework for experience and cognition that transcends all being in the world but rather we can become aware that there is no singular mode of being and experience, and instead, rocks, ice cream, Stanley Kubrick, an iPhone and *Device for the Elimination of Wonder* can all have access to their own unique existence. For Shaviro "this is why any true realism must be speculative" and therefore, "we must think outside of our own thought, and we must positively conceive the existence of things outside of our own conceptions of them" (Shaviro 2011; 67). For Shaviro and Whitehead alike we need to be able to consider existence outside of our being, which is precisely the purpose and wonderment of philosophical inquiry. As of yet we are unable to quantify or experience the existence of entities outside of our own embodied experience, however we can consider the life of *Device* - its methodical movements, provocation towards constant measurement, ability to draw, etc. - through speculative theory.

While some may consider the banal processes of measurement to be the antithesis of liveliness or agency, the object's apparent struggle provides the viewer with a feeling of empathy that grants a lively quality to the object. While the task performed by the object is uninspiring, the drawings it produces, the method by which it categorizes its environment, and the uncanny quality presented by a behaving machine all point to a wondrous inner life of the object. The object is engaged in an act of play with its components and the environment, through measurement, and with others through its physical movements and performativity in front of the viewer. The object expresses individual traits as it engages in the activity of measuring its surroundings from a particular vantage point and embodied experience of the world around it. The act of measuring is recreational in this instance in that it technically does not serve a serious or practical purpose - such as measuring the distance of a body of land in order to allocate its resources to a particular individual. This gives the actions of the robot an element of play, however banal we may consider it, and represents a whimsical quality within the machine. The quizzical being is obsessed with the play of collecting data. *Device* is interested in the site that it inhabits and uses its embodied actions of play - buzzing about on suspended wires, dropping a bob to measure its environment and sketching the data that it collects - creating a visual narrative of experience for the viewer. A viewer can observe that the object is fixed within a system of behaviors that dictate its experience of the world insofar as there exist no outside forces to affect the object's life. A viewer may also

disrupt this fixed system by engaging in play with the object, though this may not be advised in the context of a museum. One might be able to interfere in the robot's methodical gameplay transforming its initiative from a one player to two-player game.

An interloper might play with the machine by interrupting or altering its methodical measurements. One could place their hand beneath the bob at a unique height that will alter the machines embodied experience through its inability to differentiate between the ground, a pile of paper or a human's hand. This can be understood as an act of agency by the human hand onto the machine. Where does agency come into play from the perspective of the machine? We may understand the formulation of agentic machines through Andrew Pickering's framework of material agency as it applies to the agency presented by a multiplicity of matter including mechanical nonhuman bodies. Pickering's theory operates through the lenses of both scientific and philosophical inquiry (he refers to scientific practice as 'the mangle' a term that connotes the intersections and mergers between history, philosophy, social studies and science) as he supposes that science is performative rather than representational. In this "*performative* image of science, scientists interact with, rather than merely observe, phenomena, whose "material agency is irreducible to human agency," while also being constitutive of it (Pickering 1995; 54). Even the human-made machine expresses agency in a capacity apart from the human maker; "scientists, as human agents, maneuver in a field of material agency, constructing machines that...variously capture, seduce,

download, recruit, enroll, or materialize that agency, taming and domesticating it, putting it at our service, often in the accomplishment of tasks that are simply beyond the capacities of naked human minds and bodies" (Pickering 1995; 7). In other words, human and nonhuman actors interplay and intertwine in their construction, performance and production; all acting in their own unique agentic capacities. *Device* has the ability to express its agency through multiple channels. We can understand that the object, while measuring its environment may also act upon its environment. Device measures a changing landscape which it itself is changing through the act of measuring and dispensing data drawings. *Device* is also able to express its agency through its ability to generate a self-sustaining archive of data. The being is able to gather and then assert data onto others through drawings. Finally, the object expresses its agentic capacity through its ability to engage others. The meditative actions of the machine are whimsical in that they inspire interest, questioning, and interpretation. The machine, which engaged my interest and provoked this writing, has expressed its agentic capacity through its ability to attain an audience and generate a wealth of questions surrounding its purpose, functioning and experience of being.

A World Without Us

It is nearing the end of the day for the many employees, gallery attendants, janitors, monitors and security guards working at the Museum of Vancouver. Only a handful of visitors remain in the museum aside from all of the workforce who are required to remain in the museum until all of the lights have been turned off

and the doors locked. The room that has become home to *Device for the Elimination of Wonder* is deserted. The gallery goers have all made their way towards the exit and are in the process of picking up their parcels and coats. So what is taking place inside the museum, apart from human interaction or spectatorship? We can imagine quite definitively that *Device* is still performing. It continues to struggle and strain across the parallel cables that suspend it in air inside the gallery. It continues to measure its environment. And it continues to draw line images representing data it collects as it acts and interacts with the space around it. Shaviro's reading of Eugene Thacker's nihilistic and pessimistic philosophy stipulates that "it is not enough to just consider the (objective) world-in-itself in its difference from the (subjective) world-for-us. We must also actively explore what Thacker calls the world-without-us: the world insofar as it is subtracted from, and not amenable to, our own concerns. We learn about the world-for-us through introspection and the world-in-itself through scientific experimentation. But we can only encounter the world-without-us obliquely, through the paradoxical movement of speculation" (Shaviro 2011; 67). Considering Thacker's view of the nonhuman perspective we can posit the experience and existence of *Device* whether we are standing in a room with it or we imagine its continued existence without us - with the underlying implication that while this object might have been created by humans it is already also entangled within a web of other, nonhuman factors that impart upon its existence.

How does the object exist outside of human interference? The object exists to perform a task that has been encoded into its behavioral system. *Device*'s purpose, outside of the human and for itself, is the quantification and collection of data. We can "obliquely" read the goal of the machine to pose a philosophical question that will pertain to both the human and nonhuman. What does the quantization or categorization of the machine's experience have to do with our understanding of history or temporality in an increasingly digitized age? As the past is virtualized, history is converted into material (or immaterial data) that is read and experienced by computational technologies - as opposed to the written word which is understood and relayed by humans - "erasing the material and cultural differences that constitute the differential rhythms of temporal experience" (Munster 2006; 94). As computational technologies proliferate and information is translated to computer-based communication through programming languages, which are designed specifically to prioritize objects such as object-oriented-programming (OOP), it may become easier for us to consider an existence outside of the world-for-us model problematized by Shaviro and Thacker. *Device*'s physical production of drawings, which may mean more to it than to us, and function as a catalogue of experience, can perhaps draw us closer to understanding that there exists an ontology outside of our own.

The knowledge of nonhuman agency can enable us to develop a curatorial methodology, which considers robotics as evocative (and lively) entities and acknowledges their repetition, habits and behaviors. The activation of the object's

functioning and their scope of opportunity and action may be used as a method of inquiry to explore human/nonhuman relations through Speculative Realism. This method might also find application outside the curatorial discipline, with robotics being employed as an accessible access point to consider ethical, environmental, aesthetic, and political implications of our human-centrism. Sherry Turkle describes the computational object as evocative due to its ability to raise new awareness about the potential of aliveness in nonhuman beings (Turkle 1984). Using the example of a children's fascination with behaving objects such as robots, we can employ this methodology as an entry point to posit the agency of objects that do not always express themselves in ways that are obviously legible to us as lively behavior.

Re-Enchanting the Machine

Where does this leave us in relationship to disenchantment and the 'elimination of wonder'? Through the elimination of enchantment during the Industrial Revolution we were left the modernist celebration of industry, rationality and grand narratives. Post-modernism saw the dismantlement of unified narratives in favor of pluralism and incompleteness; celebrating irony and social/political criticism. Today, have we seen a return to wonder? In relationship to modernism, post-modernism and the illusive post-post-modernist (any many other sub-categorical) movements where do we stand? Though there is little literature exploring the 'metamodern' era I would like to propose this as one possible movement that could explain, and be used explore, our contemporary

condition. In the *Metamodern Manifesto* of 2011 Luke Turner proposes that the metamodern is: "the mercurial condition between and beyond irony and sincerity, naivety and knowingness, relativism and truth, optimism and doubt, in pursuit of a plurality of disparate and elusive horizons" (Turner 2011). So what lies between irony and sincerity, naivety and knowingness, relativism and truth, optimism and doubt? I am interested in this 'in-betweenness' in relationship to the robotic objects presented in this thesis and my probing into the question of wonderment. At "Navigating the Metamodern" *The 15th Annual York University Art Histories Graduate Symposium* on March 19th 2016 I presented my research in relation to the metamodernist turn. The theoretical underpinnings of this thesis were commonplace at the conference as graduate students spoke of affect, Speculative Realism, Object Oriented Ontology and vibrant matter in relation to distant and disparate fields of research that all found their common relations through the celebration of the nonhuman, the mystical, the magical and the surreal. Nods to both sincere and ironic perspectives permeated the conference as critical subject matter was often explored through humor and pop-culture references. 'Kanye-esque'[14] perspectives on critical art historical practice were explored as - like the iconic celebrity's oft exploitative, controversial and larger than life displays of performance that linger of the cusp of reality and fantasy, genuineness and

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[14] The term 'Kanye-esque' references the iconic contemporary celebrity Kanye West and is used to connote the essence of his often subversive, grandiose performances, political and social criticisms, and most specifically (in relation to the metamodern) his spectacular cultural presence due to his actions (performative, political, artistic, etc.) that are often simultaneously ironic and sincere (or indistinguishable from both irony and sincerity).

falsehood, criticism and humor - the metamodern condition celebrates simultaneity and the adoption of lenses that may criss cross, mingle and diverge in certain instances but can still be held in unison. In oscillating between perspectives in a liminal space these human and nonhuman, animal and mechanical, cold and biological, lively and robotic mechanisms may be celebrated for their reintroduction of wonder; a re-enchantment of the machine.

Conclusion

In order to conclude this body of research, I would like to point towards new areas of inquiry that the line of thinking and questions about robotic art posed in this thesis might lead us in the future. The project has gleaned perspectives from various theoretical frameworks and artworks themselves in order to understand and account for robotic art's whimsical bodies within the new media cannon. What I could not cover within the narrower scope and purview of the thesis, however, is the relationship of robotic art's whimsical ecology to interface design and computational languages. This presents potential for future research, as the field would benefit from an exploration of the complex and often inaccessible realm of computational languages in accounting for the mediation of a discourse between human and machine. In support of this project's engagements with three key humanities and practice-based methodologies - new media theory, digital theory (especially in its attention to the affective experience of interfaces, as in gaming and play) and curatorial practice – my plan for expanding the project is to

look into the complex mediating structures of human-computer interaction in order to make them more accessible.

A relatively recent turn in the humanities, towards the posthuman and nonhuman, has created a space for the reconsideration of objects. As frameworks like object oriented-ontology, new materialism and posthumanism have become more widely adopted, artists and makers have been among the first to experiment with objects in new ways in order to consider the possibility of attributing agency to them. While robotics and computational devices have not necessarily been the immediate entry point into these lines of thinking, I believe that the present theoretical paradigm change helps illuminate the enigmatic qualities and agentic capacities of such objects and the conceptualization of human machine engagement.

As expressed earlier, my future research into 'whimsical bodies' will adopt three key methodologies in looking into the mediatory role of interfaces between humans and machines in order to explore different forms of user engagement and make the communicative processes of the computational domain more accessible. I also expect my research to engage with critical code studies and computer mediating language models such as those presenting through object-oriented programming (OOP), although my interest and knowledge of these fields are at a notably nascent stage. Thankfully, the constellation of the three methodologies mentioned also provide natural entry points to these much relevant fields, which I am now ready to focus on more directly. OOP will be one possible site for the

examination of how programming languages classify and modify data for facilitated interactions between human and machine.

My future research will continue in the same vein in that it will consider human machine engagement following the writings of scholars such as: Mark Hansen (whose work, informed by the process-based-philosophy of Alfred North Whitehead, queries into the ways media shape and mediate our everyday lives), Caroline Langill (whose research into media art and curatorial practice proposes that there exists a lively quality to such work), Lev Manovich (who analyzes social computing through the 'cultural form' and lenses of digital media), Ana Munster (who explores the role of affect and corporeal experience as it relates to information aesthetics and sensory engagement), and Jussi Parikka (who traces the diverse histories/genealogies of media production and its effects, which can be related to the immaterial wasteland of computational software).

This assemblage of media theory will allow for the expansion of my current thesis. I am interested in reframing the concept of whimsical bodies as a broader category or overarching metaphor that helps understand how certain computational communication languages – which are at times inaccessible and abstract for human interaction – get mediated and made affable, while also taking on a life of their own through the independent agency of machinic interfaces. In the wake of new media technologies, the technical languages of human-machine (as well as nonhuman-machine) interactions have become somewhat alienated and less accessible. My future research objectives will be to consider the affective

potential, nested in modes of experiencing, in whimsical bodies as they affect and are affected by their environments to make the hidden domain of computational ontologies more accessible to a human user.

In gesturing towards potential lines of inquiry, I would like to reiterate my understanding of robotic art's whimsical bodies as nonhuman entities that express and exert agency as well as signs of aliveness. I am interested in the proliferation of digital culture and inaccessibility of computer-based languages, which often become comprehensible only through mediating languages. Vis-à-vis the current divide between users and computers, I see it necessary to explore the development of accessibility platforms that will allow us to relate to computational beings. In developing new communication strategies and proposing a philosophical inquiry into the modes of being for computational entities, it is my aim to further develop the conversation and interaction between humans and machines. Through the initiation of curatorial methodologies for the reading and reception of computer-based art - which I anticipate will be applicable to other environments of human machine interaction - the study of affective engagement and the consideration of nonhuman agency allows for a heightened awareness related to compatibility issues.

The user and the designed machine interface must be compatible, generating a stimulating relationship that is mutually beneficial. This could possibly take the form of the user enjoying the act of play and the machine facilitating the appropriate programmed response from the user. Bruno Latour's

actor-network-theory (ANT) supports such relational materiality. An influential case study through which to explore relationality in the digital realm has been the growing scholarly work on the affective experience of gaming interfaces. In the context of a video game, the signs of play observed are activated by a reciprocal interaction between machine and user. Associations, or reciprocal interactions, within networks form the actor's definition and naming, and provide them with substance, action, intention, and subjectivity. Gaming offers a particularly exciting and engaging mode through which to study human-machine relations. One could also consider the experience of the game interface from the perspective of affect studies. Affect, according to Baruch Spinoza and his successors Henri Bergson, Gilles Deleuze and Félix Guattari, is characterized by embodied experience that is realized through different emotional states. My own interests lie in Brian Massumi's position on affect theory as he moves beyond this framing to further distinguish between affect and emotion. He characterizes the affective experience as a state of the body, yet expands this definition to say that affect is a pre-emotional and precognitive bodily experience, which includes "micro-perceptions" (Massumi, 2015). Micro-perceptions alter the body's capacity to act. They do so by either enhancing or diminishing that capacity momentarily, resting between the individual's perceptible and imperceptible experience of embodiment. Thus, the human machine interaction or connection generated by computer-based games is not emotional but rather lies in the precognitive instinctual realm of the human mind. The micro-perception, I believe, can act as a

point of departure to consider the experience of play, outside the anthropocentric paradigm for cognition based on human emotions, to consider the machine as having access to a kind of ontological and agentic capacity too.

My continued research objectives will expand upon and continue to merge the realms of theory, curatorial practice and art in order to venture into an exploration of human machine interaction through the often-alienating processes of computational communication. Interdisciplinary crossings will occur in the examination of aesthetic and pragmatic interfaces, borrowing from my practice based research methods as an artist and curator. A potential example of such a crossing can manifest itself in a mediation of computer communication through the design of new OOP languages - outside of Perl and Ruby - that are based both on aesthetic experience and functional design. I feel that it will be beneficial to consider the order/flow of the communicative structures in OOPs and to curate them towards facilitated communication. Code can become an artistic playing field. I anticipate that this research will provide new frameworks for the philosophical understanding of digital interfaces to include nonhuman agencies and to facilitate human-machine interactivity through artistic and curatorial methods.

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