Science Fiction Cyborgs: A Bioethical Issue in the Human Evolutionary Chain

A Thesis Proposal

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By

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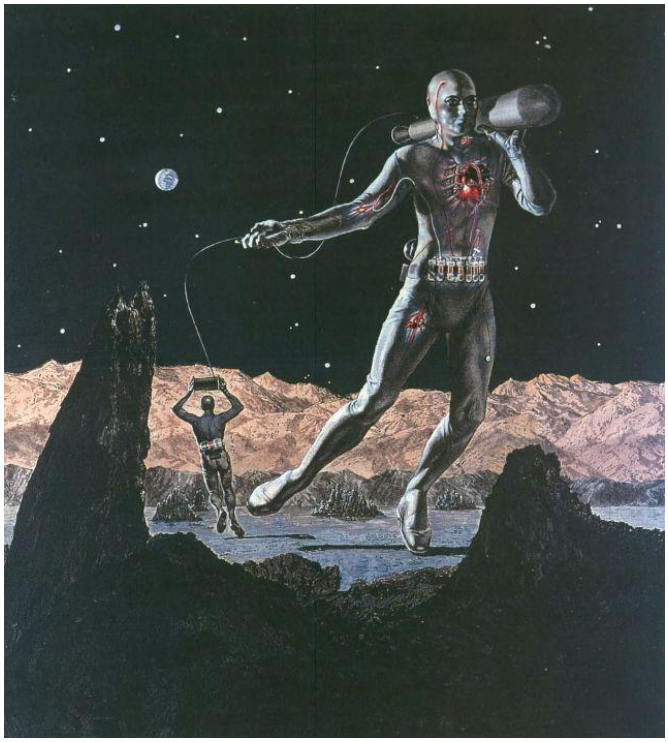
Abstract:

In various science fiction text, film, and television programs cyborgs are seen in various forms of light in their importance in the human evolutionary chain. Cyborgs encompass bionic humans, clones, and androids because of their relation with humans to technology. With this human and technological convergence comes a stage in human evolution in which humanity has the choice in designing their evolutionary path. This can be seen as an "unnatural" process and a challenge to the bioethical boundaries of crossing the "Prometheus-line" and challenging the natural order of thing and a higher being, as Prometheus himself did to Zeus and Frankenstein did in the creation of his cyborg creature. The cyborg is both an object of fear and admiration of the capabilities of technology and how it both helps and hinders human beings. Fear can come from the potential of programming brains, or program human DNA, or build humans from tangible technological pieces either in silicone or flesh. Admiration can be found in the form of giving back humanity to those who once lost it in the form of bionic prosthetics and curing deathly ailments. Examining terms such as "natural" and "human" and their relation to cyborgs and cybernetics in general opens humanity to their greatest challenge in crossing the "Prometheus-line". By challenging the norms of "human" it gives room for cyborgs to take their place as a possible next step in human evolution as projected by science fiction. As an analysis of bionic humans, clones, and androids in science fiction literature and films, studying their relevance as cyborgs in their role as a stage in human evolution, then once in existence how does one prepare for this next stage in evolution and what bioethics are entailed therein.



(Figure 1)

Introduction/Description:

"Fish, build yourself a lung!" said Dr. Manfred Clynes (1965, 8), one of two authors who coined the term "cyborg" in 1960. "For the exogenously extended organizational complex functioning as an integrated homeostatic system unconsciously, [they] propose[d] the term 'Cyborg.'"(Clynes, Kline 1960, 27) A man machine built to withstand the hardships of space, balanced and controlled by various drugs and cybernetic systems that maintain its homeostasis. What Clynes and Nathan Kline had envisioned was a man who was his own spacecraft with all that he needed, food, a mode of travel, and air supply all located within his own body. (Figure 1) So when Clynes proclaimed that a fish should build a lung to allow itself to transcend the world in which it was born in to explore another world (in this case land) it must build the necessary components to achieve this. "The cyborg concept helps man overcome the limitations of

his earthly birth and adapt himself to space by using the accumulated experience of mankind plus his own courage and inner drive." (Clynes 1965, 8) This idea still persists today but in other forms. The cyborg has come to mean much more than a man machine, cyborgs now encompass bionic humans, clones, and even androids. How the cyborg is able to do this is by rethinking "the kind of body that is formed in a place of what we have conventionally seen as human," (Nayar 2010, 67) "a form of disembodiment and a simultaneous re-embodiment. These are the posthuman bodies where 'wetware' (the flesh) merges and interfaces with hardware (the computer or the machine) and the software (code)." (67) The cyborg is the re-embodiment of what can be expected in the posthuman age. By combining wetware, hardware, and software in various combinations that involve either attaching hardware to wetware, or software manipulating wetware in the early development stages the three main embodiments of cyborgs, bionic humans, clones, and androids come into existence. But because of the manipulation involved in the birth of cyborgs it becomes easy to outcast them, though they are an extension of humans in the form of posthumans or transhumans. As an analysis of bionic humans, clones, and androids in science fiction literature and films, studying their relevance as cyborgs in their role as a stage in human evolution, then once in existence how does one prepare for this next stage in evolution and what bioethics are entailed therein.

"Implanted corneal lenses, synthetic skin, and other technological innovations blur the definition of the natural body." (Dinello 2005, 115) The wetware humans are born with is what is seen as the "natural body" and because it is believed that it was created in the image of a higher being it means that it should never be altered. But humans have been altering their bodies for generations. "Bodies have never been 'natural'. Whether

it is a prosthetic arm for the injured soldier or braces to align the teeth, bodies have constantly been modified in all cultures." (Nayar 2010, 68) Even the very environments in which humans currently live in have altered the very state of their natural bodies. Recent studies have argued that early humans were much stronger and faster than any athlete in existence today. (Hsu 2011) Simply by taking control of their surroundings and environment, to the cookware in which to make food, humans have constantly evolved their bodies into something that is similar to but not completely like their ancestors. (Kelly 2010) In fact some such as Juan Enriguez believe eventually the current generation's grandchildren will develop larger heads to accommodate large brains. ("How it all began" 2014) But what is missing in this discussion on evolution is the role in which technology plays. The cyborg needs to be part of the story of what entails the next stages in human evolution. It is naïve to think that technology would not play a larger part in how humans begin to shape their future selves, whether with eugenics, installing chips and hardware into humans, or creating humanoid robots that look and act as any other human being would. Technology is already so ingrained in human lives to imagine a future where technology plays no part in the evolution of the homo sapiens sapiens species is irresponsible and failing to grasp the larger scope of what is being accomplished with technology. Already computerized prosthetic limbs controlled by thought patterns are in testing to be made safe enough for wounded veterans. An accomplishment such as this, that allows a person to regain what is lost, is allowing them to be able to become human again. In an interview with Geoffrey Ling on 60 Minutes, he describes that the losing of one's hand, is like losing one's humanity. By gaining a new hand through bionic technologies one is regaining their humanity. (Kelly, 2013) "[T]oday's nanobiology and electronic implants are not entirely radical

developments – they extend what technology has always done for and with human bodies." (Nayar 2010, 65) Human bodies rely on technology to give humans a sense of humanity. It can be argued that with any type of technology aiding human existence makes someone a cyborg. The pacemaker one has installed the smart phone they use, or the glasses one wears. Humans have constantly shaped the environment around them to their needs and liking. It can be stated that humans no longer live in "natural" environments, similar could be said of human bodies and that they are no more natural than the technologies used every day in human existence. Just because a human is made of flesh and natural materials does not always imply a "natural" component to human beings. Yes human bodies can die and decay which implies a "natural" process, but once silicone and technology make their way into human bodies and become part of the normal functions needed in everyday life, how does that make a human unnatural? Are they now less human? Do new rules and regulations need to follow their existence? "For human beings, I want to convince you, are natural-born cyborgs." (Clark 2003, 3)

The ethics in which a cyborg lives, and is also created makes for a conundrum on how to adapt cyborgs into everyday society. "Ethical systems always contain potentially opposing tenets. I abhor violence, but I believe in self-defense; I resist war, but I honor soldiers. The former conflict is personal, the later communal, but both are ethical." (Rabkin 2011, 139) The idea of whether or not a cyborg should ever come into existence is a hard one to answer. On the individual level the greater community should be happy that the military is able to give back hands, arms, and legs to their wounded veterans. But the greater community should be worried that individuals are being given bionic limbs that can be programmed to be faster, stronger, and more durable than any current human hand. The CBS special in which this invention was introduced to the wider

public showed how far the abilities of modern technology had come. With a robotic arm or leg that acts as natural as a flesh arm and leg, why wouldn't someone as deserving as a wounded soldier have something that allows them to feel "whole" or "normal" again? What is being given back to the soldiers is their humanity in the form of something cyborgian. So that by becoming a bionic human a person can become more human. That bionic human is fulfilling the next stage in their evolution by offering humans an opportunity to be more human, and becoming the next wave of what humans will become. "The emergence of technology was a milestone in the evolution of intelligence on Earth because it represented a new means of evolution recording its designs." (Kruzweil 1999, 38) By recording how humans design the next generation of humans a blueprint can be followed and altered as needed. The great fear in all this comes from those insatiable sins such as greed and vanity that can come with the new technologies. Challenging the current ethical boundaries humans understand about their machines. Humans constantly upgrading themselves to be stronger, better, faster, stronger, prettier to improve upon what they feel might be a weaker fleshy human body. In an episode of Futurama titled the "Six-Million Mon" (*Futurama* 2012) where the character Hermes feels himself to be obsolete and starts having robotic implants to make himself remodeled to be a more efficient employee. But around every corner he found something else insufficient with himself he wanted to change and continued to get more and more "upgrades" to the point he even believed his human brain to be insufficient. This is almost exactly what is feared if becoming a cyborg is an option. "[A]s science and technology develop, they create options we have not encountered before." (Rabkin 2011, 140) These plethoras of options are strange and confusing and without much to fall back on in understanding it can provide a storm of zealousness that could end in bigotry

and hate. “Bioethics, the questions of right and wrong in biotechnological matters, just as in legal matters, hinges on knowing, whether or not we know and, if so, how we know." (Rabkin 2011, 140) Because cyborgs can seem both right and wrong at the same time, one the one hand no one would want a soldier to live without a bionic leg, giving them back literally life and limb, whereas the capabilities can be programmed to unfamiliar and frightening potential. "The fundamental problem with bioethics is that ethics is inherently stabilizing and biotechnology is inherently destabilizing; one resists change, one promotes it." (Rabkin 2011, 140) Technology as an ever changing force uproots bioethics and how to define the bioethics surrounding cyborgs. And with so much change who is to say who is in charge of setting the bioethical parameters. Who is to say a cyborg is a person and not a thing? If a scientist develops fetuses that will have super human strength does the scientist now own those fetuses? In the film *Repo: The Genetic Opera* the character, Blind Mag was born blind, but given the ability to see, on the condition that she forever works for the corporation GeneCo and its CEO Rotti Largo. (*Repo: The Genetic Opera,* 2008) The premise for the film is about the ownership of body parts people have bought, but when they fall behind on payments their organs can be repossessed. Blind Mag is in such a contract with GeneCo that if she stops singing and performing her eyes will be repossessed. “The dehumanizing impact of technology has long been a common theme of science fiction.” (Haney 2006, 13) “When in 1980 the US Supreme Court ruled that Anand Chakrabarty’s lab reared bacterium could be patented it set in motion a whole controversy and debate about the human body as *property*.” (Nayar 2010, 72) So when a new innovation in genetic material is developed by a corporation or individual who then is the owner of the innovation? Or when a android is self aware and able to recognize themselves as their

own entity, how does this android achieve civil liberties, or should it ever be granted civil liberties. At this point the question of corporeality and consciousness come into play. "The founders of all contemplative traditions have emphasized the need to integrate direct experience with conceptuality, as if recognizing that one can truly know the self only by being it, not by thinking about it." (Haney 2006, 14)

"I think, therefore I am" is insufficient in discussing the embodiment and corporeality of a cyborg. The cyborg is every bit about the convergence of any of the three combinations of wetware, hardware, and software into a human body that basses a Turing test of intelligence. A robotic arm on its own does not make for a sufficient cyborg. Without the whole human component the arm is otherwise near useless. "The body is a *source* of technology as much as it is a location of technology." (Nayar 2010, 65) The human body and bionic arm together make a complete cyborg. The ideas and challenges of clones and android are on the horizon, some closer to existence than others. "Science fiction runs these human thought experiments for us." (Rabkin 2011, 140) The various scenarios are played out in a fictional world very near to the world and reality that currently exist. This allows for an opportunity to examine many facets and problems that could arise as the existence of cyborgs comes to a head. The cyborg challenges humanity to examine what makes a human, human. "Cyborgs are the progeny of a dual heritage," (Short 2005, 108) and that is what makes them something humans should look forward to. Their versatility and potential outcomes are almost endless, limited only by human imagination and innovation. One must be responsible in creating cyborgs, but the potential to learn from science fiction offers a rare glimpse one of many potential outcomes may be. This is not to say every work of science fiction plays a major contribution to the study of cyborgs, but this offers a slight glimpse in the

examination of the future. By being able to read from a variety of science fiction text and films a greater picture of the human evolutionary chain can be designed and the bioethical issues properly probed. As an analysis of bionic humans, clones, and androids in science fiction literature and films, studying their relevance as cyborgs in their role as a stage in human evolution, then once in existence how does one prepare for this next stage in evolution and what bioethics are entailed therein.

Literature Review:

"[C]yborgs are everywhere." (Dinello 2005, 115) "[H]uman machines populate our science fiction stories, simultaneously evolving with real-world bionic enhancement of our bodies." (Dinello 2005, 115) Cyborgs can be seen in big screen Hollywood blockbusters, as well as in national new programs, and in literature reaching back as far as 1818. The cyborg is a study of hybridity and the dual worlds a cyborg exists in, both alarming and wonderfully imaginative. For the purpose of this thesis the literature and films selected cover issues of human evolution and bioethics. This body of work covers bionic humans, clones, and androids in a variety of science fictions. The purpose of this is to identify the types of cyborgs science fiction portrays and how that relates to the next stages in human evolution, and what are the bioethical consequences that go along with them.

The science fiction literature and films examined in this piece have similar if not the same types of cyborgs, with similar story lines except for a few major differences, for instance *The Matrix* and *The Neuromancer* have similar cyborgs in that both have main characters able to "jack in", as in plug into an Internet or mainframe of some kind. Others such as *RoboCop* and *Frankenstein* have similar traits in examining the piecing together process of what was once human, now altered to resemble something transient from human, rather post human. Films such as *Blade Runner* and *The Island* reflect on the ideas of ownership and what can be considered human, words such as "product" (The Island, 2005) and "replicant" (Blade Runner, 1982) imply an entity that is something other than human. In the *Terminator* films and *Star Trek: The Next Generation* series the T-800 and Data are types of androids that can pass for human but have different experiences when it comes to understanding and interacting with

humans. *Ghost in the Shell* stands a prime example of Japanese anime of cyborgs and cybernetic technology that has fully integrated into people's lives. *Bicentennial Man* has a similar story, except for the fact that an android eventually has himself declared human. These provide examples that will be used as science fiction primary sources to examine the cyborgs in each science fiction story.

In researching cyborgs a multitude of meanings could arise on a single search. One could start with cyborganthropology.com as a source. It offers its own set of definitions to questions such as "What is a Cyborg?" Answering: "Anything that is an external prosthetic device creates one into a cyborg." (cyborganthropology.com 2010) This statement seems rather vague, so to start to understand what a cyborg is or where it comes from the search leads to an article titled "Cyborgs and Space" in which Dr. Manfred Clynes and Nathan Kline define the term. Their idea was to theoretically build a man machine system. The idea of a man machine system persists, and the hybridity that entail it is a common subject amongst authors. Donna Haraway is often heralded as the one to bring the idea of the hybrid cyborgs into academia. Three of the books that will be later mentioned either contain *The Cyborg Manifesto* or a more recent essay "Encounters with Companion Species". This is to say she is one of the most dominant figures in cyborgian studies, specifically through the lens of feminism. However, this thesis will only touch briefly upon feminism, and for as much as Haraway is important to mention, one must learn to break away from using only the most notable of names. To look specifically at cyborgs in film one turns to Sue Short in her book *Cyborg Cinema and Contemporary Subjectivity* and how often she examines the hybrid form of the cyborg, as does the book *The Dada Cyborg*. Short was also the one who introduced the concept of self aware androids as part of the term "cyborg." (Short 2005, 12) Her

inclusion of them helps to broaden and better examine cyborgs as they could potentially exist in the future. Unfortunately Short does not cover anime as part of her study. Instead one must turn to Cinema Anime to have a comparison of Western to Eastern science fiction films. In the anime researched thus far it appears as though Eastern science fictions are more accepting than Western.

This does not come as a surprise no more than how the mind and body are viewed in Eastern verses Western. *Cyberculture, Cyborg, and Science Fiction* covers the value of self awareness and the body. This self awareness is important when covering the topic of whether or not a cyborg is a thing or a person. Cybercultures is also important to include because it forms the theoretical basis in which to examine cyborgs. *An Introduction to New Media and Cybercultures* by Pramod Nayar and *The Cybercultures Reader* provide a backdrop in the examination of embodiment and the idea of what being a cyborg means, asking questions like: "What is the ontological status of a cyborg body? How are identities and subjectivities of bodies reconfigured or problematized through cyborization? What are the political implications - terms of citizenship, for example - of cyborged bodies?" (Nayar 2010, 66).

All the authors and books mentioned touch upon evolution and bioethics in different respects. Either in a way that is speculative in relation to the science fiction work being examined or asking general questions the science fiction brings up. This is but a light touch on the ideas that cyborgs could potentially open up in evolution and bioethics. Ray Kurzweil goes into more depth on evolution in regards to humans and technology in *The Age of Spiritual Machines*. He states "Evolution is a master programmer" (Kurzweil 1999, 46), but "evolution's lack of documentation, it is also a very inefficient programmer." (Kurzweil 1999, 46) He argues that the conventional way

in which evolution has worked is unable to consistently make improvements. He specifically speaks about singularity, but he does not cover the idea of a human and technology convergence and the bioethical issues that can be associated with it. Eric Rabkin does cover this in a few of his own articles namely a chapter entitled "Science Fiction and Bioethical Knowledge" from the book *Bioethics and Biolaw through Literature*. He writes that science fiction is a gift and allows humans a place in which to have thought experiments. (Rabkin 2011, 148) In the book *Chimera's Children*, the whole premise is to examine human and nonhuman combinations and the ethical boundaries being tested. All of which to say that no one text has presented itself as a complete examination of cyborgs in regards to human evolution and bioethical issues. There is more written about cloning specifically and current real life examples, but the inclusion of bionic humans and androids is not made, a gap in which the work of this research should begin to cover.

All the films and literature covered thus far is not an exhaustive search of cyborgs in academic writings and science fiction. The time to do so simply was not there, but research is a never ending process and especially as more technological innovations come into existence so will the number of resources and references available. This research will continue to evolve and examine the resources as they are presented. For the present, the references listed above provide the jumping off points needed to examine cyborgs.

Project Scope and Timeline:

Date	**Task**
Nov. 14, 2014	Proposal Presentation
Dec. 1, 2014	Introduction Draft
December to April	Write approximately 5 chapters
March 2015	Submit for Graduation in June
March 2015	Oral Defense Recommendations
End of April	Oral Defense
June 5, 2015	Graduation

Preliminary Studies:

Examining the early ideas of the cyborg in science fiction, one must first delve into the ideas of the hybrid and altering what one would consider "natural". "[B]ecause of their missed origins and the way in which the problematise discrete division [cyborgs] provide a means by which to evaluate 'hybridity'". (Short 2005, 107) Mythical beings such as the chimera, and Frankenstein's creature provide some of the earliest examples of an artificial hybrid. The hybrid term "cyborg" coming from "cybernetic organism" did not come into existence until Manfred Clynes and Nathan Kline proposed the term in September of 1960. "For the exogenously extended organizational complex functioning as an integrated homeostatic system unconsciously, we propose the term 'Cyborg'." (Clynes and Kline 1960, 27) Their idea of the cyborg was a man outfitted with technological cybernetic parts to allow him to survive in space. Their meaning of cybernetic was the theory of communication and control that would be used to achieve homeostasis. A "man machine system" able to provide his own source of energy and mode space travel. These functions are mechanical in nature, but cybernetics also implies some functions as "natural" such as neurons communicating and firing off in the brain. This implies that people, such as they are today, are cyborgs because of the functions that occur naturally in their bodies. But for now, one needs to travel back via myth and religious text to explore the origins of hybridity and the creatures that came into existence.

Some of the first forms of hybrids appear in Egyptian mythology. The god of the dead, Anubis has a black jackal head and a man's body. Him and many like him were highly respected gods and goddesses. In Greek mythology hybrids are seen as monsters. Chimeras are a form of this from Greek mythology. Merriam-Webster describes the

chimera as “a fire breathing she-monster in Greek mythology having a lion’s head, a goat’s body, and a serpent’s tail.” (*Merriam-Webster Online*) The term Chimera is now used to describe hybrid animals, and is also considered a medical condition in which cells of two different DNAs merge carrying on both sets of DNA. This could be thought similarly of the cyborg. The cyborg is a hybrid of two types of functions, technological and human. The technology of a cyborg is not always a mechanical function but technology is always involved in the process. For instance a clone could be considered a cyborg because of the process needed to clone the DNA to create an identical clone. The replicants of Blade Runner would also be a part of this definition as technology was required to create them into being. (*Blade Runner* 1982) This same concept of needing an element outside of the “natural” process to bring a being to life is also seen in the story of Pygmalion and Galatea. As his creation and born of his love for her beauty, Galatea could not have come to life without Pygmalion carving her then having the secret desire to have a bride in her likeness. With Aphrodite’s blessing Galatea was no longer made of ivory but of warm flesh. This transformation is important in the idea of seeing bionic humans, clones, and androids not just as “things” but as being their own entity. This distinction of object verses person, or rather having agency, is an important distinction to make because of the object nature or ownership that a cyborg could easily be referenced to. But by being in possession of its own body a cyborg has an opportunity to identify their own “bodiliness”, or corporeality. By registering the cyborg not just as a cognizant being but also one in possession of their own agency and makes it more difficult to take “possession” of the cyborg. Galatea was never further written about beyond the Ovid (Homer 2007) in which she is mentioned, but from what is written it can be assumed that there was no question as to her humanity, and the fact

that she was a person. Cyborgs however are often mistreated or rejected in society, as Frankenstein's creature experienced time and time again.

The idea of the shibboleth comes here as the pre-history in separating those who are "other". The shibboleth, originally written about in the Torah was a way of distinguishing the Ephraimites from the Gileadites. (*King James Bible*, 12:6) This idea of distinguishing one group from another is something humans have done repeatedly over the course of human history. Whether it was in the form of slavery, or simply deciding blonde hair and blue eyes was better than any other physical trait the idea is as ancient as human history. Cyborgs in literature and film often find themselves ostracized because of what they are, and not because they themselves made the choice to be a cyborg. This otherness often causes a rift between the cyborg and the society, usually caused by the humans that created the cyborg, as Frankenstein did to his creature. A major fear that is seen over and over again in films involving cyborgs, is the idea of a cyborg harboring such a hatred for humans that it actively seeks to destroy them. This common trope in science fictions involving cyborgs is nothing recent or new. Because the idea of the cyborg taking place outside of science fiction seems so strange and terrifying it is easy for humans to seek to ostracize cyborgs, much like the chimeras are seen as monstrous and dangerous for their mutation.

"Transmutation" is the process in which a cyborg is created, because cyborgs are not necessarily "naturally occurring" because of the technological component to their birth, their evolution can be seen as a transmutation that has occurred. Transmutation means "the conversion or transformation into another species" (*Merriam-Webster Online*) it is being implied here that cyborgs are another species, but a species in which humans have the ability to shape the evolution instead of natural selection. But as

grizzly bears and polar bears are seen as part of the same family so too can cyborgs and humans. But this option of controlling evolution may be seen as having the same ability as a higher being (whether they be called God, Mother Earth, natural selection, Vishnu or otherwise) for humans to have this control is both foreign and depicted as frightening in some science fiction works. But as Charles Darwin describes in *The Origin of Species* "The key is man's power of accumulative selection; nature gives successive variations; man adds them up in certain directions use to him. In this sense he may be said to make for himself more useful breeds." (Darwin 2009) The adaptable nature of human beings, it would be of no surprise if they simply adapted to have technological components or additives to their body.

The early hybrids of chimeras and Egyptian gods display how hybrids have always existed in mythology. These hybrids have been revered and shunned for their existence. The treatment as "other" as in the form of a shibboleth, rejected for differences. But even if cyborgs are a form of "transmutation, it allows them to be part of the selective process that nature already had and humans took advantage of. "Hybridity occupies the middle grant between humanity and its presumed Other, with technology serving as a means by which to question the veracity of natural distinctions and reconsider relations of power." (Short 2005, 131) The middle ground was not where previous cyborgs lived, creatures were shunned, gods were all powerful, but future cyborgs might be able to occupy this space.

Methodology:

Like the patchwork of a quilt, or Frankenstein's monster, part of the methodology of my project is to include this as a way to express the hybridism of cyborgs as well as their evolutionary gaps in science fiction. The concept of the project is to choose how much emphasis of the typical traits and attributes a cyborg has and have that cyborg appear depending on the selections of a user. Existing cyborgs in science fiction films will be given numerical values for their attributes. Attributes may include such things as: intelligence, dexterity, strength, love/loyalty, or creativity. Using cyborgs such as Roy Batty, T-800, Data, Andrew Martin, and Alex Murphy as existing cyborgs, users will find their preferences yield different types of cyborgs depending on the attributes they choose to stress. Such as if a one to ten scale is used to determine the level in which a cyborg is intelligent and the intelligence is set to ten, strength ten, dexterity ten, and love zero, the T-800 from *the Terminator* would pop up with either an image or movie clip with a brief explanation as to why the attributes are ranked as such for the T-800. The numerical values would be determined by myself, and so the cyborgs in question would be receiving valued attributes depending on my interpretation of the cyborg in the film, and where their ranking lies amongst other cyborgs. Though this offers a potential heavy bias on what I determine to be a high or low ranking, this also gives an opportunity to find out what cyborgs do not fit in the scale and gaps then occur. What the gaps offer an opportunity for, is for the user to be able to build a unique cyborg that has not been developed in science fiction films.

Potentially what it would look like visually is each attribute will be represented by a body part, an arm for strength, the heart for love, etc, as traditionally these traits are commonly represented. This gives homage to Frankenstein's creature, and the

patchwork like nature in which the monster was made, but also to the various movie representations made over the years. Visually how this would look is an ambiguous almost stick like figure with square outlines over specified body parts and labels over each square box. Sliders would be labeled with a minimum and maximum of one to ten. As mentioned before, over an arm would be strength, the heart love, etc. The exact labels have not been completely determined; more research must be done to discover what the most common attributes amongst cyborgs in various science fiction films are. The goal would be to assign numerical values that appear when the user selects the intensity of the attributes. What has also not been determined is when the user selects an attribute to emphasize or deemphasize the opposite of that attribute would be emphasized or deemphasized. For instance, if a user selects to emphasize intelligence in a cyborg it would then deemphasize stupidity, or if strength is set to one, weakness is set to nine. I have not completely decided if this would be needed, or a necessary part of the project. But usually when one attribute is emphasized then the opposite is being deemphasized.

Finding a program to support a project such as this, does not need to be particularly complex, but must be visual. Processing is an option as it can produce excellent visuals and sliders can be programmed into it. However, because of my previous knowledge is in Logo language it seemed like the simpler choice without having to completely start over in Processing, as I feel I would have to do. Also NetLogo has a large online community and an extensive library that can offer a lot of support. Armed with knowledge of my own and an online community NetLogo presented itself as the best choice for someone as limited as myself, a world of possibilities. This does not mean that during the process it would not be possible to select another program to use,

but as of this time and the research done on the different coding languages NetLogo seems to be the best choice in accomplishing the work and scope of the project. NetLogo is able to process complex systems of code but is not so complicated to code. The process of the making of this project is open to other possibilities as they arise. Such as if a data base system with some graphics capacity presented itself, there would be a short time of experimentation and reflection to decide if this would be better suited than NetLogo. As it stands NetLogo provides the necessary components to achieve a project of this size.

Intended Outcomes and Dissemination:

One can argue that the study of cyborgs has been exhausted and champions such as Donna Haraway are such rock stars in this realm it would be impossible to top their work and ideas. What I have found however in attending conferences about science fiction and the fantastic (a term used to incorporate borderline fantasy work) the cyborg is rarely mentioned, and when it is, it is often examined through the lens of gender. Although this is a very valid form in which to gaze upon cyborgs, this largely uses Haraway's ideas and teachings, and continues to be a cornerstone in which to study cyborgs it is not the only way. For example, in the research I have been doing one of the biggest wonders I have come across is how little cyborgs are mentioned in bioethics. There is an official report written about gene modification/artificially created genomes also known as "synthetic biology" and the Commission of Bioethical Issues raises issues of how to prevent "amateur" and "DIY scientists" from trying to contribute their own visions of synthetic biology that does not agree with the overall view of the commission. What this sounded like was a prevention of allowing "mad scientists" from becoming too overzealous with creating new forms of life. Not once though in the report is there a mention of science fiction. This is understandable in the sense that science fiction is a form of fantasy, it is make believe, and who would ever use something as unsounded as a science fiction text in an official report? But I think it unwise not to include it, which is why part of my research is trying to legitimize the science fiction genre. There have been many great texts to come from science fiction, *Fahrenheit 451, 1984, A Brave New World*, are all texts that are considered "classics". If they are respected enough to be considered great works of literature, then why not use the predictive and speculative

elements in any science fiction novel deemed to be of worth used to help understand and predict what can be expected of cyborgs, and other technological innovations.

The importance of this comes at a time when technologies are so rapidly improving and evolving that society normally "takes it as it comes" because there seems to be little opportunity to get ahead of it. But in the case of cyborgs, by examining bioethical issues, civil rights, and personhood status there is time to jump ahead and start examining the ramifications, both positive and negative, of what the existence of cyborgs could do to the face of humanity. I put it so broadly, and with a rather "save the world" feel, because of the fact that the science fictions that usually involve cyborgs have the same sort of feel while reading/watching about it. By examining future issues now, and using science fiction as the blue print of what can possibly be expected society has a chance to get ahead of the curve and use science fiction as a tool instead of just as a form of entertainment.

Future iterations and projects involving this research will include the presentation at conferences such as the Northeast Popular/American Culture Association (NEPCA) and the International Associations for the Fantastical in the Arts (IAFA). They are two conferences which offer many different types of scholars to present on various topics related to science fiction, among other subjects. Typically one presenter speaks about gendered cyborgs, but there is never a panel. This lack of coverage on a topic that has such a plethora of knowledge of allowing humans to examine their humanity and begin to predict what the next stages in human evolution are going to look like. For this very reason cyborgs need to be more closely examined than we have before. This is part of the work I hope to be doing once my thesis is complete, and as more science fiction films, texts, and innovations come out the thesis

will evolve into new ideas and thoughts about the state of the cyborg and when it will be fully a part of human lives.

Another iteration this research will take, will be the fuel of my doctorate work. The whole reason why I chose Emergent Digital Practices as my department of study was to help launch me into the realm of Digital Humanities. What my research will help with is exposing me to numerous types of science fiction text and movies that help to influence future decision making of policies that involve evolving technologies. It also lays the foundation of the future work I would complete in the form of experimenting with different systems whether code, 3D printing, or projections of works normally relegated to the humanities.

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