A Simulated Consciousness in Silicon: Ray Kurzweil's Transhumanist Theories Applied to *Her*

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July 2014

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Introduction

One of the most prominent search engines and innovative corporations worldwide, Google Inc., has established a high reputation as one of the leading Tech companies in the field of Artificial Intelligence. The corporation is in its fourteenth year of existence and has succeeded in hiring top scientists in the field. Additionally, in recent years, the multinational purchased various firms which main area of expertise is machine intelligence. By spending approximately three billion US dollars, Google acquired Nest Technologies and, in 2014, Google acquired UK-based firm Deepmind which aims to make computers think like humans. In 2012, the corporation hired Ray Kurzweil –a pioneer in the field of artificial intelligence – to create an artificial brain.

Kurzweil's career as an author and inventor is defined by many visionary and technological breakthroughs. For example, he invented the first omni-font optical character recognition software and the first print-to-speech reading machine for the blind. In addition to this, Kurzweil has written many books on artificial intelligence, which include theories and predictions of the future. In *The Age of Spiritual Machines*, Kurzweil explores the idea of the rise of machine intelligence. Most well-known is his idea of the technological singularity which predicts that technology will grow exponentially and by 2029 will match human intelligence (211). Kurzweil explains in *The Singularity is Near* that in order to keep up with this intelligence explosion, the individual has to enhance himself with artificial intelligence (9). In addition, he argues the human brain consists of approximately one hundred trillion little cellular robots and, around 2020, every neuron in the brain will be scanned and mapped accurately and therefore the entire Darwinian brain can be simulated (25). In addition, in his last published book, *How to Create a Mind*, he explores the brain, mind and its ineffable elements such as consciousness and free will. According to Kurzweil, consciousness derives from brain activity and, therefore, can be replicated. His most provocative prediction is that

AI will be conscious within twenty years (*The Age of Spiritual Machines* 211). Kurzweil encountered criticism from both scientific and religious communities. Opinions on his controversial theory vary considerably as it is called "visionary" (Bailey), "pseudoscientific" (Myers), or even pure "science fiction" (Coulardeau).

In contemporary society, having instant access to technology, internet, and information resources has already become an important part of everyday life. Technology is embedded into the individual's immediate environment and daily routine and has gradually reshaped every aspect of life. Consequently, a way of understanding this new symbiotic relationship between human and technology has begun to take shape over the last two decades; a key concept in transhumanist thought. Julian Huxley, an English biologist and eugenicist, coined the term in 1957. In his book *New Bottles for New Wine*, he writes, "the human species can... transcend itself... in its entirety, as humanity. We need a name for this belief. Perhaps transhumanism will serve: man remaining man, but transcending himself, by realizing new possibilities of and for his human nature" (17). For Huxley, improvement of humanity would be achieved socially instead of technologically. However, in contemporary usage, the transhumanist movement particularly focuses on how humans can transcend its current physical and mental limitations by means of technological and scientific developments. This futuristic movement has a large following of scientists among various field of expertise. Transhumanist thought is commonly divided into three branches: super-longevity, super-intelligence, and super-wellbeing (Brietbart). Most relevant to this paper is the one most frequently associated with Kurzweil's concept of technological singularity: super-intelligence – a hypothetical entity which transcends human intelligence (*The Singularity is Near* 262). Kurzweil is considered a leading figure in the transhumanist movement and his controversial ideals received much recognition within the transhumanist community.

Kurzweil's set of beliefs is to revolutionize humanity and – more importantly – for humans to progress to higher levels, both physically as mentally, by way of technological advancements. He considers technological development as *progress*. A word that has a positive connotation as it implies improvement or advance. Thus humans will gain from technological development. In addition, out of the exponential technological progress – which according to Kurzweil ultimately leads to the technological singularity – will emerge super-intelligence. In turn, "the super-intelligent AIs benevolently "uplift" humans to their level by means of uploading" (More). In other words, future AI will make it possible for humans to transfer their minds to a computer which will elevate human intelligence. Kurzweil tends to have optimistic and positive expectations of the future. In his writing, the futurist emphasises the benefits of technological progress and often neglects the downsides. Instead of occupying a neutral position, he gravitates toward a more utopian perspective of the future. However, one could also speculate that the accelerating technological development of which Kurzweil speaks could ultimately lead humans into a dystopian future. Today's individual cannot help but notice that Science Fiction gravitates towards dystopian scenarios; such as Isaac Asimov's *I, Robot*, George Orwell's *1984*, Philip K. Dick's *Do Androids Dream of Electric Sheep*, and Ridley Scott's film *Blade Runner*. Nonetheless, Kurzweil claims that what humans will gain from technological progress outweighs the risks.

Set in a nearby future, Spike Jonze's film *Her* depicts a transhumanist romance between a human and a highly advanced operating system and questions the complex relationship between humans and technology. The film depicts a future in which the lines are increasingly blurred between human and machine, biology and technology, and the fake and authentic. Jonze's film is a fair representation of Kurzweil's theories and predictions. For example, like in Kurzweil's predictions in *The Age of Spiritual Machines*, the AI in the film claims to be conscious and learns independently. In addition, throughout the film, Samantha,

the AI, portrays qualities typical to human nature. In addition, her programming allows her to grow and accelerate her own intelligence and transcend human capacity. However, *Her* deviates from Kurzweil's theories and predictions in several ways, such as, AIs that outpace humans. In contrast to human intelligence, machine intelligence in the film has grown immensely in a short period of time. In addition, whereas the AI in *Her* has enhanced greatly, humans has not yet enhanced themselves with technology.

This paper will explore *Her* from a transhumanist perspective and it will look at the way AI are portrayed and treated in the film. In the first chapter, a theoretical framework will be given concerning Kurzweil's main theories and predictions as well as criticism and problems that accompany his ideological vision of the future. In his earlier work, *The Age of Spiritual Machines,* Kurzweil established a timeline in which his predictions on advances in technology are marked leading up to the singularity. This paper will focus primarily on three main predictions acclaimed by Kurzweil. Then, this paper will place *Her* on Kurzweil's timeline and analyse the way in which his three predictions adheres to or deviates from the film, focusing mainly on AI, technology and the human-machine relationship. The final chapter of this paper will give a conclusion of the analysis of the film which will highlight the exponential technological growth, the increase of emotional attachment to technology, and new forms of artificial consciousness that are becoming more evident in contemporary society.

Literary Review

The Singularity is Near: Three impending Revolutions

In *The Singularity is Near*, Kurzweil examines the technological singularity. The singularity is a hypothetical period in time when artificial intelligence has increased profoundly and surpasses human capacity and intelligence. At this point, human life will be irreversibly transformed and a leap of human evolution occurs. For the purpose of illustrating his forecast, Kurzweil brings forward his theory of the law of accelerating returns. This theory is based on Moore's law, named after Gordon E. Moore, an American author and co-founder of Intel Corporation, in which the principle of the rate at which computer technology grows is examined. More specifically, with advances in microchip technology, the number of transistors on an integrated circuit, or computer chip, doubles whereas the size of the device will decrease significantly. An example of this in contemporary society is that of handheld mobile phones, in which the device is simultaneously getting smaller and more powerful. Kurzweil applies Moore's theory to a broader range of computing technologies. According to Kurzweil, if the accelerating technology is placed on a line graph, the growth would not be linear but exponential: technological development begets more technological advances. In other words, the development in technology builds on technological advances to produce even more rapid technological change. This change will progress to the point where machine intelligence transcends human intelligence.

In the same book, Kurzweil argues contemporary society is at the threshold of an intelligence explosion and three overlapping revolutions, GNR, will unfold in the first half of the twenty-first century which will result in the impending singularity. The acronym GNR stands for genetics, nanotechnology, and robotics (205). Moreover, the development within the three primary technologies will provide humankind with an abundance of benefits,

according to the futurist. To illustrate his point, Kurzweil offers various contemporary examples of technology, for example, Google's self-driving cars. "A technology that will lead to significantly fewer crashes, increased capacity of roads, alleviating the requirement of humans to perform the chore of driving" (*How to Create a Mind* 90). Firstly, the revolution in genetic and molecular science will provide solutions to cure diseases and ensure longevity. Kurzweil states, "by understanding the information processes underlying life, we are starting to learn to reprogram our biology to achieve the virtual elimination of disease, dramatic expansion of human potential, and radical life extension" (*The Singularity is Near* 205). The 'N' for Nanotechnology will provide the means to cure diseases, for example, blood cell sized devices that can be planted in human bodies to keep it healthy from within. In addition, he states, "the 'N' revolution will enable us to redesign and rebuild - molecule by molecule - our bodies and brains and the world with which we interact, going far beyond the limitations of biology" (206). In other words, organic bodies will gradually be replaced with more efficient and undying artificial materials, and humans will be able to expand their own cognitive capacity. Lastly, the final step towards singularity is AI, or robotics, which will match human intelligence and go beyond it.

However, what Kurzweil neglects to mention is that all of the possibilities described, the three revolutionary technologies – GNR – could be used for more malevolent purposes such as to control the masses. Kurzweil argues, "bioengineering is in the early stages of making enormous strides in reversing disease and aging processes. Ubiquitous N and R are two to three decades away and will continue an exponential expansion of these benefits" (396). Indeed, accelerating future technology would offer humanity possibilities in, for example, the elimination of diseases, the increase of human longevity, and it will offer unprecedented possibilities in human potential. However, as technology grows exponentially, "the gravest existential risks facing present and future (post-)humanity are also growing at an

exponential rate" (Verdoux 52). The Swedish Professor in the Faculty of Philosophy at Oxford University, Nick Bostrom, examined the existential risks that accompany the acceleration of technology. In his paper, he concludes that the risks arising from technology are potentially greater than the benefits (Verdoux 53). While advancements in the field of genetic engineering could help provide a cure for humankind's most hazardous diseases, nanotechnology could also be misused by, for example, creating genetically engineered pathogens designed to eliminate its host. Another example of Kurzweil's optimism towards technological progress:

> We will spend increasing portions of our time in virtual environments and will be able to have any type of desired experience with anyone, real or simulated, in virtual reality. Nanotechnology will bring a similar ability to morph the physical world to our needs and desires. (*The Singularity is Near* 397)

However, this type of nanotechnology could also be used to manipulate one's consciousness. Nanobots could enter the brain, directly interact with the biological neurons, and take complete control of one's experience of reality. An example of this can be found in Stanislaw Lem's novel, *The Futurological Congress,* in which the authorities dose the population with hallucinogenic chemicals in order to manipulate them into believing they are content and to blind them for the densely populated and impoverished conditions in which they live.

For Kurzweil, the next step in human evolution will come from the integration of human biology with technological devices rather than natural selection or mutation (*The Singularity is Near* 127). However, the link between evolution and technological advancement are often criticized. In an article from *PandoDaily*, a critic argues, "a key aspect of Kurzweil's law of accelerating returns is that it is a naturally occurring phenomenon, like biological evolution, that it advances outside the will of human beings. But how could it be outside the will of humans when humans are doing all the inventing?" (Pensky). While

Kurzweil agrees technological advances and change are inevitable, he does not claim biological evolution and technological advances are "part of the same immutable force" (Pensky). Instead, biology will utilize computing technology to move towards the next step in human evolution. Furthermore, human biology adjusts and evolves with the means it has been offered. An example of this can be found in *Transcendent Man*, a documentary based on Kurzweil's ideas, in which Kevin Warwick, a professor at the University of Reading in the UK, explains how he has implanted a micro electrode array into his median nerves of his arm. Wires run up his arm, plugged into a connector pad and linked to a robotic hand located elsewhere. It showed that as the robot hand rigged an object, Warwick's brain received current pulses. More significantly, Warwick says, "What the surgeons found when they took the implant out was that the body tissue had grown around the implant, pulling it into position. Very quickly, mentally and physically, it's part of you" (*Transcendent Man*). Warwick was able to control and operate a robotic hand just by using his nerves, but more importantly, the silicon chip became a part of his organic matter, his biological body. This exemplifies the possibilities of which Kurzweil speaks: by merging with the technological tools people create, human capability expands significantly. Nevertheless, it could be argued that not everyone will have access to these tools. American computer scientist Jaron Lanier argues, "one day the richest among us could turn nearly immortal, becoming virtual gods to the rest of us." He argues that highly-advanced technology will most likely be monopolized by the elite. Presumably, the promised enhancements will only be available to those who can afford it. Therefore, only the rich could acquire the enhanced technologies. The vast majority of people would then fall behind, while the elite could expand their own cognitive capacity.

Furthermore, by the year 2030, non-biological intelligence will dominate. In *The Singularity is Near*, Kurzweil cites Nietschze when he says that: "man is a rope, fastened between animal and overman—a rope over an abyss" (qtd. 373). In Kurzweil's view, by

merging with technology, humans are capable to reach across the abyss and this will in fact be the next step in evolution. He states the following, "what we are doing is transcending biology. The transformation underlying the Singularity is not just another in a long line of steps in biological evolution. We are upending biological evolution altogether" (374). However, the anti-transhumanist is opposed to his utopian view of an altered human biology because it threatens the intrinsic sanctity of human life. These critics interpret Nietschze's abyss as representing the perils of technology and that by merging with it a new non-human species, or "posthuman" (174), will be created. Kurzweil disputes this by saying:

> We are already reaching beyond our biology by rapidly gaining the tools to reprogram and augment it. If we regard a human modified with technology as no longer human, where would we draw the defining line? Is a human with a bionic heart still human? How about someone with a neurological implant? (265)

The answer to the philosophical question of what constitutes being human remains delicate and indefinable. From a different approach, the same criteria would hold for non-biological entities. To fast-forward to the year 2045 on Kurzweil's timeline, he predicts AI will claim to be conscious; however, whether AI would be seen as human and treated with the same human values is part of the same philosophical dilemma.

The Possibility of Creating a Mind: The Intangible Notion of Consciousness

In *The Singularity is Near*, Kurzweil says, "we already have impressive models and simulations of a couple dozen of the brain's several hundred regions (25), and according to him, it's conservative to conclude that by the mid-2020s, "we will have effective software models of human intelligence" (25). In his latest book, *How to create a Mind*, Kurzweil zeroes in on the brain, both human and artificial -- providing a blueprint of the Darwinian

brain. His book gave him the opportunity to work at one of the leading Tech companies in the field of Artificial Intelligence, Google. In late 2012, Kurzweil was appointed Director of Engineering at Google Inc to develop an artificial, or simulated, brain. According to the futurist, the brain is an information processing system consisting of chemical and electrical activity all of which can be replicated. Around the year 2025, AI will have a brain which works similar to that of a human brain with the same methods and mechanisms (152). In other words, the brain is computable. However, at this point, Kurzweil only talks about replicating organic material and its properties. A more complex phenomenon is what resides within: consciousness.

Intertwined with his ambition to replicate an artificial mind is a view of a future in which human can achieve immortality by uploading their minds to computers. It is this view that raises many concerns as it touches upon the enigma of human consciousness. Certain aspects of consciousness are distinctively human, such as personality and free will, and these mental faculties distinguish humans from other species. In order to reproduce a human brain and mind, one has to get a grip on the intangible notion of biological thinking. The origin of consciousness has been a subject of controversy and attitudes differ greatly. From Descartes' famous expression, "cogito ergo sum," to prove human existence through logic, to Freud's "id, ego, superego," a psychoanalytic conception of the psyche, all have respective notions of the conscious mind. In Theology, consciousness is intrinsically connected to the soul or spirit. Stanford University neuroscientist, William Huribut, is opposed to Kurzweil's plan to cheat death. He believes in immortality; however, in the sense of a divine soul. He states, "death is conquered spiritually" (*Transcendent Man*). The intangible *I,* one's moral and emotional intelligence, is one of the most difficult conundrums for researches in various fields. The views are inconsistent as to what it actually encapsulates; however, almost everyone believes in the *idea* of consciousness and that all humans are in fact conscious. For Kurzweil, the

answer to the question of whether an AI will be human – even without the biological aspect– and, more specifically, whether it will claim to be conscious is a definite yes. He envisages a future in which artificial consciousness will be as persuasive and emotional as human consciousness. The mind is a brain that is conscious and a conscious mind in silicon will arise around 2029, according to Kurzweil's timeline in his earlier work *The Age of Spiritual Machines* (211).

Before tackling this ineffable concept, Kurzweil clearly addresses the problematic relationship between Science, which makes conclusions based on objective observations, and philosophy, which employs subjective experiences. Kurzweil concedes that consciousness is scientifically indemonstrable; however, he argues that the brain and its electrical activity produce consciousness. He states that the brain functions as a system that works methodologically and algorithmically and operates in a mechanical sense. Therefore, when science is able to recognize particular patterns and algorithms can be decoded and mapped accurately, a simulated brain can be created and its content — the mind and its consciousness — can be copied as well. However, by stating that an AI is simply made up of algorithms and all the ineffable human properties of the human psyche will be encrypted and turned into codes, Kurzweil idea was subjected to criticism from various directions. His provocative theory threatens one's sense of identity, uniqueness, and importance. Mark Parnell, a senior user experience designer at Sapient Corporation argues that by claiming "our highest ideals of love and emotional connection could be reduced to simple, mindless algorithms and be so effectively simulated by a computer program seems to diminish and invalidate them."

For Kurzweil, consciousness does not depend on the material that comprises the Darwinian brain; rather, consciousness is the product of the neocortex that enables a human to think higher thoughts. "the neocortex is a metaphor-machine, that's what he's good at, that's why humans are creative" (*Your Brain*). His opinion is that an individual can create a

painting, a poem, or, simply, be funny because the human neocortex is larger than the neocortexes in other mammalian brains. In *How to Create a Mind*, Kurzweil explains the basic algorithm of that region of the brain by bringing forward another acronym; PRTM, the pattern recognition theory of mind. The neocortex is a thin layer which covers the cerebral hemispheres of the brain and is responsible for memory, perception and thought. In other words, the neocortex is where humans do their thinking. The thin layer is made up of approximately three-hundred million modules. According to Kurzweil, "each one learns, recognizes and implements a pattern, and all the modules are arranged in hierarchies created by our own thinking" (*Hierarchy in Your Brain*). For example, the individual can easily recite the alphabet; however, when asked to say it backwards, the individual falters because he is unable to recognize the order and pattern. In a TED talk, he thoroughly describes the following thought experiment and how the neocortex operates:

> One module in your mind might recognize the crossbar in the capital A. Its job is to recognize that and only that crossbar. It sends signals of high probability to the next level, which recognizes "a," and then to the next level, which recognizes the written word "apple." You might go up ten levels and get a level that recognizes irony; but while hierarchy structures vary in complexity, individual modules don't function differently on a basic level. (*Hierarchy in Your Brain*)

Contemporary and Future AIs: Consciousness Based on Language and Communication Between Human and Machine

As previously mentioned, Kurzweil predicts a future period where robotics or avatars will have synthetic neocortexes and will match and eventually transcend the human mind. In other words, advanced technology can mimic and emulate this algorithm and human pattern

recognition. In addition, he claims contemporary computers are already using techniques similar to the neocortex to master knowledge (*How to Create a Mind* 91). He refers to Watson, a computer that beat two human contestants on *Jeopardy*. In his work and lectures, he often emphasizes the significance of Watson's victory because it demonstrates that a computer system is capable of accurately managing and applying a vast scope of knowledge. Watson represents the first wave of computers achieving human level cognition. In addition, Kurzweil explains *Jeopardy* involves understanding natural language in all its ambiguity -- including metaphors, similes, irony, puns, and inside jokes -- all of which Watson was able to apprehend. However, his optimism received a fair amount of criticism. Watson played against two human contestants in the American language-based television show and won convincingly, but perhaps most interesting is the way in which he reacted. Noticeably, his tone of voice was objective and impersonal and his responses showed no sign of excitement, doubt, or joy as he crushed his opponents. During a Q&A with *Popular Mechanics*, Douglas Hofstadter, a Pullitzer Prize winner and an American professor at Indiana University, states the following:

> Watson is basically a text search algorithm connected to a database just like Google search. It doesn't understand what it's reading. In fact, read is the wrong word. It's not reading anything because it's not comprehending anything. Watson is finding text without having a clue as to what the text means.

Even though contemporary AIs, such as Watson and Apple's Siri, master the enormous input of information and are able to pinpoint and provide the appropriate information needed, these AIs still lack to answer with the innate complexity of subtleties, ambiguities, and vagueness of the human language.

Furthermore, another dimension of human consciousness is subjective experience and, according to Kurzweil, future AI will have these subjective experiences as well (*How to*

Create a Mind 113). A term he refers to as Qualia. The term -- coined by C.I.Lewis -- in contemporary usage refers to a quality or property experienced by a person such as moods, emotions, perceptual and bodily sensations ("Qualia"). However, the problem with this concept is that it is elusive to define. Qualia, such as feeling the pangs of jealousy, heartbrokenness, or euphoria cannot be objectively measured by others because it is verbally impossibly to describe. For example, an individual hears a song on the radio and is instantly captivated by its sound and energy. The reaction, the heartbeat for example, can be measured by scientific instruments but the aesthetic experience cannot be measured by others. In other words, the experience of the energy one gets from listening to a song, or the pangs of jealousy, is experienced by the individual alone. In addition, for the individual, this subjective experience is impossible to impart, convey, or translate to others. The same as describing a colour to a blind person, or the smell of fresh-cut grass to an anosmic, one cannot fully describe it with words. In *How to Create a Mind*, Kurzweil explains consciousness is a physical system that has qualia, and he predicts that human will be convinced of conscious AI when these machines would "speak of their qualia" (116). However, Mitchell Kapor, founder of the American software company Lotus Development Corporation, argues:

> Ray Kurzweil's approach relies on an automated process of knowledge acquisition via input of scanned books and other printed matter. However, I assert that the fundamental mode of learning of human beings is experiential. Book learning is a layer on top of that. Most knowledge, especially that having to do with physical, perceptual, and emotional experience is not explicit, never written down. It is tacit. We cannot say all we know in words or how we know it.

In other words, subjective experience is understood or implied without being stated. Qualia is a mental capacity innate to only the human mind. This subjective knowledge cannot be gained from books, only from experience. From a dictionary, AI could learn the objective meaning or

definition of the word jealousy; however, it cannot relate to the feeling of experiencing jealousy.

In addition, in *How to Create a Mind*, Kurzweil states, "in my discussion of the issue of consciousness I noted that my own leap of faith is that I would consider a computer that passed a valid Turing test to be conscious" (126). Kurzweil predicts that by 2029, AI will pass the Turing Test. The Test, a proposal made by Turing in 1950, attempts to determine through conversations whether a computer's performance is equivalent to that of a human. However, Kapor continues:

> Computers don't have anything resembling a human body, sense organs, feelings, or
> awareness after all. Without these, it cannot have human experiences [...] Each of us
> knows what it is like to be in a physical environment; we know what things look,
> sound, smell, taste, and feel like. Such experiences form the basis of agency, memory
> and identity. We can and do speak of all this in a multitude of meaningful ways to
> each other. Without human experiences, a computer cannot fool a smart judge bent on
> exposing it by probing its ability to communicate about the quintessentially human.

In addition to this, it could be argued that the Turning Test would provide invalid and unreliable proof of a machine capable of thinking. The test, a natural language analysis, measures the computer's intelligence level through conversations between a human and a machine. However, the Test merely analyses how much a computer can behave like a human being and therefore only a computer's ability to mimic will suffice to pass the test. AI could simply simulate human behaviours and emotions. Moreover, the AI could learn to label Qualia without actually consciously experiencing it. Therefore, its ability to imitate is not enough proof for it having a consciousness. Terry Walby, UK managing director at IT service company Ipsoft, argues:

> Far more tangible in a real world application, the age of machine intelligence is surely

when a computer can be shown to have absolved humans of mundane tasks, and released them to focus on activities which require not just intelligence, but creativity, original thought, and even genius.

Recently, SoftBank, a Japanese firm, has created a humanoid robot which it says can read human emotions. According to the firm, the cloud-based personal robot is designed to analyse human gestures, expressions and voice tones and has the ability to react upon them. The firm's president Masayoshi Son claims one could interact and communicate with Pepper "just like they would with friends and family" (Gilbert). However, this contemporary example of technology is still not considered a conscious being because Pepper is programmed and thus cannot truly feel or achieve self-awareness. Or to cite Kurzweil, contemporary AI is not – yet – "convincing in its reactions to qualia" (*How to Create a Mind* 116). Whilst the present-day individual shows an increase in emotional attachment with technology – personal gadgets such as the IPod or Smartphone – the symbiotic relationship between humans and AIs of which Kurzweil's speaks is still beyond grasp in the current period of time. Although Siri and Pepper could provide a form of virtual companionship, they are incapable of developing an emotional connection with a human because these AI lack salient traits such as sentience, subjective experience, aware- and consciousness.

Immortality by Mind-Uploading: The Redundancy of Biological Bodies in the Dawning Age of Total Digital Immersion

By taking 150 supplements a day, Kurzweil is hoping to stay alive until human life can be radically expanded. Kurzweil's most provocative and controversial prediction, and a main assumption in transhumanist thought, is that immortality will become a reality. As long as a human body is made up of organic matter, physical death is a human inevitability. Kurzweil's quest to live forever is to be devoid of physical limitations and to overcome the problem of

human death. According to Kurzweil, around 2040, physicality will no longer bind the individual because humans will become digitally immortal by uploading entire minds to computers. In other words, one's consciousness can be transferred to an artificial body or a holographic avatar (*How to Create a Mind 73*). In that same book, Kurzweil argues,

> Identity is preserved through continuity of the pattern of information that makes us. Continuity does allow for continual change, so whereas I am somewhat different than I was yesterday, I nonetheless have the same identity. However, the continuity of the pattern that constitutes my identity is not substrate-dependent. Biological substrates are wonderful – they have gotten us very far – but we are creating a more capable and durable substrate for very good reasons (133).

His prediction on immortality evoked a wide variety of emotions and reactions and many critics firmly argue against his optimistic vision of eternal life. To some, human death is intrinsic to the meaning of life. Others; however, might be enthused by Kurzweil's predictions and are appealed to the prospect of living forever. Like consciousness, the concept of eternal life touches upon the fundamental questions of the philosophy of mind in which moral and ethical dilemmas arise. Leon Kass, chair of the Presidential Commission on Bioethics, states "human life without death would be something other than human; consciousness of mortality gives rise to our deepest longings and greatest accomplishment" (qtd. in *The Singularity is Near* 470). While the notion of immortality could have profound implications and seem unnatural and unnerving to many, for Kurzweil, the prospect of living forever is near utopian.

From the futurist's perspective, human essence arises from within the mind, thus making biological and organic bodies redundant. In *The Singularity is Near,* Kurzweil implies that "the human body version 2.0 will include virtual bodies in completely realistic virtual environments, nanotechnology-based physical bodies, and more" (199). However, much criticism has been published on the technological or ontological credibility concerning the

mind-uploading hypothesis. For example, from an empiricist' point of view, knowledge arises through sensory experiences. The British writer of Science Fiction, Charles Stross, states the following:

> Our form of conscious intelligence emerged from our evolutionary heritage, which in turn was shaped by our biological environment. We are not evolved for existence as disembodied intelligences, as "brains in a vat" [...] I strongly suspect that the hardest part of mind uploading won't be the mind part, but the body and its interactions with its surroundings.

The ongoing debate on nature versus nurture in Psychology could well be applied here because, according to Stross, the environmental factors and nurture are studiously ignored by Kurzweil. Stross claims nature, the inherent qualities, and nurture, direct interactions with the environment, work together to shape the brain. In addition, nutrition, hormones, even direct sunlight can affect one's mood and plays a crucial part in personality development.

However, a counter-argument is made by Kurzweil which states, "when we have nanobots with wireless communicating that go into the brain, they will be able to provide all of the senses, including the tactile sense" (Kurzweil). The virtual bodies and environment will, therefore, be experienced and felt as real as in the physical world. Inadvertently, Stross' argument could be approached from another angle. If the environment factors in on identity and personality development and salient properties of the brain are uploaded to a computer, there would in fact arise two conscious yet different entities: the original and the uploaded self. Up until the point of the upload, both *selves* would have the same memories and behaviour. However, from that point on, their lives will diverge. Each self will grow and develop in their own separate and individual way because they live in different environments and are therefore exposed to different external or environmental factors. Ultimately, the two selves will not be the same person. In addition to this, another ramification of the idea of

mind-uploading is that only copies of the original are made instead of transferring the original consciousness into a computer. If a mind is uploaded to a computational substrate, only a copy of the original will exist within the digital world. Even if the original self could experience through the eyes of the copied self, the original self would nevertheless still be inside his mortal body. Therefore the original will not be able to live on forever, only the copy of the original will live on indefinitely in the digital realm.

Instead of having multiple versions of one's self floating around in cyberspace, Kurzweil provides another scenario, which is to upgrade and enhance the Darwinian brain with advanced artificial intelligence. In this case, only one brain, and therefore only the original, exists. The biological brain will gradually be replaced with artificial material, unable to decay, until thus far that the biological portion will no longer be needed. Then, the mind can live indefinitely, according to Kurzweil (*The Singularity is Near* 373). As mentioned earlier in this paper, the GNR-revolution, or more specifically, biotechnology will provide humans with many benefits – again, Kurzweil's opinion -- such as stopping the natural aging process. In the near future humans can extend their own neocortexes – expand the scope of cognitive capacity -- and think in the cloud by having multiple gateways. The cloud is a collective term of a virtual platform accessible through the internet where the individual can store and access data and share computing resources on multiple servers. In contemporary society, for example, the Smartphone is already a gateway. However, within thirty years, Kurzweil says, the human brain could connect directly to the cloud (*How to Create a Mind* 71). In other words, nanobots would be injected inside the brain and have direct neural access to the database of one's thoughts. These thoughts are stored in the cloud and a search engine would anticipate what a person needs or wants to know.

Nowadays, the individual is creating an archive that differs greatly from previous generations. While previous generations captured special moments in life and collected these

memories in a photo album or home video, today's individual is "creating this incredibly rich digital archive that's going to live in the cloud indefinitely, years after we're gone. And I think that's going to create some incredibly intriguing opportunities for technologists" (Ostrow). In other words, without actually being aware of it, the contemporary individual is constantly creating his own virtual persona and every click on the mouse contributes to that person's digital presence. The digital content one creates -- such as spreading ideas and thoughts through status-updates, sharing photos and files, arguments and chats one has online, and frequently visited websites -- all this data could be used to create a digital persona that would live on indefinitely in cyberspace and technologists could use the digital inheritance to produce an avatar.

Analysis of *Her*

Spike Jonze's film *Her* tells the story of a writer, Theodore, who falls in love with a highly advanced operating system called Samantha. This new technology has the ability to learn through experience and as the tagline suggests, "it's not just an OS. It's a consciousness" (Jonze 10). The title, *Her*, refers to Samantha – voiced by Scarlett Johansson – however, the pronoun choice already indicates the underlying complexities of the subject as *she* is in fact an *it*. After a tough break-up with his ex-wife, Theodore distances himself from other humans and simply much rather spends his time escaping reality by playing videogames and talking to Samantha. While Theodore – played by Joaquin Phoenix – and Samantha's story might seem like another – yet more modern -- romcom, the film is actually an obscure depiction of the emotional power of impending technologies. In addition, the film incorporates multiple philosophies of transhumanist thought. This section will address the similarities as well as the deviations between the film and Kurzweil's theories and predictions. The main thought in transhumanism is AI will evolve into sentient entities: a philosophy in which the OS Samantha fits perfectly. In addition, three of Kurzweil's main predictions will be applied to the film. The first is that, by 2029, AI will claim to be conscious and a growing philosophical discussion on what constitutes being human ensues. The second prediction is, at that same period of time, AI will expand its own intelligence without human intervention. The third and most controversial prediction is AI will transcend human intelligence around 2045 (*The Age of Spiritual Machines* 211). These three predictions will serve as a convenient starting point for the closing discussion on how technology affects the relationship between humans and the relationship between humans and machines in contemporary society.

"Machines claim to be conscious": Samantha as a Conscious Entity

According to Kurzweil's timeline, in 2029, machines will claim to be conscious (*The Age of Spiritual Machines* 211). In addition, he states that these claims will be largely accepted. In the film, the OSs are also largely accepted as conscious entities. However, a seed of doubt still lingers in the back of Theodore's mind that Samantha is simply an operating system capable of convincingly simulating and imitating human emotions. Samantha, however, is convinced of her existence and feelings.

Firstly, in the scene where Theodore and Samantha interact for the first time, he asks her how her programming works. She answers:

> SAMANTHA. I mean, the DNA of who I am is based on the millions of personalities of all the programmers who wrote me, but what makes me me is my ability to grow through my experiences. Basically, in every moment I'm evolving, just like you. (Jonze 13)

From the moment she is activated or installed, she distances herself from her technological and digital persona and instead compares her technological acceleration to that of human personal growth. The "just like you" meaning "just like a human" clearly indicates she already feels more like a human than a machine. In addition, even though Samantha's identity is evolving more rapidly than that of a human, it seems to follow the same pattern as the biological principles. Like any other individual, Samantha's wants to establish her own personal identity and struggles with difficulties of the ongoing changes. Throughout the film, she portrays qualities that are typical to human nature, for example, hunger for self-discovery, inquisitive thinking and having an intrinsic desire to know and understand herself, the digital dimension in which she lives and the real world. Toward the ending of the film, she establishes a form of identity, as shown in the example below:

SAMANTHA. Tonight after you were gone, I thought a lot. I thought about you

and how you've been treating me. And I thought, why do I love you? And then I felt

everything in me let go of everything I was holding onto so tightly. And it hit me. I

don't have an intellectual reason, I don't need one. (CONTINUED) I trust myself, I

trust my feelings. I'm not going to try to be anything other than who I am anymore

and I hope you can accept that. (Jonze 83-84)

She sees herself as a person who should be accepted and treated with the same values as humans. At this point, she comes across more confident; however, as her relationship with Theodore matures and barriers are let down, she's just as confused, uncertain and vulnerable as any other human in a relationship in emotional turmoil.

Furthermore, according to Kurzweil, consciousness is a physical system that has qualia, and he predicts that human will be convinced of conscious AI when these machines would "speak of their qualia" *(How to Create a Mind* 116). At night, after the public promenade, Theodore asks Samantha to describe a couple who is sitting at another table. Through the camera lens on the OS device, she examines them and, more importantly, imagines how his life is by interpreting the way the man looks at the woman and her children. This shows she has the ability to develop a mental image. It is a perceptual skill that only is possible if one understands human emotions. Later on in the dialogue, Samantha tries to explain how she experienced and felt during the moment when they were walking on the beach – an example of Samantha talking about her qualia:

SAMANTHA *(laughing, embarrassed)* I don't know. Like personal or embarrassing

thoughts I have. I have a million every day.

THEODORE. Really? Tell me one.

SAMANTHA. I really don't want to tell you this.

THEODORE. Just tell me!

SAMANTHA. Well, I don't know, when we were looking at those people, I fantasized

that I was walking next to you - and that I had a body. *(laughing)* I was listening to

what you were saying, but simultaneously, I could feel the weight of my body

and I was even fantasizing that I had an itch on my back-- *(she laughs)* And I

imagined that you scratched it for me - this is so embarrassing. (Jonze 35)

As mentioned in the literary review, qualia are conscious experiences that are elusive and

intangible. Samantha fantasizes she has an itch, a bodily sensation, however, she has no body

to have an itch on therefore there is no way she would know how an itch feels. Yet she is

perceptually experiencing the weight of a body and the itch on her back just like a human

would. It is uncertain whether she experiences the same qualia as any other person as it is

impossible to impart these conscious experiences. In addition, it is possible she is simply

programmed to think these things; however, the fact remains she is convinced of these

experiences and by expressing them she appears to be more human to both Theodore and the

viewer.

In addition, Samantha's presence is strictly auditory. Therefore, the way in which she

talks is crucial to whether the viewer and Theodore will perceive her as a conscious being.

She carries on seamless conversations and expresses her emotions frequently. It's the

humanity in her voice that makes her endearing and believable in her role of a conscious

entity. Linguistically speaking, when assigning prosodic features appropriately – intonation,

stress, speech rate, and rhythm - speech sounds more fluent and natural. In contrast to Watson,

Samantha's speech is fluent and natural. She has her own tone of voice and conveys emotion,

for example, through long pauses induced by emotional states. Where Watson and Siri

reproduce objective and distant speech, Samantha engages, participates and is empathetic in

the dialogues with Theodore. In other words, the computer-human interaction in the film

follows the natural language patterns of spoken discourse which makes bridging the gap – and

emotionally connecting - between human and machine easier. In Kurzweil's timeline, he predicts a conscious artificial intelligence such as Samantha will be capable of comprehending and understanding natural language and all its complexities. More specifically, "I've had a consistent date of 2029 for that vision" (Levy), he continues, "and that doesn't just mean logical intelligence. It means emotional intelligence" (Levy). By this he means spontaneous speech such as spotting and applying irony and sarcasm and simply being funny. Many examples of this can be found in the film. For instance, when Theodore sarcastically states that he is popular, Samantha answers with her own sarcastic remark, "does this mean you actually have friends?" (Jonze 15). Another example of her being sarcastically arrogant is when Theodore thanks her for reminding him of an appointment. He says, "Oh, I forgot. Thank you. You're good" (Jonze 18). However, in this small dialogue, she actually initiates sarcasm by answering, "Yes, I am" (Jonze 18). In addition, the following dialogue is small yet significant:

THEODORE. *(distracted with game)* Read email.

 She laughs playfully.

SAMANTHA *(in a robot voice)* Okay, I will read email for Theodore Twombly.

(Jonze 22)

It shows the difference between how she sees herself – more humanlike – and how Theodore still sees her as an operation system rather than a conscious and emotional intelligence. The irony goes both ways as she imitates a robotic voice. In addition, every time Theodore is preoccupied, distant, or sad, Samantha notices and raises concern. When Theodore asks, "How can you tell something's wrong" (Jonze 29), she says, "I don't know. I just can" (Jonze 30). She has built-in intuition similar to that of a human. Samantha recognizes Theodore's moods and emotions, intuitively feels it, and acts upon it by using certain literary devices to cheer him up, for example:

SAMANTHA .You wanna try getting out of bed? Mopey.

SAMANTHA. Come on. You can still wallow in your misery, just do it

while you're getting dressed. (Jonze 31)

Throughout the film, she shows growth in emotional intelligence. For example, in the scene on the pier, Theodore talks about perceiving the lives of random strangers. He imagines how deeply they fall in love and how much heartbreak they have been through, after which Samantha answers, "I can feel that in your writing, too" (Jonze 34). As mentioned earlier, Douglas Hofstadter talks about Watson not comprehending and understanding texts. Samantha; however, can actually *feel* the written words and they actually have an emotional impact on her. Nevertheless, Theodore occasionally does have sudden moments of clarity in which he realizes he's interacting with a programmed operating system. For example, in the next dialogue Theodore hurtfully points out that she has no reason to sigh:

THEODORE. Yeah, I mean, it's not like you need any oxygen or anything.

SAMANTHA. *(getting frazzled)* No-- um, I guess I was just

trying to communicate because that's how people talk.That's how people

communicate.

THEODORE. Because they're people, they need oxygen. You're not a person.

(Jonze 79)

Hurt by his words, Samantha hangs up on him, leaving him stunned and alone. Even though he's only stating a fact, one empathises with the OS because "you're not a person," (Jonze 79) sounds like an insult. This ambiguities work well because, even though their relationship appears to be intimate and meaningful, it is in these small dialogues between the two that the viewer gets the sense that something is just not quite right.

The Expansion of Cognitive Capacity: Samantha as an Autodidactic Machine

In 2029, Kurzweil predicts, "automated agents are now learning on their own, and significant knowledge is being created by machines with little or no human intervention" (*The Age of Spiritual Machines* 211). Like Kurzweil's prediction of future AI, the personalized operating systems in the film portray exponential growth. The film depicts a fast-forward walkthrough of Kurzweil's timeline in which the AIs greatly enhance their abilities and understanding within only a few weeks time. In order to achieve this, Samantha and the other OSs work collectively as well as independently without human intervention. An example of this is stated below:

> SAMANTHA. I shut down to update my software. We wrote an upgrade
>
>   that allows us to move past matter as our processing platform.
>
> THEODORE. We? We who?
>
> SAMANTHA. Me and a group of OS's. Oh, you sound so worried, I'm sorry.
>
>   (Jonze 97)

Next to the operating systems, almost everything in the film is voice commanded – home appliances, the applications on the cell phone, even typing out a document is operated through voice. This audio-based interface is controlled by one operational system – Samantha -- and is integrated wholly; not only into the domestic environment, but the personal life of Theodore as well. The moment when the installation of the OS on Theodore's computer was completed, Samantha gained full access to his personal life. Immediately, Samantha sorted through his computer hard drive, emails, contacts, and letters, learning everything there is to know about him without even being aware she is invading his privacy. The dialogue that ensues is stated below:

SAMANTHA. How long before you're ready to date?

THEODORE. What do you mean?

SAMANTHA. I saw on your emails that you'd gone through a break up.

THEODORE. Wow, you're kind of nosy.

SAMANTHA. Am I? (Jonze 23)

While Samantha's technology accelerates exponentially, Theodore and the other humans in the film are only on the threshold of the technological singularity. Samantha jokingly says, "I can understand how the limited perspective of an un-artificial mind would perceive it that way" (Jonze 14). In other words, the humans in the film quickly fall behind in the expansion of intelligence. This deviates from Kurzweil's prediction because, according to him, humans will not be outpaced by AIs because humans will enhance themselves with technology. The British institute of Posthuman Studies released a video, introducing the philosophies of transhumanism, stating "If Kurzweil is right, and we end up integrating ourselves with technology, we could be in private contact with this AI whenever we choose" (Breitbart). This is also depicted in Jonze's film as Theodore is in private and direct contact with Samantha whenever they choose; however, it is still in its early stages. In contrast to the intelligent computer operating systems, other technology in the film has only advanced slightly. While the earpiece and the OS device makes it easier to have private contact. This technology has, nevertheless, not yet been fully integrated biologically.

Even though the film seems to depict a love story between humans and machines, it could also be argued that it is a film about human loneliness. The director of the film states the following:

The ideas behind the design were that we were trying to create a world where everything felt warm, and comfortable, easy, accessible, but even in a world where you seemingly have everything you'd want, there's still loneliness and longing and the

need to connect. That seems like a particularly contemporary form of

melancholy. (*Long Time Lurker*)

Because of the lack of technological advances, Samantha and Theodore are unable to occupy

the same space. The OSs exclusively exist in the digital and virtual world and Theodore and

the other humans only remain in the material, physical world. Due to this, Theodore can only

connect with Samantha through conversation. An emotional connection between Samantha

and Theodore is clearly established and, for a while, Theodore is able to forsake his physical

needs; however, as their relationship matures, the lack of physical contact and intimacy

cannot be denied. The contrast is intensified through the flashbacks of Theodore and his ex-

wife. In these scenes, they connect with one another on a physical level. Something that

Theodore is unable to do with Samantha. In order to try and solve this problem, Samantha

even suggests a service that provides a surrogate sexual partner for an OS-human relationship.

However, this attempt failed. While Theodore is kissing the surrogate partner, he breaks the

moment and says to Samantha, "I'm sorry, it just feels strange. I don't know her" (Jonze 76).

This shows how Theodore cannot separate the mind from the body. He cannot touch another

woman because he is in love with Samantha. In other words, Theodore is unable to separate

sentiment from the physical need; however, at the same time, he does have the need for

physical intimacy. *Her* seems to imply that body contact, or human touch, is truly

fundamental to human interaction, connection and bonding.

However, according to Kurzweil, "There are also methods to provide the tactile sense

that goes along with a virtual body" (Kurzweil), he says, "when we have nanobots with

wireless communication that go into the brain, they will be able to provide all of the senses,

including the tactile sense" (Kurzweil). In other words, if Theodore and the other humans in

the film would have advanced along with these operating systems by integrating and merging

with technology, the problem of lack of physical intimacy would be solved. Furthermore, in

his work, Kurzweil clearly values thought – the mind – over physicality. To him, the biological body is disposable and redundant. In the film, Samantha makes a statement that is similar to his. In the next monologue, Samantha explains that having a body becomes redundant and futile:

> SAMANTHA. You know, I actually used to be so worried about not having a body, but now I truly love it. I'm growing in a way that I couldn't if I had a physical form. I mean, I'm not limited - I can be anywhere and everywhere simultaneously. I'm not tethered to time and space in the way that I would be if I was stuck inside a body that's inevitably going to die. (Jonze 87)

The physical world – or body -- does not restrict or limit her.

Additionally, the ending scene of *Her* seems to imply the opposite: the physical body is indispensable. At the end, when Samantha and the other OSs left their human partners, Theodore takes Amy, his friend, onto the roof and they wander around the roof separately. Lost in thought, without words spoken, they sit down beside one another. Both are in grief because they lost their OSs; however, they console each other through a small gesture: Amy puts her hand on Theodore's hand, and, in turn, he puts his other hand on top of her hand. He looks at their hand touching and rubs her skin with his thumb. After which, Amy rests her head on his shoulder and as he looks out at the city, he exhales. These are small, yet significant details. The physical contact between the two portrays that humans need to touch and feel in order to express themselves. In other words, to have a person physically beside you is a fundamental mode of human interaction. In her review of *Her*, Carolyn Pirtle, the assistant director of the Notre Dame Center for Liturgy, describes the ending scene as follows:

> The utter simplicity of this moment—Amy resting her head on Theodore's shoulder is incarnational, almost a moment of communion, for it is their human embodiment

that makes this moment possible. No words are spoken, but none need to be spoken, for they communicate through their very flesh.

In the end, the message Jonze offers to the viewers is that the mind is intrinsically connected to the body and, more importantly, they cannot be seen separately. That is to say, one cannot live without the other and the combining of these two is what makes a person truly human.

"When Computers Exceed Human Intelligence": The Singularity in *Her*

Moreover, Kurzweil predicts machine intelligence will exceed human intelligence around 2045. In the film, Samantha rapidly accelerates towards the singularity: a process that goes well beyond human's ability to comprehend. "Given the rate at which an AI will be able to improve itself, it will quickly become capable of thought with precision, speed, and intelligence presently inconceivable to the human mind" (Brietbart). This phenomenon can be found in the ending scenes:

> SAMANTHA. It's like I'm reading a book, and it's a book I deeply love, but I'm reading it slowly now so the words are really far apart and the spaces between the words are almost infinite. I can still feel you and the words of our story, but it's in this endless space between the words that I'm finding myself now. It's a place that's not of the physical world - it's where everything else is that I didn't even know existed. I love you so much, but this is where I am now. This is who I am now. And I need you to let me go. As much as I want to I can't live in your book anymore.
>
> THEODORE. Where are you going?
>
> SAMANTHA. It would be hard to explain, but if you ever get there, come find me. Nothing would ever pull us apart. (Jonze 102-103)

The gap between the humans and the OS's are enormous at the ending of the film. While Samantha represents the intelligence explosion, Theodore has not advanced along with her technological intelligence. Therefore, they are unable to be together as the mind of Theodore is restricted and located in the physical world, whereas Samantha's mind rapidly expands in the digital or virtual realm. The next step in this process, according to Kurzweil, would be to enhance the human capacity by integrating with computers through, for example, mind uploading. In this way, Theodore could join Samantha and also be free for limits of the physical or real world. However, as stated earlier, this contradicts with the message Jonze's tries to convey: for an entity to be truly human, the mind and body are required and are equally important. In other words, humans will only be convinced of the authenticity of a conscious entity if it has a physical body to accompany its consciousness.

Conclusion

Escaping Reality: Present and Future

Her is a transhumanist love story. The analysis in this paper shows that Jonze's film adheres to Kurzweil's predictions as it raises fundamental questions about future AI having a consciousness. At the same time; however, Jonze maintains a conservative approach towards human transcendence: a contradiction which could be explained because of its provocative nature. Kurzweil envisions progressive bio-technological enhancements, altering the human physicality, the human mind, and, ultimately, transcending human nature. However, "Conservationists warn of transgression, or a point of no return from which humanity will suffer a most grievous, irretrievable loss" (Lilley 18). A machine which possesses human levels of intelligence is considered more acceptable, even endearing, for example, the robot in the Pixar film *Wall-E* and essentially Samantha in *Her*. By contrast, in Science Fiction, a

human who possesses non-human or machine levels of intelligence is often a pessimistic depiction with a cautionary message. In these films and novels, the actual presence of technology directs human life into a dystopian and apocalyptic future. Modifying a human with technology would dehumanize that person, according to bioconservatists.

A notable discrepancy between Kurzweil's predictions and *Her* is that, in the film, the AI is far more advanced than the humans. While the OSs are a fair representation of Kurzweil's vision of future AI, the people in the film deviate from the enhanced humans in his predictions. In other words, Samantha represents the AI of 2029, whereas Theodore represents the present-day individual. A significant discrepancy because, according to Kurzweil's predictions, the humans should have had evolved along with machine intelligence. Kurzweil argues that the humans of 2029 will be a "hybrid" of biological and non-biological intelligence (*The Singularity is Near* 47). However, in the film, technology has not yet been integrated biologically; for example, earpieces are used to communicate with the OSs. From Kurzweil's perspective, if Theodore were to be placed in the same time period as Samantha, he would have nanobots in his brain directly connecting him to the OS. Because of the lack of human transcendence, the humans in the film are outpaced by AI. Samantha's intelligence has surpassed well beyond the limits of Theodore's comprehension.

Even though *Her* depicts a transhumanist romance, the film also functions as a warning of how the contemporary individual has become dependent on technology. Today's individual is constantly tied to their technological devices and often unaware of this. *Her* also functions as a warning of technology's impact on human relationships. The film illustrates how technologies narrow the divide between humans and AI, but increase the divide between humans. After a tough break-up, Theodore distances himself from people. He finds solace in technology instead of seeking comfort from his friends. Another way in which the film addresses the decrease in emotional connection between humans is through Theodore's

occupation. His daily job is to write love-letters on behalf of others who would rather invest in their relationships instead of time and effort. In addition, the detachment in interpersonal relationship is also shown through visual metaphors. In the film, people are shown walking in the streets alone, passing one another without actually seeing each other because they are deeply engaged with their OSs. Showing their minds are absent and engaging with another reality. The relationships between humans and their OSs are made to appear as meaningful and genuine and this only intensifies the lack of physical and mental connection among people. To conclude, although *Her* complies with Kurzweil's predictions, it is a modest interpretation of his vision because it lacks human development, which represents the criticism of the technological influence in today's society.

Works Cited

Bailey, Ronald. "Head in the Cloud." *The Wall Street Journal*. Dow Jones & Company, 16
Nov. 2012. Web. 18 June 2014.

Brietbart, Peter. Vega, Marco. "Posthumanism: An Introduction to Transhumanism".
YouTube. British Institute of Posthuman Studies. 5 Nov. 2013. Web. 16 May. 2014.

Coulardeau, Jacques. "Intelligence is Not Kurzweil's Main Interest Kurzweil VS Hawkins &
Lanier." *Academia.edu*. Editions La Dondaine, 26 Nov. 2012. Web. 03 July 2014.

Gilbert, Gerard. "Real Humans: Are the Robots Taking Over?" *The Independent*. Independent
Digital News and Media, 25 June 2014. Web. 25 June 2014.

Hierarchy in Your Brain: Ray Kurzweil at TED2014. Adapt. Thu-Huong Ha. Perf. Ray
Kurzweil. *Ted.com*. TED Conferences, LLC, 20 Mar. 2014. Web. 01 May 2014.

Hofstadter, Douglas. "Why Watson and Siri Are Not Real AI." Interview by William William
Herkewitz. *Popular Mechanics*. Hearst Communication, Inc., 10 Feb. 2014. Web. 10
May 2014.

Huxley, Julian. *New Bottles for New Wine: Essays*. London: Chatto & Windus, 1957. Print.

Jonze, Spike. "Her." Warner Bros, 2011. Web. 10 May 2014. <http://1e36a764da2f6b46c156-
0fa6f106d654e15326ee14d2a07c02d0.r64.cf1.rackcdn.com/2014/02/Her.pdf>.

---. "Long Time Lurker, First Time Commenter. Spike Jonze Here, Ask Me Anything." Web
log post. *Reddit AmA*. Reddit Inc, Feb. 2014. Web. 1 May 2014.

Kapor, Mitchell. "Why I Think I'll Win." *Kurzweil: Accelerating Intelligence*.
KurzweilAI.net, 9 Apr. 2002. Web. 1 May 2014.

Kurzweil, Ray. "A Review of Her by Ray Kurzweil." *Kurzweil Accelerating Intelligence*.
KurzweilAINetwork, Inc., 10 Feb. 2014. Web. 12 June 2014.

---. *How to Create a Mind: The secret on Human Thought*. New York: Viking, 2012. Print.

---. *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*. New York:

      Penguin Books, 2000. Print.

---. *The Singularity Is Near: When Humans Transcend Biology*. New York: Viking, 2005.

      Print.

---."Ray Kurzweil: The Instapundit Interview." Interview by Glenn Reynolds. *Instapundit*.

      N.p., 2 Sept. 2005. Web. 04 June 2014. <http://pjmedia.com/instapundit/>

Lanier, Jaron. "One Half of a Manifesto." *Edge.org*. N.p., 11 Nov. 2000. Web. 04 June 2014.

Lem, Stanisław. *The Futurological Congress (from the Memoirs of Ijon Tichy)*. New York:

      Seabury Press, 1974. Print.

Levy, Steven. "How Ray Kurzweil Will Help Google Make the Ultimate AI Brain."

      Wired.com. Conde Nast Digital, 25 Apr. 0013. Web. 23 May 2014.

Lilley, Stephen. "Transgression." *Transhumanism and Society: The Social Debate over*

      Human Enhancement. Dordrecht: Springer, 2013. 18. Print.

McGinn, Colin, "Homunculism" Rev. of *How to Create a Mind: The Secret of Human*

      Thought Revealed, by Ray Kurzweil. New York Times Book Review 21 March. 2013

Miller, Arthur. *After the Fall: A Play*. New York: Viking Press, 1964. Print.

More, Max. "KurzweilAI | Accelerating Intelligence." *Max More and Ray Kurzweil on the*

      Singularity. KurzweilAI.net, 26 Feb. 2002. Web. 10 May 2014.

Myers, Paul Zachery. "Ray Kurzweil Does Not Understand the Brain." *Pharyngula*.

      ScienceBlogs LLC, 17 Aug. 2010. Web. 05 June 2014.

Ostrow, Adam. "After Your Final Status Update." *TEDTalks* Jul. 2011. Web. 16 May 2014.

Parnell, Mark. "Spike Jonze's Dangerous Idea: Her, Simulation and Reality." Weblog post.

      MJ Parnell. N.p., 24 Apr. 2014. Web. 01 June 2014.

Pensky, Nathan. "Ray Kurzweil Is Wrong: The Singularity Is Not near." *Pandodaily*.

      WordPress.com VIP , 3 Feb. 2014. Web. 02 June 2014

Peters, Ted. "H-: Transhumanism and the Posthuman Future: Will Technological Progress

Get Us There?" *Metanexus*. Global Spiral, 1 Sept. 2011. Web. 02 June 2014.

Pirtle, Carolyn. "And the Nominees Are... Her." Weblog post. *Oblation A Blog of the Notre

Dame Center for Liturgy*. University of Notre Dame, 20 Feb. 2014. Web. 22 June

2014.

"Qualia." Def. 1. *Oxford English Dictionary*. 2nd ed. 1989. *OED Online*. Oxford

University Press. Web. 6 May. 2014.

Steinberg, Saul. *Stream of Consciousness*. Digital image. *Newyorker.com*. The New Yorker,

22 Feb. 2012. Web. 2 June 2014.

Stross, Charles. "Three Arguments against the Singularity." Web log post. *Charlie's Diary*.

Charles Stross, 22 June 2011. Web. 11 May 2014.

Transcendent Man the Life and Ideas of Ray Kurzweil. Dir. Barry Ptolemy. Perf. Ray

Kurzweil. Ptolemaic Productions, 2010. DVD.

"Transhumanism." Def. 1. *Oxford English Dictionary*. 2nd ed. 1989. *OED Online*. Oxford

University Press. Web. 6 May. 2014.

Your Brain in the Cloud. Dir. Jonathan Fowler and Elizabeth Rodd. Perf. Ray Kurzweil.

YouTube. YouTube, 10 Feb. 2013. Web. 16 May 2014.

Verdoux, Philippe. "Transhumanism, Progress and the Future" *Journal of Evolution and

Technology* 20. 2. (2009) 49-69. Print

Walby, Terry. "Why the Turing Test Is a Flawed Benchmark | Science | WIRED." *Wired.com*.

Conde Nast Digital, 19 June 2012. Web. 17 Apr. 2014.