

A DRAMATISTIC APPROACH TO THE SINGULARITY MOVEMENT

BY

ERIC SCHUMACHER

ADVISOR: JAMES W. CHESEBRO

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**Abstract****THESIS:**

A Dramatistic Approach to the Singularity Movement

**STUDENT:** Eric Schumacher

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The Singularity is a hypothetical moment in the not-so-distant future when machine intelligence will supplant human intelligence as the dominant force in the world. There is a growing movement of scientists, authors, and advocates who believe the Singularity is not just possible, but inevitable. There is maybe no more eloquent or influential argument for the Singularity than futurist Ray Kurzweil's 2005 book, *The Singularity is Near: When Humans Transcend Biology*. Kurzweil predicts a utopian future of advanced human/machine hybrid intelligence and radically extended life by the year 2045. This thesis applies Kenneth Burke's system of dramatism, specifically the pentad, to *The Singularity is Near* as well as a sample of technology articles from *The New York Times* and *The Wall Street Journal* to examine Kurzweil's motives and the way Singularity discourse "chains out" through other media. I will also draw on movement theory to examine the discourse of Singularity advocates to determine if Singularity discourse qualifies as a rhetorical movement.

## Chapter One: Introduction and Justification

The beginning of the twenty-first century is a time of rapid technological progression and pervasion. In an information economy and connected society, an array of ideas and concepts compete for our attention and action. Some of these are short term fads while others constitute more serious long-term trends. The growing dominance of technology in the life of the average American appears to constitute a long-term trend that invites, if not demands, our attention and action. One of the many complex technological concepts has been aptly identified as “technological singularity” or just “Singularity” in reference to the specific event. In his 2005 pop-science book *The Singularity Is Near: When Humans Transcend Biology*, Ray Kurzweil identified dimensions of the Singularity that bear directly upon the object of study of this thesis. He has argued that the Singularity is an “idea” and “important meta-idea” for the notion that “the specter of machine intelligence” will become “indistinguishable from that of its human progenitors with the first half of the twenty-first century” (Kurzweil, 2005, p. 3).

In greater detail, Kurzweil (2005) has risen and answered a critical question: What, then, is the Singularity?

“A future period during the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed. Although neither utopian or dystopian, this epoch will transform the concepts that we rely on to

give meaning to our lives, from our business models to the cycle of human life, including death itself...There will be no distinction post-Singularity, between human and machine or between physical and virtual reality” (p. 8-9)

As Kurzweil implies, Singularity can be part of a belief system for some which can affect, if not determine, the identity of its believers. Kurzweil calls this group “singularitarians.” Singularitarians believe that humanity will inevitably create a super-intelligent machine. They are dedicated to achieving this goal on terms that will benefit humanity the most.

This thesis examines the discourse of singularitarians as a “rhetoric of inception” of a “movement” (Griffin, 1952) which has, thus far, remained uninstitutionalized within American and global society. Griffin’s system of movement studies is designed to “discover, in a wide sense of the term, the rhetorical pattern inherent in the movement” (1952, p.188). The Singularity been developing as a concept and a rhetorical movement for decades.

Visions of the Singularity have haunted scientists and science fiction writers since the 1950s (Kurzweil, 2005). For some, it is a malevolent technological specter that will lead a misguided humanity to an inhumane end. To others, it is a kindly spirit delivering humans into its most enlightened age. Either way, the change would be radical and unpredictable. It would be “a throwing away of all the previous rules, perhaps in the blink of an eye, an exponential runaway beyond any hope of control” (Vinge, 1993), a blending of man and machine with unforeseeable consequences. It would be the next and perhaps final step in the evolutionary process of intelligent life on Earth, eventually saturating the Universe with intelligence (Kurzweil, 2005). Nearly thirty years before Kurzweil, Hans

Moravec speculated, “a postbiological world dominated by self-improving, thinking machines would be as different from our own world of living things as the world is different from the lifeless chemistry that preceded it (1988, p. 5).

Herein lies the power and fear of the Singularity. Should it come to pass, life on Earth would be irrevocably changed in a completely unpredictable manner. Humanity could prosper. All the world’s problems could be solved through technology. Pain, trouble, and violence could be erased. People could live happily with all their needs met, with no fear of death. Humanity could also be destroyed, both literally and figuratively. If humans merge with machines, will they still be human? What happens to those who can not or will not merge? What happens if a super-intelligent machine decides it could use the resources humans consume much better than us?

The melding of man and machine is already underway. A small number of humans are using robotic tools and body parts to enhance abilities lost by injury or illness. For example, Northwestern University’s Feinberg School of Medicine has developed a robotic arm being tested for physical therapy with stroke victims (Warren, 2012). Patients wear a mechanical sleeve that gives the arm the sensation of weightlessness. Patients’ damaged nerves can control affected limbs more easily with no weight resistance. Therapists gradually dial up the resistance as patients’ arm function improves. Dr. Julius Dewald, who leads the project, hopes to give stroke victims who have suffered paralysis at least partial control of their damaged limbs. A singularitarian may cite Dewald’s work as an example of how technology like robotics and artificial intelligence are permeating scientific fields. Dewald’s experiments may also show that



some people are becoming more willing to use machines to solve biological problems like nerve damage.

In a more mundane example, Ling and Donner (2009) have tracked how mobile phone users around the world are increasingly relying on their devices. Mobile phones are relied upon for storing information, communication, navigating roadways, doing business, and many other functions in daily life. The phones also operate as status symbol and safety blanket. Though the phones are not physically attached to their users, they are becoming inseparable. This type of public acceptance of technology is essential to the Singularity.

A small-but-growing group of futurists are actively working toward achieving the Singularity. X Prize Foundation founder Peter H. Diamandis and Ray Kurzweil founded Singularity University in 2008 (<http://singularityu.org>). It is a not-for-profit, Google supported graduate program located at the NASA Ames campus in Silicon Valley. The school is dedicated to preparing humankind for the explosion of computer intelligence that will determine our planet's future (Vance, 2010). Students study new technologies and the way they interact with one another. The ultimate goal is to solve humanity's problems with technology and create a conditions in which the singularity would positively impact humankind. Other entities such as the Singularity Institute and [singularityhub.com](http://singularityhub.com) are also actively promoting and preparing for the Singularity. Meanwhile, the Singularity is also growing in popular culture, suggesting the concept is spreading far beyond the technical elite.

*Time* magazine devoted their February 25, 2011 issue to the Singularity with the headline, "2045: The Year Man Becomes Immortal" ([www.time.com](http://www.time.com)). Lev Grossman's

featured article in *Time* introduced a new audience to Kurzweil and his philosophies. Kurzweil appeared on *The Daily Show with Jon Stewart* in 2005 and was featured in the 2010 documentary *Transcendent Man*. The Singularity or its elements have also been discussed in popular television shows like *Futurama* (Comedy Central), *Friends* (NBC) and *The Big Bang Theory* (CBS) and in science fiction novels like William Gibson's *Neuromancer* (1984). Popular movies like *The Terminator* (1984) and *The Matrix* (1999) offer poignant examples of machine-controlled futures, albeit dystopian ones. It is quite possible that the Singularity movement has taken shape; and there is reason to believe it is growing.

Singularitarians have been drawing increased attention in pop-culture, news media and scientific organizations but they have been mostly absent from the field of communication. I hope this thesis begins to fill that gap. The Singularity is a dense, unique and broad-ranging topic that has massive implications for the world should it be proven true. It, therefore, must be critically examined from as many angles as possible.

This study is not about the likelihood of the Singularity occurring or the conditions under which it could occur. Neither is it about the philosophical or ethical dilemmas a radical paradigm shift necessarily creates. Rather, this thesis approaches the Singularity as a rhetorical movement using Kenneth Burke's system of dramatism, which examines language as a mode of symbolic action. I apply Burke's system, especially the pentad, in hopes of revealing the motives of technology advocates. By understanding the rhetoric of singularitarians, I hope to investigate how the Singularity concept circulates in popular culture and molds our notions of the Singularity. For if "rhetoric has...a vital function as a shaping agent in human affair" (Griffin 1952, p. 188), the rhetoric and the

motives of a movement are inseparable from the movement itself. Though the concept has been evolving for half a century, the Singularity has only recently resembled a movement. I hope to shed some light on that movement as it takes shape so future scholars and I may track its progress.

The remainder of this chapter will provide an introduction to the Singularity and the theories that guide its progression. I will also discuss the movement's key figures and texts, with special interest paid to Kurzweil's 2005 book *The Singularity is Near*. It is perhaps the most eloquent and influential text the movement has produced. Next, it will lay out my research questions and provide a framework for understanding the rest of the document. Finally, I will offer some preliminary thoughts on the topic before transitioning into the literature review in chapter two. But first, let us start formally with the most perplexing question for many newcomers to the topic: "What is the Singularity?"

### **What is the Singularity?**

The Singularity is a technological event horizon in which the world will become populated with machine intelligence dwarfing that of humanity. These super-intelligent machines will be able to design even more intelligent machines, escalating the speed of progress. At this point the future becomes unknowable. Humans will lose control of the evolutionary process and the age of machine control will begin. Just as animals are unable to comprehend the inner workings of our minds, we will be unable to comprehend the inner workings of super-intelligent machines. They will be able to outthink all of humanity combined, thus "the first ultra-intelligent machine is the last invention man

need ever make, provided the machine is docile enough to tell us how to keep it under control” (Good, 1965, p. 33).

Mathematician John von Neumann is believed to be the first person to apply the term “singularity” to technology back in the 1950s. Stanislaw Ulam paraphrased him as saying “the ever-accelerating progress of technology...gives the appearance of approaching some essential singularity in the history of the race beyond which human affairs, as we know them, could not continue” (Kurzweil, 2005, p. 10; Vinge, 1993). The term derives from a concept called a “mathematical singularity, a “point at which an equation, surface, etc., blows up or becomes degenerate” (Weisstein, n.d.). The term was borrowed and adapted as an obvious metaphor for the Singularity. It is a point where our models break down and a new model is needed. Vernor Vinge (1993) evolved the term to “the Singularity,” with a capital “S” in reference to the specific event.

Mathematicians and computer scientists like I.J. Good have been at the forefront of the movement since its conception (Chalmers, 2010). From there, science fiction authors ran with the idea, capitalizing on the hopes and fears surrounding a new technology: computers. Vernor Vinge (1993) popularized the issue with his article “The Coming Technological Singularity: How to Survive in the Post-human Era,” which was widely distributed online. World Wide Web users were quick to pick up the idea. Since then, the Singularity movement has developed and fragmented into different groups of believers. It has evolved into a near-religious set of beliefs to a small but passionate group. They argue the Singularity is no longer a possibility, but an inevitable event and often view it in apocalyptic terms (Geraci, 2010). A more in-depth history of the idea’s progression and its depiction in pop-culture is provided in chapter two.

**How will it come about?**

The Singularity is based largely on Moore's Law: the theory that computational capacity doubles every two years, and Kurzweil's Law of Accelerating Returns: the idea that technology grows exponentially, not linearly (Kurzweil, 2005). Technology will double its speed and power faster and faster until the tipping point, the Singularity, is reached. For example, Kurzweil (2007) argues that a \$1,000 personal computer will have the processing power of a human brain (20 million billion calculations/second) by 2019 and the processing power all human minds by 2055 (p. 191). Developing technologies will provide many intersecting and diverting paths to reaching the Singularity. A comprehensive collection of Kurzweil's graphs and charts from *The Singularity is Near* that illustrate trends in technology can be found online at [singularity.com/charts](http://singularity.com/charts).

Kurzweil (2005) claims the most likely avenues to Singularity are nanotechnology, robotics, and genetics. First, genetics will be used to enhance the human body as much as biologically possible. This could mean increased longevity, DNA repair, better health, and increased capabilities. Kurzweil has long been interested in improving human health through genetics. He published a book, *The 10% Solution for a Healthy Life* in 1993. Second, robotics will continue to improve in intelligence and design. In some places they will blend with humans, creating cyborgs. Others will remain separate entities. In some ways humans and machines are already blended, though not physically. Castronova (2005, 2007) has noted how readily and totally some people have flocked to virtual environments like Second Life. In some cases, users spend more time interacting with their virtual world than the real one. Ling and Donner (2009) describe how people across the world are increasingly relying on mobile devices for information, socialization,

and business. Some people are so inseparable from the devices, they feel a real sense of anxiety when separated from their devices (Avvannavar, Kumar, Shrihari, & Babu, 2008) Third, nanotechnology will be utilized to reduce the cost of computing and eventually allow atoms themselves to be computational tools.

Kurzweil's three methods can all be placed under the umbrella of "artificial intelligence" or "AI" which is the primary force of the Singularity. However, Kurzweil uses the phrase "machine intelligence" in its place when referring to hard AI. "Artificial intelligence" frames computer intelligence as being fake, conversely framing biological intelligence as being "real." No matter how sophisticated AI may become, it is not real. A virtual representation of a flower is not a flower. A strawberry-flavored candy is not a strawberry. "Machine intelligence" frames computer intelligence as much more significant and relevant. Kurzweil has been documenting this progression from *The Age of Intelligent Machines* (1990) then *The Age of Spiritual Machines* (1999), to *The Singularity is Near* (2005). It is not a shadow of real intelligence. It is not a carbon copy. It is real intelligence. Real intelligence is much more threatening.

### **When will it Occur?**

Just when the Singularity will occur, if at all, is unclear. The most popular date is 2045, which Kurzweil predicted using his Law of Accelerating Returns in 2005 based off of various models. Twelve years earlier, Vinge (1993) estimated we would achieve Singularity no later than 2030. Critics predict it will never occur.

### **What will it look like?**

In short, we do not know. If we create a super-intelligent computer that can access its own source code to improve its intelligence, the machine will think beyond human

understanding. We cannot predict if the computer will follow orders, develop consciousness or have morals. The future will be effectively unknowable after the Singularity.

### Key Terms

For the sake of clarity, Table 1.1 provides definitions of some key terms that necessarily will be employed in this discussion on the chapters that follow.

**Table 1.1: Key Terms**

Futurism	A branch of science in which the primary focus of study is predicting the future by studying trends and extending those models. Scientists ascribing to this practice are known as “futurists”
The Law of Accelerating Returns	A theory developed by Ray Kurzweil in the 1990s that explains exponential growth in technology and evolution. This law is the cornerstone of all of Kurzweil’ predictions regarding the Singularity.
Moore’s Law	Observation made by Gordon Moore, co-founder of Intel, that computing power doubles every two years. The principle has been described as a “self-fulfilling prophecy” that has guided improvements in computing. Moore’s Law is a pillar of Singularity predictions.
The Singularity (technological singularity)	The creation of a super-intelligent machine that will replace mankind as the predominant intelligence on the planet, after which the fate of humanity is utterly unpredictable.
Strong AI	The intelligence of a machine that can successfully perform any intellectual task that a human being can, as opposed to weak AI.
Transhumanism	Cultural movement that seeks to transform and improve the human condition through technology, greatly enhancing physical and mental capabilities.
The Turing Test	A test proposed by father of computer science Alan Turing in 1950 to gauge non-human intelligence. If a human interacting with a machine is unable to tell if the machine is human or inhuman, it is considered intelligent.
Weak AI	Artificial intelligence that does not meet human intelligence, such as a

	Roomba vacuum cleaner.
Mathematical singularity	A “point at which an equation, surface, etc., blows up or becomes degenerate” (Weisstein).
Singularitarian	Kurzweil’s term for a person who believes in the probability of the Singularity and is working to make it as quick, effective, and humane as possible.
Uncanny Valley	The theory that the closer a machine resembles a human, the more unnerving the sight of it becomes, until it becomes so realistic it is again accepted. For example a robot with wires and gears showing would be more accepted than a humanoid robot covered with synthetic skin and human features.

### **The Singularity as a Movement**

Understanding the technology of the Singularity is not the only goal of this paper, though it is necessary to continue. Rather, I study the Singularity movement as a rhetorical movement, complete with leaders, followers, goals, and resistance. I hope to show the rhetorical power of Singularity texts and examine the strategies their authors use to persuade. I do this in hopes of revealing the motives of the Singularity movement so that future studies may be better connected with the group’s goals and rhetorical strategies.

### **Preview**

The rest of this thesis is dedicated to answering the following questions: RQ1) How does the Singularity qualify as a rhetorical movement? RQ2) What are the underlying motives of the Singularity movement from a dramatic perspective? RQ3) What impact does contemporary rhetoric have on the future of the Singularity movement? Toward that end, chapter two discusses Singularity milestones in terms of technology, philosophy, and popular culture, culminating in the development of the



Singularity as a rhetorical movement. Chapter three describes the critical methods used to answer my research questions and the rationale for their inclusion. I provide an in-depth discussion of Kurzweil's *The Singularity is Near*, outline dramatism, and position the Singularity movement within rhetorical movement theory. Chapter four will discuss the results of my research and establish the motives the of the Singularity movement. Finally, chapter five outlines this study's limitations and provides suggestions for future research

### **Conclusion**

Should the Singularity occur, it will be the definitive moment of human existence. As we get closer to 2045, I imagine the Singularity will loom larger and larger in the minds of those that believe in it. Resistance has already begun to develop and will likely become a staunch counter movement if the Singularity appears to be a real possibility. The time for study, then, is now.

## Chapter Two: Literature Review

### Introduction

Rhetorical movements have been defined and studied for decades. However, there has yet to be a critical study of Singularity advocacy as a social movement. As far as I know, at the time of this writing, nobody has defined the writings of Singularity advocates as constituting a social and rhetorical movement. In this chapter, I catalogue the history of the Singularity as a concept, the many faces of the Singularity in pop-culture, and Kurzweil's *The Singularity is Near*.

### The Singularity: A History of the Idea

Though Singularity is a relatively new concept for many, it has been percolating in the minds of scientists and authors for nearly sixty years. Humans have been progressing toward the Singularity since we first used tools to enhance our physical abilities. Cataloging all the advancements in technology and thought that could contribute to the Singularity would be nearly impossible. Instead, I will discuss a few game-changing events that have occurred in the 20<sup>th</sup> and 21<sup>st</sup> centuries. I have also compiled a short table of key dates that give the events some context in terms of technology. See Kurzweil's website [singularity.com/charts](http://singularity.com/charts) for a collection of charts that illustrate technological progression in terms of the Singularity

The principles of the Singularity were first laid out in 1965 by statistician I.J. Good in his article “Speculations Concerning the First Ultrainelligent Machine.” His vision has guided more recent and expansive visions of the Singularity:

“Let an ultrainelligent machine be defined as a machine that can far surpass all the intellectual activities of any man however clever. Since the design of machines is one of these intellectual activities, an ultrainelligent machine could design even better machines; there would then unquestionably be an “intelligence explosion”, and the intelligence of man would be left far behind. Thus the first ultrainelligent machine is the last invention that man need ever make.” (p. 1)

Good was the first to articulate the concept in print, but speculations about super-intelligent computers had existed for some time. Science-fiction writers like Carl Kapek and Isaac Asimov had speculated about the future of artificial intelligence since the 1920s. The same year as Good’s landmark article, Intel cofounder Gordon Moore described the trend of transistors doubling on computer chips every two years. This prediction became known as Moore’s Law. The prediction has proved true since, guiding the development of technology and the imaginations of writers (Kurzweil, 2005). Many predictions of futurists, including Kurzweil’s, are based largely on Moore’s Law.

In his 1988 book, *Mind Children*, Hans Moravec used Moore’s Law to predict that robots would become a new, intelligent species somewhere between the years 2030 and 2040. His prediction is relatively close to Vernor Vinge and Ray Kurzweil’s predictions of the future of artificial intelligence. Moravec speculates a future in which people can be “resurrected” in machines or have their consciousness uploaded into a computer.

In 1993, Vernor Vinge published “The Coming Technological Singularity: How to Survive in the Post-Human Era.” The article was circulated widely on the internet and was well-received among technophiles. It crystallized an argument that Vinge had been developing for over a decade. Kurzweil expanded on Vinge’s work, emerging as the Singularity’s key figure and most well-known advocate. He turned a barely known and high-minded concept into public news on the cover of *Time* magazine and an appearance *The Daily Show with John Stewart*. His profile in *Time* was the magazine’s most widely circulated article on the internet in 2011. Table 2.1 on page 19 catalogs some key events in achieving the Singularity, such as the founding of Singularity University, which was mentioned in chapter one.

**Table 2.1: Robotics, Biology and AI: The Technological Development of the Singularity in the 20<sup>th</sup> and 21<sup>st</sup> Centuries**

2045	The Singularity saturates the universe with intelligence and radically transforms human life. Kurzweil (2005) predicts “nonbiological intelligence created in that year will be one billion times more powerful than all human intelligence today” (p. 136).
Early 2030s	Nonbiological intelligence is predicted to equal all living biological human intelligence (Kurzweil, 2005).
Late 2020s	Computers are predicted to pass the Turing test, suggesting nonbiological intelligence will be impossible to differentiate from human intelligence (Kurzweil, 2005).
2011	Watson, an IBM computer capable of understanding and answering questions in common language, beats <i>Jeopardy!</i> champions Ken Jennings and Brad Rutter (Markoff, 2011). Watson is commonly used as an example of advancing artificial intelligence.
2008	Singularity University is founded at NASA’s Ames Research Center. The not-for-profit organization operates a summer graduate program to instruct students in the study of “exponentially advancing technologies in order to address humanity’s grand challenges” ( <a href="http://singularityu.org/about/history">singularityu.org/about/history</a> ).

2003	The Human Genome Project completes sequencing the approximately 25,000 genes in the human genome. The result is the most complete roadmap of how human genetics work (Philipkoski, 2003).
2000	Honda creates the Asimo humanoid robot.
1997	IBM supercomputer, Deep Blue, defeats reigning world chess champion Garry Kasparov (Weber, 1997).
1988	Computer memory costs only one hundred millionth of what it did in 1950 (Nocks, 2007).
1970	Masahiro Mori develops the concept of the “uncanny valley.”
1965	I. J. Good writes about an "intelligence explosion" in his article “Speculations Concerning the First Ultraintelligent Machine” Gordon Moore creates what becomes known as Moore’s Law
1958	Jack Kilby demonstrates the first working integrated circuit.
1950	Alan Turing creates the Turing Test in his article "Computing Machinery and Intelligence" (Turing, 1950).
1946	ENIAC, the world’s first general-use electronic computer is announced.

The next section of this chapter includes a similar table geared specifically to representations of the Singularity in popular culture. I recommend Nocks’ 2007 book, *The Robot: The Life Story of a Technology*, for a more extensive treatment of the history of robotics in science and pop-culture. The timelines in the preface are especially helpful.

Vinge and Kurzweil develop Good’s concept from speculation to near-certainty. Their advocacy shifts Singularity dialogue from “what if?” to “when will?” Current dialogue focuses on when it would occur, and what role mankind will play in a machine future. There has been little discussion, however, about the rhetorical character of these arguments and the context in which they occur. This essay intends to fill that gap. The rhetorical character of a movement in part determines whether a movement will fail or

succeed. As well-thought-out and positive as a movement may be, it will not succeed if leaders are unable to mobilize its base. For this reason, study of the Singularity as a movement is critical.

### **The Technocalypse: The Singularity in Popular Culture**

Twentieth century science-fiction is rife with images of technology taking over and destroying humanity. In the 1999 movie, *The Matrix*, humans have lost a war against a super-intelligent machine, which now uses humans as batteries to power its ever-growing network. The humans are unconscious in the “real world,” but are plugged into a virtual reality world known as “the matrix.” A group of rebels wakes up a computer hacker in the virtual world and takes him to the real world. There, the hacker, Neo, learns to fight within the Matrix to take the system down. The success of *The Matrix* sparked two sequels, scholarly debate, and philosophical discussion. The series grossed over \$1.6-billion worldwide (the-numbers.com). *The Matrix* may be one of the most iconic dystopian films in recent memory. It is, however, only part of a long tradition of technologically dystopian films.

In *The Terminator* (1984), a super-intelligent computer known as Skynet develops sentience and seeks to destroy the human race. Arnold Schwarzenegger plays a cyborg assassin who is sent into the past to kill Sarah Connor, a woman whose unborn child will lead humanity to destroy SkyNet in the future. A rebel from the future also visits the past to protect Connor. Together, they defeat the Terminator but do not save the future. Three more *Terminator* movies were released over the next thirty years.

Both films feature a recurring theme in science-fiction: the creation of super-intelligent machines that ultimately rebel against their human masters. Benford and

Malartre (2007) blame pop-culture and myth for rampant robo-phobia. They cite HAL, the sentient computer from Stanley Kubrick's 1968 movie *2001: A Space Odyssey*, as an example of this robo-phobia. HAL 9000, a powerful AI that runs the spaceship *Discovery*, turns on his astronaut commanders. HAL must be shut down after killing several crew members.

Benford and Malrtre (2007) argue that HAL, The Terminator, and other robots gone amok date back to an earlier tradition, namely Mary Shelley's iconic 19<sup>th</sup> century novel, *Frankenstein*, and Jewish myths of the golem. Anne Forest describes the golem legend during an interview in Benford and Malrtre's 2007 book *Beyond Human: Living with Robots and Cyborgs: A 15<sup>th</sup> century rabbi built a human body out of clay, or a golem, which he brought to life with prayer . The rabbi placed the name of God on a slip of paper in the golem's mouth, which he would take out on the Sabbath so the golem may rest. The rabbi forgets one week and the golem goes crazy, eventually fighting his creator. In one version, the golem kills the rabbi. In the second version, the rabbi retrieves the paper and stashes the innate golem in a Prague synagogue, where it remains to this day. The rabbi's descendants have the formula to revive the golem, which they pass generation to generation (p. 187-190). Here is the same theme as modern dystopian science fiction: foolish humans play God and create something they do not fully understand and can not control. The creation turns on its creator, much like in *Frankenstein*.*

Many futuristic works of fiction are not nearly as hopeful as Kurzweil's predictions. Technology is often portrayed as a dehumanizing force in print, film, and

television. In this study, then, we may expect journalistic articles to mirror popular culture's tendency to be wary about humanity's relationship with technology.

Cataloging each pop-culture work about intelligent machines controlling the world would be impossible. A short list of selected works is provided below. They range in tone but many are dystopian. Table 2.2 below provides a brief summary of some Singularity milestones in popular culture.

**Table 2.2: The Apocalypse Approaches: Depictions of the Singularity in 20<sup>th</sup> and 21<sup>st</sup> Century Popular Culture**

2010	The plot of an episode of the TV program <i>The Big Bang Theory</i> (season 4, episode 2, "The Cruciferous Vegetable Amplification") revolves around the anticipated date of the coming Singularity.
2009	<i>Transcendent Man</i> , a documentary about Kurzweil and his philosophies is released.
2008	Singularity Hub, a website dedicated to promoting the Singularity and aiding its happening.
2005	<i>The Singularity is Near: When Humans Transcend Biology</i> is published.
2003	Virtual world <i>Second Life</i> is launched. It allows users to create new lives in virtual space.
1999	<i>The Matrix</i> is released. It deepens popular culture's concerns about a dystopian future.
1993	Vernor Vinge popularizes the Singularity with his article "The Coming Technological Singularity: How to Survive in the Post-Human Era." He predicts the creation of superhuman intelligence by 2030 (Vinge, 1993).
1988	In his book <i>Mind Children</i> , futurist Hans Moravec predicts that the robots will evolve into a new series of artificial species some time from 2030-2040 (Moravec, 1988).
1984	<i>The Terminator</i> is released.
1968	<i>2001: A Space Odyssey</i> is release. It introduces the world to the infamous HAL 9000 computer that gains sentience and turns on its astronaut masters.



1950	Science Fiction writer Isaac Asimov publishes <i>I, Robot</i> .
1942	Asimov develops the Three Laws of Robotics in his 1942 short story "Runaround." The laws help guide the imagination of engineers and the public since. The Three Laws are: <ol style="list-style-type: none"> <li>1. "A robot may not injure a human being or, through inaction, allow a human being to come to harm.</li> <li>2. A robot must obey any orders given to it by human beings, except where such orders would conflict with the First Law.</li> <li>3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law" (Asimov, 1950).</li> </ol>
1920	Karel Capek publishes <i>R.U.R. (Rossum's Universal Robots)</i> , introducing the public to the word "robot."

Kurzweil is at odds with many authors in his confidence and optimism for the future of technology. An optimistic view of a technological future is at the heart of the Singularity movement, which makes Kurzweil's rhetoric so powerful. It flies in the face of many pop-culture depictions of a totalitarian and dehumanizing future.

### **The Singularity is Near**

Kurzweil has a long history of technological optimism. He published *The Age of Intelligent Machines* in 1990 and *The Age of Spiritual Machines* (1999). Both document the rise of AI and make predictions for the future and are the logical predecessors of *The Singularity is Near* (2005). Kurzweil grounds many of his predictions for the future in what he calls "the Law of Accelerating Returns." It's the idea that technological progress is exponential, not linear. As the power of technology progresses, the faster and faster it becomes more powerful. For example, if the number of transistors on a circuit doubles five times, there are not five times more transistors than at first. There are thirty-two times as many. This is how Kurzweil accounts for the incredible speed of progress in the

near future. By his own account, Kurzweil's predictions over the last three books have been pretty accurate:

Of my predictions, 86 percent were correct or essentially correct. Essentially correct, meaning if I predicted something in 2009 with a specificity of decades and it came correct in 2010. Even the ones that were wrong, I didn't get that wrong. Like I counted as wrong my 90s prediction that we'd have self-driving cars by 2009. The technology does exist but I count it as wrong because it's not commonly used yet ([wired.co.uk](http://wired.co.uk)).

Kurzweil sees genetics, nanotechnology, and robotics to be the primary fields of technology that will bring about the Singularity. Genetics will improve the human body and mind far beyond their current biological capabilities. Robots will be exponentially intelligent and functional, becoming a ubiquitous part of every day life. Nanotechnology will improve both the human body and machines, combining biological and non-biological intelligence to create new hybrid organisms. Eventually the real world and the virtual world will be indecipherable from each other.

Kurzweil sees everything in the world as patterns of information, even humans. A pattern can be replicated and repeated. If that is true of consciousness, a human could potentially upload his consciousness pattern into a network or robot body and live as long as he wants. There are, of course, numerous philosophical and ethical implications to uploading a consciousness. Because there is currently no scientific way to test for consciousness, we could not tell if the machine you uploaded yourself into is truly you, or a program designed to be indecipherable from you. As Kurzweil himself points out, it may some day be possible to replicate your pattern and make a new you on a server. At

that point, would you want your body shut down, confident you exist somewhere else?

You may insist that there is something that makes you what you are that can not be quantified and replicated.

Kurzweil catalogues the development of intelligence in the world, beginning with simpler patterns of structure such as carbon molecules, building up to biological life, human intelligence, and finally the dominance of machine intelligence. The patterns of intelligence become increasingly more complex. Kurzweil (2005) divides the stages of intelligent progress into six distinct epochs.

**Table 2.3: Kurzweil’s Six Epochs in the Evolution of Intelligence**

Epoch one	<b>Physics and Chemistry</b> - The Big Bang creates the universe. Atoms form. The atoms, especially carbon, bind together to create molecules, “giving rise to complicated, information-rich, three-dimensional structures” (Kurzweil, 2005, p. 15).
Epoch Two	<b>Biology and DNA</b> - Carbon-based compounds increase in complexity, giving rise to self-replicating organisms and creating life. DNA develops and stores evolutionary biological information.
Epoch Three	<b>Brains</b> - Brains and nervous systems develop. Animals, especially humans, become self aware and recognize patterns. Increasing intelligence gives humanity abstract thought and the ability to use symbols. Information is stored in neural patterns.
Epoch Four	<b>Technology</b> - The human race uses abstract and rational thought to create simple tools then complex machines. Nonbiological intelligence becomes a human pursuit. Information is stored in hardware and software.
Epoch Five (Present Day)	<b>The Merger of Human Technology and Human Intelligence</b> – Technology masters biology. The merging of man and machine through virtual reality, implants, prosthetics, nanotechnology, robotics, and genetics eventually expand the human brain’s capacity for intelligence. Epoch Five ends with the Singularity. Machines achieve consciousness and self replication and improvement. They become part of humanity and humanity become part machine.
Epoch Six	<b>The Universe Wakes Up</b> - After the Singularity, the age of biological

intelligence is ended. Nonbiological intelligence will spread itself outward from Earth and through the rest of the universe by “reorganizing matter and energy to provide an optimal level of computation” (Kurzweil, 2005, p. 21). The future is beyond the capacity of human intelligence and therefore becomes unknowable.

*The Singularity is Near* does not describe a dystopian future where humans are ruled by machines. It is a future where human intelligence will be enhanced by technology. Kurzweil argues that if the transition to Singularity is handled properly, the machines will be humanized. We will not be dehumanized. Technology will be available and capable of solving all of humanity’s problems, even death. That is why singularitarians argue the time to discuss the Singularity is now. If the Singularity happens, which they say it will, we want it to be on our terms.

### **Shortcomings of Current Research**

The Singularity has received a great deal of attention from academics, scientists, and journalists. Its controversial nature, wide-ranging implications, and charismatic leadership in Kurzweil demand attention. However, that does not mean research opportunities have been exhausted. I have identified several gaps in the research, some of which may be filled by this study.

First, many of the writings about the Singularity and *The Singularity is Near* get understandably caught up debating whether or not the Singularity is possible. Singularitarians portray the Singularity as inevitable. Opponents see it as a sci-fi fantasy based on faulty science and the dream of transcendence. Kurzweil (2005) spends chapter nine of *The Singularity is Near* on the defensive, deflecting attacks based on software, economic factors, government regulation, theism, and holism, among others. For example, Kurzweil defends against criticism from virtual reality pioneer, Jaron Lanier,

that software is too unreliable and prone to failure to ever achieve the Singularity. Lanier also criticizes Kurzweil for assuming software will some day be available to approach any problem. A summary of this debate appears on page 435 of *The Singularity is Near*.

The “could it happen?” debate is necessary and fascinating, but it consumes the majority of the public dialogue. Less attention is paid to understanding how singularitarians function in a larger social context and the strategies they employ to attract followers. Robert Geraci’s 2010 book, *Apocalyptic AI: Visions of Heaven in Robotics, Artificial Intelligence and Virtual Reality* examines how apocalyptic fantasies have influenced technology, including Singularity discourse.

Geraci sees the Singularity primarily as an apocalyptic issue. His description of apocalyptic thought also aptly describes Kurzweil’s position:

“Apocalypticism refers to 1) a dualistic view of the world, which is aggravated by 2) a sense of alienation that can only be resolved through 3) the establishment of a radically transcendent new world that abolishes dualism and requires 4) radically purified bodies for its inhabitants” (p. 9).

A simplified position of Kurzweil’s (2005) argument could be characterized by 1) a separation of biology and machines, 2) a refusal to accept illness and death as inevitabilities, 3) the melding of human and machine to the point that virtual reality and reality are indistinguishable, and 4) the uploading of human consciousness into computers and robots, prolonging life indefinitely.

Kurzweil’s motivations may not necessarily represent the motives of the Singularity movement. This thesis attempts to uncover motives of Singularity discourse by studying newspaper articles that introduce robotics and AI to lay people. Hopefully,

this will give us a view of Kurzweil's work in the broader social context and position it within the movement.

Second, relevant news articles generally illustrate individual cases of technological progress, or progress in a specific field. Rarely do they bridge the gaps and position each achievement in the larger context. For example, one of the articles in this study's sample size, "Protecting Your Home From Afar with a Robot" describes how do-it-yourselfers use modified remote control and video equipment to protect their homes. It provides an anecdote of a programmer who uses the equipment to patrol his home and check-in on his children. It also discusses the growing field of telepresence and ubiquity of digital technology. Telepresence is remotely representing oneself as an avatar, rather than appearing in person. The article does not illustrate how telepresence fits into other tech trends or how these technologies contribute to the Singularity. Obviously, not all tech articles deliberately tie-in to the Singularity, nor should they. I believe the articles, though, are part of a larger trend of Singularity discourse. Chapter four will examine a sample of these articles in an attempt to uncover and describe common motives.

Third, to my knowledge, mainstream representations of the Singularity like the articles I just spoke of have not received much critical attention. Critics have written extensively about Moravec, Kurzweil, and Vinge as leaders of the movement. More attention is paid to the leadership of the movement than the movement's broader base. For example, John Markoff has written extensively about technology, robotics, and AI for the *New York Times*. He reaches an audience that Kurzweil and company may not. In his role as a journalist, Markoff does not advocate for the Singularity. He does describe it in detail and bring the concept to a larger audience. I believe studying the day-to-day

motivations and influence of writers like Markoff will yield a better understanding of how the Singularity movement appears in popular culture and reaches its base.

### **Conclusion**

In review of the literature, I have found four primary concepts drive discourse about the Singularity:

1. Technology is the best way to solve the world's problems.
2. Man-machine hybrids are the next logical step in mankind's evolutionary process.
3. A post-Singularity world is beyond prediction.
4. The Singularity is inevitable.

Moravec, Vinge, and Kurzweil popularized these concepts in the collective imagination of singularitarians. I expect there are some ways in which Kurzweil's rhetoric and ideology converge and diverge with the rhetoric and ideology of the rest of the movement. I hope to identify those convergences and divergences in this thesis by filling in gaps in the existing research. In the next chapter I will outline my method of criticism for rhetorical movements and individual situations. Hopefully, I will address the ways in which rhetorical criticism can be applied to the movement. In chapter four, I will examine *The Singularity is Near* in greater detail, as well as articles from *The New York Times* and *The Wall Street Journal* to define and examine the issue.

### Chapter Three: Methodology

This chapter outlines the procedures employed to examine Kurzweil's motives and the way Singularity discourse is creeping into daily life. Kurzweil has been selected specifically because of his leadership in the Singularity movement. His 2005 book, *The Singularity is Near* may be the most highly-publicized and well-received artifact of Singularity discourse. Tech articles from *The New York Times* and *The Wall Street Journal* are used as examples of the Singularity movement's growing impact and popular culture.

*The NYT* and *WSJ* were chosen because they are two of the largest and most well respected newspapers in America. The two newspapers reach over three million people every week (huffingtonpost.com). The *NYT* is also widely considered to be a liberal newspaper, directed more toward the cultural elite than the average person. Conversely, *The WSJ* has a reputation for being conservative and holding to more traditional values. It could be assumed that these values will hold true for robotics and AI discourse. While one paper may see the adoption of new technologies as progress, the other may classify it as dehumanizing or offensive.

This thesis is grounded in the dramatistic approach within the dramaturgical perspective. The dramatistic approach, originally part of the "new rhetorics," was developed in the 1950s and 1960s by Kenneth Burke as a method of rhetorical criticism



(Brock, Scott, & Chesebro, 1990). Burke expanded and refined his system over a lifetime of prolific writing, gaining acceptance across many disciplines such as sociology, literary criticism, and speech communication. As the name suggests, dramatism approaches the world as a drama, not metaphorically, but literally (Brock, 1999).

### **Kenneth Burke's Dramatism**

Kenneth Burke developed dramatism throughout his career as a critical method to account for the social use of language and symbolic action. Burke gained attention for dramatism in the 1950s, though he extended and refined his system throughout his career. Dramatism is intended to uncover the motives of individuals by systematically dissecting and examining individual situations. Dramatism is built around the pentad (*A Grammar of Motives*, 1945), identification (*A Rhetoric of Motives*, 1950) and the cycle of pollution-guilt-purification-redemption (*The Rhetoric of Religion*, 1961), which is essentially a striving for order. Men, the symbol-using animals, are actors. Brock (1985) said “in dramatism as a philosophy, symbol-using is cast as a basic and defining feature of the constitutive nature of the human being and as a physical action in a ‘real’ world” (p. 102).

The dramatistic approach seems especially well-suited for discussing Kurzweil and Singularity discourse. The Singularity, or the creation of super-intelligent machines that irrevocably transform the world, is essentially a striving for order through transcendence. It is the application of technology to work through the cycle of pollution-guilt-purification-redemption. Before we can employ the dramatistic model, we must start with the pentad.

### **The Pentad**

Burke says that all human motivations can be broken down into five categories that make up the whole motivation, or a *Grammar of Motives* (1945):

1. act
2. agent (who performs the act)
3. agency (the means by which the agent performs the act)
4. scene (the situation in which the act takes place)
5. purpose (the reason for the act).

These five elements combine to create the overall motive. So, dramatism and the pentad allow us to “consider the matter of motives in a perspective that, being developed from the analysis of drama, treats language and thought primarily as modes of action” (Burke, 1945, p. xxii).

Manipulating one of the elements changes the understanding of the motive. For example, a man (agent) stabs (act) another man (counter-agent) using a knife (agency) with the intention to kill (purpose) in a fight (scene). If we can explore the scene which contains the act, we may find a history of wrongdoing that classifies the stabber’s motive as revenge. If we change the agent and counter-agent from “man” to the more clearly defined “soldier” we have a whole new understanding of motive, maybe one of survival, national pride, or victory.

We can understand the ways in which each element affects the other in terms of ratios. Ten ratios exist: act-agent, act-agency, act-scene, act-purpose, agent-agency, agent-scene, agent-purpose, agency-scene, agency-purpose, scene-purpose. If we return to the metaphor of a soldier killing another soldier in battle, we can apply the agent-scene ratio. The scene (the battle) contains the agent (soldier). The agent himself cannot be

defined outside the scene, for a soldier derives his identity from battle. To understand the scene is to understand the agents within. In the Singularity movement, the scene is technological. The agents operate within the scene, from which they are inseparable. So, the pentad is necessary in dramatism for the uncovering of motives. The next step, identification, could be viewed as an aligning of motives between speaker and listener.

### **Identification**

The success of a rhetorical movement is reliant on the aligning of motives. Burke argued that the primary reason for rhetoric is not “persuasion” as asserted by Aristotle. Instead, it is about “identification,” though identification can contain persuasion. Persuasion is merely convincing. Identification is the establishing of a common principle between the speaker and the listener: “A is not identical with his colleague, B. But insofar as their interests are joined, A is *identified* with B. Or he may *identify himself* with B even when their interests are not joined, if he assumes that they are, or is persuaded to believe so” (Burke, 1950, p. 20). In a clearer example, Burke says that a politician may declare “I was a farm boy myself,” when speaking to a rural crowd (1950, p. xiv) to create a common bond between A and B, or to make A and B consubstantial. There are innumerable ways to create identification.

Futurists and singularitarians may create identification in the definition of man. For example, Ray Kurzweil describes human beings as biological machines or patterns of information. Acceptance of this idea is crucial to accepting the rest of his ideas on mortality, life extension and human improvement. Should a reader believe in the immortality and uniqueness of the human soul and the afterlife, seeing humans as a pattern of information is difficult. Conversely, anti-singularitarians could frame the

Singularity as anti-humanity, thus positioning them with humanity and creating identification.

For the rhetorical movement, identification can occur through the establishing of common goals. The most common human goal, Burke said, is the striving toward order, hence the cycle of pollution-guilt-purification-redemption.

### **Burke's Pollution-Guilt-Purification-Redemption Cycle**

Burke lays out the process of striving toward order in *The Rhetoric of Religion* (1961, p. 4-5):

Here are the steps  
In the Iron Law of History  
That welds Order and Sacrifice:

Order leads to Guilt  
(for who can keep commandments!)  
Guilt needs Redemption  
(for who would not be cleansed!)  
Redemption needs Redeemer  
(which is to say, a Victim!).

Order  
Through Guilt  
To Victimage  
(hence: Cult of the Kill)

Brock simplified and reinterpreted the process as “pollution, guilt, purification, and redemption” (1985, p. 99). The striving toward order is ultimately a striving toward transcendence and perfection. Humans are “rotten with perfection,” he says, always trying to improve and transcend. Guilt can be relieved either through scape goating (the blaming of others) or self-mortification (the blaming of self). The cycle is universal and applicable in any system, creating the “plot” of human actors (agents) in the drama of existence.

The motives of a rhetorical movement are not so different than that of the individual. Every movement has act, agent, agency, scene, and purpose. A movement's leaders seek to gain followers and advance the movement's agenda by establishing common goals and recruiting members. Finally, the movement strives to improve and transcend by relieving guilt caused by an ill in society and striving to a new order. Griffin and Simons extended Burke's work to account specifically for rhetorical movements.

### **Dramatism as applied to Rhetorical Movements**

Leland M. Griffin, perhaps best known for combining the study of rhetorical movements with Burkeian theory, laid out a system of "isolating and analyzing the rhetorical movement" (1952, p. 185) and discovering rhetorical patterns. Griffin's 1952 essay, "The Rhetoric of Historical Movements" launched movement studies (Brock, Scott, & Chesebro, 1990). Griffin argues that men create organizations because they desire order. The movement itself begins with the rejection of the current order and a striving toward a new order. Movements begin "with Guilt and the dream of salvation. They end with the achievement, and maintenance, of a state of Redemption – of a new identity, a new unity, a new condition or 'substance': which is to say, a new *motive*" (Griffin, 1969, p. 461). They are united by a grand shared motive, even if that motive is unspoken. Therefore, an effective rhetorical movement is based on shared motives, identification, and the dream of a new order.

Griffin said that both *pro* and *anti* movements exist. *Pro* movements fight for the acceptance of a new concept into the social order. *Anti* movements strive to reject an existing idea in the social order. Either movement goes through three stages:

1. A period of inception: when pre-existing ideas begin to catch the public eye. For example, the Singularity's inception period could be Vinge's 1993 essay, "The Coming Technological Singularity: How to Survive in the Post-human Era." Vinge uses the term capital "S" Singularity for the first time. The article is widely dispersed to a tech-savvy and forward-thinking crowd on the fledgling World Wide Web. Vinge sets the stage for Kurzweil's work. The inception period of the movement, which it appears the Singularity movement is currently in, is a time for advocates to create goals, establish common motives, and recruit followers. The leadership expands their rhetoric to reach a broader audience.

2. A period of rhetorical crisis: When a member of the opposing group succeeds in "irrevocably disturbing that balance between the groups which had existed in the mind of the collective audience" (p. 186). This is the point in which the tides turn, for example, when Singularity discourse appears like it is may become widely accepted. I do not believe the Singularity is to this point yet. The establishment of the Singularity Institute and increased visibility has raised the movement's profile. However, opposition from religious movements will likely arise when the Singularity nears this point. After the inception period, the movement moves through a period of crisis in which the leadership is questioned, a new motive is established and shared, the Kill in Burke's model.

3. A period of consummation: A time when the aggressing speakers give up their cause, either because the battles is won, or the movement is convinced persuasion is impossible. Here, the movement purifies through scape goating or self-mortification. Next the movement achieves its new Order or fails. The movement ends in stasis.

If the Singularity movement is still in its inception period, we can not trace its development. Griffin's model is still useful, though. Griffin's 1964 article "The Rhetorical Structure of the 'New Left' Movement" considers the "New Left" movement's inception period identifies its "initiating terminus," as well as its pentadic elements.

### **Employing Griffin's Model**

We can draw some parallel between the "New Left" and singularitarians. The "New Left" was in its inception period in 1964 when Griffin's article first appeared, the period I believe the Singularity is in now.

Griffin writes about the editors of *Dissent* (agents) creating the initiating terminus of the "New Left" movement (act) with the creation of the *Dissent* project (agency) during the Cold War (scene) in an attempt to keep radicalism alive in America (purpose). The overall motivation is to provide an alternative mode of action from the status quo. Like the Singularity movement, the "New Left" viewed themselves as "radical intellectuals" making a "new start." They decided to move in a direction of "socialist humanism." The Singularity's goal is not so different, the goal of a human-centered system of social equality brought about by machines. The "New Left" also primarily targeted intellectuals to receive their message.

The messages are also similar conceptually: revolution, transcendence, and a new authority. The inception period, which is the developing of pre-existing ideas into the public sphere, this would put both the "New Left" in 1964 and the Singularity movement in 2011 as being in the purification stage of the guilt-purification-redemption-order cycle.

There is dissatisfaction in the movement with the current order and striving toward a new one through purification

Griffin's approach is centered on group rhetoric, or the movement as a whole. Another scholar, Herbert W. Simons extended Griffin's work in movement studies with a sociological perspective in the 1970s, focusing on individual orators, rather than the group (Brock, Scott, & Chesebro, 1990).

### **Simons' Contributions**

Simons defined the social movement as an "uninstitutionalized collectivity that mobilizes for action to implement a program for the reconstitution of social norms or values" (1972, pg. 3). Simons argued the movement's rhetoric must originate from the group's leadership. It does not emerge from the members of the movement (Brock, Scott, & Chesebro, 1990). Simons (1972) outlined a series of rhetorical requirements, problems, and strategies that an effective movement leader must meet in his article "Requirements, Problems, and Strategies: A Theory of Persuasion for Social Movements." Simons (1972) argues that effective leadership must "attract, maintain, and mold workers (i.e. followers) into an efficiently organized unit" (p. 3), "secure the adoption of their product by the larger structure" (p. 3) and "react to resistance generated by the larger structure" (p. 4).

In the case of the Singularity, Simons' leader-centered approach is far less useful than Griffin's system based on the Burkeian system. The Singularity movement, still in its inception period, has no large-scale formal organization. There are small, formal organizations that work independently of each other to achieve and prepare for the Singularity. For example, the Singularity Institute in Silicon Valley has donors, instructors, a board of trustees, students, and a shared mission. Kurzweil is a leader of



that specific arm of the movement, but the movement as a whole has no definitive leader. Likewise, Moravec and Vinge established some of the guiding principles and ideals of the Singularity, but have no ongoing leadership role. Perhaps the lack of strong leadership is a result of the eclectic blend of technologies that must be cobbled together to achieve a true singularity. Or, perhaps the still seemingly distant date of 2045 is just too far away to adequately motivate central leadership. Instead, the uninstitutionalized Singularity movement spreads through the “chaining-out” of rhetorical fantasies existing within the group.

### **Bormann’s Fantasy Chains in Rhetorical Visions**

Ernest G. Bormann (1972) describes the way that group fantasizing “chains out” from individuals to audiences, then to the mass media in similar terms to Simons and Griffin. Bormann developed fantasy theme analysis in the 1970s to account for how groups create common narratives, heroes, and enemies to mobilize a group (Brock, Scott, & Chesebro, 1990). Members of a group build “rhetorical visions” from shared ideas that control the direction of the movement in “all the diverse settings for public and intimate communication in a given society” (Bormann, 1972, p. 398).

Chesebro has used fantasy theme analysis in movement studies when researching how the term “homosexuality” is treated in the rhetoric of social scientists (Chesebro, Scott, & Brock, 1990). Chesebro (1980) found that social scientists got caught up in two irreconcilable fantasies that homosexuals are degenerates, and that homosexuals can be “mainstreamed.” The paradoxical views sometimes appeared in the same studies. A shared rhetorical vision chained-out based on a pre-existing belief, even if scientific evidence did not support it.

The chaining-out of fantasy themes is essentially the same as Griffin's group-centered approach to rhetoric. Group fantasies are disseminated and adopted by a larger audience.

### **Methodology**

This study examines articles related to the Singularity movement in *The New York Times* and *The Wall Street Journal* from February 2009 to February 2011. These dates were chosen for their significance in the movement. *TIME* magazine's Singularity issue in February of 2011 has been the movement's most highly visible and well-received artifact. Lev Grossman's article "2045: The Year Man Becomes Immortal" was *TIME*'s most-read and most widely circulated article via e-mail in 2011. This issue, so far, has been the culmination of the singularity as a rhetorical movement. This could be the moment in a movement's inception stage when the movement begins to address a larger and more public audience (1964, p. 127). A *TIME* magazine cover has long been considered an honor. News organizations speculate for months before *TIME*'s person of the year is named. The movement may not have such a public and in-depth treatment in the mainstream media for some time.

February 2011 is also the same month that IBM's Watson computer bested human competitors on "Jeopardy!" Watson may be the most popular example of AI since IBM's last massively public contest against chess champion Gary Kasparov. They received years of attention in the *NYT* and *WSJ*.

This study examines two years of newspaper articles leading up to Kurzweil's *TIME* magazine cover and Watson's victory. Two years of articles was determined to be

a manageable sample size, while still providing enough data to provide a useful view of Singularity discourse. It is, ultimately, though, a sample size of convenience.

The articles were pulled from *The NYT* and *The WSJ* websites, [www.nyt.com](http://www.nyt.com) and <http://online.wsj.com>, respectively. This study includes all articles filed under “robot” and “artificial intelligence” from February 2009 to February 2011. Neither website listed “singularity,” “technological singularity” or “Kurzweil, Ray” as searchable topics, so they were not considered. Other terms such as “technology,” “gadgets” or “computers” were considered too broad for inclusion. Likewise, “genetics” was not included. Ray Kurzweil identifies genetics, nanotechnology, and robotics as the instruments of the Singularity. However, popular considerations of the topic are focused primarily on artificial intelligence and robotics.

This study also excludes podcasts, blogs, book and movie reviews, letters-to-the-editor, photo slide shows, and obituaries. Though a rhetorical movement expresses itself in a variety of artistic forms, it is difficult to compare written words to photos. Blogs and letters-to-the-editor are created outside the papers’ control. By limiting this study to written articles directly from two organizations I hope to provide a consistent analysis that would not be possible examining multiple mediums.

This study also excludes articles that appeared to have little relation to the topic, though they were filed under “robot” or “artificial intelligence.” For example, an article titled “Moratorium on Deepwater Drilling Is Lifted, and New Rules Are Imposed” was not included because it deals primarily with environmental policy, not technological development. Robots were only a peripheral part of the article, referring to underwater drilling robots.

In total, the search yielded 46 articles from *NYT* and 43 from *WSJ*, for a total of 89 articles. A complete list of these articles can be found immediately after the reference section of this thesis.

For employing Burke's pentad we can use John Markoff's *NYT* article, "Computer Wins on 'Jeopardy!': Trivial, It's Not" from February 17, 2011 as an example. Markoff's article details Watson's win over "Jeopardy!" champions Ken Jennings and Brad Rutter. The agents (Jennings and Rutter) lost a trivia match requiring memory, recall, and reflex (act) on a popular cable TV show in an era of computer ubiquity and a mix of technological paranoia and optimism (scene) to a computer (agency and/or counter-agent) for the purpose of testing computer intelligence compared to humans. We can determine the motive is, in Markoff's perspective is "a vindication for the academic field of artificial intelligence." Markoff describes the situation positively, celebrating Watson's triumph, which he infers is a triumph for humanity. Tying the success of humanity and technology together is necessary for the Singularity movement to thrive.

Performing this same analysis on each article should give us perspective on how The *NYT* and the *WSJ* approach technology. We can see how each organization furthers or impedes the Singularity movement.

## **Conclusion**

The object of this study is robotics and AI discourse. Each year, scientists make new advances in the fields of robotics and AI. Those advances are catalogued in the *NYT* and *WSJ*. The way these papers treat their subject matter could potentially affect the way in which these technologies are adopted.

This study uses Kenneth Burke's pentad, derived from his larger theory of dramatism in an attempt to uncover the motives of the *WSJ* and *NYT* and compare them to that of Kurzweil. It also applies Griffin's extension of the Burkeian system to account for rhetorical movements.

## Chapter Four: Results and Discussion

*The Singularity is Near* has been one of the vehicles that popularized the concept of Singularity from small circles of science-fiction writers and futurists to a broader pop-science audience. However, the book is still limited in terms of its audience. Beyond Kurzweil's book, our everyday media systems, especially vivid in the nation's leading newspapers, have repeatedly held that technologies are accelerating and changing human evolution (Kurzweil, 2005, pp. 7-8). In addition to *The Singularity is Near*, I have applied Burke's pentadic analysis to two years of robotics and artificial intelligence articles published in this chapter examines the results of that analysis.

Examining the motives of the *New York Times* and *Wall Street Journal* articles in the sample size (46 *NYT* and 43 *WSJ* articles) yielded six basic categories of motives. The articles focus on:

1. Enhancing human capabilities and improving life through robotics and AI.
2. Technological pessimism or questioning the role of technology in human life.
3. A demonstration and/or celebration of technological innovation.
4. Replicating human biological or social processes in machines.
5. Saving human lives through technology.
6. Replacing human lives with technology.

A convenient summary of the motive categories can be found below in tables 4.1 and 4.2.

Detailed tables that complete a pentadic analysis of each article can be found in the appendix.

**Table 4.1: *New York Times* Articles Summary**

<b>Types of Articles</b>	<b>Total</b>	<b>Percentage</b>
Enhancing human capabilities/improving human life	15	32%
Technological skepticism/pessimism	10	21%
Demonstration/Celebration of technological innovation	9	20%
Replicating human processes in machines/social robotics	5	11%
Replacing human with technology	4	9%
Saving humans lives with technology	4	9%
	<b>47</b>	<b>102%</b>

**Table 4.2: *Wall Street Journal* Articles Summary**

<b>Types of Articles</b>	<b>Total</b>	<b>Percentage</b>
Enhancing human capabilities/improving human life	13	30%
Demonstration/Celebration of technological innovation	12	28%
Technological skepticism/pessimism	7	16%
Replicating human processes in machines/social robotics	5	12%
Replacing humans with technology	3	7%
Saving human lives with technology	3	7%
	<b>43</b>	<b>100%</b>

### **Enhancing Human Capabilities**

The motive category that appeared in the highest percentage in both the *NYT* and *WSJ* was enhancing human capabilities with technology (32% and 30%, respectively).

The articles presented an array of possible ways for technology to enhance human capabilities such as telepresence and telecommuting, or opening new opportunities in medicine, education, and art. Vinge (1993) espoused enhancing human abilities, such as with intelligence augmentation as a real (and potentially better and more attainable) alternative to replacing human processes with AI and robotics.

Both newspapers generally viewed this topic favorably, but not entirely favorably. For example, in the *NYT*'s "Results Unproven, Robotic Surgery Wins Converts," Kolata (2010) detailed how more patients are demanding robot-assisted surgery, even though it is more expensive, and there is no hard data that proves it is more successful than traditional surgery. This suggests an increasing comfort and faith in technology to perform the most important and delicate tasks. Some doctors pointed to marketing-hype from robot manufacturers as the primary culprit for the demand. Kolata described two doctors who use the robot to assist in surgeries: "The message for patients is not to assume that new is better,' Dr. Barry said...that sort of message is falling on deaf ears. Patients want the robot" (Kolata, 2010).

*The WSJ* article, "Entrepreneurs Doing Business by Avatar" by Dyan Machan details the way business people use virtual environments to meet and conduct business. Machan points out how virtual world Second Life's highly-publicized online storefronts originally drew tech giants like Dell and IBM and clothing manufacturers like American Apparel. The buzz died quickly, though. Businesses found Second Life users were more interested in clothing for their avatar than buying real world goods. Machan's overall assessment is still positive. He calls the technology "every-improving" and worthy of respect.

Kolata and Machan both acknowledge imperfect nature of their respective technologies, but do not dwell on them. Kolata focuses on consumer demand. Machan focuses on the improvements the technology is continually experiencing. I see several possible reasons why human technological enhancement is generally given so much positive attention:



1. Enhancing human skills and jobs with machines, rather than replacing them, is less offensive to human nature and protects human jobs.

2. People see enhancement technology as advanced tools and toys, not as threats, especially if the technology is non-invasive.

3. Technological tools and toys can make life easier and more enjoyable.

If better technology means better lives, it make sense that the second most popular motive group I uncovered in *The WSJ* , and the third-most popular in *The NYT* was the celebration and demonstration of technology.

### **The Celebration and Demonstration of Technology and Innovation**

20% of the *NYT* articles (9 total) and 28% of the *WSJ* articles (12 total) focus on the demonstration and/or the celebration of technological innovation. These articles can include other featured topics like replacing humans with technology or enhancing human abilities as anecdotes, but the overarching motive is more positive. Many of the articles use IBM's "Jeopardy!" playing AI program Watson as the centerpiece for this celebration. IBM made international news when its chess-playing program, Deep Blue, defeated world-champion Gary Kasparov. The Watson program is considerably more sophisticated. Understanding questions posed in common phrasing, unraveling puns and wordplay, and returning an answer with a high confidence rating is a much more difficult task than playing a game with rigid rules.

The *NYT*'s John Markoff is especially a proponent of the Watson system, calling it a "vindication for the academic field of artificial intelligence" in his 2011 article, "Computer Wins on 'Jeopardy!,' Trivial It's Not." He chose to discuss the future benefits of Watson's software in daily application and downplay the unease some feel when

powerful technology defeats humans in contests. He also interviewed IBM researcher David Ferrucci about Watson, who compared the system to the interactive and intelligent computer on *Star Trek* rather than HAL, the malevolent sentient AI from *2001: A Space Odyssey*. McClain (2011), Powers (2011), and Thompson (2010) likewise wrote about Watson for the *NYT*, all in positive light. Fish (2011) is the lone holdout in my sample size from the *NYT* when extolling Watson's significance. That article is detailed shortly in the "technological pessimism" classification of articles.

In *The WSJ*, David Gelertner (2011), a professor of computer science at Yale, described Watson's system as a model for future technologies. He envisioned a future of "software super-specialists" that will use powerful parallel processing to tackle a variety of problems like medical diagnoses. He said Watson could also AI systems more active. They could "hear" people talking and offer up relevant information without ever being asked for it. Gelertner does not believe that Watson could pass the Turing test, but wrote, "when a program does pass the Turing test, it's likely to resemble a gigantic Watson... Watson is one giant leap for technology, one small step for the science of mind. But this giant leap is a major milestone in AI history."

Technology writing, especially science fiction, can be dystopian at times, often about dehumanizing AI run amok. Kurzweil and other futurists who envision an ideal technological future are more in line with this set of articles than the dystopian crowd. Kurzweil's *WSJ* article, "When Computers Beat Humans on Jeopardy" extols Watson's virtues. Unlike some technological pessimists, Kurzweil sees a win for technology as a win for humanity. In some ways, the celebration of technology is the celebration of humanity. After all, who makes and uses these tools and toys? When human's

Not every technology writer is as optimistic about the Watson system as Markoff, Gerlertner, and Kurzweil. The second most common *NYT* motive classification in the sample size is technological skepticism and pessimism. It's the third most common motive classification in *The WSJ*.

### **Technological Skepticism/Pessimism**

21% of *NYT* articles (10 total) and 16% of *WSJ* articles (7 total) are centered on technological skepticism or pessimism. Technological skeptics and pessimists are unimpressed with the current state of progress and/or the promises computer scientists have made about the future. That is not to say they are Luddites. Some are concerned with the increased reliance on technology will cause humans to treat each other as machines. Others are advocates of innovation, but are deeply concerned with the ethical and philosophical implications of a digital existence.

Virtual reality pioneer and author Jaron Lanier's 2010 *NYT* article, "The First Church of Robotics," challenges religious thought crossing over into technology. He argues that technology should be used to improve our material existence, but should not be relied upon for spirituality. He believes Kurzweil and other singularitarians are misguided in their work to humanize computers, and in his view, computerize humans.

Lanier (2010) argues:

If technologists are creating their own ultramodern religion, and it is one in which people are told to wait politely as their very souls are made obsolete, we might expect further and worsening tensions. But if technology were presented without metaphysical baggage, is it possible that modernity would not make people as uncomfortable?

Technology is essentially a form of service. We work to make the world better. Our inventions can ease burdens, reduce poverty and suffering, and sometimes even bring new forms of beauty into the world. We can give people more options to act morally, because people with medicine, housing and agriculture can more easily afford to be kind than those who are sick, cold and starving.

Lanier has spent his professional life innovating technology. According to his website, he “either coined or popularized the term ‘Virtual Reality’” ([jaronlanier.com/general](http://jaronlanier.com/general)). Lanier explores the political, ethical, and philosophical implication of new technologies. However, questioning man’s relationship with technology does not necessarily oppose the singularity movement. Technological skepticism is a healthy and necessary part of singularity discourse. It keeps human beings part of the equation.

Many of the other articles focus on a primary source for technological pessimism in popular culture: science fiction. John Jurgensen and Jamin Brophy-Warren (2009) describe Hollywood’s fascination with the apocalypse, which is often brought on by technology, such as *Wall-E*, *The Matrix*, and *The Terminator*. These movies include the destruction of the world or the recreation of new post-apocalyptic cultures, mostly by man’s own devices. Other apocalyptic visions include Martian attacks, environmental disaster, and epidemic disease. In these cases, humans use technology to fight (and sometimes triumph) over the opponent, but are often saved by their humanity, not technology. The preservation of humanity is the key to the movies’ plots. Preservation of humanity is portrayed as noble, but the replication of humanity is abhorrent.

Overall, technological pessimism is not a substantial part of the *NYT*’s or *WSJ*’s discourse on robotics and AI. Only 21% of *NYT* and 16% of *WSJ* fall into this category.

Surprisingly the *WSJ* had fewer articles dedicated to technological pessimism. Some negative articles are also filed under “replacing human” (9% and 7%, respectively).

However, the bulk of the articles focused on replacing humans described menial tasks that humans would not have to deal with anymore. Both newspapers have a much more positive view of technology.

It is difficult to tell whether that optimism will translate into action from news consumers or decision centers like Washington D.C.

### **Replicating Human Processes**

11% of *NYT* articles (5 total) and 12% of *WSJ* articles (5 total) are about mimicking or eliciting human processes like affection. For example, a Japanese medical robot named “Paro” is being used in nursing homes in several countries to engage hard-to-reach residents (Tergesen, & Inada, 2010). Paro looks like a furry, white seal with long eyelashes. Small sensors across its skin allow it to respond to the human touch and react the way a pet might. It coos and squirms and recognizes some commands. Some patients who spend time with Paro take to it quickly. They pet it, talk to it, and become quite attached. In this case, human processes are not replicated, but the machine is built to elicit a very human response. Paro is meant as a companion, which people interact with in human ways.

Other social robots are specifically for conversation, like Bina48. “She” is programmed to converse with humans in a realistic manner. She consists of a human bust with lifelike-ish facial and eye movements that plugs into a computer and microphone. She looks creepily like Bina Rothblatt, a real-life woman Bina48 is built to replicate. The robot is built specifically to be a friend like Paro.

Gautam Naik (2009) details how Dr. Henry Markram is using technology in an attempt to determine the nature of consciousness. He is using an IBM supercomputer, rat brains, and neuron simulators to understand how intelligence emerged. Once a scientist can create self-emerging intelligence, we can understand how human intelligence came to be. We could then determine when consciousness occurs. Is it a product of intelligence alone or something else?

This may be the grandest use of AI detailed in the *WSJ*, to use artificial intelligence to create “real” biological intelligence, which would be recreated and improved upon in silicon. Extra fast human-like intelligence could be used for a number of applications in different fields. Determining the nature of consciousness is at the root of human existence. If it could be proven that consciousness rose from intelligence alone, a machine could become conscious. It would also make many question the nature of the soul. Without the soul, many more people would be likely to upload their consciousness into a server and live indefinitely. Kurzweil portrays this end as the highest in human achievement, while others like Jaron Lanier, are actively fighting this outcome.

### **Replacing Humans**

9% of *NYT* articles (4 total) and 7% of *WSJ* articles (3 total) are about replacing humans with technology, which is not always portrayed as negatively as one may think. Humans are sometimes replaced by machine to complete tasks that human beings find tedious, difficult, and dangerous. Neato has introduced a robot vacuum that can replace humans when doing domestic chores, Google has built cars that can drive themselves, and Boston Dynamics has created a robotic pack mule called “Big Dog.”

While other machines would enhance human functions, like working from home,

these machines replace a human when performing a specific task. Many of these robots work under a narrow set of parameters and can only perform limited functions. The more human the activity, the more likely people are to be distrustful of that technology,

Many people seem to be most threatened by robots and AI of this type, though this type of technology isn't necessarily more advanced. The Watson computer is far more advanced than a robotic vacuum cleaner or even some drones. Replacing humans in some situations can potentially improve life. If robots are doing the tedious, dangerous task that humans do not want to perform, humans can focus on more appealing types of work.

### **Saving Lives**

Replacing humans is shone in a more positive light when it comes to automating war. Many articles in both the *WSJ* and *NYT* describe the use of drones, sensory robots, and remote-controlled machines as the future of combat. 9% of *NYT* articles (4 total) and 7% of *WSJ* articles (3 total) describe the war of the near future as being almost entirely automated. Remote controlled and self-piloting vehicles in the land, sea, and air will attack remote targets while being controlled 3,000 miles away. Portable robots with cameras, sensors, and small artillery will search for threats in hostile environments before human soldiers ever step in.

The primary focus of each article is on the preservation of human life. It should not be forgotten, though, that the preservation is dependent on taking other humans' lives more efficiently. The real motive is not to save human lives, but to save American lives.

### **Overall Motives**

If we were to boil down all 89 articles in the sample size to a single, over-arching

motive, it may look like table 4.3.

**Table 4.3: Singularity as a Philosophy in the American Socio-cultural System**

Act	Identifying, describing, praising, and criticizing new developments in robotics and AI
Agents	Writers in the <i>Wall Street Journal</i> and <i>New York Times</i>
Counter-agents	Luddites, authors, advocates, scientists, philosophers.
Agency	<i>The New York Times</i> and <i>The Wall Street Journal</i>
Scene	The Singularity Movement
Purpose	To encourage technological innovation
Motivation	<b>Extending human capabilities, saving, extending, and improving human life</b>

Technology writers (agents) identify, describe, praise, and criticize new developments in robotics and AI (act) in *The NYT* and *WSJ* (agency) amidst the Singularity movement (scene) in order to encourage technological innovation (purpose). Their motive for encouraging this innovation is to extend human capabilities, save human lives, extend the human lifespan, and improve the quality of human life through AI and robotics.

The journalists' motives are practical, optimistic, and human-centered. They occasionally get bogged down in existential or philosophical debates, but the focus is on improving human life now and in the future. The most common motive among the articles was the extension and improvement of human abilities, not a grand scheme for a robotic afterlife. The most spiritual debates and the most assertions of humanity come from the opposition, the technological pessimists. Does this motive line up with Kurzweil's?

### **Kurzweil's Motives**

Kurzweil's vision of the future comes to pass, people will live as long as they want in robotic bodies or uploaded on a server. He puts enormous emphasis on mankind's humanity as being its saving grace. People will design machines in our own



image, only enormously intelligent. He is intent upon transcendence, on extending human intelligence beyond our physical bodies. A pentadic analysis of *The Singularity is Near* can be found in table 4.3 below.

**Table 4.4: The Pentadic Elements of Kurzweil's Argument**

Act	The Singularity
Agents	Humans (scientists, authors, engineers, programmers, advocates, etc) and intelligent machines*.
Counter-agents	Luddites, authors, advocates, scientists, philosophers
Agency	Nanotechnology, robotics*, genetics.
Scene	The world and eventually the universe.
Purpose	To achieve next step in the evolutionary process, specifically increased intelligence and eternal life.
<b>Motivation</b>	<b>Transcendence</b>

\*Machines must be both agents and agencies in Kurzweil's argument. Machines, such as robots and computers, are tools. However, the Singularity is dependent upon humans creating a machine intelligent enough to become an active participant and contributor in society. When scientists achieve this end, they will achieve the Singularity.

Kurzweil's argument can be broken down as such: Humans with a variety of skill sets and backgrounds (agent) will achieve the Singularity (act) through nanotechnology, robotics, and genetics (agency), spreading human intelligence in machines throughout the world and eventually universe (scene) to achieve the next step in the evolutionary process: machine intelligence (purpose). The motive of this act is transcendence.

Kurzweil hopes to not only extend human life, but conquer death. He is driven by transcendence, the creation of radically transformed bodies, and a new order within the cycle of guilt-purification-redemption-order.

We could also rework the pentadic analysis to feature *The Singularity is Near* as agency.

**Table 4.5: *The Singularity is Near* as Agency**

Act	To convince skeptics of the Singularity's inevitability and mobilize believers into action
Agents	Ray Kurzweil
Counter-agents	Luddites, authors, advocates, scientists, philosophers.
Agency	<i>The Singularity is Near</i>
Scene	The Singularity movement
Purpose	The propagation of a vision for the Singularity, preparing us for the Singularity and improving the technology necessary for the Singularity to occur.
<b>Motivation</b>	<b>Transcendence</b>

Kurzweil (agent) attempted to convince skeptics of the Singularity's inevitability and mobilize singularitarians into action (act) through his book *The Singularity is Near* (agency) in the Singularity movement in order to propagate a vision for the Singularity, preparing us for the Singularity and improving the technology necessary for the Singularity to occur (purpose). Here, the motive is the same: transcendence. Kurzweil is deeply committed to becoming more than human. Though he does not consider himself a "transhumanist" (Kurzweil, 2005) his goals do align with the transhumanism movement, which is to create a new and improved humanity through technology.

Kurzweil positions himself as a scientist and a skeptic, or a reluctant realist who has been convinced by the evidence. He described himself as a Unitarian son of a holocaust survivor, deeply committed to the power of the human mind (2005). Kurzweil does not argue as an ideologue. He makes his argument as a scientist, showing each piece of his evidence and drawing conclusions, coming to the conclusion of the Singularity. The *NYT* and *WSJ* come very close to Kurzweil's tone (attitude toward subject material) and mood (attitude towards readers) in their own writings. The journalistic impulse is similar to the scientist's: a commitment to objectivity and the pursuit of "truth."

The *NYT* and *WSJ* articles' motives are a much less radicalized version of

Kurzweil's. Technological optimism and the improvement, extension, and protection of human life are paramount in both systems. Kurzweil's is larger in scope and vision, hoping to transcend human existence to permanently solve humanity's problems. It is impossible to tell if Kurzweil and *The Singularity is Near* have had a direct influence on the motives of *NYT* and *WSJ* writers. However, fantasy theme analysis accounts for the "chaining out" of a rhetorical vision, which could explain the relation between the two motives.

As new groups adopt a rhetorical vision, they adapt it to their own purposes. Some concepts, like technological optimism, for example, carry on. Other concepts, especially radical ones like the transcendence of human existence, can be lost. So, Kurzweil's radical and optimistic vision can be slowly co-opted by each link in the rhetorical vision's "chain." The more moderate ideas are picked up by early adopters, which slowly chains out to a mass audience. More radical ideas chain out much more slowly or are cast aside. The *NYT* and *WSJ* could be a link in Kurzweil's "chaining out" of his rhetorical vision.

## **Conclusion**

The *NYT* and *WSJ* were surprisingly similar in their coverage of robots and AI. The motives of each paper's articles fit easily into the same classifications. The similarity in total articles covered and the number of articles in each motive class was also surprisingly similar. This may suggest that a persistent atmosphere of technological optimism is developing, though detractors are and always will be present. For example, Chorost's 2012 article "A World Wide Mind: The Coming Collective Telepathy" in *The Futurist* details the combination of humanity and the internet creating a

“hyperorganism” or “World Wide Mind.” It is a more modest version of the combination of man and machine that Kurzweil predicts, and a likely topic for the *NYT* or *WSJ*.

Only about one in five articles were pessimistic about the future of technology. I was especially surprised at this result, given the rampant dystopianism in modern film and literature associated with technology. There were only a handful of articles that called the Singularity by its name. Neither newspaper matches Kurzweil’s grand dream of the future, but both fit in with typical Singularity discourse. Kurzweil’s position is much more optimistic than the rest of the movement. The *NYT* and *WSJ* still discuss the Singularity as a possibility, not inevitability as Kurzweil does. Their positions are similar, but Kurzweil’s is far larger in scope and power. The consistency of the coverage across both papers suggests that robots and AI have become a regular part of the news, thus reinforcing their dominance.

## **Chapter Five: Major Conclusions, Limitations, and Suggestions for Future Research**

This chapter presents the study's major conclusions and limitations and propose avenues of future research that may remedy those limitations.

Chapter one included the following research questions: RQ1) How does the Singularity qualify as a rhetorical movement? RQ2) What are the underlying motives of the Singularity movement from a dramatistic perspective? RQ3) What impact does contemporary rhetoric have on the future of the Singularity movement?

At the end of this study, I believe I can say:

1) The Singularity is in the inception phase as a rhetorical movement. It is likely to continue expanding, and expand its influence. I can accept Vinge's 1993 essay, "The Coming Technological Singularity: How to Survive in the Post-human Era" as the movement's initiating terminus in Griffin's system. It is the moment when pre-existing ideas crystallize into the foundation for a rhetorical movement. The article was widely celebrated among techies on the fledgling World Wide Web. Vinge sets the stage for Kurzweil's work and helped establish a vocabulary and timeline for the movement. Kurzweil's high-profile advocacy has moved the movement toward a period of rhetorical crisis, or tipping point when the balance between the aggressing rhetors and the counter

movement is shifted irrevocably. But, the movement is still some time from reaching this point.

The movement also fulfills Simons' definition of an "uninstitutionalized collectivity that mobilizes for action to implement a program for the reconstitution of social norms or values" (1972, pg. 3). The consistent message regarding robotics and AI in *NYT* and *WSJ* suggests that the rhetoric of the Singularity movement is being adopted by a larger audience.

2) The improvement of human life through technology is the ultimate motive of the movement. Eternal life through technology is espoused by Ray Kurzweil and others, but is not at the heart of the greater movement. 32% of the *NYT* articles and 30% of the *WSJ* articles focused on the enhancement of human capabilities with technology. The meta-analysis of the articles' motives in chapter four (Table 4.3) shows that the overall motive of the movement is the protection, extension, and improvement of human life. The articles presented an array of possible ways for technology to enhance human capabilities such as telepresence and telecommuting, or opening new opportunities in medicine, education, and art.

Kurzweil shares the motive of extending human capabilities, saving, extending, and improving human life. His rhetoric goes a step farther, though. He suggests the radical transformation of human existence through technology. We can say, then, that Kurzweil's rhetoric does not represent the rhetoric of the larger movement. His unofficial leadership is still important to the development of the movement and the spread of its messages.

3) Mainstream media sources like *NYT* and *WSJ* have shown a similar dedication to technological issues. These sources and other will slowly accept the Singularity, co-opting its more radical ideas into the mainstream. The mainstream will also wear off on the radicals, creating a more palatable and distributable vision of the Singularity. Both newspapers have dedicated a similar amount of resources to technological reporting and have covered the same topics with relatively similar viewpoints.

Hopefully, this research serves as a starting point for understanding this burgeoning field and sets up a framework to track the movement's progress as it develops. This study, like all studies, has some limitations. I will detail them in the next section of this chapter along with recommendations for future research.

### **Limitations and Possibilities for Future Research**

This study collected articles from *The Wall Street Journal* and *The New York Times* over a two year period (Feb 2009 – Feb 2011), ending with the month Watson took on human champions in “Jeopardy!” and Kurzweil appeared on the cover of *TIME* magazine. Articles were pulled from each paper's online archives searching for articles tagged with “Artificial Intelligence,” “Singularity,” “Kurzweil” and “Robot.” This sample size is ultimately one of convenience, though I believe it large and comprehensive enough to prove my point. Future studies could extend the length of the sample size, possibly back to 2005 when *The Singularity is Near* was first published or back to 1993, which may be the initiating terminus of the movement. A researcher may also choose to go back further, following the process through the birth of AI in the 1960s, its lull in the 1980s, and into today. Additional search terms could also be included such as other prominent futurists, “Futurism,” or “genetics.”

It would be interesting to see if the *NYT* and *WSJ*'s perspectives on technology have held steady over the past decade. The perspective over the past few years may not be representative of the newspapers' coverage over time. Conducting the same study with a larger sample size over a longer period of time would remedy this

This study also avoided blogs, videos, and book reviews in the *NYT* and *WSJ* archives, hoping a single story format would allow for the establishing of clear guidelines for analysis. Other media such as television, radio, films, and the internet are shaping public understandings and reception to the Singularity.

This study also does not delve into the rich world of science-fiction, which is sometimes the catalyst for technological innovation. Two prominent futurists, Vernor Vinge and Hans Moravec write science-fiction. Kurzweil himself has dabbled in science-fiction with 2010's *The Singularity is Near* movie, which is advertised as "A true story about the future." The popularity of movies like *The Terminator*, *The Matrix*, and *Wall-E* may suggest that fiction portrayals of our technological future are more grim than journalist ones. The examination of that pessimism could be quite interesting.

This study deliberately focused on two mainstream, traditional information sources to chart how a fringe idea is bleeding into the mainstream. Singularity dedicated websites like [singularityhub.com](http://singularityhub.com) and [singinst.org](http://singinst.org) provide news and discussion for dedicated singularitarians, not lay people. A critical analysis of their news and discussion pages could provide fascinating insights into movement's base. The *WSJ* and *NYT* were chosen partly for their reputations as a conservative paper and a liberal paper, respectively. Far more view points exist, especially in fringe publications.



Other methods outside of content analysis, such as a quantitative approach could be enlightening. A survey of internet users could examine if modern technology users agree with Singularity concepts, even if they have not been exposed to the idea.

This study focused strictly on a movement, without great consideration for the counter-movement. It would be interesting to survey a group who rejects technology as a dominant force in human life. Their perspective could shed some light on the rhetorical strategies a counter-movement would employ and how they would disseminate those messages. That study could make an interesting companion-piece to this one.

### **Conclusion**

The description and discussion of robotics and AI innovations in the mainstream news media show how Singularity discourse is slowly entering the mainstream. The more these messages enter the public debate, the more heated they will become. I imagine it will not be too long before a religious countermovement, offended by the possibility of a material afterlife, develops. As the movement grows, interested parties will increasingly question what it means to be human. This study serves as a jumping off point for future scholars to study the Singularity as a rhetorical movement and the messages of singularitarians in popular media outlets.

## Appendix A

**Table A.1: Pentadic Analysis of *New York Times* Articles**

<b>Biersdorfer, J. D. (2010, June 30). Neato introduces the XV-11 vacuum robot.</b>	
Act	The release of the XV-11 vacuum robot
Agent(s)	Neato (a technology company)
Agency	A product launch
Scene	The global home robotics market
Purpose	To improve on previous vacuum cleaner robots
<b>Motive</b>	<b>To replace humans with machines for domestic chores</b>
<b>Bilton, N. (2010, September 4). Dropping jaws and stopping conversations in a test-drive.</b>	
Act	Interacting with coworkers via a telepresence tobot
Agent(s)	Nick Bilton, coworkers
Counter-agent(s)	Annoyed/creeped out coworkers
Agency	Texai, a telepresence remote control robot built by Willow Garage
Scene	An office building
Purpose	To test how people react to a simple robot avatar for interactions
<b>Motive</b>	<b>To allow people to work from home</b>
<b>Broad, W. J. (2010, May 22). Surveillance suspected as spacecraft's main role.</b>	
Act	Detecting and tracking a secret U.S. spaceship, the unmanned X-37B
Agent(s)	Amateur sky watchers in the U.S., Canada, and South Africa.
Counter-agent(s)	The U.S. military
Agency	Telescopes
Scene	A secret U.S. military project, suspicions of weaponizing spacecraft
Purpose	To determine the purpose of the unmanned craft
<b>Motive</b>	<b>To attempt to prove the U.S. is using the X-37B for spy activities</b>
<b>Carey, B. &amp; Markoff, J. (2010, July 10). Students, meet your new teacher, Mr. Robot.</b>	
Act	Teaching children, especially those with disabilities like autism
Agent(s)	Researchers, robot designers, children
Agency	RUBI, Simon, Asimo, and other social robots
Scene	Experimental classrooms and therapy sessions in Japan, South Korea, Southern California
Purpose	To reach difficult-to-educate children
<b>Motive</b>	<b>To improve education through social robotics</b>
<b>Chang, K. (2009, April 7). Hal, call your office: Computers that act like physicists.</b>	
Act	Building robotic scientists that can create and test hypotheses from data.
Agent(s)	Scientists Hod Lipson, Ross D. King, and Michael Schmidt
Agency	AI, scientific data, scientific experiments, Robotic scientists Adam and Eve
Scene	Aberystwyth University and Cornell University, modern
Purpose	Building a program that can process massive amounts of data, bridge gaps in that data, and make hypotheses base on virtual experiments it runs.

<b>Motive</b>	<b>Forwarding scientific research and making data processing and experimentation more efficient, allowing scientists to concentrate on exploring scientific theories.</b>
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**Chang, K. (2010, November 1). NASA's quest to send a robot to the moon.**

Act	Attempting to send a humanoid robot to the moon
Agent(s)	NASA engineers working on Project M
Counter-agent(s)	The Obama Administration, Congress
Agency	A Robotic astronaut named Robonaut, rockets, guidance systems, etc.
Scene	A decrease in funding for space exploration projects
Purpose	A cheaper, easier return to the moon
<b>Motive</b>	<b>To demonstrate the power of technology and inspire awe</b>

**Cieply, M. (2009, May 30). Remaining transfixed by Transformers.**

Act	Introducing Transformer fan conventions and an American sub-culture
Agent(s)	Michael Cieply
Agency	<i>The New York Times</i>
Scene	BotCon, a Transformers convention in Pasadena, CA, a resurgence of the Transformers brand
Purpose	Charting the rise of a sub-culture
<b>Motive</b>	<b>Detailing a sub-culture's fascination with robots</b>

**Cline, F.X. (2009, January 17). Back to the future on four legs.**

Act	Creation of the "BigDog" robot.
Agent(s)	Pentagon, defense contractors
Agency	Modern technology (not detailed in story)
Scene	Increasing mechanization of military development during wartime.
Purpose	Hauling heavy gear over rough terrain when wheeled vehicles are inadequate.
<b>Motive</b>	<b>Giving difficult and dangerous work to robots instead of humans.</b>

**Cohen, R. (2009, November 13). Of fruit flies and drones.**

Act	Mechanizing warfare
Agent(s)	The U.S. military, defense contractors, scientists, President Obama
Counter-agent(s)	Authors, ethicists, advocates
Agency	Unmanned combat vehicles on the ground and in the air
Scene	2009, American occupations of Afghanistan and Iraq, rapid tech development
Purpose	To kill enemies more effectively without involving American soldiers in-person
<b>Motive</b>	<b>To save American lives through robotic technology and displays of force</b>

**Daly, I. (2010, February 24). Just like Mombot used to make.**

Act	Creating robots that cook
Agent(s)	Universities, robot designers and manufacturers
Counter-agent(s)	A skeptical public
Agency	Human interaction guidelines, robotics technologies

Scene	Japan, an increasingly mechanized workforce
Purpose	To humanize machines and endear them to humans
<b>Motive</b>	<b>To incorporate robots into daily life</b>

**Drew, C. (2009, August 11). A soldier's eye in the sky.**

Act	Creating small support and combat robots for American troops
Agent(s)	U.S. military, defense contractors
Counter-agent(s)	Congressional committees, budget cuts
Agency	Wireless systems, motion sensors, video cameras, artillery, flying systems
Scene	Fort Bliss, TX , the modernization of the American military, budget reductions
Purpose	To discover, track, and engage enemy troops through robots
<b>Motive</b>	<b>To save American lives</b>

**Downes, L. (2010, April 11). Geeks on a train.**

Act	Demonstrating MakerBot, a 3-D printer that can create useful objects based on images
Agent(s)	Creators Bre Pettis and Zach Hoeken
Agency	2D images, computer modeling, and liquid plastic.
Scene	An Amtrak car in Boston, the development of home 3-D printing
Purpose	To show what the MakerBot is capable of
<b>Motive</b>	<b>To celebrate technology and human innovation</b>

**Fish, S. (2011, February 21). What did Watson the computer do?**

Act	Extolling the virtues of the human brain
Agent(s)	Stanley fish
Agency	The article itself
Scene	One week after Watson defeated human opponents on "Jeopardy!"
Purpose	To separate thought (the human brain) from calculation (AI)
<b>Motive</b>	<b>To encourage readers not to be fooled by the "fiction" of machine intelligence, thus maintain humans as the dominant intelligence in the world.</b>

**Foderaro, L.W. (2009, May 4). Rutgers uses robot sub to interest students in marine sciences.**

Act	Using high-tech undersea robots as recruitment tools for Rutgers students interested in studying oceanography
Agent(s)	Rutgers oceanography faculty, staff, and students
Agency	Submersible, unmanned robot gliders
Scene	Rutgers University, a problematic shortage in oceanographers, a rise in ocean exploration through unmanned subs
Purpose	To increase the number graduate students in oceanography
<b>Motive</b>	<b>To improve oceanography by expanding the talent pool and available technology.</b>

**Harmon, A. (2010, July 4). A soft spot for circuitry.**

Act	Interaction between robots and humans
Agent(s)	MIT, nursing home administrators, the elderly, dieters, other technology companies
Counter-agent(s)	Sherry Turkle and other psychologists
Agency	Paro (a robotic seal pet), Autom (an exercise robot) and others
Scene	The development of human and animal like robots, nursing homes, gyms, etc
Purpose	To soothe and encourage humans with addiction, weight loss, loneliness, etc
Motive	<b>To mimic human and animal emotions and reactions</b>

**Harmon, A. (2010, July 4). Making Friends with a robot named Bina48.**

Act	Attempting to understand a robot.
Agent(s)	Amy Harmon, Bina48
Agency	A conversation between a human and a robot
Scene	A lab in Bristol, VT
Purpose	To test the Bina48 friend robot
Motive	<b>Creating robotic companions</b>

**Helft, M. (2009, May 11). New search tool aims at answering tough queries, but not at taking on Google.**

Act	The release of WolframAlpha, a “computational knowledge engine” that processes data rather than just searching the web like Yahoo! Or Google
Agent(s)	Wolfram Research, Stephen Wolfram
Agency	The Internet
Scene	A competitive search engine climate
Purpose	Computing and returning search results that are unavailable with other search engines
Motive	<b>Creating a more AI-intensive search engine</b>

**Helft, M. (2010, March 8). Google’s computing power refines translation tool.**

Act	The development of Google’s translation tool
Agent(s)	Google
Agency	Massive amounts of linguistic and textual data in Google’s servers
Scene	2010, a world of imperfect translation programs that cannot yet rival trained human translators
Purpose	To allow people to communicate across language barriers on Google platforms
Motive	<b>To create a worldwide communication network for sharing ideas and creating profits</b>

**Kerr, D. (2009, December 13). Guilty robots.**

Act	Creating prototype software for war robots that make ethical decisions
Agent(s)	Roboticist Ronald Arkin, the U.S. Army
Agency	Ethical rules that will govern ethical robots and create “guilt” for poor decision-making.
Scene	A rapidly mechanizing army, Georgia Tech
Purpose	To improve rational decision-making on the battlefield.
Motive	<b>Using machines to make war more humane</b>

**Kolata, G. (2010, February 14). Results unproven, robotic surgery wins converts.**

Act	An explosion in robot-assisted prostate procedures
Agent(s)	Intuitive Surgical, makers of the robot, surgeons, prostate cancer patients
Counter-agent(s)	Traditional laparoscopic surgeons, researchers whose data about the effectiveness of the robots conflicts with manufacturers and marketers
Agency	Surgery robots
Scene	Increasing demand for robot-assisted surgeries, marketing hype
Purpose	To make surgery easier and more precise than with human hands
Motive	<b>To enhance human capabilities in surgery</b>

**Lanier, J. (2010, August 9). The First Church of Robotics**

Act	A plea to keep religious ideology and technology separate
Agent(s)	Jaron Lanier
Counter-agent(s)	Singularitarians
Agency	The article itself
Scene	Six months before Watson's "Jeopardy!" match, several years after Singularity University is founded
Purpose	To convince people to treat machines like tools and toys, not people
Motive	<b>To prevent people from treating humans like machines</b>

**Lohr, S. (2010, June 24). Jobs created and displaced.**

Act	The creation and destruction of jobs by technology
Agent(s)	Tech companies like Google
Agency	The Internet, AI
Scene	2010, the mechanization of routine tasks
Purpose	To reduce the amount of routine tasks human workers will perform
Motive	<b>To increase profits and create a specialized work force</b>

**Lohr, S. (2010, June 25). Speech recognition's early days.**

Act	The statistical model of speech recognition software replacing the linguistic model
Agent(s)	Frederick Jelenick, David Nahamoo, and other computer scientists
Counter-agent(s)	Linguists working on speech recognition programs
Agency	Large amounts of speech data and faster processors
Scene	1982-present, the early days of speech recognition software
Purpose	Improving speech recognition software
Motive	<b>To create a system that can understand human speech and inflection in real time</b>

**Lohr, S. (2010, October 4). Aiming to learn as we do, a machine teaches itself.**

Act	The creation of a machine that learns facts on its own
Agent(s)	Carnegie Mellon University, DARPA, Google, Yahoo
Agency	The internet
Scene	A competitive environment for speech recognition tools and computer searches
Purpose	To improve speech recognition software and search capabilities

<b>Motive</b>	<b>To mimic human processes in AI</b>
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**Lohr, S. & Markoff, J. (2010, June 25). Computers that listen to you make strides in talking back.**

Act	Improving human-machine interactions
Agent(s)	Tech companies like Apple, Google, Microsoft, and Siri
Agency	Voice-recognition software
Scene	A competitive environment to build voice-recognition systems
Purpose	Replacing mundane and data-intensive jobs with machines
<b>Motive</b>	<b>Integrating human-like machines into daily-life</b>

**Markoff, J. (2009, April 17). Computer program to take on ‘Jeopardy!’**

Act	Announcing the near-completion of Watson, the “Jeopardy!” robot.
Agent(s)	I.B.M., John Markoff
Agency	<i>The New York Times</i>
Scene	A liberal-leaning newspaper in an era of computer ubiquity and a mix of technological paranoia and optimism.
Purpose	To improve how AI systems understand human language
<b>Motive</b>	<b>To test and demonstrate the current state of AI</b>

**Markoff, J. (2009, May 23). The coming superbrain.**

Act	An introduction to the concept of AI surpassing human intelligence and the current state of AI progress.
Agent(s)	John Markoff
Agency	<i>The New York Times</i>
Scene	The month two movies starring Ray Kurzweil were released, <i>Transcendent Man</i> and <i>The Singularity is Near</i>
Purpose	To highlight notable people and landmarks in the field
<b>Motive</b>	<b>To alert people to mankind’s complicated relationship with artificial intelligence</b>

**Markoff, J. (2009, June 9). Opening doors on the way to a personal robot.**

Act	Creation of the PR2 robot, which can navigate hallways, locate wall plugs, and open doors.
Agent(s)	Willow Garage, a company founded by Scott Hassan, a designer of the original Google search engine, roboticists at the University of Tokyo
Agency	Microprocessor chips, scanning lasers, and video cameras.
Scene	Menlo Park, CA, the slow development of highly functional robots
Purpose	The next stage in robotic development, a robot aware of its surroundings
<b>Motive</b>	<b>To create independent robots that can sense and respond to their environments</b>

**Markoff, J. (2009, July 26). Scientists worry machines may outsmart man.**

Act	A report on the dangers of developing super intelligent AI systems
Agent(s)	Computer scientists, AI researchers, and roboticists
Agency	A meeting of prominent scientists
Scene	Monterey Bay, California
Purpose	To explore and investigate technical, ethical

<b>Motive</b>	<b>Maintaining humankind's world dominance</b>
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**Markoff, J. (2009, December 8). Optimism as artificial intelligence pioneers reunite.**

Act	Bringing together 200 of the original scientist from the Stanford Artificial Intelligence Laboratory (SAIL)
Agent(s)	Stanford University, SAIL scientists
Agency	A two-day reunion.
Scene	Stanford, CA, 50 years after SAIL's launch, technological optimism
Purpose	Celebrating the accomplishments of computing and AI pioneers from the 1960s and 1970s.
<b>Motive</b>	<b>Furthering AI and computer research</b>

**Markoff, J. (2010, September 4). The boss is robotic, and rolling up behind you.**

Act	Supervising employees
Agent(s)	Tech company managers (mostly in Silicon Valley), doctors
Counter-agent(s)	Annoyed or skeptical employees or patients
Agency	Telepresence robots
Scene	Tech company offices, the rise of telecommuting
Purpose	To monitor and interact with employees
<b>Motive</b>	<b>To allow managers to work from home or while traveling</b>

**Markoff, J. (2010, October 9). Google cars drive themselves, in traffic**

Act	Cars driving themselves
Agent(s)	Google engineers
Agency	GPS, motion sensors, 3D mapping technology, and others
Scene	Highway 1 between San Francisco and Los Angeles, five years after Google won DARPA's "Grand Challenge" to build a self-navigating car
Purpose	To mass produce self-driving cars
<b>Motive</b>	<b>To save lives and energy on roadways</b>

**Markoff, J. (2010, October 9). Guided by computers and sensors, a smooth ride at 60 miles per hour.**

Act	Demonstrating a self-driving car
Agent(s)	Google Engineers
Agency	A test drive
Scene	A busy California freeway
Purpose	To perfect self-driving cars
<b>Motive</b>	<b>To make driving safer and more efficient</b>

**Markoff, J. (2010, November 27). War machines: Recruiting robots for combat.**

Act	Mechanizing combat operations
Agent(s)	The United State Military, defense contractors
Counter-agent(s)	Ethicists and human rights advocates worried that robotic armies will make going to war easier and more likely
Agency	Combat and support robots like Predator drones
Scene	Pressure from Congress and the military to use more robots in warfare
Purpose	To make fighting safer, cheaper, and easier.



<b>Motive</b>	<b>To save American lives</b>
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**Markoff, J. (2011, February 14). A fight to win the future: Computers vs. human.**

Act	Discussing the nature of AI and IA
Agent(s)	John Markoff
Agency	The article itself
Scene	The day a computer challenges human competitors on “Jeopardy!” Rapidly expanding artificial intelligence and intelligence augmentation
Purpose	To highlight how machines are changing human life, especially the economy.
<b>Motive</b>	<b>To question what it means to be human</b>

**Markoff, J. (2011, February 17). Computer wins on 'Jeopardy!': Trivial, it's not.**

Act	Humans lose to a machine in a trivia match requiring memory, recall, and reflex.
Agent(s)	“Jeopardy!” champions Ken Jennings and Brad Rutter
Counter-agent(s)	Watson, IBM’s trivia computer
Agency	Computer
Scene	A highly publicized contest on a popular cable TV show in an era of computer ubiquity and a mix of technological paranoia and optimism.
Purpose	Testing computer intelligence compared to humans
<b>Motive</b>	<b>Vindication for the academic field of artificial intelligence</b>

**McClain, D.L. (2011, February 18). First came the machine that defeated a chess champion.**

Act	Comparing IBM’s Deep Blue to Watson
Agent(s)	Dylan Loeb McClain
Agency	The article itself
Scene	Several days after Watson defeated human “Jeopardy!” champions
Purpose	To illustrate the progress in deep computing
<b>Motive</b>	<b>To downplay the possibility of robots taking over human jobs in the near future</b>

**Powers, R. (2011, February 5). What is artificial intelligence?**

Act	Doubting Watson’s chance of winning “Jeopardy!”
Agent(s)	Richard Powers
Agency	The article itself
Scene	Urbana, IL. Weeks before a highly anticipated “Jeopardy!” Match between human champions and a supercomputer
Purpose	A Celebration of the human mind and its creations
<b>Motive</b>	<b>To make readers seriously think about the role of machinery in human life</b>

**Sang-Hun, C. (2010, July 10). Teaching machine sticks to script in South Korea.**

Act	Teaching English to South Korean students
Agent(s)	The Korea Institute, educators and administrators
Agency	English speaking robots
Scene	South Korean kindergartens
Purpose	To replace native English speakers with robots

<b>Motive</b>	<b>To help South Korean students, and the rest of the country by extension, function globally</b>
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**Shostak, S. (2009, April 14). Boldly going nowhere.**

Act	The stalled and ineffectual development of space exploration technology
Agent(s)	Astronauts, scientists
Counter-agent(s)	Scientists, legislators
Agency	Various rockets, hi-tech cameras, and computers
Scene	Space exploration in a period of NASA budget cutbacks now and in the near future.
Purpose	To promote telepresence as a viable way for common people to explore the galaxy.
<b>Motive</b>	<b>To discover and “visit” alien planets</b>

**Steinberg, J. (2009, May 22). Animatronics Obama going to Disney World with high-tech style.**

Act	Building an animatronic representation of Barack Obama for Disney’s Hall of Presidents exhibit in Orlando, FL
Agent(s)	Disney “imagineers,” Barack Obama, speech writers
Agency	Robotic technology
Scene	Walt Disney World in Orlando, FL, Obama’s first presidential term
Purpose	To create as realistic a representation of Obama as possible
<b>Motive</b>	<b>To educate children about Barack Obama in the Hall of Presidents</b>

**Tabuchi, H. (2009, July 13). In Japan, machines for work and play are idle.**

Act	Robotics factories closing
Agent(s)	Consumers and investors
Counter-agent(s)	Robot manufacturers, designers, and inventors
Agency	The decrease in demand for robots
Scene	Worldwide robotics consumer market, Japan in 2009 during an economic recession
Purpose	To save money
<b>Motive</b>	<b>Viewing robots as a luxury good, rather than a necessity</b>

**Thompson, C. (2010, June 16). What Is I.B.M.’s Watson?**

Act	Describing IBM’s Watson computer
Agent(s)	Clive Thompson
Agency	The article itself
Scene	IBM laboratories, eight months before Watson’s “Jeopardy!” match
Purpose	To compare and contrast Watson to similar technologies and monitor IBM’s progress
<b>Motive</b>	<b>To explore the limits of technical innovation</b>

**Vance, A. (2009, March 2). Microsoft mapping course to a Jetsons-style future.**

Act	Developing ubiquitous computing technologies, such as a virtual assistant
Agent(s)	Microsoft, Intel

Agency	AI, microchips, and digital displays
Scene	The present and near future of rapidly expanding technology.
Purpose	Innovating new technology and meeting consumer demands.
<b>Motive</b>	<b>Using technology to enhance human capabilities</b>

**Vance, A. (2010, June 12). Merely human? That's so yesterday.**

Act	Cataloguing the Singularity movement and identifying its key players.
Agent(s)	Ashlee Vance
Agency	The article itself
Scene	2010, an era divided between the benefits of technology and maintaining traditional ways of living
Purpose	To give readers a comprehensive look at where the Singularity movement is at the moment.
<b>Motive</b>	<b>To bring the Singularity movement from the fringe to the mainstream</b>

**Wayner, P. (2010, November 3). Protecting your home from afar with a robot.**

Act	Home protection
Agent(s)	Home owners
Agency	High-end toys modified to act as remote control sentinels
Scene	Lowering costs of robotic toys, the rise of do-it-yourself roboticists
Purpose	To monitor homes remotely from other locations
<b>Motive</b>	<b>Peace of mind</b>

**Wortham, J. (2010, June 27). Technology innovator's mobile move.**

Act	Adapting business models to accommodate mobile platforms
Agent(s)	SRI, Siri, and other tech companies
Agency	Speech recognition software, mobile devices
Scene	The decline of PC computing and the explosion of mobile devices
Purpose	To stay competitive with other tech companies
<b>Motive</b>	<b>To augment human intelligence with AI</b>

**Table A.2: Pentadic Analysis of *Wall Street Journal* Articles**

<b>Angwin, J. &amp; Stecklow, S. (2010, October 12). ‘Scrapers’ dig deep for data on web.</b>	
Act	Scraping websites for info
Agent(s)	Research companies like Nielsen Co., dedicated scraping companies like Screen-scraper
Counter-agent(s)	Websites containing personal information like PatientsLikeMe.com and Monster.com, privacy advocates
Agency	Sophisticated scraping software that circumvents security measure to obtain personal marketing information
Scene	A data economy with legal grey area on the web
Purpose	To learn personal information about web users
<b>Motive</b>	<b>To customize ads for consumers and create more revenue</b>
<b>Baker, S. (2011, February 5). Can a computer win on ‘Jeopardy’?</b>	
Act	Improving and testing the Watson computer
Agent(s)	IBM
Agency	Mock “Jeopardy!” matches, huge amounts of data, speech-recognition software
Scene	IBM Research in New York, months before Watson’s highly-anticipated “Jeopardy!” match
Purpose	To defeat the world’s most successful “Jeopardy!” players
<b>Motive</b>	<b>An exhibition of powerful AI that could eventually revolutionize search engines and a variety of other technologies</b>
<b>Barrett, J. (2010, October 18). Friends made in low places.</b>	
Act	Searching closed-in areas
Agent(s)	Swat teams
Agency	Small remote-controlled robots with cameras and sensors
Scene	Potentially dangerous situations that require Swat assistance
Purpose	To keep humans out of potentially dangerous situations
<b>Motive</b>	<b>To save lives</b>
<b>Baskin, B. (2010, June 28). Robots apply ocean depths as storm veers away</b>	
Act	Attempting to stop an oil leak in the Gulf Coast
Agent(s)	BP, SeaTrepid International
Agency	Underwater industrial robots
Scene	One mile below the ocean’s surface in the Gulf of Mexico during a 60,000 barrel/day oil leak
Purpose	To stop the oil leak
<b>Motive</b>	<b>To perform dangerous tasks impossible for humans.</b>
<b>Brophy-Warren, J. (2009, April 17). Robot reality check: How real are the fighting machines in the new Sci Fi show ‘Caprica’?</b>	
Act	Describing the technology on the new science fiction show “Caprica”
Agent(s)	Jamin Brophy-Warren, P.W. Singer
Agency	The article itself
Scene	Several days before “Caprica” is released on DVD

Purpose	To draw parallels between the technology in a science fiction program and real life
<b>Motive</b>	<b>To show that technology is more advanced than the average person believes</b>
<b>Brophy-Warren, J. (2009, July 30). 13 apocalyptic visions</b>	
Act	Describing well-received works of apocalyptic art
Agent(s)	Jamin Brophy-Warren
Agency	The article itself
Scene	<i>The Wall Street Journal</i>
Purpose	To illustrate how humans imagine their destruction
<b>Motive</b>	<b>To show our fear of technology</b>

**Carreyrou, J. (2010, May 4). Surgical robot examined in injuries.**

Act	The purchase and implementation of a da Vinci surgery robot
Agent(s)	Wentworth-Douglass Hospital
Counter-agent(s)	Some surgeons opposed to the new system, patients who were injured by surgeons using the new robot
Agency	\$1.4 million dollars, da Vinci training
Scene	Well-marketed surgery robots being implemented across the country
Purpose	To attract more patients
<b>Motive</b>	<b>Profit</b>

**Carreyrou, J. (2010, May 25). Botched operation using da Vinci robot spurs lawsuit.**

Act	Filing a lawsuit against a hospital that uses surgical robots to assist human surgeons
Agent(s)	Sherry Long, a woman whose ureters were cut by a surgeon during an operation with a da Vinci robot in 2009
Counter-agent(s)	Wentworth-Douglass Hospital in New Hampshire
Agency	The U.S. legal system
Scene	A series of injuries allegedly caused by surgeons using da Vinci robots in New Hampshire and elsewhere
Purpose	To question the hospital's training methods with new technology
<b>Motive</b>	<b>To hold Wentworth-Douglass Hospital responsible for long's injuries</b>

**Craymer, L. (2010, November 22). Army robot deployed to search for miners.**

Act	Searching for 29 trapped miners
Agent(s)	The New Zealand Army
Agency	A remote-controlled robot
Scene	Three days after a group of miners were trapped underground in dangerous conditions
Purpose	To locate and extract trapped miners
<b>Motive</b>	<b>To save lives, both of rescuers and miners</b>

**Crease, R.P. (2009, April 24). Building a better robot.**

Act	Competing in an international robotics challenge
Agent(s)	Founder Dean Kamen, high school robot-building teams such as one from the Bronx High School of Science

Agency	School-built robots
Scene	An international robotics competition in Atlanta, GA
Purpose	To interest young people in science
<b>Motive</b>	<b>To inspire a new generation of innovators and thinkers</b>

**Davies, P. (2010, April 10). Is anybody out there?**

Act	The search for signs of extraterrestrial life
Agent(s)	The SETI Institute, astronomers, scientists
Counter-agent(s)	Agencies like the U.S. Congress, which has cut funding for E.T projects
Agency	Radio telescopes
Scene	50 years after humans began listening for radio signals from extraterrestrial life forms with no success
Purpose	To find signs of life outside of Earth
<b>Motive</b>	<b>To understand mankind's place in the universe</b>

**DeBaise, C. (2009, October 21). Launching LinkedIn from a living room.**

Act	Interviewing Reid Hoffman, creator of social networking site, LinkedIn
Agent(s)	Colleen DeBaise
Agency	The article itself
Scene	Six years after the launch of LinkedIn, the massive success of social networking platforms
Purpose	To show how LinkedIn was conceived and developed
<b>Motive</b>	<b>To advise readers on the future of social media and developing businesses</b>

**Dollar, S. (2010, August 19). The symphony you can take with you.**

Act	Creating unusual digital music
Agent(s)	Composer and designer Tristan Perich
Agency	Programming code, an inexpensive computer chip, small-scale electronics
Scene	The avant-garde music scene in New York
Purpose	To experiment with low-fidelity audio
<b>Motive</b>	<b>To use hard sciences like computer programming, math, and physics to create a human art form</b>

**Fowler, G.A. (2009, December 10). Internet policy groups strengthen ties.**

Act	Improving ties between two internet policy organizations
Agent(s)	The Internet Society and the World Wide Web Consortium
Agency	A \$2.5-million donation
Scene	Rapidly changing internet-based technologies
Purpose	To improve and eventually replace some internet standards
<b>Motive</b>	<b>To keep the internet as open and accessible from as many devices and platforms as possible</b>

**Fowler, G.A. (2010, December 19). Holiday help: People vs. robots.**

Act	Using robots to fulfill orders
Agent(s)	Crate & Barrel, and other online retailers
Counter-agent(s)	Amazon and other companies still using mostly humans for packaging

Agency	Kiva Systems robots
Scene	The increased mechanization of industry
Purpose	To increase the speed and decrease the cost of filling orders
<b>Motive</b>	<b>To replace human workers with machines</b>

**Gelernter, D. (2011, February 5). Coming next: A supercomputer saves your life.**

Act	Suggesting future uses for IBM's Watson technology
Agent(s)	David Gelernter
Agency	The article itself
Scene	Two weeks before Watson's "Jeopardy!" match
Purpose	To celebrate IBM's technical achievements
<b>Motive</b>	<b>Predicting the future of technology</b>

**Gorman, S. (2010, November 3). Drones get ready to fly, unseen, into everyday life.**

Act	The spread of remote-controlled aircraft into the private sphere
Agent(s)	MIT Humans and Automation Lab, private drone companies
Counter-agent(s)	Privacy advocates
Agency	Reducing functionality and reduced cost of manufacturing drones
Scene	The widespread use of drones in the military, a legal grey zone for drones in personal and commercial use
Purpose	Security, spying, and other surveillance issues
<b>Motive</b>	<b>Control</b>

**Hotz, R.L. (2009, July 17). For Mars Rover, really remote roadside assistance**

Act	Attempting to free the Spirit rover, which was stuck in loose silt on Mars
Agent(s)	NASA
Agency	A remote control interface, a re-creation of the situation on Earth
Scene	NASA's Jet Propulsion Laboratory in Pasadena, CA five years after the Spirit rover landed on Mars
Purpose	To free the Spirit Rover
<b>Motive</b>	<b>To continue robotic exploration of Mars</b>

**Hotz, R.L. (2010, May 13). They walk. They work. New DNA robots strut their tiny stuff.**

Act	The creation of microscopic robots made from DNA molecules that can move and follow instructions
Agent(s)	Researchers at New York University, Arizona State University, Harvard, and other research institutions
Agency	DNA molecules, synthetic chemistry, enzymologist, structural nanotechnology and computer science
Scene	The infancy of nanorobotics
Purpose	To carry out simple man-made tasks at the molecular level
<b>Motive</b>	<b>To create and control biological processes from scratch</b>

**Javey, A. & Takei, K. (2010, September 13). Robots need skin too.**

Act	Creating skin for robots
Agent(s)	Researchers at the University of California at Berkeley and Stanford University

Agency	Silicon in the form of little hairs or “nanowires”
Scene	An inability of roboticists to replicate functional skin, expanding functionality of humanoid robots.
Purpose	To allow robots to “feel” objects they touch
<b>Motive</b>	<b>To give robots more human functionality</b>

**Jenkins, H.W. Jr. (2010, August 14). Google and the search for the future.**

Act	Improving and expanding Google services
Agent(s)	Google
Agency	Chrome OS on phones and tablets
Scene	The increasingly popularity of the Android platform, which is outpacing Apple’s iPhone, stagnating Google stocks, an information economy
Purpose	To create messages and information specifically for users
<b>Motive</b>	<b>Amassing a huge amount of information about Google users</b>

**Jenkins, H.W. Jr. (2010, October 9). Technology = salvation.**

Act	An argument that a dead-end in American innovation caused the burst in the housing bubble
Agent(s)	Peter Thiel, cofounder of PayPal
Agency	The article itself
Scene	A supposed halt in American innovation
Purpose	To spread libertarian views on business and technology
<b>Motive</b>	<b>To increase innovation by reducing restrictions on tech companies</b>

**Jurgensen, J. (2009, September 10). The battle over bionic vocals.**

Act	Debating the merits of modifying vocal performances
Agent(s)	T-Pain, musicians, producers, music fans, and sound engineers
Counter-agent(s)	Jay-Z, musicians, producers, music fans, and sound engineers opposed to artificially enhanced vocals
Agency	The article itself, internet forums
Scene	The increasing popularity of Auto-Tune
Purpose	To question the merits of artificially adjusting vocals with technology
<b>Motive</b>	<b>To catalogue how technology is changing an art form</b>

**Jurgensen, J. & Brophy-Warren, J. (2009, July 31). Hollywood destroys the world.**

Act	Describing apocalyptic Hollywood films
Agent(s)	Jurgensen and Brophy-Warren
Agency	The article itself
Scene	A new wave of disaster movies being released
Purpose	To illustrate how disaster movies one-up each other in destruction
<b>Motive</b>	<b>To demonstrate the public’s obsession with the end of the world</b>

**Kane, Y. I. (2010, May 31). iPad fans face new dilemma with rough-to-tote gadget.**

Act	Selling of iPad carrying cases to accommodate the new gadget
Agent(s)	Clothing and luggage companies, small businesses
Agency	Online and traditional retailers
Scene	The release of newly sized gadget
Purpose	To make iPads easier to carry



<b>Motive</b>	<b>To expand ancillary businesses around a popular tech product</b>
<b>Kane, Y. I. (2010, October 26). A tour of Tokyo's geek paradise.</b>	
Act	Touring the Akihabara neighborhood in Eastern Tokyo
Agent(s)	Yukari Iwatani Kane
Agency	The article itself
Scene	Akihabara, a gadget Mecca for technology geeks in Tokyo
Purpose	To describe the unusual gadgets, stores, and foods in Akihabara
<b>Motive</b>	<b>To shed light on a growing sub-culture in Japan</b>
<b>Kurzweil, R. (2011, February 17). When computers beat humans on Jeopardy</b>	
Act	Predicting the future of AI and computing power
Agent(s)	Ray Kurzweil
Agency	The article itself
Scene	Just days after Watson beat human champions on "Jeopardy!"
Purpose	To celebrate advances in AI
<b>Motive</b>	<b>To prepare humans for super intelligent machines</b>
<b>Lahart, J. (2009, November 13). Tinkering makes comeback amid crisis.</b>	
Act	A rise in hands on and do-it-yourself tech projects
Agent(s)	Startup companies, students, engineers
Agency	Power tools, home workshops, open-source products
Scene	Rampant outsourcing, an increase in mechanical engineering students, a decrease in computer engineering students
Purpose	To save money and create businesses
<b>Motive</b>	<b>Innovation</b>
<b>Lanier, J. (2010, January 8). World Wide Mush</b>	
Act	Fighting the collectivization of online products and services
Agent(s)	Jaron Lanier
Counter-agent(s)	Companies that profit from democratic web services
Agency	The article itself
Scene	Rampant pirating online, the devaluing of some tech work
Purpose	To protect lucrative tech jobs and innovation
<b>Motive</b>	<b>To secure the future of employment and innovation in a connected society</b>
<b>Levinson, C. (2010, January 13). Israeli robots remake battlefield.</b>	
Act	Mechanizing Israel's military
Agent(s)	The Israeli military, defense contractors
Agency	Unmanned land, sea, and air robots
Scene	A high-tech nation enduring 60 years of conflict in a volatile region
Purpose	To defend the Israeli border and the take people off the front lines
<b>Motive</b>	<b>To save lives</b>
<b>Machan, D. (2010, April 16). Entrepreneurs doing business by avatar</b>	
Act	Interacting and doing business online
Agent(s)	Business people, mostly in technology and entertainment fields

Agency	Avatars
Scene	Virtual environments like Second Life after the business hype faded away
Purpose	To cut costs by meeting online
<b>Motive</b>	<b>To find new ways of doing business and opening new revenue streams</b>
<b>McKirdy, E. (2009, July 24). Domo arigato, Mr. Roboto.</b>	
Act	Marking the 30 <sup>th</sup> anniversary of the Gundam series
Agent(s)	Bandai, the parent company of the Gundam series
Agency	The construction of an 18 meter tall Gundam statue
Scene	Shiokaze Park in Odaiba, Japan, the 30 <sup>th</sup> anniversary of the Gundam series
Purpose	Celebrating Japan's love of technology and the Gundam series
<b>Motive</b>	<b>To continue the expansion of the Gundam franchise</b>

**Michaels, D. (2010, June 16). It's a bird, It's a plane, it's a robotic bald eagle.**

Act	Scaring birds away from airport airspace
Agent(s)	Robotics company, Green X
Counter-agent(s)	Skeptical airport administrators don't believe that the technology is effective or worth the cost, rival company Bird Raptor Internacional SL
Agency	Remote controlled, robotic birds of prey
Scene	Airports world-wide that use old-fashioned and not entirely effective methods to control bird populations near airports
Purpose	To scare away birds at airports
<b>Motive</b>	<b>To make air travel more secure with technology</b>

**Milo, P. (2009, December 8). Why don't we live to 200?**

Act	Documenting the failed promises of science
Agent(s)	Paul Milo
Agency	The article itself and Milo's book <i>Your Flying Car Awaits: Robot Butlers, Lunar Vacations, And Other Dead-Wrong Predictions of the Twentieth Century</i>
Scene	Nine years after the year 2000, a landmark date for technology predictions
Purpose	To highlight the shortcomings of modern science
<b>Motive</b>	<b>To celebrate the idealistic nature of human achievement</b>

**Naik, G. (2009, July 14). In search for intelligence, a silicon brain twitches.**

Act	Attempting to replicate how human brains operate with AI
Agent(s)	Dr. Henry Markram
Agency	An IBM supercomputer, rat brains, neuron simulators
Scene	École Polytechnique Fédérale de Lausanne in Switzerland, the competitive development of faster and more advanced AI
Purpose	To understand how human intelligence emerged
<b>Motive</b>	<b>To determine the nature of consciousness</b>

**Nass, C. (2010, August 28). Sweet talking your computer.**

Act	Treating computers like people
Agent(s)	Computer users
Agency	Software programs
Scene	Social rules that govern human interactions, even those with computers
Purpose	Improving computer interfaces

<b>Motive</b>	<b>To make computers more human-like</b>
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**Patterson, S. (2010, July 13). Letting the machines decide.**

Act	Trading stocks on Wall Street
Agent(s)	Rebellion Research, a small New York hedge fund
Counter-agent(s)	Investors skeptical of the AI trading approach
Agency	An AI trading program named "Star"
Scene	Skepticism of AI trading programs in the larger trading market
Purpose	To continually outperform the market
<b>Motive</b>	<b>To outperform human traders</b>

**Raice, S. (2011, February 17). Google's Android the talk of Barcelona.**

Act	The proliferation of Google's Android platform
Agent(s)	Google
Counter-agent(s)	Apple, companies worried Google is developing a duopoly with Apple in the mobile market
Agency	New high-end Android devices
Scene	Mobile World Congress, a tech industry conference in Barcelona, Spain
Purpose	To compete with the Apple's high-loyalty brand
<b>Motive</b>	<b>To encourage competition in the mobile market</b>

**Sandstrom, G. (2011, February 21). Gadgets rule the 'connected society'.**

Act	The release of new and varied mobile technology
Agent(s)	KT Corp, Sony Ericsson, AT&T, and other tech companies
Counter-agent(s)	Privacy advocates, some consumers
Agency	Wireless-connected trees, monkey robots, and other new wireless platforms
Scene	Mobile World Congress in Barcelona
Purpose	To solve problems everyday problems with new technology
<b>Motive</b>	<b>To saturate every part of life with wireless technology</b>

**Sintumuang, K. (2010, November 13). How'd this LOLcat get on my flat-screen?**

Act	Delivering online content to the traditional television
Agent(s)	Google, Apple, and other tech companies
Counter-agent(s)	Ken Sintumuang
Agency	Google TV, Apple TV, similar devices
Scene	A multimedia environment in which cross platform content is common
Purpose	To make media content easier to access
<b>Motive</b>	<b>To provide a more flexible and pervasive media experience</b>

**Tergesen, A. & Inada, M. (2010, June 21). It's not a stuffed animal, it's a \$6,000 medical device.**

Act	Attempting to soothe senior citizens
Agent(s)	Japanese robot manufacturers, nursing home staff and administration
Counter-agent(s)	Patient advocates, ethicists and some nursing homes that unsuccessfully used the Paro

Agency	Paro (a Japanese robotic seal)
Scene	Nursing homes in Japan, the U.S. (which both have growing senior populations) and Denmark.
Purpose	To encourage communication and well-being in senior citizens
<b>Motive</b>	<b>To establish emotional connections with robots</b>

**Veach, E. (2010, July 19). A robot that helps you diet.**

Act	Attempting to maintain a healthy diet and exercise routine
Agent(s)	Dieters, Corey Kid (inventor of the Autom robot)
Agency	Autom, a fitness assistant robot
Scene	Rising rates of obesity, diabetes, and other weight-related health problems
Purpose	To reach healthy weight levels
<b>Motive</b>	<b>To provide a lower cost alternative to human trainers</b>

**Zax, D. (2010, June 5). Making science sexy**

Act	Attempting to popularize scientific concepts to the lay community
Agent(s)	Physicist Brian Greene and his wife, celebrities, other scientists and entertainers
Agency	The World Science Festival
Scene	A culture in which science is traditionally considered boring
Purpose	To bring science into the mainstream
<b>Motive</b>	<b>To make people care about and support science</b>

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