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Artificial Intelligence and Robots: From Fiend to Friend

In 1940, during World War II, Alan Turing constructed the world's first computer; the

Turing Machine, or Bombe, could decrypt German messages encrypted by the Enigma, and it

potentially saved millions of lives by the end of the war (*The Imitation Game*). In the 1950s,

Alan Turing proposed a game, now known as the Turing Test, which "tests a machine's ability to

exhibit intelligent behavior indistinguishable from that of a human" (Kelley). Over the years, the

exponentially increasing rate of technological growth has allowed humans to come closer and

closer to passing this test of artificial intelligence. The current race of development and

improvement of artificial intelligence and robot technologies was ignited by a transition of

viewpoints. The evolution of the portrayal of artificial intelligence in mainstream media from the

traditional "evil" to "good," along with the continuous development of artificial intelligence

technologies in companies like Tesla and Google, has caused a paradigm shift: from the

perception of these technologies as "science-fiction" and as separate entities harmful to humans

to perceptions of them as helpful, and even as extensions, of ourselves. Some would even argue

that we have become too dependent on these technologies that were once thought of as

unattainable.

Even though the term "robot" was first used in 1922 in *The New York Times,* according to

the Oxford University Press, the idea of inventing machines that work more efficiently than

humans can date back to the Industrial Revolution (Marshall). Though not considered artificial

intelligence per se, the advance in machinery was the first stepping stone toward automation. At what seemed like the peak of human intelligence at the time, the end of the Industrial Revolution encouraged humans to believe that we were special, specifically smarter, than anything the Earth had seen. Therefore, artificial intelligence in its early days was very controversial, with scientists promising that the future would not need humans; in 1965, Herbert Simon wrote that "machines will be capable, within 20 years, of doing any work a man can do" (Vardi). Additionally, people not only contested that artificial intelligence would go "rogue", but also that it and machinery combined would also put everyone out of a job. Consequently, many people were skeptical of artificial intelligence development in the mid-1900s, headlined "The Machine Age" rather than "The Industrial Age" (Marshall).

While artificial intelligence continued to advance scientifically, it was not uncommon to see movies and books in mainstream media reflecting the commonplaces of what the usual person used to believe, before the paradigm shift, regarding artificial intelligence. Robots would continuously be portrayed as servants of mankind that would eventually gain consciousness and revolt against the humans. In *2001: A Space Odyssey*, a novel and film by Arthur C. Clarke and Stanley Kubrick, respectively, the spaceship's Heuristically Programmed Algorithmic computer, or HAL 9000, perfectly reflects what people saw as a potential danger in developing artificial intelligence to resemble human intelligence. At first, HAL was portrayed as friendly and helpful. Even while HAL talks, the frame changes to show HAL's point of view from his camera, like he truly is a person. However, when HAL made a mistake and recognized that he might be shut down due to his calculation errors, he cuts the oxygen tube to one of the astronauts in space and the life support for the rest of the humans on board. Despite the fact that the remaining astronaut on board was finally able to turn off HAL manually, the audience is stunned with the ease at

which HAL can terminate the lives of the very beings that created him. Kubrick's depiction of HAL instilled in people's minds that computers that could gain their own consciousness were dangerous to humanity. Even though he was "beautiful [and] functional," HAL was also calculating, "cold, and heartless" (Phillips). *2001: A Space Odyssey* and other films were just one form of mainstream media used pathos to inspire fear in the audience and perpetuate the former mindset.

Isaac Asimov, a Russian writer and graduate from Columbia University, is best known for his science fiction works on robots. Asimov's arguably most successful work, *I, Robot,* consists of short stories on different robots with different personas. In this book, Asimov is credited with inventing the "Three Laws of Robotics":

> 1. A robot may not injure a human being, or, through inaction, allow a human being to come to harm.
> 2. A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.
> 3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws. (Asimov)

When Asimov published his book in 1950, the status quo around robots was already one of apprehension. It was in response to these ominous perceptions of robots and artificial intelligence that Asimov had created the rules that the robots must follow. By using precise diction like "must obey" and "must protect," Asimov directly reacts with the audience's held commonplace that robots can revolt by telling the audience that these robots can't. With the common perception that artificial intelligence would surpass and defy human intelligence, we begin to see writers like Asimov, who challenged this idea, inciting a new era for advanced robotic development and the values held towards it.

Advancements in artificial intelligence in the turn of the century has made it ubiquitous. Once the development of artificial intelligence became more commercialized and mainstream,

the public perception of it began to change. Following the "AI winter," where artificial intelligence development was slow, commercialized artificial intelligence opened a gateway for consumers. Now that artificial intelligence was more easily accessible, it was everywhere. From the 1960s until now, we have been able to program robots to function more and more like the human brain. In the 1980s, Japan and Europe increased their funding to develop "expert systems" and artificial intelligence research, which ultimately gave rise to a new generation of technologies (Waltz). Simultaneously with artificial intelligence's rapid progress, the public mindset of robots changed from being fearful of its advancements to being excited about it. Even simple robots used in industrial factories, as spurred on by the "Robot Revolution," allowed people to embrace advancements (Rosenblatt). This shift from human workers to robot workers was coupled with the new fascination with the extent to which artificial intelligence can mimic the human mind to create a new, positive, cultural attitude towards artificial intelligence.

Not only has the use of artificial intelligence and its integration in our day-to-day lives allowed the impressions people hold towards it to change from negative to positive, but these impressions have shaped the ways artificial intelligence *have already integrated.* Conversation bots like Apple's "Siri", Amazon's "Echo", and most recently Google's "Home" has allowed the public to go "hands-free." As a species, our newly developed dependency on artificial intelligence is a complete reversal from our original ideas of robots being innately evil. Furthermore, the simple use of artificial intelligence by companies like Google, Apple, Amazon, and others have has placed new implications and values of privacy in society (an extensive topic beyond the scope of this essay). On another note, engineer Eugenia Kuyda shows how the role of artificial intelligence can extend past the human grave by building upon a conversation bot, additionally demonstrating how our commonplaces towards artificial intelligence has drastically

shifted. Only months after Kuyda's closest friend, Roman Mazurenko, died in a car accident, Kuyda developed the "Maruzenko Bot," taking past text, email, and phone conversations and integrating them into the bot's software. The result was a bot that responded like the late Maruzenko that allowed Kuyda and others to grieve his sudden loss (Newton). The mixed reactions to the bot, from thankful to disturbed, from Maruzenko's friends and family show how society's attitudes towards artificial intelligence have evolved to the point that we are purposely using it for its ability to mimic human characteristics instead of fearing its revolt from doing so. As a consequence, this shift in values have pushed forward the use of other artificial intelligence robots that extend human abilities in addition to bots in everyday life.

The cultural shift in viewing robots as potentially helpful rather than malevolent is also shown in the scientific development of robotic technologies. Google and Tesla have been popular in recent news for their testing of self-driving or driverless cars. On May 27th, 2014, Google unveiled a car with an electric engine and no steering wheel, accelerator, or brake pedal (Hosansky). The innovation of the prototype, in conjunction with crash-avoidance, assisted driving, and vehicle-to-vehicle communication technologies rocked the scientific world. Even the possibility of Google's new car shows how our stance – and more specifically, our trust – towards artificial intelligence has evolved to the point where we are not only putting our faith in it to write a grocery list, but also to keep us alive while driving to the grocery store. Moreover, despite the fact that Google's self-driving cars have gotten into accidents, we continue to promote its development (Zeigler). Though the previous paradigm may have encouraged people to think of the car's mistake as its plot to end human lives, our contemporary viewpoint acknowledges the fact that the science is still imperfect and that we should strive for betterment.

The paradigm shift away from perceiving artificial intelligence as dangerous is also evident outside of everyday civilian use. For example, the CHIMP, or CMU Highly Intelligent Mobile Platform, robot was engineered to maneuver around difficult terrain to rescue potential victims of disaster, where the situation is too hazardous for human responders. According to the *Journal of Field Robotics*, "CHIMP has a near-human form factor, work-envelope, strength, and dexterity to work effectively in these environments" (Stentz). In the context of warfare, the shift away from the attitude towards robots and artificial intelligence as inherently evil grants robots like CHIMP and drones with artificial intelligence the opportunity to help humans in dire situations. The use of robots as extensions of ourselves whether on our phone or in the battlefield directly reflects the adaptation of our values towards artificial intelligence; as artificial intelligence became more and more widespread, being scared of its advancement was ineffectual and retrograde.

On a lighter note, another large feat in overcoming the fear of developing artificial intelligence to best represent the human mind is the invention of artificial intelligence that can beat a human at a game. In 1997, Deep Blue, developed by IBM, was the first computer to defeat the world chess champion at the time (Brooks). In 2001, Watson, also developed by IBM, was the first supercomputer that obliterated the top two all time champions of Jeopardy! (Marshall). In 2015, Google's AlphaGo beat Lee Se-dol, the world champion of the ancient Chinese board game Go – a board that has a larger combination of potential patterns on the board than there are stars in the sky (Byford). The celebration of these accomplishments illustrates our newfound enthusiasm to *want* computers to be smarter than humans, contrary to the former paradigm of apprehensiveness.

The transition from laboratory to commercial use of artificial intelligence in the turn of the century allowed for the shift of seeing robots as helpful instead of hurtful to take place (Leepson). This transition is not only present in the real world and is, to come full circle, reflected in the mainstream media that evil robots once controlled. Recent Disney movies, *Wall-E* and *Big Hero 6*, both use robots with an incredible amount of intelligence as the protagonists of the film. In the 2008 movie, Wall-E, a robot whose job is to compact trash into stackable cubes, has distinct human characteristics; he is kind, gentle to his cockroach friend, and even makes the audience laugh with his awkwardness. Before, human characteristics in a robot were considered dangerous; now, they are the very things that make us sympathize with Wall-E, not fear him. Although the spaceship's artificial intelligence captain (whose demeanor is implicitly based off of HAL from *2001: A Space Odyssey*) turns against the humans on board, it is Wall-E who ultimately saves humanity without human intervention. Similarly, Walt Disney Animation Studios further promoted our new attraction to helpful robots by releasing an adaptation of the Marvel Comic *Big Hero 6*, featuring Baymax, a robot that defies its stereotype. The squishy, inflatable robot was literally designed to be a human health care provider. Marvel emphasizes Baymax's bubbly personality and innocence, which are usually specific human qualities, to form an empathetic connection with the audience. These movies and other mainstream show how the idea of artificial intelligence has lost its malicious undertones in the commonplaces held by the general public by characterizing robots as friendly instead of evil.

In a world where artificial intelligence is available at our fingertips, the former, suspicious attitude towards artificial intelligence would not have survived. As a result, mainstream media has responded to the previous paradigm around artificial intelligence to drastically shifting from suspicious to auspicious. When science fiction became science fact,

society readily adjusted to anticipate the positive prospects artificial intelligence might bring us rather than the potential evil intentions by celebrating and encouraging significant accomplishments. From artificial intelligence designed to know what advertisements a consumer would prefer to see to robots developed to save human survivors in rubble, artificial intelligence has assimilated itself into the everyday lives of people all over the world. Instead of fearing its revolt, we have encouraged its innovation by pushing the boundaries of robotic development.

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