Artificial Intelligence: The Rise of the Machine and Its Impact on Society

Brandi McElhaney

First Colonial High School

 Legal Studies Academy

Abstract

This paper starts off indicating the current status of Artificial Intelligence: the abilities, type, and pop culture. The future potential of Artificial Intelligence is then analyze through Moore’s law and examples of rising technology. Issues, such as job loss and potential security gain, the dangers of Artificial Intelligence, how Artificial Intelligence is rising, and how it affects the legal system. Safety and privacy rights of citizens are analyzed and the Three Laws of Robotics establish a potential solution for these safety concerns. This paper will cover the issue of Artificial Intelligence and discuss beliefs and held concerns of those in the technology industry.

*Keywords*: artificial intelligence, technology, robots, algorithms

Artificial Intelligence: The Rise of the Machine and Its Impact on Society

Artificial Intelligence (AI) is a machine’s ability to exercise thought or demonstrate intelligence. AI is, at its most basic definition, the ability of machine technology to perform tasks that usually require the intelligence of a person, but can be done by machines. This includes, but is not limited to, visual perception, speech recognition, decision-making, and translation (Hauser, n.d.). Chess is a game that normally requires logical thinking, as provided by a human; however, Deep Blue, a chess playing computer created by IBM, is able to play chess and came close to beating Garry Kasparov, a chess master. Deep Blue is one of the first examples of AI that had a huge success with completing an activity only able to be done by humans (Selman et al., 1996, p. 1340-1345). While AI technology is still being adapted and refined, there are numerous questionable consequences that arise from AI technology, including the future potential of AI and the legal issues accompanied.

 In order to fully understand the issues of AI, it is important to fully examine the current and future status of AI to organize people’s opinions based on where AI currently is and where AI could have the potential to go. There are countless perspectives on the issue of AI, including Stephen Hawking, who have conflicting opinions about the research and development of AI. As well, to understand the issue fully, how laws apply to AI must be examined, so it can be better understood that as AI is developed, it has laws that govern the use and possible future laws that may govern its procedures. These laws mostly consist of case law, as well as the Three Laws of Robotics, which regulate the actions of machines in relation to how they should behave and how they should treat people. These laws do not cover how humans should treat the machine, however. The status of Artificial Intelligence, while not currently as advanced, has a potential impact jobs, healthcare, law, and other areas of the workforce and security.

**Types of Artificial Intelligence**

There are three main types of AI: weak, strong, and super-intelligence, some of which have already been created and some that are still being explored.

**Weak Artificial Intelligence**

The first type is weak AI, which is non-sentient computer intelligence. These machines follow a certain task and have limited intelligence (Bryan & Bryan, 1997, p. 774-777). In 2010, a robot was created that has the technology to sew up a grape. While this is an impressive task and can lead to more machine use in the medical field, currently this robot is weak AI, as it cannot reason on its own and only completes one task that it is programmed to do (Mercer, 2015).

**Strong Artificial Intelligence**

The second level of AI is known as artificial general intelligence, or strong AI. This AI is at least as smart as a human and it should have the ability to think and evolve in its thinking (Bryan & Bryan, 1997, p. 774-777). AI is beginning to reach this point, as at current, only some of the technology has the ability to reason generally on its own (Sunstein, 2001). Watson has come close to being able to think on its own, as it can complete cancer treatment plans for patients without human interference, simply by accessing and comparing files (Algar, 2015). Even closer to strong AI is Bina48, the robot created in the image of Martine Rothblatt’s wife. Rothblatt requested a robot be built to look and act just like her wife. The robot has access to the internet, so it is able to answer any factual question, but it doesn’t end there. If one were to ask Bina48 questions about the real Bina, such as her favorite color, a memory, etc., she is able to respond just as Bina would. This is because of Bina48’s access to hundreds of interviews of Bina, as well as programming that allows her to access other information not in the interviews (Harmon, 2010). The military has even funded multiple programs that represent close examples of strong AI. The University of California-Berkeley created a robotic cockroach that allows it to get around any obstacle without the use of sensors. Most machines must employ sensors to map out an environment and use multiple algorithms in order to get around obstacles placed in this path, but this U.S Army funded project allows a machine to get through a cluttered environment, such as a forest or rough terrain, without programming algorithms for each situation. This small discovery could lead to bigger machines being able to get around on their own, making the world much closer to strong AI than engineers have ever been (Lewis, 2015).

**Super Intelligence**

The final type of AI is super intelligence, which develops from the second type of intelligent AI. Super intelligence is an extreme interval of increased intelligence that leads to the AI machine being smarter than a human and gives them the ability to out think a human (Bryan & Bryan, 1997, p. 774-777). This type of AI requires on element that is just now being touched upon: self-awareness. An experiment done by the New York Rensselaer Polytechnic Institute used the “wise men” puzzle to see if the robots could differentiate themselves from one another. In the riddle, three advisors are sent to a king and all are wearing unseen hats. The rules presented are as follows: “the contest is fair, their hats are either blue or white, and the first one to deduce the color on his head wins.” One man would be able to see the color of the two others hats and could deduce the color of his hat, as “the contest is fair”, so all the hat colors must be the same. He would see, for example, that the other two men had on blue hats, so he would be able to figure out that his hat is blue. This test is only able to be passed by a person, so if a robot is able to pass this test, it shows how close robots are to becoming self-aware. The test was changed for the robots. They were programmed to believe that two of them had been given a pill which would mute them and, when asked who had received the pill, one was able to say aloud “I don’t know”, in which case he changed his answer to state that he was the one not given the pill. The robot must have understood the rules of the experiment, heard and recognized its own voice, and been aware that it was a separate entity from the others, showing its self-awareness (Chong, 2015).

This could lead to complications, as people would no longer be able to control them, since they would have a better understanding of the world around them, as well as a better understanding of where they stand in the world, especially in relation to themselves, humans and other living creatures (Bryan & Bryan, 1997, p. 774-777). While there are several examples of weak AI, strong AI is coming close, which means super intelligence could be right around the corner.

**Current Status of Artificial Intelligence**

 At the moment, almost none of the working AI technology has the ability to think logically on their own, forcing them to be programmed to complete certain tasks that are within their field. This programming includes the use of algorithms that the machine can use to pursue multiple obstacles and decide the best answer, but they must have the programmed algorithm to do so, meaning the technology at present does not have the ability to think or reason on their own, thus instead of being a researcher, they can only provide “research assistance” (Sunstein, 2001). IBM recently created a supercomputer with powerful cognitive capabilities, yet it is still not able to think on its own. Watson, the supercomputer, selects the best treatment for cancer patients by looking at the genetic fingerprint of their cancer and accessing several scientific databases, in order to develop these personalized treatment plans. Watson has taken a task that would normally take weeks, and decreased it to only taking minutes. Fourteen cancer treatment centers have already partnered with IBM, though the cost of using this technology is unknown, as the vice president of IBM declined to disclose the cost (Algar, 2015). This new technology may be a good solution for now, but since this AI does not have the ability to think like a human, Watson can’t adapt to a situation or event, given that AI does not have the evolutionary thought process, which would allow them to do so (Selman et al., 1996, p. 1340-1345), so if Watson were to be given a case that does not have a good match to another case in the system, it would not be able to create an effective treatment plan. Most AI is only able to research, complete similar tasks, or apply the ‘brute force’ method, instead of thinking logically. Deep Blue is only able to play chess using the ‘brute force’ method due to its inability to think logically (Selman et al., 1996, p. 1340-1345). Other machines, such as Samuel 1954, who plays checkers, MYCIN, who is able to apply knowledge to diagnose bacterial infections, and GPS, who proves mathematical theorems, are not able to think on their own, but must use already existing information to complete their tasks (Hauser, n.d.). These machines are able to do tasks currently reserved for humans; however, their ability to logically think through these situations is not a capability they currently possess.

**Artificial Intelligence in Popular Culture**

AI is recognized in almost all aspects of our society: movies and television shows mainly represent these in the science fiction genre. In Alien, a science officer Ash reveals he is an android, a fact no one knew before he announced it, showing strong AI, as he was as smart as the humans and able to blend into society. Star Wars features numerous android intelligence and logical thinking machines, including R2D2 and CP3O and even more recent movies present examples of AI, like Age of Ultron, which features a computer system that is given the ability to think and reason on its own, but it ultimately goes rogue, demonstrating the potential consequences of strong AI adapting to super intelligence. These are just a few of the hundreds of examples in movies (Warnock, 2008).

In video games, AI has made a huge impact on younger culture. Metal Gear Solid is a video game featuring multiple protagonists, who must fight walking battle tanks, known as Metal Gear, which are being used by the antagonist to take rule over humanity. The antagonist, Major Zero, lost faith in humanity and, instead of passing down his organization, he decided it would be better run by five AI systems, which are infected with a virus and turn evil, using the Metal Gear to fight against humanity. The newest released game from this series also uses an AI program to alter the game based on the player. It operates with an algorithm to keep track of the player’s game play and change the difficulty level based on the person (IMDB, n.d.). Portal is a video game in which the AI, Genetic Lifeform and Disk Operating System (GLaDOS), guides the main character through the game, while commenting on the players progress. GLaDOS eventually tries to kill the main character at the end of the game and arrives in a physical body, showing an evolution in AI from strong AI to super intelligence. Halo, a video game about an advanced species of aliens, features Mendicant Bias, an intelligent and powerful AI, which is created to stop a parasite from destroying the galaxy (IMDB, n.d.). Selections of these examples feature positive or even neutral portrayals of AI, while most of them feature the negative consequences of AI. These examples in popular culture have been in society for a long while and while one may think it is merely science fiction, as the world gets closer to developing AI, these references represent where technology could be headed.

**Future Potential of Artificial Intelligence**

 According to Moore’s law, which was written by American engineer, Gordon Moore, in 1965, the number of transistors per silicon chips doubles every year. This means the processing power of technology increases, giving them the power to do more than in the past. While Moore did change the number to two years, it was later proven that it doubles around every eighteen months (Moore’s law, 2010). In 2000, the number of transistors equaled 37.5 million, while in 2009, the number increased to 904 million. While this law isn’t perfect and isn’t exact, it shows that computer processing will increase as time goes on and technology is advanced (Moore, n.d.). Inventions, such as TrueNorth, the custom-made brain-like chip, show the ability of AI to be more like a human brain. TrueNorth has over four thousand processor cores and 5.4 billion transistors, which is four times more than a typical PC processor. TrueNorth also mimics two fundamental biological building blocks of the human brain: one million human neurons and two-hundred fifty-six million synapses. This means that TrueNorth can encode data as “a pattern of pulses”, similar to the way in which the brain stores information. The chip is able to process information, such as recognizing images, fairly quickly, with eighty percent accuracy (Service, 2014). There is also a robot able to adapt to its situation when it is injured, and it is known as the first self-healing robot. Animals and humans are able to adapt to their injuries, while robots are normally not able to, as “they are limited to their pre-specified self-sensing abilities” and are only able to aid themselves in anticipated, pre-programmed situations, and it is impractical to program every potential situation into one robot. This new robot has an “intelligent trial-and-error algorithm”, which allows it to adapt to the damage it receives without self-diagnosis or previously programmed plans. The robot is able to act in less than two minutes by taking a map of prior knowledge of the behaviors it can perform and using the trial-and-error algorithm to “behavior that compensates for the damage”, such as, when a robot was injured in five different ways, with damaged and missing legs and its arm broken in fourteen different ways, it was able to adapt to the injuries in a quick and effective manner (Cully, et al., 2015). Scientists agree that technology has the capability of being faster, more powerful, self-driven, and even self-optimizing (Williams, 2002), so when looking at the technology already in society, it is easy to tell that as time goes on, this technology will advance to even greater heights.

**Issues**

Artificial Intelligence has multiple issues that have multiple conflicting perspectives. Scientists, engineers, and those in the work force have different opinions on the development of AI, as well as how it should be used in society.

**Jobs**

Numerous scientists and engineers agree that AI technology is the best course of action that society can take. Google's driverless cars, which have the intelligence to avoid pedestrians and follow traffic laws down complex roads can be a benefit to society, however, with laws and regulations such as the California regulation on driving, Cal. § 227.18 (a), which states that a “test driver is either in immediate physical control of the vehicle or is actively monitoring the vehicle’s operations and capable of taking over immediate physical control”, but Google’s driverless cars did not have a steering wheel or brake pedals, thus the car could not have a driver with “physical control” over the vehicle. Google was able to get around the law by installing an on/off switch, which they argued that it counted as control over the vehicle (Weaver, 2014). Delivery businesses, such as Amazon and Pizza Hut, will have the ability to deliver their items to customers, while saving money and time (Stanford, 2004-2005). Amazon presented a form of weak AI delivery, when it revealed “Amazon Prime Delivery”, which was its use of unmanned aerial vehicles (UAVs) or drones in delivery services. Amazon tested its use of drones in other countries, due to the Federal Aviation Administration’s (FAA) resistance of supporting the use of drones by companies. The FAA’s “one-size-fits all approach” in the regulation of drones, which includes that operators of the drone must be a licensed pilot, does not match the operation of these drones, which is a much different from what most would view as the normal use for drones. With a fear of job loss due to the use of drones instead of human delivery services, Paul Misener, Amazon's vice president of global public policy, has stated that it is Amazon’s “continued desire to also pursue fast-paced innovation in the United States, which would include the creation of high-quality jobs and significant investment in the local community." (Berr, 2014).

Security cameras able to determine threats within an image, and even robotic security guards in Silicon Valley businesses are a huge benefit to citizens and businesses, as well as police. Robotic security cameras with the ability to determine threats will be a benefit to police, as they will be able to identify that a crime is being committed and get to the scene before it is over. The robotic security guards will also have a better response to a situation, since they will have a certain task programmed into them. It will also offer more protection to police officers, as they will not have to be put in such dangerous situations, when a robot can be put in their place. Citizens will have more protection this way, as the police will be able to respond to situations damaging to their property or self. The security of citizens, as well as police officers, will maximize the positive outcome of each situation, as people will be better protected and safer, which, according to utilitarianism, is the best course of action. If the action of using robots in place of people will result in a safer environment, it is the best option. AI technology does have the potential benefit of safety among society, as the human brain is finite, meaning it can only take a small amount of information in short bursts, which is why people must go to school for so long; however, AI technologies can be programmed quickly with this information, but this also presents a problem due to lack of jobs available for people (Stanford, 2004-2005). Police officers and delivery people will lose their jobs, as they are replaced by robot security guards and Google’s driverless cars (Mercer, 2015). Noriko Arai, a professor at Japan’s National Institute of Informatics, is currently working on Torobo-kun, a robot who is able to pass the University of Tokyo’s college entrance exam. Arai has stated that AI will “eliminate 50 percent of white-collar jobs” possibly within the next decade (Hoffman, 2015). The consequences of people losing their jobs and incomes can, as stated by Mercer, outweigh the benefits of safety, as people will no longer have the security of a stable income. Mercer questions whether journalists will soon be replaced by technology, sarcastically reporting that "this article was written by a flesh-and-blood...human..", while it may soon not be that way among society, but other journalist companies are beginning to use software to report earthquakes, homicides, and crime, establishing the benefits of AI, even in the journalism field (Mercer, 2015) and not only the journalism field, but one could argue that soon human writers will become obsolete as well. Fluency, a robot created by SwiftKey, studied sonnets of William Shakespeare until he was able to write his own sonnet using words generated by an algorithm. These words were just suggestions Fluency picked from until he had his own poem completed (Daily Mail, 2015). This isn’t the first time rampant fear due to loss of jobs to machines has been seen among the people, either. In 1786, for fear of losing their jobs in the wool-industry, the Luddites of northern England protested the use of machines, which would ultimately take their jobs. They feared for ways in which they could make money and care for their families, especially since for several of them these jobs were their only hope (Krugman, 2013). This fear is re-emerging in our society, as AI is smarter and faster, thus able to better replace its human counterpart.

**Dangers**

 The intelligence of machines could lead to a society where machines know everything about humans and the world around, while humans know nothing about the machines and are unable to control them, yet others agree that machines being able to think for themselves could lead to a technological ‘manifest destiny’. Cognitive scientist Douglas Hofstadter criticizes the emergence of AI technology, who calls the "current trend" of defending the use of AI "troubling" and states that there is a "casual disregard for the monumental difficulties" that come along with machine intelligence (Williams, 2002, p. 3). Professor Stephen Hawking has stated that AI “could spell the end of the human race”. He agreed that, while weak AI has proved to be beneficial, Hawking “fears the consequences of creating something that can match or surpass humans” (Cellan-Jones, 2014). Dr. Nick Bostrum (2003) believes that the best way to keep machines from becoming a danger to humans is to keep their tasks and motivations specific, keeping the machines from being able to go rouge and hurting people. Machine ethics, though, is established in the scientific community to create a machine that follows an ideal ethical principle that guides its course of actions. This ensures that “the behavior of machines toward human users and perhaps other machines as well, is ethically acceptable”. Machine ethics deals with how a machine would gather the information it needs to make a decision and how it would act on this information. This is an ethical way to protect humans and ensure that AI technology would not harm them in any way (Anderson & Anderson, 2007).

**Security Violations**

 The use of Artificial Intelligence in security has been violating people’s rights to their security and this problem can only increase with the rising intelligence and abilities of the machines.

United States v. Jones is a Supreme Court case in which the court considered whether police needed a warrant to attach a GPS tracker to a suspect’s car and record his movements. The court decided that the police did, in fact, need a warrant. Grady v. North Carolina (2015), a North Carolina Supreme Court case deemed that Grady having to wear a life-time satellite-based GPS so the police could track his movements and ensure that he was following the law, after he had been released from prison, was a Fourth Amendment search. The first decision in this court case reasoned that it was not a search; however, the Supreme Court overturned this ruling due to United States v. Jones. The technology in use was physically on his person, making it a search under the Fourth Amendment. Grady v. North Carolina and United States v. Jones can be utilized to question the validity of the use of AI by companies- Google and Facebook- to monitor and track the public’s internet usage. Companies have been using lower levels of AI for years; however, with a rise in the capability of AI, the decision of whether limits should be placed should be greatly considered (Weaver, 2014). United States v. Kyllo (2001), Danny Kyllo was convicted of growing marijuana in his home in Western Oregon when agents found over one hundred plants. Thermal imaging devices were used by a federal agent in order to detect whether the heat output pattern from his home was consistent with the high-intensity lights needed to grow marijuana. They used the information gathered from the thermal imaging to obtain a search warrant, which Kyllo argued constituted a Fourth Amendment search, since the device revealed details of the interior of the home. The Supreme Court held that the use of the device constituted a search, making it unconstitutional and held that the government may not exploit technology to “circumvent constitutional protections of privacy in the home”. AI technology will not be able to benefit the government nor the police, as this court decision has limited the use of technology in investigations. As AI develops, it will have more regulations set in order to protect the rights of citizens and ensure that the constitution is upheld.

 Recently, Electronic Privacy Information Center (EPIC) has filed a lawsuit against the FBI, who was using weak AI in the form of secret algorithms to “to identify individuals who will commit crimes in the future”. With nearly four thousand pages of documents, EPIC showed that the FBI has also been using cell phone tracking technology to track the location of communication devices, such as cell phones. These cell-site simulators, known as “Stingray”, “act like a fake cell tower and can be used to monitor and track cell phone users even when the device is not in use”, even if they aren’t the suspect in an investigation. This is a warrantless search of people’s cell records and a monitoring of their cell use, which the FBI shared with other law enforcement agencies. The court sided with EPIC because not only did the court deem the use of Stingray illegal due to the Fourth Amendment’s requirement of a warrant in searches, but also, since several of the people monitored were not under investigation, the FBI had no probable cause to get a warrant, much less perform these searches. The FBI now limits its use of Stingray technology (EPIC, 2015). This court ruling, similar to Grady v. North Carolina (2015) and United States v. Kyllo (2001), has established that technology must be regulated and this ruling limits the power law enforcement agencies have in their use of technology. This will protect citizens later on, as law enforcement will have limits and guidelines in their use of current and future AI.

**Intelligence of AI**

 While AI is a program and can be altered, it has the potential of being equal to or greater than a human, not only in intelligence, but in "reproduction" rates. There is also no guarantee that their thinking will be human-like or have any kind of moral basis, making them unable to sympathize with events or cases. While their lack of morals and human-like thinking will lead to a lack of bias, it can also lead to other mistakes a human would not normally make, as their thinking is different (Bostrum, 2003). However, currently, a miniscule amount of AI has the ability to think like a human, as most can’t adjust to a situation or event, like that of a human. They do not have an evolutionary thought process that allows them to adapt, meaning they would need to be programmed to do such and, if they are programmed to do that, they may need to be reprogrammed in factories, causing issues among the technology. Being unable to think and not having the ability to adapt means that the AI technology will not be up to par with the human brain. To be considered a person, one must become “aware of every fact… relevant to his existence.” so if they AI technology is unable to think on its own, it cannot be considered equal to that of a human (Cooper as cited in Craig, 1998). This means that the rights of robots will not be considered, as they are not necessarily equal to people, thus they don’t get rights of their own (Selman, et al., 1996). However, if they are able to think and process information in their own way, when they are completing tasks, they could choose differently from what society needs or wants, since it would be their own decision, not something the AI technology was forced to do (Poole & Mackworth, 2010). With the ability to think on their own and have an adaptive thought process, the rights of robots would have to be considered. Equals should be treated equally (Andre et al., 2014), so if AI technology adapts enough to equal or surpass the intelligence of humans, they will have to be given rights, in order to keep them equal (Selman et al. 1996).

**Socialization**

 While much of the United States is using and developing AI for military purposes, as well as improving the time is takes to complete tasks, speech recognition, enhancing consumer situations, etc., Japan is currently using the AI they have developed to embed a more cultural and social aspect. The robots are used for service, such as in hotels working at the desk. Feeling lonely? One can even download Rinna, a very own, personal AI Girlfriend. More than 280,000 users have already downloaded her and the reviews are enormously positive. She is able to answer questions such as: “What is your favorite food?” to which she responds, “My dad’s squid snacks!” or “who do you most resemble?” and she answers, “I’ve been told I look like a Mexican salamander, but that didn’t make me happy!” (McKirdy, 2015). Japan has even opened the first robot operated hotel Henn-na, comprised with only about a ten percent human staff. There are concierges at the front desk; one which looks like a human woman who speaks only Japanese and a velociraptor, which speaks English. The stay also includes robotic arms that store luggage for a small fee and a robotic assistant, Chu-ri-chan, in the room used for the lights, weather, and wake-up calls (Rajesh, 2015). While the U.S may soon move towards AI, used specifically for social situations, currently, Japan is the leading competitor in that field of AI.

**Legal System**

AI does have the potential to help make decisions in legal cases, but the debate is whether this is the best option for the legal system. A group of lawyers from Plexus Law Firm, based in Australia, released an AI system in 2014, which they coded themselves, that tells whether an advertisement is in compliance with the law. A task that would usually take around four to six weeks has been reduced to around ten minutes, at a cost reduction of twenty to thirty percent (Henderson, 2014). According to Ralph C. Losey (2013-2014), “use of computerized categorization techniques, such as predictive coding, will likely become the norm for large-scale reviews in the future.” Losey was interviewed about legal use in artificial intelligence:

Brandi McElhaney: “Do most lawyers use Artificial Intelligence computer systems when researching or is it a new system that many still aren't accustomed too?”

Ralph Losey: “No. Not really. I'm on the cutting-edge. We probably have another 10 to 20 years before it really takes off in the law. So there will be a lot of opportunity for [the next] generation.” (R. Losey, personal communication, September 23, 2015).

While a some may see the time and cost reduction as a positive, since a lawyer is no longer needed to do this researching process, which means fewer jobs for those in the legal research field (Mercer, 2015). If humans are losing jobs to robots, not only in the legal research field, but also in all other fields, these people will not have an income any longer and it could negatively affect their lives. The positive and negative consequences of a situation should be examined and if people are unhappy and poor due to a lack of jobs being lost to AI, the negative consequences may outweigh the benefits of tasks being completed better, faster, and cheaper; however, lawyers and medical professions have an obligation to help people in the best and fastest way possible, so if AI technology will provide the best solution for a client or patient, then that is the way that the field should go (Poole & Mackworth, 2001). Currently, AI technology can only do research, so there is still a need for lawyers, who must debate and defend the cases in court. Cass Sunstein, a legal scholar and a Professor of Law at Harvard Law School, believes that since AI does not have the ability to think on its own, it becomes merely a research assistant, unable to link and separate court cases. While a few believe that AI will have the ability to decide the outcome of court cases, Sunstein argues that AI can find cases and present potential arguments to lawyers from existing case law, so it can make a decision based on specific facts that differ from compared cases. Without a precedent, the AI will not be able to make case by case decisions. This argument is based upon the current AI technology in place, so Sunstein does concede that there is a potential for AI to aid in legal decisions (Sunstein, 2001). The resolution of cases by computers can be beneficial to the legal system, though, as the cost and time will be reduced significantly. The reduction in cost and time will help alleviate much of the money spent on lengthy court cases, allowing that money to be used elsewhere. Engineers and university professors in the technology field, such as El Jelali, professor at the University Carlos III de Madrid, and Fersini, professor at the University of Milano-Bicocca, believe that when the AI system is able “to retrieve relevant court decisions with respect to disputant case description”, then AI technology will be able to make decisions in court cases (Fersini et al, 1992).

**Protecting AI Through Law**

 There are only a handful of laws that currently apply to AI technology, since AI is an upcoming technology that is yet to be fully regulated. There are a court cases and laws that apply to AI technology, though.

There are established laws within the AI community that are accepted by most scientists and engineers. The Three Laws of Robotics, established by Isaac Asimov, are the main laws of AI. The first law is that “a robot may not injure a human being or, through inaction, allow a human being to come to harm”, which provides protection to humans, in order to keep the robots from harming others. The second law is that “a robot must obey orders given it by human beings except where such orders would conflict with the First Law.” The third law of robotics states that “a robot must protect its own existence as long as such protection does not conflict with the First or Second Law.” These laws establish that human beings have supreme control of AI, but these laws have a moral conflict that, if not addressed, could lead to trouble for the machines who are forced to follow these laws. If AI technology gets to the point where the intelligence is equal to that of humans, then equals should be treated as equals, so if the robots are treated as servants to humankind, then they are being treated as underneath humans. This would break the fairness and justice principle, as the robot would be equal to humans in intelligence, but not equal to the human in rights. In this case, the AI could be related to slavery, since they would be able to understand their situation. However, if the machines being treated as servants to humans can maximize the usefulness towards humans, since that is most likely the reason they are created, it can be seen as acceptable because it is good for the people, but it is still critical for AI. There is no guarantee that using the Three Laws of Robotics will be followed by the AI, if the laws are used to oppress them. This could lead to more issues in the future (Stanford, 2004-2005).

**Discussion**

AI technology is an upcoming issue that cannot be avoided. If there are dangers involved with the development of AI, society will have to deal with them as they being apparent. Since scientists and engineers can only guess at what could possibly go wrong with intelligent technology, society cannot limit the abilities and benefits of the machinery based on a hunch. While science fiction often portrays AI as dangerous, people’s opinions of the advancement of AI should not be based upon this, seeing as it is only an extreme negative with no basis of science; however, people will still form a foundation of fear against the technology. This fear must be combatted by showing people what AI can truly do and that AI’s extreme potential for aiding citizens is too great and must not be disregarded based on these irrational fears. AI technology can: give new life to cancer patients with IBM’s supercomputer, Watson (Algar, 2015), aid in legal research and decision making with the machine created by Plexus Law Firm (Henderson, 2014), and think and adapt like a human brain, such as TrueNorth, the brain chip that has numerous comparisons to the human brain (Service, 2014), or the robot able to adjust and fix itself when it is injured, without having separate algorithms for each situation (Cully, et al., 2015). There are still some issues with these inventions and not all of them are perfect, but AI is heading to a place where it will have the ability to think at the level of intelligence of a human and adapt to situations with minimal to no future repairs. While people should still be wary of the dangers of AI, people should also acknowledge that it can and most likely will provide assistance in medical research, the legal field, etc.

 **Conclusion**

 AI technology is on the rise and scientists and engineers are considering the implications and benefits of the technology. While some believe that AI could be a danger to the human race, others believe that AI technology could benefit humans in the field of law, medical research, and other various fields. With the rise in the use of AI, the consideration of the rights of the AI must also be considered, since, if they soon have the ability to reason on their own, they will be equal to that of humans. Legal issues have arisen from the exploitation of AI, but currently there are no specific laws to govern the use. For now, scientists and engineers can only discuss what they think may occur, but they do not have a definite answer as to what will happen as AI technology progresses.

References

Algar, J. (2015, May 05). IBM's Watson Supercomputer to help doctors choose best cancer therapies. Retrieved from <http://www.techtimes.com/articles/50948/20150505/ibms-watson-supercomputer-to-help-doctors-choose-best-cancer-therapies.htm>

Anderson, M. and Anderson, S. L. (2007). AI MAGAZINE. Retrieved from <http://www.aaai.org/ojs/index.php/aimagazine/article/view/2065>

Andre, C., Meyer, M., Meyer, S,. Shanks, T., & Velasquez, M. (2014, August 1). Justice and Fairness. Retrieved September 12, 2015, from <http://www.scu.edu/ethics/practicing/decision/justice.html>

Berr, J. (2014, December 09). Why Amazon's drone delivery service is a long way away. Retrieved from <http://www.cbsnews.com/news/why-amazons-drone-delivery-service-is-a-long-ways-away/>

Bostrum, N. (2003). Ethical issues in advanced Artificial Intelligence. Retrieved from [www.nickbostrom.com/ethics/ai.html](http://www.nickbostrom.com/ethics/ai.html)

Bryan, L. and Bryan, E. (1997). Artificial Intelligence and PLC systems. *Programmable Controllers*. Retrieved from <http://www.univasf.edu.br/~joseamerico.moura/pag_autom_arquivos/ARTIFICIAL_INTELIGENCE.pdf>

Cellan-Jones, R. (2014, December 2). Stephen Hawking warns artificial intelligence could end mankind - BBC News. Retrieved from <http://www.bbc.com/news/technology-30290540>

Chong, C. (2015, June 23). This robot passed a ‘self-awareness’ test that only humans could handle until now - Business Insider. Retrieved from <http://www.businessinsider.com/this-robot-passed-a-self-awareness-test-that-only-humans-could-handle-until-now-2015-7>

Craig, E. (1998). Socrates. In *Routledge encyclopedia of philosophy*. London: Routledge.

Cully, A., Clune, J., Tarapore, D. and Mouret, J. (2015). Robots that can adapt like animals. *Nature,* *521*(7553), 503-507. doi:10.1038/nature14422

Daily Mail Reporter. (2014, January 27). The robot that writes poetry: machine helps compose sonnets after ‘studying’ Shakespeare’s work. Retrieved from <http://www.dailymail.co.uk/sciencetech/article-2546811/The-robot-writes-POETRY-Machine-helps-compose-sonnets-studying-Shakespeares-work.html>

EPIC. (2015, February 26). EPIC - EPIC files lawsuit for details about government "pre-crime" program. Retrieved from <https://epic.org/2015/02/epic-files-lawsuit-for-details-3.html>

Fersini, E., Jelali, S., and Messina, E. (March, 2015). *Artificial Intelligence and Law* (1st ed., Vol. 23). (pp. 1-22). Springer Science.

Grady v. North Carolina, 135 S. Ct. 1368, 575 U.S. (2015).

Hauser, L. (n.d.). Artificial Intelligence. Retrieved from <http://www.iep.utm.edu/art-inte/>

Harmon, A. (2010, July 04). Making friends with a torbot named Bina48. Retrieved from <http://www.nytimes.com/2010/07/05/science/05robotside.html?_r>=

Henderson, B. (2014, September 14). The Legal Whiteboard. Retrieved from <http://lawprofessors.typepad.com/legalwhiteboard/2014/09/artificial-intelligence-and-the-law.html>

Hoffman, M. (2015, June 27). Humans may face a singular concern when it comes to robot employment. Retrieved from <http://www.japantimes.co.jp/news/2015/06/27/national/media-national/humans-may-face-singular-concern-comes-robot-employment/#.Vfg0cvlVikr>

IMDB. (n.d.). Retrieved from <http://www.imdb.com/>

IMDB. (n.d.). Metal Gear Solid. Retrieved from <http://www.imdb.com/title/tt0808372>

Krugman, P. (2013, June 13). Sympathy for the Luddites. Retrieved from <http://www.nytimes.com/2013/06/14/opinion/krugman-sympathy-for-the-luddites.html?_r=0>

Kyllo v United States (Certiorari to the United States Couer of Appeals for the Ninth Circuit June 11, 2001), U.S Justia 99-8508.

Lewis, T. (2015, June 24). This sneaky cockroach-inspired robot can finagle its way through tiny openings – Business Insider. Retrieved from <http://www.businessinsider.com/cockroach-inspired-robot-sneaks-through-obstacles-2015-6>

Losey, R. (2013-2014). Predictive coding and the proportionality doctrine: a marriage made in Big Data. *Regent University Law Review* 26:7

McKirdy, A. (2015|, August 6). Line’s AI program captures hearts with lifelike personality. Retrieved from <http://www.japantimes.co.jp/news/2015/08/06/business/tech/lines-ai-program-captures-hearts-lifelike-personality/#.VfgxbflVikr>

Mercer, B. (2015, May 11). Could robotic grape surgery be the tipping point for robo buses, robo security guards, even robo news articles? Retrieved from <http://sanfrancisco.cbslocal.com/2015/05/11/robot-grape-tipping-point-robo-buses-robo-security-guards-even-robo-news-articles-futurist/>

Moore, G. (n.d.). Moore's Law. Retrieved from <http://www.mooreslaw.org/>

Moore’s law. (2010). In Encyclopædia Britannica. Retrieved from Encyclopædia Britannica Online: <http://www.britannica.com/EBchecked/topic/705881/Moores-law>

Poole, D., and Mackworth, A. (2010). Social and ethical consequences. Retrieved from <http://artint.info/html/ArtInt_344.html>

Rajesh, M. (2015, August 14). Inside Japan’s first robot-staffed hotel. Retrieved from http://www.theguardian.com/travel/2015/aug/14/japan-henn-na-hotel-staffed-by-robots

Requirements for Autonomous Vehicle Test Drivers. Cal. Code. § 227.18 (a)

Selman, B., Brooks, R. A., Dean, T., Horvitz, E., Mitchell, T. M., and Nilson, N. J. (1996). Proceedings of the Thirteenth National Conference on Artificial Intelligence and the Eighth Innovative Applications of Artificial Intelligence conference. Menlo Park, CA: AAAI Press.

Service, R. F. (2015). The brain chip. *Science, 345*(6197), pp. 614-616. doi:10.1126/science.345.6197.614

Stanford. (2004-2005). AI - ethical issues. Retrieved from <http://cs.stanford.edu/people/eroberts/courses/soco/projects/2004-05/ai/ai-ethics.html>

Sunstein, C. R. (2001). Of Artificial Intelligence and legal reasoning. Chicago. Retrieved from <http://egov.ufsc.br/portal/sites/default/files/anexos/3753-3747-1-PB.pdf>

Warnock, J. (2008, July 8). Top 10 Artificial Intelligence movies. Retrieved from <http://www.scene-stealers.com/top-10s/top-10-smart-machines-movies/>

Weaver, J. F. (2014, February 3). What a Supreme Court case means for Google's and Facebook's use of Artificial Intelligence. Retrieved from <http://www.slate.com/blogs/future_tense/2014/02/03/deepmind_google_ai_ethics_board_what_u_s_v_jones_means_for_tech_companies.html>

Weaver, J. F. (2014, September 12). We Need to Pass Legislation on Artificial Intelligence Early and Often. Retrieved from <http://www.slate.com/blogs/future_tense/2014/09/12/we_need_to_pass_artificial_intelligence_laws_early_and_often.html>

Williams, S. (2002). Introduction. In *Arguing A.I.: The battle for twenty-first century science* (pp. 1-7). New York: At Random.