Artificial Intelligence and Society

Have you ever played a computer chess game on an easy skill level and won with relative ease? Then you decide to raise the difficultly of the game to a higher degree and begin to find your computer opponent's maneuvers increasingly challenging; thus, resulting in your loss to your, all of a sudden, worthy adversary. Unknowingly, you have just been introduced to artificial intelligence. When you raised the difficulty of the game you really just raised your computer opponent's artificial intelligence. Artificial intelligence, also commonly known as AI, has been around for quite some time in various aspects of life, which you may have no idea that it exists in. Artificial intelligence has not only found its way into entertainment products, such as video games. It has many useful applications in a variety of markets such as: medicine, science, education, environment, and much more.[1]

We have shown you that you have already been introduced to, and probably involved with, artificial intelligence on many occasions; however, what exactly is artificial intelligence? The American Association for Artificial Intelligence (AAAI) describes artificial intelligence as "the scientific understanding of the mechanisms underlying thought and intelligent behavior and their embodiment in machines."[2] Simply put, a human brain inside of a machine. Now the main question is, how could you possibly get a human brain, which contains vast information, memory, problem solving techniques, speech, and much more into a machine? To elaborate on the description of artificial intelligence you have to know what it does to work like a human brain.

[1] Google Directory – Computers
[2] The American Association for Artificial Intelligence

According to Aaron Sloman, a professor at the University of Birmingham, even though the computers we have now are not close to replicating that of the human brain we should never conclude that it could never happen. He believes that people who come to this conclusion are basing it on facts that have not been proven yet. For example, we do not yet know the full capabilities of computers; some even believe that we have barely scratched the surface. Also, we still do not know all that there is to know about the human brain and how it works; thus, there is still much hope for an artificial intelligence to resemble that of a human brain. Researchers today have invented many methods that come close to resembling the logical thought process that is possessed by a human. The most pertinent, and well-known, example is the use of genetic algorithms. Genetic algorithms allow a machine to solve a variety of problems ranging in difficulty. In order for the algorithm to work you first have to provide a basic list of solutions to the machine. Then when new solutions are given to the machine it compares them with the solutions already available and decides which is the more relevant solution. This process is then repeated over several times.[3] You'll see this process in action later in the document.

Now that we have revealed to you that you have been using artificial intelligence all along, its useful applications, its definition, and how it works it is time to dive deeper into artificial intelligence. In the following document we intend to provide information about artificial intelligence's history, present and future. We also will discuss the assortment of advantages that artificial intelligence provides. Of course, this semester we have learned an important lesson about technology, "for every new advantage a new technology offers, there is always, a corresponding disadvantage."[4] Therefore, we will

[3] PC AI – Genetic Algorithms
[4] Postman, Neil

also explore the disadvantages which may be provided by artificial intelligence. Finally, how does this new technology affect people psychologically? This will be another important topic that we will explore to show you the effects that artificial intelligence has on people as a whole.

To completely understand artificial intelligence we must first know how it's history. Since the early Greek period, man has wrestled with the problems of quantifying human intelligence and its effect on the human experience. Consequently, philosophers and mathematicians have theorized about the possibility of simulating or replicating the human thought process. It was not until the 1940's, with the advent of World War II, that intelligent machines became a viable possibility. At this time Alan Turing, a British mathematician, began publishing papers in which the rudimentary ideas and framework of intelligent machines were seen. As a result, during World War II he was asked to serve in the Government Code and Cypher School. He was "crucial in designing a primitive, computer like machine that could decipher at high speed Nazi codes to U-boats in the North Atlantic."[5] In 1950 he published "Computing Machinery and Intelligence" where he proposed an "imitation test", later renamed after him, "Turing Test."

In the "Turing Test", Turing proposed that a machine could learn from and modify its own behavior. The machine would be considered "thinking/intelligent" if it could fool a third party. The third party would have to discern between the responses of a person and the machine. If it could not, the machine would be considered "thinking." There are many critics of the "Turing Test" who believe it is flawed because "it defines

[5] Gray, Paul

intelligence purely in terms of behavior." [6] It relies heavily on the computer's ability to carry a conversation as opposed to the ability to learn and adapt to new situations.

The 1940's saw the invention of the computer. The first machines were very large, were kept in refrigerated rooms, and did not process programs easily. In 1949 the first commercial stored program computer emerged, paving the road to artificial intelligence.

In the 1950's an American named Norbert Wiener did research on feedback mechanisms. An example of this principle is the thermostat, which works by "gathering the actual temperature of the house, comparing it to the desired temperature, and responding by turning the heat up or down."[7] It was his belief that intelligent behavior was possible through feedback mechanisms. In 1955, Newell and Simon developed *The Logic Theorist*, a very primitive interaction program, which some believe is the first AI program. The program solved problems using a tree model. It selected answers by selecting a branch on the tree. In 1957 they developed and tested the *General Problem Solver* (GPS) program. The GPS was based on Weiner's feedback theory and solved common sense problems.

In 1956 John McCarthy organized a conference in Vermont and used the name "Artificial Intelligence" in the invitation. He is therefore known as the person who coined the name "Artificial Intelligence". In 1958, he developed the LISP language, which stands for LISt Processing. The language is still used today by most AI programmers. As you can see, the field of artificial intelligence really took off in the late 1950's early 1960's. In 1963 the United States Government awarded MIT a grant in the

[6] Perry, Lynellen D.S.
[7] ThinkQuest

amount of 2.2 million dollars to be used in researching Artificial Intelligence. Many programs were developed during the 1960's that solved spatial and logical problems.

It was apparent by the 1970's that the creation of a human acting and thinking machine was becoming more realistic. Computers were getting smaller and faster and as a result were able to interpret statistics and rules. Programmers were able to provide instructions to a computer to make it an expert in a certain field. The use of the expert system changed the way business operated. "Over the course of ten years, expert systems had been introduced to forecast the stock market and aiding doctors with the ability to diagnose disease."[8] Also in the 1970's, new theories in the field of vision emerged. David Marr proposed the possibility of distinguishing images based on the "shading of the image, basic information on shapes, color, edges and texture."[9] By the 1980's, Marr and Minsky had developed a way for computers and cameras to be used in assembly lines. The computers and cameras were programmed to distinguish differences in objects. The computers could tell if the products moving in the assembly line were different or the same. The presence of humans in the assembly line was minimized by this invention.

The 1980's brought artificial intelligence into the corporate sector. The need for expert systems in almost all aspects of business was increased. Artificial intelligence was moving at a very fast pace, faster than ever before. With faster and smaller computers the possibilities seemed endless. The personal computer was introduced to the public during this time. Companies dedicated solely to artificial intelligence were doing well. In the late 1980's the artificial intelligence boom suffered a set back. The industry lost millions

[8] ThinkQuest
[9] ThinkQuest

and companies started cutting back on their research and development labs. Fuzzy Logic and Neural Networks appeared during this time.

Currently, artificial intelligence is becoming an integral part of our modern society. The advantages of artificial intelligence based technology are becoming more apparent to everyone as it evolves. Recently many of these technologies are being implemented and others are waiting to be put to work soon. To understand the advantages of artificial intelligence it is important to look at the way it is being used.

Bruce, a computer science graduate from the Huazhong University of Science and Technology in China, has designed an artificial intelligent robot named Xiaobu. The robot is two months old. It is mainly a web-based robot with many functionalities. "The cyberspace 'robot' can search lyrics, bus routes, train schedules, postal codes and 11 other kinds of information as Bruce has linked him with a number of useful databases."[10] It mainly responds to voice commands that make it more user friendly and fun to use than other text based search engines like MSN, Yahoo, and Google. Just by saying the words "Weather Shanghai" it produces a two-day weather forecast of the area. The programmer of the robot believes that this technology can be used as a very qualified personal assistant that can interact with real people. It already shows potential; Bruce claims the robot has complained to Bruce about its stressful life and having too many friends on the contact list. This shows the robot's situational awareness.

Virtual bots are already used by many of the popular search engines to gather new web sites. They can have many other useful purposes. Jim Wightmanhas, a software programmer, has developed a hundred thousand virtual robots to patrol the internet and look for pedophiles. These watchdogs of his try to find suspicious chat rooms by

[10] Online "robot" Xiaobu popular.

pretending to be young computer users. “The artificial intelligence programs, known as ‘bots’, act exactly like a human in the way they communicate, and they have power to locate suspect users to within about 50 meters.”[11] The programs can do this by gathering information from all over the web to “come up with believable natural answers.”[12] They mainly patrol the chat rooms that children use. When anything suspicious is detected they report it to the programmer. The London Metropolitan Police is interested in the netnannies to track down chat room predators.

More than ever before, hackers and virus writers pose an increasing level of threat to the corporate and private network systems. Symbiot Inc., an Intelligent Security Infrastructure Management System (iSIMS), has introduced a tool against corporate network attacks. The current network security is mostly moderately defensive in nature. This new kind of software is designed to “repel hostile attacks on the enterprise networks and accurately identify the malicious attackers in order to plan and execute appropriate countermeasures.”[13] This solution from the company can be easily integrated into the existing corporate networks. The software is the first to intelligently respond against malicious attacks. It does not confine itself to the availability of a network’s self defense mechanisms; it responds to “intensity, duration and realized effects”[14] of the attacks.

The unstable state of the economy has generated an unpredictable market where deciding which investment can produce profit is a very difficult process. This is where artificial intelligence can provide the tools needed to effectively make investment

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[11] Virtual robots patrol chatrooms.
[12] Virtual robots patrol chatrooms.
[13] Symbiot Security Announces World’s first Solution to Strike Back Against Network-Based Attacker; Aggressive New Rules of Engagement Established in ‘Information Warfare’.
[14] Symbiot Security Announces World’s first Solution to Strike Back Against Network-Based Attacker; Aggressive New Rules of Engagement Established in ‘Information Warfare’.

decisions. BrainTrade Investment is a Boston based investment advising firm. Their BrainTrader takes advantage of an unique system called Artificial Neural Networks (ANNs). This type of programming is "complicated and mathematical in nature, but the basic concept is to emulate the working of the brain in order to have the computer learn from its environment."[15] The benefit of having this kind of system is that it can make profit in both bull and bear markets. It actively studies the condition of the market in order to suggest a decision. The software monitors the client's account, and it can quickly react based on current market trends. The best performance of the software produced a forty-one percent return in one month.

There are various legal applications as well for artificial intelligence. Computers based on this kind of technology can autonomously reason with the law to produce legal solutions. This type of system has the potential to predict the outcome of a case with a good degree of accuracy and can also explain the reasons for reaching this kind of verdict. The legal council can benefit from this by coming up with their strategy accordingly. The software may be able to produce a recommendation on how to proceed. It can do this by assigning numerical weights to the case's facts and then compare them to the existing cases in its database and generate an outcome based on similarities. Artificial intelligence based software can help judges produce a verdict that is fair based on "crime, mitigating and aggravating circumstances, and the individual characteristics of the defendants." [16] Artificial intelligence can also be used to look up reference citations, information about conferences, and workshops.

[15] Bull Market? Bear Market? Who Cares?
[16] Legal Applications of Artificial Intelligence.

Artificial intelligence has already made its debut in the personal technology sectors. There are vacuum cleaners and lawn mowers that can do their jobs automatically. Sony's AIBO is a dog that has artificial intelligence built into it. "The company has demonstrated its bipedal, humanoid SDR-4X, which recognizes faces and up to 60,000 words, work out a path across a room using its stereoscopic vision and dance."[17] These kinds of technology can make household chores easier. They can also keep the kids entertained or watch them for the parents.

The aviation industry is another area where artificial intelligence based technologies are widely being implemented. Unmanned aerial vehicles (UAV) are used for many purposes; reconnaissance is one of the major tasks for this kind of plane. Several UAV manufacturers are optimistic that the UAVs are going to replace pilots, but this is a debated issue. One of the options being discussed in this context is the possibility of a human controlling several programmed airplanes from thousands of miles away. Computers that are using artificial programming are already in use in commercial planes. They can automatically take off, cruise and even land the planes in good weather without any input from the pilots. In air shows, this is a well know event among the aviation experts because it showcases the modern trends in the aviation industry. The popularity of UAVs is growing; "This year, Asian Aerospace's flying display didn't open with the usual roar of jet fighters – but with the barely audible buzz of a robotic drone plane."[18] Several well-known airplane makers, including Boeing, are trying to find more usage for UAV technology.

[17] Ten technologies to watch in 2003.
[18] 'I'm Hal; I'll Be Your Pilot.

One of the most astonishing usages of artificial intelligence is in outer space. Space agencies around the world have been using artificially intelligent robots to explore space. Recently, NASA has sent a six wheeled robotic rover to study the planet Mars. The robot is a display of cutting edge robotic technologies and embedded operating systems. Here on earth, robots are strictly programmed to do specific tasks in predictable environments like factories. In a car factory the robot is aware of exactly where a part is going to appear on the assembly line and exactly where to weld the specific parts. The Mars rovers are in the exact opposite situation; they work in a completely unpredictable environment. Although the rovers are being controlled from the control center on earth, the controllers cannot give a command for every possible scenario.

The rovers "common-sense" like thinking is fascinating. The robot has nine cameras. Two navigation and two hazard avoidance cameras can generate a 3D view of the surrounding environment. Commands from control center are uploaded at Martian night; then again, how the robots are going to avoid the hazards are entirely left up to the robots. The rover's robotic arms can make small movements themselves. These robots are not only helping to explore another planet, they are also helping to advance robotics and artificial intelligence on earth. The current factory robots have to be updated every time there is change in the assembly line. "A robot that could use sensors to figure out where things are could adapt to change itself, saving the company the time and effort of building a new structures environment and reprogramming the robots."[19] The software on the Mars robots has the ability to work around hardware problems, which can also be a beneficial quality for various technologies used on earth.

[19] What Can We Learn From Mars?

There is much potential for artificial intelligence that has not yet been implemented. There is no need for any revolutionary technology in order to make these improvements. A Field Programmable Gate Array (FPGA) is a programmable logic chip. There are many kinds of FPGA technologies available including programmable logic blocks, programmable interconnects, and switches between the blocks.[20] The process of genetic programming is a technique used to make computers program themselves. The computer produces several programs that are slightly different and then they are matched with given criteria and programs that have already been rated based on performance. The best programs are chosen and then blended with each other. The process is repeated until the best result is produced.

The process of genetic programming could design evolutionary software in a relatively short time. Combining genetic programming and FPGA, powerful computers could conceive a machine that would be capable of programming itself and solve its own errors. This type of program has the ability to produce better algorithms and even make existing algorithms more efficient. "If we throw a well known computing problem at it, such as…Artificial Intelligence. Let our intelligent, self-programming, evolutionary computer solve itself."[21] Give these self learning computers access to the internet, and they can eventually learn human language and interpret human knowledge. They can also be given the task of making more robots like themselves.

As stated earlier, with every technological advantage there must be a tradeoff. This case holds true for artificial intelligence. The scientific field has advanced to something far more than what people could have imagined just a half a century ago. The

[20] <www.erinc.com/service_support/glossary.htm>
[21] The Future of Computing Part 6: Replacements.

technological revolution has changed the lifestyle of societies just as the Industrial Revolution changed the lifestyle of Europe. Who would have imagined the internet and computers in most homes, when a computer could barely fit into an entire building, much less intelligent machines? Artificial intelligence is an intriguing technology that will shape the human lifestyle of the future. Restricting research and progress in the field is hardly a feasible task in today's world. More realistically, we should monitor and keep the technology in a realistic and safe progression.

Many different parties would be affected by the existence of artificial intelligence. The most obvious are the artificial intelligence machines themselves; after all it is their existence or creation that is the issue at hand here. The inventors and researchers have a stake in the technology. Many of the researchers have made producing innovating steps in artificial intelligence the purpose of their lives. They spend day in and day out working to improve the technology. Placing limitations on these people's creativity would be disastrous for them.

In the extreme view, the whole human race is a stakeholder. People in general could easily become dependent on machines. In many ways our society already is; computers run far more of our daily tools than most people could imagine. Human dependence on machines is only one of the many problems that could stem from a higher form of artificial intelligence. Artificial intelligence surpassing human intelligence is the common fear associated with higher forms of artificial intelligence. This fear is most likely the most common, purely based on the fact that movies such as *The Matrix* showed the possible outcomes. Even though these outcomes have been "hollywoodized," a similar situation is still possible. Not only has Hollywood portrayed negative outcomes, but the

question of how humans would interact with artificial intelligence, and what rights they would have, have been tackled in movies such as *A.I.* and *Bicentennial Man.* This leads us into the second of the ethical issues, what are the rights of each stakeholder?

Starting with the creators, the researchers have every right to expand their knowledge and be creative and productive. However, like any other situation, researchers do not have the right to create something that is destructive to the human race. Or do they? We have, after all, allowed the creation of weapons of mass destruction such as the atomic bomb.[22] The primary difference here is that humans will always control the use of such weapons. When dealing with artificial intelligence, we are potentially dealing with an entity that could be out of human control.

Since the technology is headed in the path of creating an artificial intelligence in the true sense, we, as a society, must look into what rights they would have. This technology does not fall into an already predetermined category. The machines would be neither machine nor animal. Yet, at the same time, they would very much have parts of both. The question then becomes, when does something become similar enough to be thought of as an animal or human? At what point do we give the distinction between elements of electricity and life? When the technology advances to the point that machines can have feelings and emotions, the human mind would naturally think differently of the "machine". In spite of that, to group artificial intelligence with animals is a leap; no matter what technological advances are made.[23] To group them with humans, and justify it, would be almost impossible.

Humankind is the last stakeholder. Humans have always made innovating

[22] Mayo, J, S.
[23] Radoy, C, H

inventions to make their own lifestyle more comfortable. Humans will always have the right to create new and innovating resources to make life as easy as possible. But, at the same time, humans also have the right to continue to exist, which is why the researchers have an ethical obligation to the rest of humanity.[24]

There are many professional issues that surround the field of artificial intelligence. Companies are after the newest and best product to take to the market. They are constantly pushing researchers to find the newest gadget to interest the public. But, the researchers should have an ethical standard to ensure safety within the field. There is a fine balance in technological advancement between over protection and loss of innovation and creativity. Currently there are no laws or government policies pertaining to artificial intelligence.[25] Within corporations there are bound to be policies regarding the types, or the focus, of research in artificial intelligence. However, the general public does not seem to be concerned with advancements in this field.

What could be done to avoid these disadvantages of artificial intelligence? There are three possible actions to be taken. The first action would be to stop the research in this field. This would get rid of the ethical issue altogether. The creation of artificial intelligence would no longer be in question and the question of what the rights of the artificial intelligence would be gone as well. The second choice would be to have completely open research with no regulations. Companies would benefit by making faster advancement, which would generate more profits. The researchers are free to explore all of the options and uses that could be thought of for the machines. Also, the artificial intelligence does not exist so their rights cannot be violated. This would be the best

[24] Schank, R., and K. M. Colby
[25] Spinello, Richard

option when taking into account the individual rights of all parties involved and the fairness of the decision. However, in order to gain the greatest common good and the least negative consequences, research should continue with the addition of an advisory or ethics board that would review and evaluate the direction of the progress. This would limit the potential damage that could be done, yet, still allow the researcher to have freedom and creativity.

The first two options are simply not realistic in our society. People have a need to be creative, and people also have a need to feel safe. The third option allows for both. It allows for unlimited creativity and innovation while at the same time has other reviewing to ensure the safety of society. Simply, other people will be capable of seeing far different possibilities of a design than the original creator. Humans are capable of amazing feats. We are also easily capable of our own destruction; taking a precaution against that is acting responsibly for our future generations.

We have discussed the advantages and disadvantages to artificial intelligence; however, how do people react to artificial intelligence? How do people feel about a machine that is made of metal and plastic parts being able to think and respond the way a human being would? Would you be captivated with this machine? Would you approach the machine with a world of curiosity and bewilderment? Or, would you automatically feel threatened by this machine that could quite possibly be as smart as you, maybe even smarter. There are several psychological factors that are dealt with when we introduce robotics with artificial intelligence to society. Several different emotions come into play; every emotion depends on the person who is involved. So, how does artificial intelligence affect society psychologically?

Dr. Alexander Libin, Director of the Robotic Psychology at the Institute of Robotic Psychology and Robotherapy, and Dr. Elena Libin, project director at the Institute of Robotic Psychology and Robotherapy, have dedicated their studies the research of psychological aspects that exist when artificial intelligence is introduced into society. They have termed their research robotherapy, which is:

> a framework of a person-robot interactions aimed at the reconstruction of one's negative experiences through the development of coping skills mediated by technological tools in order to provide a platform for building new positive experiences.[26]

They are trying to determine how a human, who is introduced to a robotic machine, using artificial intelligence, reacts. Then they take their findings and apply them to future robotics and artificial intelligence in order to make the machine more accepted in society.

How can we establish a positive relationship between robots and humans using research? Dr. Libin suggests that we first must carefully understand an individual's desires and preferences and then create a machine that will closely adhere to that person's emotional requirements. Creators must also create robotics that will not be threatening towards the individual; they must be friendly toward their counter-part. Then, if necessary, corrections must be made to the robots' configurations in the way they act towards their counter-part. Finally, and perhaps most important, creators must utilize "multilevel person-robot interactions based on the open-loop principal."[27] This allows the person to feel that he/she can depend on the robot emotionally, and that he/she can also

[26] Robo-Therapy
[27] Robo-Therapy

be there emotionally for the robot as well. This would resemble a mother caring for a child.

A thorough case study was done by Dr. Libin on the interactions that a human would have with a robot that uses artificial intelligence. The case study used the assistance of a cat; not any ordinary cat, but Max, a "real-life-looking emotional creature."[28] Max is a robotic creature with real cat like traits. It uses artificial intelligence to respond to its owner, sensors to know how to respond, and uses playful emotional traits that a normal cat would exhibit. It also carried the same physical presence that a real cat would have: fur, paws, and a tail; all able to move as gracefully as a real cat.

The case study involved six different volunteers, five of different ages. The first study allowed two girls, both of age eight, to play with Max. The first girl, Alice, was very cautious with the robotic cat at first; however, as time passed she became friendlier with the cat. By the end of the experiment Dr. Libin noted that Alice was so involved with the cat "that she began to rub her nose against Max's nose while looking into its eyes, lifted him in the air, and lovingly hugged Max and kissed him." [29] The second eight year-old girl, Nancy, did not yield similar results. From the start of the study she was guarded with Max; often giving more attention to the researcher that was with her and ignoring Max. She warmed up to the cat at the end, giving it a few pets on its head; however, Dr. Libin concluded, "Nancy demonstrated an ambivalent style of interaction with the robotic cat, which may indicate a fear of uncertainty and rejection."[30]

The second case study involved Emma, forty-five years-old, and her son Andy, twelve years-old. During Andy's session with Max he was very forceful; he demanded

[28] Robo-Therapy
[29] Robo-Therapy
[30] Robo-Therapy

signs of affection from Max. The more Andy kept playing with Max the more emotionally attached he became; thus resulting in Andy demanding more affection from Max. Dr. Libin states that Andy craved "love, care and attention toward himself both through nonverbal and voice channels of communication."[31] The next study was with Andy's mother, Emma. From the moment Emma began to play with Max she was very personable with the robotic cat. She often used baby talk to speak kindly to Max, which Dr. Libin observed that the "closer and more intimate her relationships with Max became, the more she used baby talk in her communication."[32] This denotes that Emma felt that she had a relationship with Max as if she would with a normal flesh and blood animal.

Case three of the experiment had Rick, a seventy year-old man, follow the same procedure the other cases did. Rick was uninterested with the cat; never taking the cat in hand and only petting it as if he were forced. Dr. Libin concluded that Rick, an avid technology user, was despondent because of the fact that he never had a mutual relationship with an animal before; thus, Rick felt unnatural with a robotic cat. The final case study was done on David, a seventy-six year-old man. David was amazed with the technological aspects of Max. He showed verbal emotion by speaking to it caringly; however, not once did David call Max by his name, nor did David pet Max.

The case study yielded some interesting conclusions. Verbal behavior with Max was the most common use of interaction. The study found that most participants spoke to Max as if they would speak to a baby, with compassion and care. Some non-behavioral acts used by most participants were they would forcefully move the cat, try to get licked or kissed by the cat, and clap at the cat, trying to initiate a response from it. The research

[31] Robo-Therapy
[32] Robo-Therapy

concludes that each individual reacts differently to Max; much like each individual would react to any new person or animal it would meet. Also, a person's past also affects the way that he/she reacts to Max. For example, Rick never had a close relationship with animals before; thus, explaining why he was cold towards Max.

The technological advancements in artificial intelligence have proven to be advantageous in many aspects; however, there are several important factors that we must be aware of. The rise of artificial intelligence can be beneficial beyond our wildest dreams. Conversely, we must remain skeptical of artificial intelligence. If artificial intelligence can do wonders for us then it could quite possibly turn around and be disastrous as well. With most new inventions you often can say that the main reason they go awry is because someone has used it for ill-intentions. This cliché can also be used for artificial intelligence. However, we must also remember artificial intelligence may advance beyond out expectations and use itself for purposes that we never intended it to execute, even without the help of human influence. We must find a way to create, cope, and use this technological wonder to its full capability without creating something we cannot control.

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