Artificial intelligence and our ethical responsibility

Artificial Intelligence and Our Ethical Responsibility

We live in a world that is consistently growing with emerging technologies and fast innovation. For this reason, it is no surprise that artificial intelligence is becoming a prevalent technology in modern society. Such profound technological advancements lead us to question ethics; however by demolishing cultural barriers, strengthening our police forces, implementing smarter warfare, and advancing medical technology, we are working towards the betterment of society. Considering the plasticity of our society, it is no surprise that humans will quickly need to learn how to live alongside artificially intelligent machines.

AI is defined by Professor McCarthy of Stanford as “… the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable.” (McCarthy). From this perspective, it is understood that the concepts and development in artificial intelligence are best influenced by human intelligence. It is the goal of humanity to ultimately develop computers that are capable of the same thought processing and decision making that the human mind is already capable of, all while minimizing potential risks of failure. Therefore, since AI is considered to be intelligent, it must be capable of learning. To this extent, we must develop machines that are able to interact with their external environment and experience some range of sensations including: sight, sound, touch, or even potentially smell and taste.

While these sensations can all be accomplished with various sensors and algorithms, machine learning can only take place with repetition and interaction with humans. Data is collected and stored in order to reinforce existing algorithms, or propose cause for development of new algorithms. For a successful AI system, it is critical for there to be an abundant collection of historical data that is continually being added to the more the machine interacts with its environment. The combination of data analysis and complex algorithms used in AI allows for the intelligence of these particular machines to experience what is referred to as “ growth” in intelligence. Although it is not biologically sound, the machine is technically learning from its experiences. The software and iterative processing behind artificial intelligence is able to recognize and group together patterns and features found within a sample of data. And, since AI does not require energy refreshment or sleep, and has an extensive memory capacity, it is capable of processing these patterns at speeds that well surpass the human mind.

With an economy and society that is forever growing more international, it is not uncommon to encounter foreign influences in your home country. With foreign interactions becoming the norm, it is also expected that you will encounter cultural and language barriers the more you venture outside your comfort zone. In order to enhance your cultural experience, and perhaps understand a language that is unfamiliar to you, it is popular to turn to artificial intelligence for assistance. Technologies such as Apple’s Siri, Amazon’s Alexa, the Google Assistant, or even a program as simple as Google Translate all utilize AI in their goal of breaking down language barriers.

Surely there will be error in machine comprehension of variations in voices and accents, but the software behind AI technologies such as Alexa or Google Translate function through an extensively diverse collection of data, helping to improve the accuracy of voice recognition over time. This allows for speech recognition to be implemented in talk-to-text features, writing emails hands free, or using hands free voice commands through smart home assistants such as turning the lights on or asking for the weather forecast.

Aside from sound, one of the most crucial senses to have as an intelligent being is sight. This is where image and pattern recognition are established in AI technology, and allow for far more uses than generally thought when considering the role of artificial intelligence in our society. Smartphones such as Apple’s iPhone have a front facing camera which uses the AI in unlocking some of their devices – no passcode required. Every time a photo is taken on one of their devices, AI will automatically run through a series of algorithms to analyze any patterns in the photos. With facial recognition, the phone is capable of sorting through your photos and organizing the images into folders based on the people recognized in each picture.

How does this work? The answer lies in AFR, or automated facial recognition. “ This works by analysing key facial features, generating a mathematical representation of them, and then comparing them against known faces in a database, to determine possible matches.” (Davies, et. al.). Although this sounds ethically unsound, technology like AFR could potentially better our society by aiding police in their work. With AFR technology, police are able to sort through thousands of images in their database to identify potential criminal activities. Not only this, but with AFR, there is opportunity for

automatic image captioning, which all runs off of pattern recognition in images detected by AI. So, AFR technology works both on the software and hardware level of machine intelligence. Our sensors in the case of facial recognition would be the cameras used, and the software is responsible for sorting through the databases and analyzing any patterns found in the images captured.

When we consider the total automation of machines allowing them to operate without human intervention, there is a reasonable concern of ethical responsibility and where that line should be drawn. This is especially evident when discussing the potential for artificial intelligence showing up on the front lines in war and weaponry. When we allow complex algorithms and computers to operate fully autonomous weapons, we are risking what many people feel is inevitable – disastrous consequences. (Deadly US AI). The issue is not the performance of the AI technology on the battlefield. Actually, it would save human lives by being able to send robots into war zones rather than people. The AI armies would be less capable of error, have a higher level of accuracy, and do not have biological needs.

Despite all the potential benefits of AI powered warfare, how can we be certain that placing our trust in robots will not backfire on humans? If a robot is given an automatic weapon, and the capability of “ thinking” for itself, then there is no way to guarantee that the robot will not turn on us, right? This is as close to science fiction as artificial intelligence gets. Our current levels of artificial intelligence do not have the capacity to “ think” or “ feel” on the same emotional level as human soldiers do. Therefore, AI does not feel compassion, anger, sympathy, hatred, discrimination, hunger, or any

other emotional state we are subject to. AI simply follows the algorithms it is developed with, collects data, and makes adjustments to its intelligence based on the data and patterns stored in its databases. The real concern in AI warfare is the lack of human judgement of whether or not force should be exercised. (Deadly US AI). If and when AI recognizes an enemy, it will follow through with whatever force it is equipped with for use on enemies.

Aside from keeping human lives off of the battlefield, artificial intelligence poses other benefits to the war scene. Most crucial, the technology is able to quickly adjust and adapt to its environment. This is important, considering the less than favorable conditions and the physically demanding aspect of war. Humans would tire quickly, and senses would be inhibited by our own biological demands. AI eliminates the need for rest and allows for more complicated missions to be carried out more effectively.

When discussing global powers and the countries which have the highest global influence, it is no surprise that AI is one of the top factors to take into consideration. There is a huge economic dependence on AI development, with the hope that it will result in a better future for everyone. The Chinese government, as one example, invests billions of dollars each year into tech companies like Alibaba and Tencent – both major contributors to the future of artificial intelligence. AI smart home assistants are becoming more common in the US and worldwide, with systems like Siri, Cortana, Alexa, or the Google Assistant. Google Accelerated Science and Climate and Energy is also making large advances in machine learning with the hope to apply the technology to the natural sciences, biomedical research, and cleaner energy solutions.

The reliability and consistent precision of AI with minimum error is a technology that could revolutionize the field of medicine if utilized. Once the algorithms and software is perfected, AI would be capable of performing the same diagnoses without concern of human error or biological needs impacting quality of work. Rather than replace medical doctors with robots, our existing and future doctors could depend on AI technology for second opinions with more complicated cases.

Although the technology has not yet been introduced into medicine and there are ethical concerns underlying the prevalence of AI in medicine, there have been numerous successful experimental attempts in using the technology. The algorithms used in artificial intelligence have been able to alert clinicians in a UCSF study of potential pneumothorax cases in patients as soon as the patient is scanned (GE Healthcare). This same technology, SonoCNS, has been able to successfully automate the process of measuring fetal brains, and has minimized the number of keystrokes needed by technicians (GE Healthcare). Other variations of AI have been successful that “ When tested on previously unseen cases, the AI could diagnose glandular fever, roseola, influenza, chicken pox and hand-foot-mouth disease with 90-97 percent accuracy” (Whyte, Chelsea).

It is evident that artificial intelligence is still a long way from playing a significant role in our society. The issue is not the technology, the issue is whether or not humanity can place their trust in the technology – it is an ethical dilemma. Although there is a need for caution when contemplating how to move forward with AI, it is also evident that the human race would not be as far ahead if it were not for AI technology. The future has no limits

and is well within our control, all we have to do as humans is take advantage of the technology around us in order to create a better future for everyone.

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Thesis: We live in a world that is consistently growing with emerging technologies and fast innovation. Considering the plasticity of our society, it is no surprise that humans will quickly need to learn how to live alongside artificially intelligent machines.

1. Introduction:
    1. Main Points
        1. How AI Works
        2. Language/Cultural Barriers
        3. Crime Stopping
        4. War/Autonomous Weapons

5. Medical Technology

2. Restate Thesis: An idea that once seemed to be the far reach of science fiction is quickly becoming a reality, AI is the new normal.

2. How AI Technology Works:

1. Interaction with the outside world

1. Sensors (Touch, Sound, Sight, etc.)
2. Human Interaction results in more intelligent technology
3. AI does not require sleep and does not lose energy; also has a large memory capacity
4. Algorithms and data analysis/storage allow for “ growth” in intelligence and more complex intelligence in machines
5. Software and iterative processing learns from patterns or features recognized in data

3. Breaking Language/Cultural Barriers:

1. Language Barriers
    1. Google Translate
    2. Siri Voice Recognition
    3. Alexa Voice Recognition
    4. Google Assistant
2. Uses
    1. Type Emails on the Go
    2. Speak to text features
    3. Hands free voice commands (Alexa, Smart-home, Google Assistant, etc.)

4. Fighting Crime / Image Recognition

1. Facial Recognition
    1. Used to unlock devices
    2. Sort/search through photos for friends and family
2. Police Work
    1. Automatic image captioning
    2. Law enforcement can use to sort through thousands of images and identify criminal activity
3. Pattern Recognition

5. War / Autonomous Weapons
    1. Ethical Concern / Potentially Dangerous
        1. Complex algorithms incorporated into fully autonomous weapons systems could have disastrous consequences
        2. Opposing forces get ahold of and misuse such technology
    2. PROS
        1. Less lives at risk at the front lines
        2. Intelligent technology is able to quickly adapt and adjust
        3. Economy

a) Chinese government with tech giants like Alibaba and Tencent invest billions in AI

b) AI smart assistants are prevalent in mobile devices and home assistants (Siri, Alexa, Cortana, etc.)

c) Google Accelerated Science and Climate and Energy are using the latest advances in machine learning and AI to progress work in the natural sciences, biomedical research, and cleaner energy

6. Medical Technology
    1. Reliability
        1. AI does not require sleep, and does not run out of energy
        2. Not susceptible to the same human error humans are likely to make
    2. Diagnosis / Disease Recognition
        1. Complex algorithms can alert clinical teams of pneumothorax cases in conjunction with UCSF technology
        2. Glandular fever, Roseola, Influenza, Chicken pox, Hand-foot-mouth disease; all with 90-97 percent accuracy
    3. Fetal Development
        1. GE Healthcare SonoCNS automates the process of measuring the fetal brain by aligning the system automatically and can reduce keystrokes by more than 75 percent
7. Conclusion
    1. Restate Main Points
        1. AI and how it works
        2. Language and Cultural Barriers
        3. Image Recognition
        4. War and Ethical Concern
        5. Medical Technological Advancement
    2. Restate Thesis: Although it is evident there is a need for caution when contemplating how to move forward into the future with AI, it is also evident that the human race would not be as far ahead if it were not for artificial intelligence.

3. The future has no limits and is well within our control, all we have to do as humans is take advantage of the technology around us in order to create a better future for everyone.