Modern Artificial Intelligence Sylvia Sharma Introduction to Computing, George Mason University IT 104 - Section 008 September 24, 2020

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Modern Artificial Intelligence

Introduction

Artificial Intelligence, or AI for short, has been a phenomenon that has been budding for many years. However, with the introduction of the latest technology and software, the latent aspect and potential of AI has skyrocketed. This development, especially in the modern era, is essential to the everyday life of many people as devices such as smartphones, smart cars, and even smartwatches have made an entry and are equipped with this technology. The use of these robots has also become increasingly prominent, creating a new level of uncertainty, especially concerning the livelihood of workers, as many believe these innovations are leading to unemployment. Nonetheless, the introduction and advancement of modern AI should be exciting to say the least, considering how this technology has made human life substantially easier and should continue to do so.

Current Use

At the moment, the main purpose of Artificial Intelligence is to perform tasks that are intellectual, almost human like. Many speculate that the arrival and increase of data storage capacity, computation power, and wireless digital communications has provided the basis for current AI technology (Boyd & Holton, 2018). Currently, "AI relies upon data-driven algorithms, and gives rise to a new information environment. These calculations will be driven by the increasing amount of big data, sensors and networks, and cross-media information" (Pan, 2016, p. 411). This advancement can also be seen almost everywhere in the job industry as well. Some examples of AI technology in jobs today include self-checkout systems at a store, shelf-stocking machines, virtual assistance online, and virtual financial investors. Other common technologies that include AI are self-driving cars, applications such as Siri and Uber, and websites such as Amazon. There has also been a rise in businesses and companies that collaborate with AI technologies, most notably known are Google, Samsung, Apple, and Tesla, which are all very successful.

Advantages

Besides making life easier for humans, AI has other benefits as well. Although many people believe that AI is taking over jobs and leading to unemployment, recent studies have also shown some favorable results. Essentially, if there is a demand for robot 'employees', there will be a surge in jobs based on creating new technological innovations (Borenstein, 2011). Even though the gap of unemployment is larger, a rise in employment is still possible considering the need for more AI technology (Borenstein, 2011). For employers, an advantage of AI in the workforce is that they are more cost efficient compared to regular human workers and in some cases can be more proficient and reliable (Borenstein, 2011). More so, many believe that AI in jobs could prevent abuse of human rights, such as child labor (Borenstein, 2011). Many industries have benefited from artificial intelligence, such as the medical and automation industry (Brubaker, 2018). Specifically, the medical industry views AI as a great advancement to detect new diseases and medical concerns earlier (Brubaker, 2018). An example of this would be positive results garnered from kids with autism through AI (Brubaker, 2018). This development has also allowed the automation industry to save a lot of money, even though there are many ethical issues involved with that (Brubaker, 2018). From an economic perspective, many businesses that are AI-driven have seen growth due to significant global investment, which has increased to over 5 billion dollars during the year 2016 (Brubaker, 2018).

Security

Although security is a very significant aspect of AI applications, there are a lot of security concerns associated with this development. For many jobs and businesses, it is highly required that systems have strong security properties in order for the jobs to function well (Stoica et al., 2017). The two mostly prevalent security issue categories include the decision process and learning the secret model (Stoica et al., 2017). An example of a security problem would be the breaching of webcams. Many stores have self-checkout systems in service for willing consumers, however, the self-checkout systems most of the time are installed with cameras. Although the chances are low since many companies should be able to install a secured network, hackers could still find a way into the camera system. In some other cases, consumers could also find a way to cheat the checkout system and end up not having to pay. Similarly, this issue is also occurring during online school. Most schools nowadays require a webcam-based format when students are taking their exams. It is understandable why a lot of institutions require this format, since it can catch a student violating honor codes or conducting inappropriate behavior during the test. However, many students have come out and said that they are actually uncomfortable with this altercation. Students feel this way because they are obligated to share and display their personal information to their cameras and sometimes give a 360 view of their surroundings. For instance, Jackson Hayes, a student of University of Arizona, was required to take a proctored exam on zoom (Chin, 2020). He was told to provide his ID, full name, email, and phone number when signing up on Examity, a website catered towards online proctored testing (Chin, 2020). When the time came to take his exam, Hayes was required to go on Zoom video conferencing website, which is also known to be infused with many security concerns (Chin, 2020). Unfortunately for Hayes, his computer got hacked by his online proctor (Chin, 2020). Likewise, online shopping sites such as Amazon can have a lot of security problems and data breaching because personal

information and credit card information can be stored in there. Although hackers are growing more proficient, Anati, Gueron, Johnson, and Scarlata have conveyed that an ideal solution to this issue would be to utilize a "'secure enclave' abstraction—a secure execution environment—which protects the application running within the enclave from malicious code running outside the enclave" (Stoica et al., 2017, para. 39).

Ethical, Social, and Legal Implications

As there are and will be significant usage of AI technologies in the workforce, society as a whole will have to adapt to these changes. Even though it is already occurring, it is very apparent that there will be *additional* emotional and social instability in the future as more coveted jobs preoccupied by humans will be vacant due to AI. This would also lead to less communication between people, as an example would be traditional bankers and brokers being replaced by automated machines (Bughin et al., 2020). Overall, the rise in unemployment would also lead to several policy changes since there would be an immense need for governmental financial/employment assistance and role clarification of individuals, companies, and state agencies (Bughin et al., 2020). From an ethical standpoint, the immense dependability of AI could lead to numerous unpleasant outcomes. For example, the medical industry has been severely reliant on AI technology to create new medicine and to detect illnesses (Brubaker 2018). However, there is always a chance that the detection could be false, and the medicine won't function the way it is supposed to and possibly lead the patient to death (Brubaker, 2018). Imagine the amount of legal actions that could be taken because of this! Similarly, many taxi companies or companies that deal with driving are planning on using self-driving cars (Brubaker, 2018). Although it sounds very cost efficient and appealing, what if there is a system error and

the car fails to function properly? This could potentially lead to multiple deaths and fatal injuries, which could only spur more legal action against those companies (Brubaker, 2018).

Future

Artificial Intelligence is all about the future since society still hasn't seen the maximum potential and effect of it. It is very likely that jobs involving technology will increase as a demand for skill sets involving these technological innovations will rise (Bughin et al., 2020). Scholars also expect the fastest growth in the need for advanced IT and programming skills, which is expected to excel as much as 90 percent between 2016 and 2030 (Bughin et al., 2020). However, if not prepared, the expansiveness of AI, or what some called the technological revolution, will impact countries significantly, emitting a need for change in policies (Watson, 2018). Surprisingly, the only industry that is predicted to have an increased usage in manual and physical work is the healthcare industry till 2030 (Bughin et al., 2020). More so, it is predicted that this technological revolution would lead to a cultural shock, needing a new mindset and businesses would have to adapt to this change by refocusing and reorganizing (Bughin et al., 2020). Although AI related businesses, such as Google and Apple, are already growing at a rapid rate, there would be a continuation as new technology and AI continues to accelerate. Currently, some specific aspects of AI include speech synthesis, vision of the machine, and speech recognition, which is already exhilarating (Torressen, 2020). Still, research on artificial intelligence has been making more new advancements. An example includes progress in training artificial neural networks (Torressen, 2020). Computer scientists and medical researchers have also been collaborating to understand how the human body operates to eventually mimic it onto devices that could help people with disabilities and diseases (Torressen, 2020). Many specialists predict that there will

be new AI advancements, however, it will be hard to predict when it will happen and how easily systems can be created to handle it (Toressen, 2020).

Conclusion

As assessed before, artificial intelligence is a developing phenomenon that will continue to grow as the years progress. Although this sensation has economic, social, legal, and ethical implications, it has served its purpose by making life easier for many humans across the world. Sure, it is terrifying that someday, if not already, jobs are reducing due to AI technology. However, it is also important to acknowledge that there might be an increase in jobs required to perform tasks associated with AI technology. As research continues and businesses start investing, it is not hard to imagine inventions superior to self-driving cars or talking robots. Without a doubt, the combination of humans and AI will be the new normal, whether it is exciting or not!

References

September 14, 2020

Bughin, J., Hazan, E., Lund, S., Dahlström, P., Wiesinger, A., & Subramaniam, A. (2020, July 23). Skill shift: Automation and the future of the workforce. McKinsey & Company. https://www.mckinsey.com/featured-insights/future-of-work/skill-shift-automation-and-the-future-of-the-workforce#

> This article is essentially about the future of the workforce due to AI and automation. The authors convey that there will be skill shifts due to the introduction of new technology. Additionally, the article highlights that technological skills will be more in demand around 2030 than manual. The demand for technology related jobs will also increase significantly in the future. Certain industries such as banking and insurance will not be in need of cognitive and social jobs, instead will be looking for technology experts. Automation and retail will see a surge in the use of AI technology, leading to some unemployment. Healthcare is indifferent since they will be one of the only sectors in need of manual and physical work. Companies will also have to find a way to adapt to these changes. Conveniently, the article is published on the McKinsey & Company website, with surveys conducted by them. McKinsey & Company is an influential business and management institution.

September 14, 2020

Pan, Y. (2016). Heading toward Artificial Intelligence 2.0. *Engineering*, 2(4), 409–413. https://doi.org/10.1016/j.eng.2016.04.018

> This article is about the revolution of AI technology. The history of this development is analyzed as well. Pan conveys that big data, spread of sensor networks, and the prominence of the internet has changed the development of AI. More so, Pan articulates that AI 2.0 is the now the new normal, with a lot of promises and goals attached. This article also goes through the social aspects of AI 2.0 (its relation to China) and the adjustments that have been made to create it. In regard to reliability, the article includes pages 409-413 of the journal 'Engineering' and multiple references as well. It is also reliable because the article is a part of the website Science Direct, which includes a lot of published research and academic journals.

September 07, 2020

Watson, T., M.P. (2018). THE FUTURE OF WORK: Improving the quality of work. *Renewal : A Journal of Labour Politics, 26*(1), 10-17. Retrieved from https://search-proquestcom.mutex.gmu.edu/docview/2031700760?accountid=14541

> This article is mainly talking about the future of the job industry. It emphasizes the fear humans have of artificial intelligence basically taking over, as author Tom Watson calls this the technological revolution. Watson questions (and eventually answers) how society will function when the change takes place, how humans can prepare, and if a balance could be implemented. This article is

reliable because it is a part of ProQuest, a database paid by school libraries. Watson also includes a lot of references and citations from researches and reports to his work.

September 06, 2020

Borenstein, J. (2011). Robots and the changing workforce. *AI & Society, 26*(1), 87-93. doi: http://dx.doi.org.mutex.gmu.edu/10.1007/s00146-009-0227-0

This article is about the effect of robots on the workforce. The writer, Jason Borenstein, highlights that the use of robotics in jobs will not slow down anytime soon, therefore it will lead to numerous different outcomes that are either negative or positive. A positive outcome Boreinstein mentioned is that new job opportunities could emerge, however at the same time, some jobs could be closed off, leading to unemployment. More so, Borenstein is affiliated with Georgia Tech and includes multiple references to his work. Some examples of work he used are 'Engineers and engineering in the US and Japan: a critical review of the literature and suggestions for a new research agenda' by Lynn LH and 'The design of future things' by Norman DA.

September 06, 2020

Boyd, R., & Holton, R. J. (2018). Technology, innovation, employment and power: Does robotics and artificial intelligence really mean social transformation? *Journal of Sociology*, 54(3), 331-345. doi:

http://dx.doi.org.mutex.gmu.edu/10.1177/1440783317726591

This article highlights the social and economic transformation from artificial intelligence. It also provides insight about the historical, political, and social

aspects of the technological revolution. Writers Robert J. Holton and Ross Boyd provide different approaches to this topic and new arguments. The research was able to be conducted through funding by an Australian Research Council Discovery Grant. Both authors are affiliated with the University of South Australia and Holton is affiliated with Trinity College Dublin as well. The paper includes references from many Google Scholars such as Bruno Latour and Nicholas Carr.

September 21, 2020

Stoica, I., Ada Popa, R., Patterson, D., Mahoney, M., Katz, R., Joseph, A., Jordan, M.,
Hellerstein, J., Gonzalez, J., Goldberg, K., Ghodsi, A., Culler, D., Abbeel, P., & Song, D.
(2017, December 15). *A Berkeley View of Systems Challenges for AI*. ArXiv.Org.
https://arxiv.org/abs/1712.05855

This article goes through the aspects of AI. The authors question whether the upcoming AI systems will impact lives and fulfill its promise by making critical decisions for humans. The paper also analyzes the security aspects of the AI systems, declaring that AI applications will need strong security properties. To a greater degree, there is a summary of the relation of Moore's Law towards AI and the reasoning behind the success of AI. It is also conveyed that AI will lead to new innovation in hardware architecture and systems. To add, this paper is a part of the official website for the University of Cornell and includes a lot of references/citations.

September 21, 2020

Anati, I., Gueron, S., Johnson, S., & Scarlata, V. (2013, August 14). *Innovative Technology for CPU Based Attestation and Sealing*. Intel.

https://software.intel.com/content/www/us/en/develop/articles/innovative-technology-forcpu-based-attestation-and-sealing.html

This article is essentially about a technology that Intel was developing at the time. The technology is that they were developing at the time is called the Intel SGX. This advancement is supposed to prevent security attacks and threats on enclaves. It is an ideal solution to attacks targeted towards AI applications. The paper is reliable because it comes from the official Intel website and includes multiple references.

September 14, 2020

Brubaker, K. (2018). Artificial intelligence: Issues of consumer privacy, industry risks, and ethical concerns. (Order No. 10812829, Utica College). ProQuest Dissertations and Theses, , 85. Retrieved from

https://search.proquest.com/docview/2038967424?accountid=14541

This article is published by Proquest, a reliable database paid by many school libraries, which includes the issues concerning AI. The author Brubaker states that there are a lot of privacy concerns when dealing with AI devices. Additionally, there are many ethical and industrial risks caused by AI. Some examples include controlling AI devices in the automation industry and miscalculated AI in the medical industry. Brubaker questions whether in the future these issues will be solved and if there will be research conducted towards the self-learning of these devices. Brubaker is also associated with Utica College.

September 24, 2020

Chin, M. (2020, April 29). *Exam anxiety: how remote test-proctoring is creeping students out*. The Verge. https://www.theverge.com/2020/4/29/21232777/examity-remote-test-proctoring-online-class-education

> This article is mainly about students and their fears towards proctored online exams. Chin goes through an event where a student's computer got hacked while taking an exam. To add, Chin goes into detail about Examity, a website catered towards students taking online exams. She talks about its privacy policy and recalls its technical issues. Additionally, Chin questions the security of Examity and similar websites. Chin is also a writer for The Verge, an American website that is centered around news regarding technology. Specifically, this paper is about an event that happened recently and includes information from students attending University of Arizona and Ocean County College. Screenshots of Examity's proctoring services are utilized in the article as well.

September 21, 2020

Torresen, J. (2020, September 24). *A Review of Future and Ethical Perspectives of Robotics and AI*. Frontiers. https://www.frontiersin.org/articles/10.3389/frobt.2017.00075/full

> This article is essentially about the future of AI systems. Torresen goes through the future warnings related to the advances of AI and analyzes its potential. He also shares research that is currently being done on future development and

highlights, while questioning, when these changes will be implemented. More so, Torresen goes through the potential challenges of society because of AI, and how there might be unemployment. The ethical aspects and how some conditions/rules need to be applied on future applications/devices so problems will not occur is conveyed as well. Additionally, Torreson is affiliated with the University of Oslo and his work on this paper is supported by the Research Council of Norway.