COMPUTER & DATA SCIENCE QUESTION SUBMISSION

Contents:

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<u>Assess the ethical implications of integrating AI technology into various aspects of society, such as healthcare, education, and employment. How can we ensure that AI systems are designed and used responsibly to promote fairness, transparency, and accountability?</u>

The 1970s marked an immense change for humankind, marking the start of a new age – the Digital Age (or Information Age). With this new age came even more rapid developments to technology, most notable in recent years the development of Artificial Intelligence (AI). At its current rate of development, AI has the power to revolutionize many industries but at the same time has many ethical implications which must be first discussed before it is integrated into various aspects of society.

Firstly, the issue with integrating AI into society is how it will affect employment. AI is more efficient than human labor as AI will be able to carry out tasks much faster and with less chance of error; a computer system is 125,000 times faster than the human neuron.[1] This would greatly affect employment; an IMF report published in January 2024 states that "almost 40 percent of global employment is exposed to AI, with advanced economies at greater risk…".[2] Integrating AI into the workforce therefore has many negative implications which would greatly affect the future job market.

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[1] Iype, S.M. (2018) *Human brain vs artificial Intelligence systems, ignitarium.com*. Available at: https://ignitarium.com/human-brain-vs-existing-artificial-intelligence-systems/ (Accessed: December 23, 2024).

[2] *Gen-AI: Artificial Intelligence and the Future of Work* (no date) *Imf.org*. Available at: https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2024/01/14/Gen-AI-Artificial-Intelligence-and-the-Future-of-Work-542379?cid=bl-com-SDNEA2024001 (Accessed: December 23, 2024).

This is not the only negative effect AI will have on employment. AI can also assist in hiring labor, an example being Amazon's AI recruitment tool in 2014. While this solution seemed ideal at the time, it turned out to be an incredibly flawed system. The AI's original role was to review the job applicants' resumes to find top candidates. In an interview, one of the engineers on the team had said: "They literally wanted it to be an engine where I'm going to give you 100 resumes, it will spit out the top five, and we'll hire those".[3] However, by 2015, it had become clear that the AI was not rating the candidates in a gender-neutral way; the AI had begun to discriminate against CVs with the word "woman". Because of this, it became clear that they could not rely on the system, and Amazon removed it in 2017.

Amazon's AI was biased due to the inherent nature of AI; AI systems analyze patterns and features of large sets of data then make predictions based on the patterns it finds. In this case, the AI recruitment tool was trained to evaluate applicants by observing resumes that were submitted to the company over a ten year period. Most applicants during this period had been men as the tech industry had been a male-dominant one. This example shows that AI's decision making is not on par with humans currently, and that if left to make decisions on its own, its bias gets in the way. This makes it a clear example of the negative impact AI will have on employment.

However, according to the World Economic Forum's "Future of Jobs Report 2023", AI is being increasingly used by organizations around the world, and 49% of these organizations anticipate AI to be a catalyst for job creation with 23% expecting it to drive job

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[3] BBC News (2018) "Amazon scrapped 'sexist AI' tool," *BBC*, 10 October. Available at: https://www.bbc.com/news/technology-45809919 (Accessed: December 14, 2024).

displacement, meaning a shift in roles and skills rather than job elimination.[4] This suggests

that AI will not replace human labor, but instead encourage people to go for high-skilled

jobs. With the current rate of AI development and its rise in society, it would be possible for

AI to leave a positive mark on employment, not just by taking over low-skilled jobs. Learning

from Amazon's tool in 2014 paired with the development of AI, companies could use

customized AI systems in order to assist with hiring processes, making sure that the AI is

programmed to rate applicants as unbiased as possible to ensure fairness.

Secondly, there is the issue of AI in education. The increased use of AI in education –

particularly with students – can be pinned to ChatGPT, an AI chatbot that launched in

November 2022. In a survey conducted in February 2024 by Intelligent.com, 37% of 588

college students currently use ChatGPT. Out of that 37%, 96% used ChatGPT for schoolwork;

69% used it to help with writing assignments with 29% using it to write entire essays.[5] While

this is a useful and easy solution in the short run, its consequences are detrimental in the

long run. Normalizing the use of AI in education in this fashion may lead to students putting

in less effort and may encourage students to use AI as a "shortcut". Educators also voiced

the concern of students using ChatGPT to "cheat" on homework assignments, presenting

what they've generated without any individual input or critical thinking.[6] This would mean

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[4] *The Future of Jobs Report 2023* (no date) *Weforum.org*. Available at:
https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf (Accessed: December 23, 2024).

[5] *4 in 10 college students are using ChatGPT on assignments* (no date) *Intelligent*. Available at:
https://www.intelligent.com/4-in-10-college-students-are-using-chatgpt-on-assignments/ (Accessed:
December 26, 2024).

[6] *The impact of Chat GPT on education* (no date) *Digital Learning Institute*. Available at:
https://www.digitallearninginstitute.com/blog/the-impact-of-chat-gpt-on-education (Accessed: December 28,
2024).

that students would be unable to consolidate their knowledge, therefore missing the purpose of their education.

This is not the only issue with using AI; using AI to write whole assignments could be classed as plagiarism. When asking ChatGPT to write an essay, it generates an essay that is similar to an existing piece of work. This is because it is trained on vast amounts of text. While this is not technically plagiarism – ChatGPT generated texts can score as low as 5% with tested by some plagiarism tools[7] – it is still considered academic dishonesty and unethical without proper citation and particularly if the user is trying to pass off the text as original work,[8] according to the University of South Florida. It is therefore crucial to regulate the use of AI in an educational setting, for example, by limiting the use of AI to simply creating frameworks for assignments or for research only in order to maintain meaning to learning.

However, AI is not solely used by students. Teachers can also use AI in creating lesson plans. This is one example of a positive use of AI in education; by using AI to create lesson plans teachers can direct their attention to helping students understand the content rather than focusing on creating a lesson plan. Another benefit to using AI for education is that it can create a more personalized lesson plan, which would greatly improve the effectiveness of teaching, especially for students with learning disabilities. Taking the example of ChatGPT, the platform can personalize lessons to fit the individual student's learning styles and

[7] *Does Chat GPT Plagiarize? Is it Plagiarism Free?* (2023) *Whats the Big Data*. Available at: https://whatsthebigdata.com/does-chat-gpt-plagiarize/ (Accessed: December 28, 2024).

[8] "LibGuides: Library skills for all students: Plagiarism and ChatGPT" (2016). Available at: https://guides.lib.usf.edu/c.php?g=451607&p=9675504 (Accessed: December 28, 2024).

abilities, meaning that students will receive targeted learning. This application of AI is also

relevant for independent learning, where students can easily work on their own "problem

areas". But for this application of AI to be fully implemented into education, there must be

guidelines set for ethical use of AI, for example only using it as a framework for writing

assignments or only using it for research and with proper citation, in order to ensure

students are transparent with and can take accountability for unethical use of AI.

Finally, AI can be integrated into healthcare. With ageing populations and the global

pandemic, healthcare systems globally have faced significant challenges. The global

pandemic has particularly highlighted the shortages in the healthcare workforce and

inequities in the access to care.[9] Implementing AI could potentially resolve these supply-

and-demand issues due to its broad uses. Currently, AI is used in healthcare for repetitive

and time-consuming tasks, however it shows signs of developing, for example, it can scan

radiological images for early detections and can predict outcomes from electronic health

records.[10] There has also been AI development in surgical robotics in a project led by

Professor Liu Yunhui of the Chinese University of Hong Kong. Novel AI and automation

functions have been introduced to surgical robots to enhance operational safety and

accuracy with the aim of developing cutting-edge AI-powered surgical robots to perform

surgical procedures accurately with high autonomy.[11] This would allow for surgical

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[9] *Artificial intelligence in healthcare: transforming the practice of medicine* (no date) *Nih.gov*. Available at:
https://pmc.ncbi.nlm.nih.gov/articles/PMC8285156/#CIT0004 (Accessed: January 1, 2025).

[10] *Artificial intelligence (AI) in healthcare & medical field* (no date) *ForeSee Medical*. Available at:
https://www.foreseemed.com/artificial-intelligence-in-healthcare (Accessed: January 1, 2025).

[11] *AI-powered surgical robots* (no date) *Edu.hk*. Available at:
https://www.cuhk.edu.hk/english/research/excellence/ai-powered-surgical-robots.html (Accessed: January 2,
2025).

procedures to take place with less manpower, which would therefore address the supply-and-demand issues of today and ultimately shows how AI can play a vital role in healthcare in the future.

However, there is a downside to implementing AI into healthcare: the absence of an emotional bond between the patient and doctor. This doctor-patient relationship is considered a keystone of care,[12] and thus it must be preserved. This issue can be addressed by having AI and doctors work hand in hand rather than AI replacing human roles in healthcare. This would therefore make sure that patients will be able to receive the exceptional treatment provided by AI while still having the emotional support and connection that doctors provide.

In conclusion, integrating AI into various aspects of society poses many ethical issues; the question of replacing human labor, over-reliance on AI, and privacy are all important issues that must first be addressed. With AI's rapid development and increasingly relevant uses, it is important to implement rules and systems in order to fairly use it to humanity's advantage. Using specially customized AI for specific jobs – for example to aid with the hiring process, making lesson plans, or performing surgery – would be a solution to ensuring that AI is used fairly while aiding professionals in these fields. Using AI sparingly would also be beneficial for jobs that require emotional connection such as in the field of healthcare. Additionally, setting guidelines for AI use would also be a solution for ensuring use of AI is

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[12] *The Doctor–Patient Relationship* (no date) *Nih.gov*. Available at:
https://pmc.ncbi.nlm.nih.gov/articles/PMC1496871/ (Accessed: January 2, 2025).

properly mentioned and would help educators and critics search for uncredited AI

generated texts, making people take accountability for their use of AI.

(1,523 words)

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https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf (Accessed: December 23,

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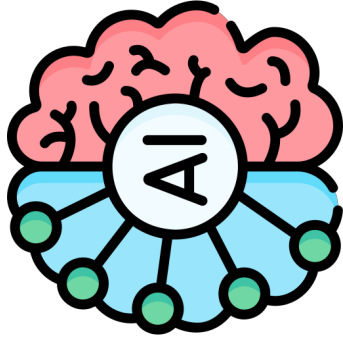https://www.digitallearninginstitute.com/blog/the-impact-of-chat-gpt-on-education

(Accessed: December 28, 2024).

The Ethical Implications of Integrating AI into Society

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AI in Employment

As a general concern, AI is more efficient than human labor, which may lead to AI "taking over" previously human-led jobs in various industries, which will heavily affect employment.

A computer system is around **125,000 times faster** than the human neuron.

"Almost **40%** of **global employment** is exposed to AI…" – IMF report, January 2024

Integrating AI into employment therefore will have many negative implications, for example, increasing use of AI will decrease job availability, which will therefore be a catalyst for rising unemployment.

However, this is not the only use of AI in employment. An example of another use would be Amazon's AI recruitment tool in 2014.

CASE STUDY #1: amazon

2014

Amazon introduces a new AI recruitment tool to go through job applicants and pick out top candidates for the role.

2015

Amazon finds out the AI is not rating candidates in a gender-neutral way, instead it discriminates against CVs mentioning "woman". This is because the AI was trained on previously submitted CVs over a ten-year period, most of which were male applicants because the tech industry was a male-dominant one.

2017

Amazon removes the AI recruitment tool.

This example shows that AI's decision making is not on par with humans currently, and that if left to make decisions on its own, its bias gets in the way, making it a clear example of the negative impact AI will have on employment.

AI in Employment (continued)

However, according to the World Economic Forum's "Future of Jobs Report 2023", AI is being increasingly used by organizations around the world.
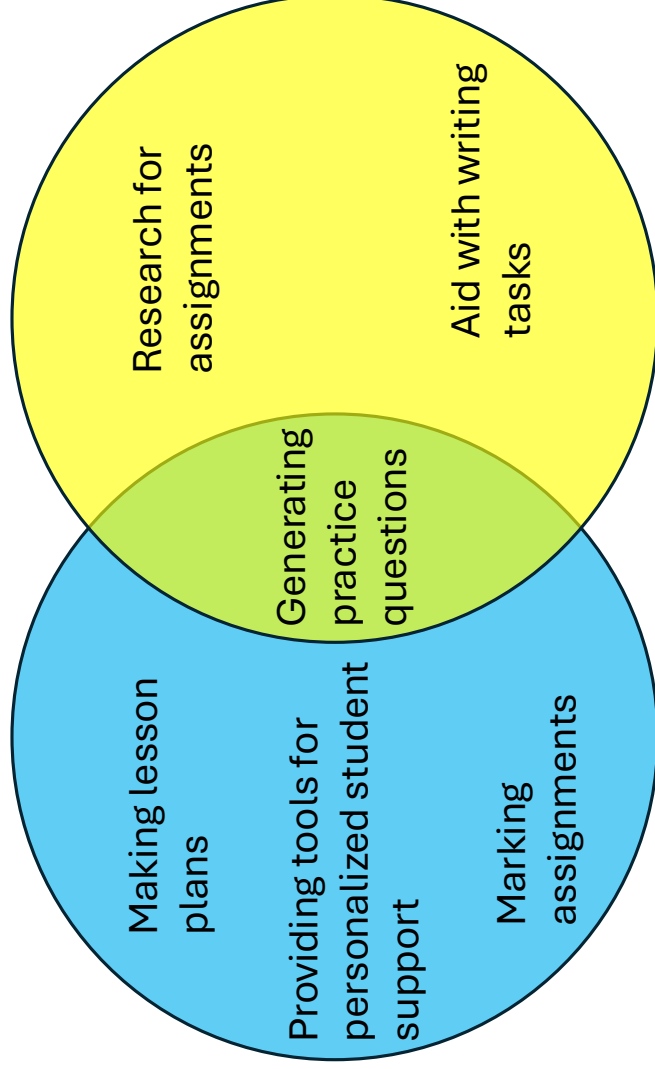
Out of these companies, **49%** anticipate AI to be a catalyst for job creation, with **23%** expecting it to drive job displacement, meaning a shift in roles and skills rather than job elimination.

This suggests that AI will not replace human labor, but instead encourage people to go for high-skilled jobs. With the current rate of AI development and its rise in society, it would be possible for AI to leave a positive mark on employment, not just by taking over low-skilled jobs. Learning from Amazon's tool in 2014 paired with the development of AI, companies could use customized AI systems in order to assist with hiring processes, making sure that the AI is programmed to rate applicants as unbiased as possible to ensure fairness.

AI in Education

Uses of AI for teachers and students

Research for assignments

Generating practice questions

Aid with writing tasks

Making lesson plans

Providing tools for personalized student support

Marking assignments

Overall, AI has many uses in the field of education that will have positive outcomes.

Example #1: using AI to create lesson plans teachers can direct their attention to helping students understand the content rather than focusing on creating a lesson plan.

Example #2: creating a more personalized lesson plan would greatly improve the effectiveness of teaching, especially for students with learning disabilities. Taking the example of ChatGPT, the platform can personalize lessons to fit the individual student's learning styles and abilities, meaning that students will receive targeted learning. This application of AI is also relevant for independent learning, where students can easily work on their own "problem areas".

However, educators have voiced concerns about the ethical implications of AI in the field of education as well as how it will affect future generations of students.

ChatGPT

"Out of **588** students, **37%** used **ChatGPT** for their assignments." – survey conducted by Intelligent.com

Out of this 37%:

96% used it for schoolwork

69% used it for writing assignments

with

29% using it to write entire essays

Concerns with the use of ChatGPT:

While this is a useful and easy solution in the short run, its consequences are **detrimental** in the long run. Normalizing the use of AI in education in this fashion may lead to **students putting in less effort** and may encourage students to **use AI as a "shortcut"**. Educators also voiced the concern of students using ChatGPT to **"cheat" on homework assignments**, presenting what they've generated **without any individual input or critical thinking**. This would mean that students would be unable to consolidate their knowledge, therefore **missing the purpose of their education**.

How should AI be implemented into education?

As AI has the ability to be both incredibly useful and also unethical in education, **there must be guidelines set to ensure ethical use of AI**. For example only using it as a framework for writing assignments or only using it for research and with proper citation, in order to ensure students are transparent with and can take accountability for unethical use of AI.

AI in Healthcare

Healthcare systems globally have faced significant challenges with ageing populations and following the global pandemic, in particular, the shortage of healthcare workers as well as the inequities of access to healthcare.

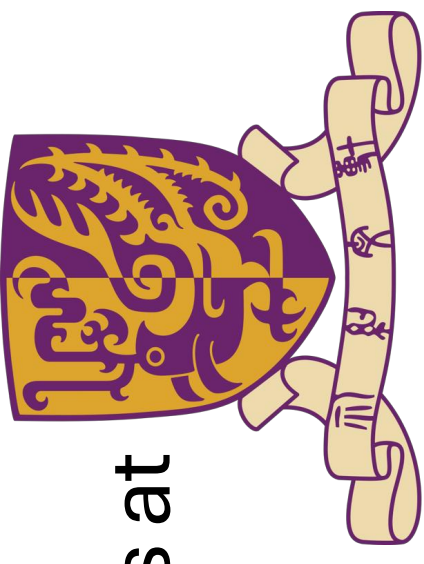| Benefits of AI in healthcare:	Disadvantages of AI in healthcare:
Implementing AI could potentially resolve these supply-and-demand issues due to its broad uses. Currently, AI is used in healthcare for repetitive and time-consuming tasks, however it shows signs of developing, for example, it can scan radiological images for early detections and can predict outcomes from electronic health records.	By implementing AI into healthcare, there will be an absence of an emotional bond between the patient and doctor. This doctor-patient relationship is considered a keystone of care, and thus it must be preserved. This issue can be addressed by having AI and doctors work hand in hand rather than AI replacing human roles in healthcare. This would therefore make sure that patients will be able to receive the exceptional treatment provided by AI while still having the emotional support and connection that doctors provide.

Overall, AI has many positive contributions to the healthcare industry. There are examples of how useful AI can be in healthcare even now with the development of AI in surgical robotics, which when fully developed will have the power to revolutionize surgery.

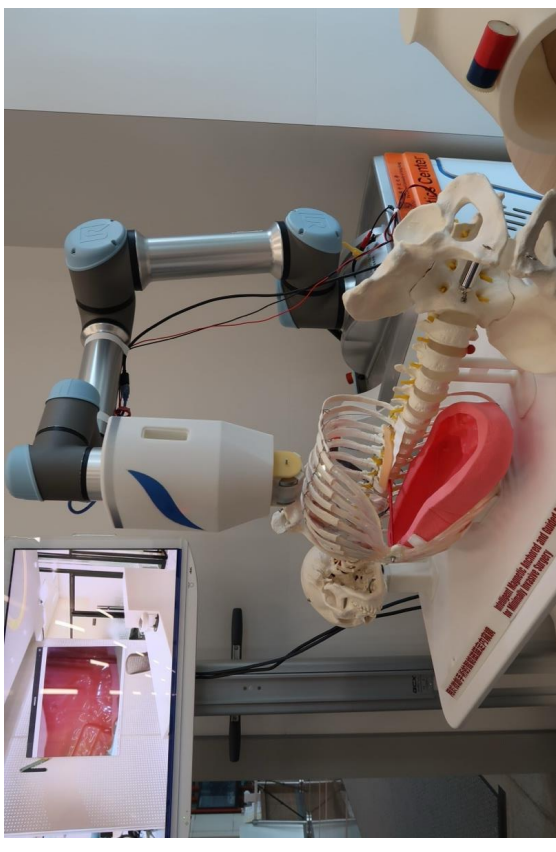# 📖 CASE STUDY #3: Surgical Robotics at

At the Chinese University of Hong Kong, there has been some development of surgical robotics to include AI technology.

Novel AI and automation functions have been introduced to surgical robots to enhance operational safety and accuracy with the aim of developing cutting-edge AI-powered surgical robots to perform surgical procedures accurately with high autonomy.

What does this mean for the future of surgery?

This would allow for surgical procedures to take place with less manpower, which would therefore address the supply-and-demand issues of today. It can also perform surgeries with greater precision and efficiency, ultimately showing that AI will play a vital role in healthcare in the future.

Conclusion

In conclusion, integrating AI into various aspects of society poses many ethical issues; the question of replacing human labor, over-reliance on AI, and privacy are all important issues that must first be addressed. With AI's rapid development and increasingly relevant uses, it is important to implement rules and systems in order to fairly use it to humanity's advantage. Using specially customized AI for specific jobs – for example to aid with the hiring process, making lesson plans, or performing surgery – would be a solution to ensuring that AI is used fairly while aiding professionals in these fields. Using AI sparingly would also be beneficial for jobs that require emotional connection such as in the field of healthcare. Additionally, setting guidelines for AI use would also be a solution for ensuring use of AI is properly mentioned and would help educators and critics search for uncredited AI generated texts, making people take accountability for their use of AI.

Thank you for reading!