PG Induction Assignment

Essay Topic: Discuss the importance of a postgraduate degree in the Computer Science field.

Student: William Bolton

Word count: 730 (Max 750)

Advances in computer science have transformed almost every sector and unlocked new capabilities that have benefited billions of people around the world. I am an NHS doctor specialising in Neurosurgery, and I see first had how technology can improve human lives. I chose to study a Post Graduate Certificate in Artificial Intelligence with the University of Essex Online because I wanted to learn how to harness skills from computer science more effectively in my surgical practice.

One of the most widely used definitions of Artificial Intelligence (AI) refers to Turing Test, where a computer exhibits intelligence if the user cannot reliably distinguish between the computer's responses and a real human's response (Turing, 2009). A more recent development in the definition suggests that "AI will be such a program which in an arbitrary world will cope not worse than a human" (Dobrev, 2012). A common theme in both attempts at defining the field is the bringing together of the theory of the human mind and theory of computer programming. While comparing AI to humans is a natural thing to do, it is not always helpful. At the time of writing, humans remain uniquely suited to large domains of problem-solving and are far superior to even the most advanced AI technologies. However, iAI technologies can process huge quantities of data far faster than any human. Speed and mathematical accuracy are fundamental strengths of computers, as is the fact they do not have human needs like sleep.

When most people use the term AI, they are often referring to branches of AI including Machine Learning (ML) and Natural Language Processing (NLP). ML refers to programmes that can be 'trained' to process and interpret data to solve real-world problems (Brynjolfsson and Mitchell, 2017). NLP is focused on the area of human and computer interaction, where programmes such as Large Language Models (LLMs) are designed to understand written or spoken human languages (Chopra, Prashar and Sain, 2013). A recent report from the technology company Databricks highlights that the number of companies using LLM products has grown 1310% between November 2022 and May 2023, NLP is now the most popular application on Python data science library usage, and companies are getting increasingly efficient with ML experimentation (Databricks, 2023). These trends have been fuelled by significant coverage and adoption of tools like ChatGPT from OpenAI (https://openai.com). With each passing month, the importance and emerging dominance of AI technologies in almost every sector is becoming clearer and clearer.

The healthcare sector has a huge amount of use cases for AI adoption to benefit the healthcare workforce, healthcare systems, and the delivery of patient care. Despite the significant need for these solutions, adoption of digital technologies in healthcare is often hindered by a number of barriers (Asthana, Jones and Sheaff, 2019). I have experienced first had the challenges of integrating digital health records across departments and trusts, as well as the effects of a lack of investment in newer technologies. Indeed, when I became a doctor in 2016 one of my first tasks was to learn how to use a fax machine and a bleep (also known as a pager). The frustration I feel because of these challenges, coupled with the potential benefits I can see for patients, colleagues and the system more widely, are personal motivation factors to pursuing this post graduate qualification in AI.

Responsibly and ethically adopting the use of AI in healthcare will be one of the greatest challenges of my career. Everything from surgical robotics, AI medic chat bots, computer-aided diagnosis of radiology imaging data, through to treatment discovery, will be dominated by AI. Safety and security are of profound importance in healthcare. Societal views will also be a major influencer. Would you allow a computer to operate on you? Legally, who will be liable if something went wrong? The AI engineer, the surgeon, or the AI itself? Through completing this course, I hope to have a better grasp of the technical and computer science side, and blend this with my understanding of ethics form my medical training to contribute in an engineering capacity, AI deployment and adoption strategy capacity, and in a medical ethics capacity. The doctors of the future will need to know when and how to use AI. They will also need to fully understand the limitations of technology. Humans need to figure these challenges out, and fast.

References

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