This article is a partial summary of sources on data science and analytics. This is written to highlight some of the key challenges and risks associated with artificial intelligence. Interested readers are suggested to refer to references and further references therein, for a broader discussion and for insights.

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Artificial Intelligence – Risks and Benefits

Introduction

Artificial Intelligence (AI) has been discussed so much in recent media [1,2,3,4] that one could be forgiven for assuming that the ideas behind AI are new and until recently that there was no such thing as AI. This is far from the truth. AI in one form or another has been present for decades. Arthur Samuel conducted what was groundbreaking work at IBM in the 1950s, developing artificial intelligence initially to play the game of checkers [5]. Samuels AI would go on to defeat the Connecticut state checkers champion [6]. This work has been built on for decades to give rise to widespread use of models such as neural networks (initially proposed in the 1940s [12]), random forests, support vector machines, in addition to models which will be more familiar to those with an interest in statistical modelling such as regression analysis and naïve Bayes.

Risks

From reading material such as a recent article by Metz, one could be forgiven for thinking that AI will spell the end of humanity [7]. While there are certainly risks that AI could take actions that could be contrary to the best interests or safety of humans this is not considered likely by many experts. In his work, Metz asks Prof Yoshua Bengio about the risks. The professor is quoted as saying "Today's systems are not anywhere close to posing an existential risk," The professor goes on to say that he cannot speak for future states of AI being safe highlighting the uncertainty of what could come in the future.

For many the more concerning issues of the immediate future are centred around issues such as Bias in machine learning models. In [8] Woollacott discusses legal issues faced by a large technology company, due to allegations that the models the company has developed to estimate blood oxygen, perform less effectively on people with darker skin. Issues such as this will be a significant challenge as AI becomes more widespread.

While there are several other issues that can be discussed in the context of AI, e.g. privacy, ethics, job displacement, misinformation one other area that will be mentioned here as a key risk from AI is in the area of security. A recent article by Harvard Business Review discussed how advances in AI were making cyberspace more dangerous by empowering bad actors to do harm in more sophisticated ways. [9] This is likely to be a greater risk in the future.

Benefits

While much of what is presented by the media can be quite negative and, in some cases, illicit a fearful response to the growth of AI, it is important to note that in many ways AI is improving peoples lives [4,10]. This includes areas such as fraud detection and medical imaging. Medical imaging is an area ripe for application of artificial intelligence. In some cases, machine learning algorithms can be more accurate at detecting disease than a trained radiologist. It is expected that AI will be able to support radiologists in a clinical setting more and more in the coming years. While there are some discussions around replacing radiologists using AI, this would seem unlikely to this author. It is also the case that AI tools are being used in screening and diagnosis of cancer [11]. Outside of healthcare, AI tools are being used in a variety of settings every day. It is likely that you may have interacted with a bot in a web browser recently. Again, these bots are tools that depend on AI to provide a service to a user.

Discussion

The importance of AI cannot be understated. It is likely to continue to grow in the coming years. More and more applications will be supported by AI. While there are undoubtedly challenges and risks associated with these tools, the opportunities are massive. In terms of how data analytics feeds into AI, it is important to realise that all models are in a sense statistical tools that can be applied to a dataset. These tools are used by some analysts without understanding the mechanics of the models. This is a massive risk and can lead to issues such as biases in models.

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