**IT Technology – Machine Learning**

**What does it do? (600 words) What is the state of the art of this new technology? What can be done now? What is likely to be able to do be done soon (say in the next 3 years)? What technological or other developments make this possible?**

‘Machine Learning is a set of techniques that sits inside the even more ambitious goal of artificial intelligence’- Crash Course: Machine Learning (YouTube)

There are two main types of AI, weak and strong. Weak AI functions based on data input and can process this data to form one specific function and is generally very 1 dimensional. Examples of this form of AI would be Classifiers. Strong AI functions on a more comparable level to the human brain, where true internal learning can take place. Although a true strong AI has yet to be developed, AI like IBM’s Watson, Summit or Sierra are good examples of how far we have come in AI technology

It is hard to fully understand AI without looking deep into the complex algorithms that produce the core functions, but for the purposes of this report I will give an overview of just the functions and outputs.

At the core of weak AI lives classifiers. Classifiers reduce real world data into ‘features’ (values that usefully characterise the things we wish to classify) Training data is used to compare features using decision trees and the AI is able to make assumptions based on this data. The amount of data stored in a classifier can be astronomical and allow the AI to have incredibly in-depth predictions or classifications.

Artificial Neurons give these classifiers the ability to produce ‘machine learning’. Based on the neural network within the human brain. As opposed to the human brain where these signals are chemical and electrical, the artificial neurons send signals in the form of numbers.

Artificial Neurons function as a data processing power houses. Each ’neuron’ has a data input and output function. The neuron’s work collaboratively to take the series of inputs, combines them and emits multiple signals with different values. Each neuron produces a slightly different value based on the data input and then the algorithms allow for the data patterns to be understood by the AI.

Some of the key Weak AI milestones in the area of neural networks are face recognition, driverless cars and translating human speech.

Strong AI has yet to reach or surpass human intelligence. It is widely debated whether or not this feat can be achieved by a computer but never the less strong AI in my opinion seems to be only just around the corner.

Reinforcement learning, like that of Google’s Alpha Go is one of the functions of these near strong AI. It allows the AI to practice a single function millions of times over to produce better, more informed strategy or knowledge.

The mass amount of digitised knowledge (Wikipedia, YouTube, Facebook etc.) coupled with the ability of reinforcement is believed by many to be the perfect starting point for a true strong AI.

The future of AI is limitless but in the next 3 years some technologies will definitely be more refined. A good example is driverless cars. The technology and rollout of driverless technology is only a few years away with pioneers such as Tesla currently setting up infrastructure to support this technology. AI phone assistants are another technology that is believed to be more functional in the near future. Allowing users to have their phone know when to book and appointment and to do this autonomously.

**What is the likely impact? (300 words) What is the potential impact of this development? What is likely to change? Which people will be most affected and how? Will this create, replace or make redundant any current jobs or technologies?**

With AI technology on the cusp of so many great innovations, improvements in all aspects of human life will be seen. Sunil Kumar of Towards Data Science outlines some of these positive aspects as reduction in human error, faster decisions and new inventions. Erasing human error could be seen as an example, in a surgery room an AI machine can perform precise movements and incisions for tricky surgery. Faster decisions relate to the manufacturing of anything being replicated in a faster manner through the use of an AI thought process rather than a much slower human brain.

Most of the initial impacts of will only be felt by the people in first world countries and more than likely the top 20% of people within those countries. Autonomous driving technology, medical technology, Phone assistants and AI for manual tasks are things that will only become available to people of wealth.

It’s not all happy days though, Bernard Marr and Co’s What Are the Negative Impacts of Artificial Intelligence (AI)? Cites Job Loss, AI terrorism, AI bias and accelerated hacking as some of the worrying issues related to the progress of Artificial Intelligence. Bernard describes AI bias as the bias the machine is designed with based on the AI creator, meaning that the AI could be designed with the mal intent of its creator. This links in to AI terrorism and says more about people then it does about AI. Accelerated hacking will be more common as AI computers get faster and smarter. Job loss will be seen much like that of the blacksmith and horse carriage driver, but this also creates jobs on the other side.

Machine learning in the realms of marketing, advertisement and general consumerism will be felt by most people however. The impacts of this will only further the capitalist mentality of modern society and whether this is better or worse is really an individual perception.

**How will this affect you? (300 words) In your daily life, how will this affect you? What will be different for you? How might this affect members of your family or your friends?**

As a person looking to enter the field of IT, I believe most aspects of my life will be improved by the innovations that we will see over the coming decades in relation to AI.

In my day-to-day life things like driverless cars and phone assistants will be technologies that I will utilise. Other aspects of AI such as medical advances in the realms of AI will also improve my life, just not on a da-to-day scale.

I don’t think initially a lot would be different for me, a lot of the AI functions we have talked about in this report are many years away and even when they do become widely accessible, they will be extremely expensive.

Both my parents work in jobs that could be completed by a robot and lucky for them they are about to retire. My father is a forklift operator and my mother is in administration at a mechanics workshop. It is because of this aspect that I have put a lot of time and effort into choosing my future career path. I decided to be the person creating, rather than the person getting replaced.

**References**

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