IT Technologies – Ben Mason

**Machine Learning**

**What does it do?**

Machine learning is a process undertaken by computers whereby algorithms are utilised in order to analyse a set of data and in turn, improve a system. This can be done through 3 main types of machine learning, being supervised, unsupervised and reinforcement learning. Supervised learning is where machines use labelled data to learn and improve their system whereas unsupervised learning involved machines analysing unlabelled data. The last type is reinforcement learning where negative feedback is given to the machine time and time again until the machine analyses enough data and through the use of the feedback, develops an ability to differentiate the data on its own. Machine learning is used in many everyday tasks that some may not notice such as when Netflix makes a recommendation for the next T.V. show or movie the user should watch, that is made based on user data indicating that they may be interested in that specific show based off their previous viewings. At the moment most if not all large information technology giants such as google Facebook, Microsoft and Apple all use machine learning to be able to understand and make the most of the data they possess about their users which could help them in all aspects of their business from user spending habits to what new products the consumers require and where there are gaps in the market that they can take advantage of, all invaluable sets of information only accessible through machine learning. Currently, supervised learning is the predominant type of machine learning in the IT industry where ‘the analysist firm Cognilytica estimated that in the average AI project, about 80% of project time is used aggregating, cleaning, labelling, and augmenting data to be used in machine learning models’ [1]. Due to this, a shift to unsupervised learning is clearly the next step for many larger companies that rely on machine learning to further their business and if Cognilytica can be used as benchmark for the industry, an 80% decrease in workload that can be offloaded to other areas of a business can be monumental and greatly increase the company’s efficiency and output. Due to this, unsupervised machine learning, where a machine can accurately identify patterns independent from outside influence and labelling that were previously unknown would be an exciting step forward for the domain of machine learning. Unsupervised machine learning not only increases workplace efficiency and accuracy in patterns identified but actually has additional uses and purposes that supervised learning cannot meet. Examples of this are where an outcome of identifying patterns is unknown such as when even manually labelling cannot do the job. This can be observed in cases such as potential fraudulent activity that needs to be identified but might slip under the radar when it comes to humans that must manually label and approve data sets which come with a higher degree of inaccuracy over their machine counterparts. One ever changing components of machine learning is the hardware that is needed to power and run the machines. Purpose built accelerators are currently in the works to improve the performance of these computers in order to speed up workloads and propel machine learning forwards in society. The computers and servers used are very expensive and require large quantities of power in order to efficiently analyse sets of data. Because of this, improvements made in the discipline of machine learning are directly correlated with the improvements being made to computers being how fast and power efficient they are. Due to this domain being one that has exponentially improved in the last decade, the same can be predicted for the next decade where improvements can be expected in computer operating power and respectively in machine learning.

**What is the likely impact?**

The potential impact of this development would be increased levels of machine learning in everyday life due to the ease of use and increased accessibility through increased ability of hardware that powers the machines. This increase of machine learning in daily life could affect all aspects of a persons life from learning what time you wake up everyday and automatically putting the kettle on at a certain time everyday, opening all the curtains in the house at 7am, learning what times you are in which rooms of your house and to automatically turn on lights in certain rooms. Why stop in the home? Machine learning would be the final step to truly driverless cars where all cars could communicate together to form a network on cars on the road that through machine learning, know what to do and how to deal with a hazardous situation through studying millions of human drivers in many data sets to find the 100% safest way to avoid a collision or stopping accidents from happening altogether. There is no certain group of people that could be directly benefited by machine learning the most but rather society as a whole would be benefited causing for increased ease and automation in ones everyday lifestyle. An increase in unsupervised machine learning would mean that the data scientists that would normally supervise and label the data would be out of the job however with machine learning being a new and expanding area, their jobs would simply be changed to where they need to tweak the algorithms perhaps or install new machine learning systems for each new company that opts for it with the greater accessibility to machine learning through improving hardware. Therefore data scientists would not be replaced but would instead have their skills put to use in other areas of machine learning along with many other disciplines and employees in the industry that comes with the growing machine learning area.

**How will this affect you?**

As a university student, I am very time poor having to balance work with university, sports and family time. Due to this, saving time in any way possible is extremely helpful to me and machine learning more often than not assists me in that way by recommending things to be that I may be interested in. This can also apply to advertisements on the internet where they apply to me and my interests through what the machine has learnt about me and my searches, this prevents adverts that I have no interest in popping up on my screen and leaving me frustrated. An increase in unsupervised machine learning will not directly impact me, friends or family as we are not the data scientists who must label the data sets but through the indirect increase in general machine learning linked with the increase in the unsupervised learning can help me however. Machine learning has enabled creations such as google home and such by having to interpret millions of different voice patterns to identify and separate different words into something the computer can understand, making things like google home impossible without adequate levels of machine learning. Google home specifically has benefited me by saving me time every day from being able to turn on the T.V., play music, change channels or pull up recipes and assist me with cooking meals for the entire family. Google home is simply one example of everyday household items and uses for machine learning that we are all surrounded by without realising it and that save us time and effort.

**Bibliography:**

1. YouTube. 2020. Machine Learning Basics | What Is Machine Learning? | Introduction To Machine Learning | Simplilearn - YouTube. [ONLINE] Available at: <https://www.youtube.com/watch?v=ukzFI9rgwfU&t=363s>. [Accessed 03 May 2020].
2. The past, present and future of edge machine learning. 2020. The past, present and future of edge machine learning. [ONLINE] Available at: <https://www.imagimob.com/blog/the-past-present-and-future-of-edge-machine-learnin>. [Accessed 03 May 2020].