Machine Learning

Azure Machine Learning Platform

What is Machine Learning?

Machine learning is a method of data analysis that automates analytical model building. By using learning algorithms it can iteratively learn from data, and as the algorithm is trained it provides more accurate data analysis. A nice definition from www.sas.com states that "machine learning is that just like statistical models, the goal is to understand the structure of the data – fit theoretical distributions to the data that are well understood". Machine Learning allows and enables us to automatically apply complex mathematical computations and calculation to big data. There have been many widely publicised example uses of machine learning applications such as the self-driving Google car, online recommendation offers from Amazon and Netflix and fraud detection systems.

There are many machine learning algorithms which help you build models and implement iterative machine learning process. Some examples of these algorithms include, "Neural Networks", "k-means clustering" and "Decision trees". Additionally, algorithms alone does not build up machine learning, tools and process comes in pair with algorithms. For examples tools/processes such as "Comprehensive data quality and management" and "GUIs for building models and process flows"

Why Machine Learning is important?

In today's world machine learning allows us to write algorithms to build models that enable organisations to make better decision without human intervention. Machine learning has many practical applications in nearly all industries such as within Internet of Things and health care organisations. Furthermore, in a world where organisations are moving forward faster than ever before making critical decisions and predictions are crucial to a business. The most common application of machine learning tools is to make predictions, within complex environments, where the right decision might depend on a lot of variables; machine learning enables us to make the best decision possible.

What Are Some Popular Machin Learning Methods?

Two of the most widely implemented machine learning methods are supervised learning and unsupervised learning.

Supervised learning algorithms are trained using labelled examples where the desired output is unknown. The program is shown possibly thousands and millions of data sets with the corresponding correct outputs and the algorithms learn by comparing its actual output with correct outputs to find errors. By doing so the program than is able to adjust its model accordingly.

Unsupervised learning algorithms are used against data that has no historical labels. The program/system is not told the correct answer and the algorithms alone must figure out what is being shown. The point of this method is to explore and investigate the data to figure out patterns and structure within.

Why Azure Machine Learning Platform?

Since Microsoft is an integral collaborator of our project we have been exposed to the support they can offer us. Azure ML is a fully managed cloud service that enables us to easily build and deploy and share predictive analytics solutions. Since we are new to machine learning it enables us to build models through a user friendly and informative GUI alongside providing many tutorials, documentations and support from Microsoft directly.

Since Azure ML was designed for applied machine learning we are able to use built in algorithms and a simple drag and drop interface to go from an idea to deployment very quickly. It has made it incredibly easy to deploy your model into production as a web service within minutes. Furthermore, since we are using Microsoft Azure as a central part of our project, using Azure ML fits perfectly within our architecture design and it is compatible with all of our other components

Useful Links:

https://azure.microsoft.com/en-gb/services/machine-learning/ (Azure ML info)

https://en.wikipedia.org/wiki/Machine_learning (Machine Learning info)

https://www.quora.com/What-is-machine-learning-4 (More Machine Learning basics)

https://www.analyticsvidhya.com/blog/2015/08/common-machine-learning-algorithms/ (Machine Learning Algorithms)

https://azure.microsoft.com/en-us/resources/videos/getting-started-with-ml-studio/ (Azure ML getting started)