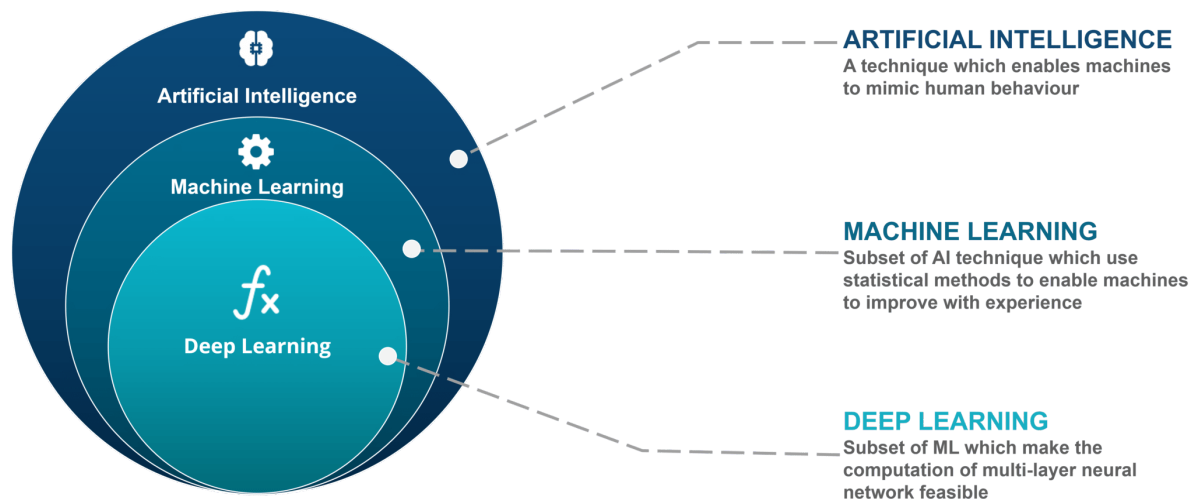# Introduction to Machine Learning & Data Science

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving. It is the 21st century, and technology is changing faster than ever. To meet the market current opportunities, we should know the difference between Artificial Intelligence, Machine Learning, Deep Learning & Data Science. Although these terminologies are usually used interchangeably, they do not quite refer to the same things.

ARTIFICIAL INTELLIGENCE
A technique which enables machines to mimic human behaviour

MACHINE LEARNING
Subset of AI technique which use statistical methods to enable machines to improve with experience

DEEP LEARNING
Subset of ML which make the computation of multi-layer neural network feasible

Aritificial Intelligence

As the name suggests, artificial intelligence can be loosely interpreted to mean incorporating human intelligence to machines. Whenever a machine completes tasks based on a set of stipulated rules that solve problems (algorithms), such an "intelligent" behavior is what is called artificial intelligence.For example, such machines can move and manipulate objects, recognize whether someone has raised their hands, or solve other problems. AI-powered machines are usually classified into two groups — general and narrow. The general artificial intelligence AI machines can intelligently solve problems, like the ones mentioned above. The narrow intelligence AI machines can perform specific tasks very well, sometimes better than humans — though they are limited in scope.

Machine Learning

As the name suggests, machine learning can be loosely interpreted to mean empowering computer systems with the ability to learn. The intention of ML is to enable machines to learn by themselves using the provided data and make accurate predictions. ML is a subset of artificial intelligence. In fact, it's simply a technique for realizing AI. It is a method of training algorithms such that they can learn how to make decisions. Training in machine learning entails giving a lot of data to the algorithm and allowing it to learn more about the processed information.

Deep Learning

As earlier mentioned, deep learning is a subset of ML. In fact, it's simply a technique for realizing machine learning. In other words, DL is the next evolution of machine learning. DL algorithms are roughly inspired by the information processing patterns found in the human brain. Just like we use our brains to identify patterns and classify various types of information, deep learning algorithms can be taught to accomplish the same tasks for machines. The brain usually tries to decipher the information it receives. It achieves this through labelling and assigning the items into various categories. Whenever we receive new information, the brain tries to compare it to a known item before making sense of it — which is the same concept deep learning algorithms employ. For example, artificial neural networks (ANNs) are a type of algorithms that aim to imitate the way our brains make decisions. Comparing deep learning vs machine learning can assist you to understand their subtle differences. For example, while DL can automatically discover the features to be used for classification, ML requires these features to be provided manually. Furthermore, in contrast to ML, DL needs high-end machines and considerably big amounts of training data to deliver accurate results.

Data Science
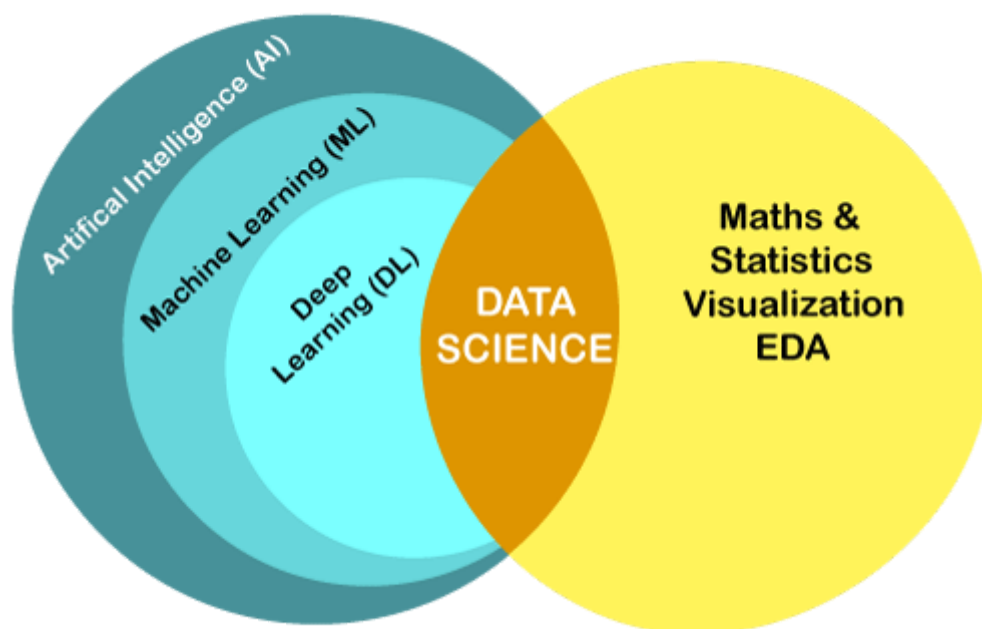
Data science is distinguished from the other two fields because its goal is an especially human one: to gain insight and understanding. Again, not everything that produces insights qualifies as data science (the classic definition of data science is that it involves a combination of statistics, software engineering, and domain expertise). But we can use this definition to distinguish it from ML and AI. The main distinction is that in data science there's always a human in the loop: someone is understanding the insight, seeing the figure, or benefitting from the conclusion. This definition of data science thus emphasizes statistical inference, data visualization, experiment design, domain knowledge and communication.

Data scientists might use simple tools: they could report percentages and make line graphs based on SQL queries. They could also use very complex methods: they might work with distributed data stores to analyze trillions of records, develop cutting-edge statistical techniques, and build interactive visualizations. Whatever they use, the goal is to gain a better understanding of their data.