Difference Between Machine Learning and Artificial Intelligence

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Key Difference - Machine Learning vs Artificial Intelligence

Artificial Intelligence is a broad concept. Self-driven cars, smart homes are some examples of Artificial Intelligence. Some countries have intelligent robots in fields such as medicine, manufacturing, military, agriculture, and household. Machine Learning is a type of Artificial Intelligence. The **key difference** between Machine Learning and Artificial Intelligence is that **Machine Learning is a type of Artificial Intelligence that gives the ability for a computer to learn without being explicitly programmed and Artificial Intelligence is the theory and development of computer systems able to perform tasks intelligently similar to a human.** Machine Learning uses an algorithm to parse data, learn from it and make decisions accordingly. It is a development of self-learning algorithms, and Artificial Intelligence is the science of developing a system or software that is smart as a human.

What is Machine Learning?

An algorithm is a sequence of steps that tell the computer to solve a problem. Machine Learning is a type of Artificial Intelligence. It provides computers the ability to learn without being explicitly programmed. They are various algorithms available for solving Machine Learning problems. Depending on the type of the problem, one can choose a suitable Machine Learning algorithm. It focusses on developing computer programs that can give a result when exposed to new data.

There are different types of Machine Learning. They are Supervised Learning, Unsupervised Learning and Reinforcement Learning. Supervised Learning uses a known dataset to make predictions. A set of input data(X) and set of corresponding response values or outputs (Y) are given to the supervised learning algorithm. That dataset is known as a training dataset. Using that dataset, the algorithm builds a model (Y= f(X)), so it can give an output value to complete new dataset.

Classification and Regression are Supervised Machine Learning algorithms. Classification is used to classify a record. One simple example is “whether the temperature is cold”. The answer can be either “yes” or “no”. There is a specific

number of choices to classify. If there are two choices, it is a two-class classification. If there are more than two choices, it is a multi-class classification. Regression is used to calculate the numeric output. For example, predicting the temperature of tomorrow. Another example would be predicting the value of the house.

In Unsupervised Learning, only the input data is given, and there are no corresponding outputs.Instead, the algorithm finds a pattern or a structure to learn more about the data. Clustering is categorized as Unsupervised Learning. It separates data into groups or clusters to ease out the interpretation of data.

Figure 01: Machine Learning

Reinforcement Learning is inspired by behaviorist psychology. It concerns on maximizing some notion of cumulative reward. One example of Reinforcement Learning is by instructing the computer to play chess. There are so many steps in learning chess. Therefore, it is not possible to instruct about each step. But it is possible to tell, whether the certain action was performed correct or wrong. In Reinforcement Learning, the computer will try to maximize the reward and learn from experience. Another example is an Automatic Temperature Controller.The system should increase or decrease temperature according to the requirement. Reinforcement learning is good for systems that should make decisions without much human guidance.

What is Artificial Intelligence?

Artificial Intelligence is to make a computer, a computer-controlled robot or a software think intelligently similar to a human. It applied to the system, the way human think, how humans learn, decide and solve problems.Finally, a smart and intelligent system is built. Artificial Intelligence is a trendy technology in the

modern world. It is a combination of a variety of disciplines such as Computer Science, Biology, Mathematics and Engineering.

Figure 02: Artificial Intelligence

There are many applications of Artificial Intelligence (AI). Modern Gaming applications use AI. AI research also includes Natural Language Processing. It is to give the ability to a computer or machine to understanding the natural language spoken by humans and perform tasks accordingly. Another application

is Industrial Robots. There are more sophisticated robots with efficient processors and a huge amount of memory. They can adjust to new environment and collect data using light, temperature, sound etc. They are used in fields such as medicine and manufacturing. Artificial Intelligence also applied in optical character recognition, autonomous vehicles, military simulations and many more.

What are the Similarities Between Machine Learning and Artificial Intelligence?

- Both can be used to build sophisticated systems to perform certain tasks.
- Both are based on Statistics and Mathematics.
- Machine Learning is the new cutting-edge technology of Artificial Intelligence.

What is the Difference Between Machine Learning and Artificial Intelligence?

Machine Learning vs Artificial Intelligence	
Machine Learning is a type of Artificial Intelligence that gives the ability for a computer to learn without being explicitly programmed. It uses an algorithm to parse data, learn from it and make decisions accordingly.	Artificial Intelligence is the theory and development of computer systems able to perform tasks intelligently similar to a human being.
Functionality	
Machine Learning focus on accuracy and patterns.	Artificial Intelligence focuses on intelligent behavior and the maximum change of success.
Categorization	
Machine Learning can be categorized to Supervise Learning, Unsupervised Learning and Reinforcement Learning.	Artificial Intelligence based applications can be categorized as applied or general.

Summary - Machine Learning vs Artificial Intelligence

Artificial Intelligence is an advance and a broad discipline. It consists of many other fields such as Engineering, Mathematics, Computer Science etc. The difference between Machine Learning and Artificial Intelligence is that Machine Learning is a type of Artificial Intelligence that gives the ability for a computer to learn without being explicitly programmed and Artificial Intelligence is the theory and development of computer systems able to perform tasks intelligently similar to a human.Machine Learning is the new cutting-edge technology of Artificial Intelligence.

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How to Cite this Article?

APA: Difference Between Machine Learning and Artificial Intelligence. (2018 January 19). Retrieved (date), from http://differencebetween.com/difference-between-machine-learning-and-vs-artificial-intelligence/

MLA: "Difference Between Machine Learning and Artificial Intelligence" Difference Between.Com. 19 January 2018. Web.

Chicago: “Difference Between Machine Learning and Artificial Intelligence”. Difference Between.Com. http://differencebetween.com/difference-between-machine-learning-and-vs-artificial-intelligence/accessed (accessed [date]).