Machine learning is a subfield of computer science[1] that evolved from the study of pattern recognition and computational learning theory in artificial intelligence.[1] In 1959, Arthur Samuel defined machine learning as a "Field of study that gives computers the ability to learn without being explicitly programmed".[2] Machine learning explores the study and construction of algorithms that can learn from and make predictions on data.[3] Such algorithms operate by building a model from an example training set of input observations in order to make data-driven predictions or decisions expressed as outputs,[4]:2 rather than following strictly static program instructions.

Machine learning is closely related to (and often overlaps with) computational statistics; a discipline which also focuses in prediction-making through the use of computers. It has strong ties to mathematical optimization, which delivers methods, theory and application domains to the field. Machine learning is employed in a range of computing tasks where designing and programming explicit algorithms is unfeasible. Example applications include spam filtering, optical character recognition (OCR),[5] search engines and computer vision. Machine learning is sometimes conflated

with data mining,[6] where the latter sub-field focuses more on exploratory data analysis and is known as unsupervised learning.Within the field of data analytics, machine learning is a method used to devise complex models and algorithms that lend themselves to prediction. These analytical models allow researchers, data scientists, engineers, and analysts to "produce reliable, repeatable decisions and results" and uncover "hidden insights" through learning from historical relationships and trends in the data.

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