BCA SEMESTER - II

0302203
HISTORY OF COMPUTING

UNIT – 5
HISTORY OF ARTIFICIAL INTELLIGENCE

- Dr. Disha Shah

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  - Tim Bernes Lee
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  - Steve Jobs
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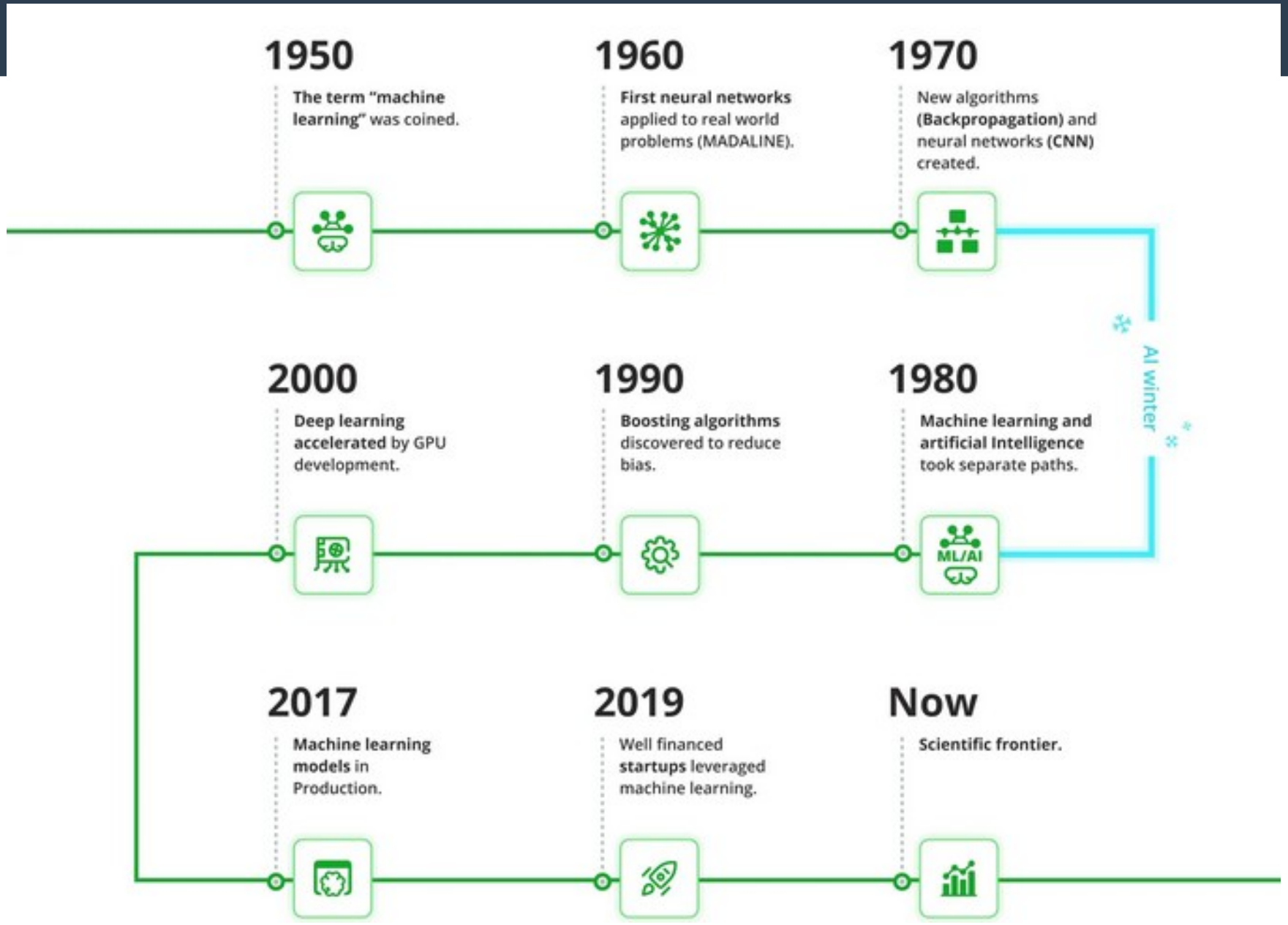
  - Claude Shannon

History of Machine Learning

- It seems like machine learning is everywhere these days.
- Businesses increasingly rely on tools that use ML algorithms to provide them with accurate data for improving and growing their organization.
- Many services we use daily, such as social media and Netflix, use ML to analyze consumer behavior and recommend trending content.
- While machine learning may seem like a very recent concept, you may be surprised to know that the history of machine learning dates back to the 1940s.
- However, it wasn’t until the 1950s that we saw how ML works for the first time.

History of Machine Learning



History of Machine Learning

- Arthur Samuel, a computer scientist at IBM and a pioneer in AI and computer gaming, coined the term “Machine Learning” in 1952.
- That was when he designed a computer program for playing checkers.
- The more the program played the game, the more it learned from its experience, thanks to a minimax algorithm for studying moves to come up with winning strategies.

History of Machine Learning

History of Machine Learning

- 1949 – Donald Hebb published “The Organization of Behavior,” introducing theories on the interaction between neurons, which were later crucial in developing machine learning.
- 1950 – Alan Turing invented the Turing Test, or the imitation game, to determine if a computer can pass for a human-based on its written linguistic fluency.
- 1951 – Dean Edmonds and Marvin Minsky built the SNARC machine, the first machine with an artificial neural network, based on Hebb’s model.
- 1952 – Arthur Samuel developed a computer game of checkers.
- 1957 – Frank Rosenblatt used Hebb’s model and Samuel’s ML algorithms to develop the perceptron, a computer program with human-like thought processes, primarily designed for image recognition.

History of Machine Learning

- 1967 – Thomas Cover and Peter E. Hart came up with the nearest neighbor algorithm, which later became the foundation for pattern recognition.
- 1979 – Stanford students built the Stanford Cart, a remotely-controlled, autonomous cart that could navigate on its own and avoid bumping into objects. It was designed to help study the remote control of a Moon rover.
- 1979 – Kunihiko Fukushima published a research paper on the Neocognitron, an artificial neural network (ANN) with multiple layers for detecting complex patterns. His work later inspired a convolution neural network (CNN) for deep learning.

History of Machine Learning

- 1981 – Gerald DeJong proposed EBL (Explanation-Based Learning), a method that an ML algorithm can use when analyzing data to create general rules and ignore irrelevant data points.
- 1985 – Terrence Sejnowski invented NETtalk, an ML-based computer program that could perform cognitive tasks like a human. With written English text and phonetic transcriptions as input, it learned to “talk” like a baby.
- 1986 – Paul Smolensky invented the restricted Boltzmann machine (RBM) for predicting probabilities of various possible outcomes based on input data. Today, this algorithm is commonly used for AI-driven recommendations and price predictions.

History of Machine Learning

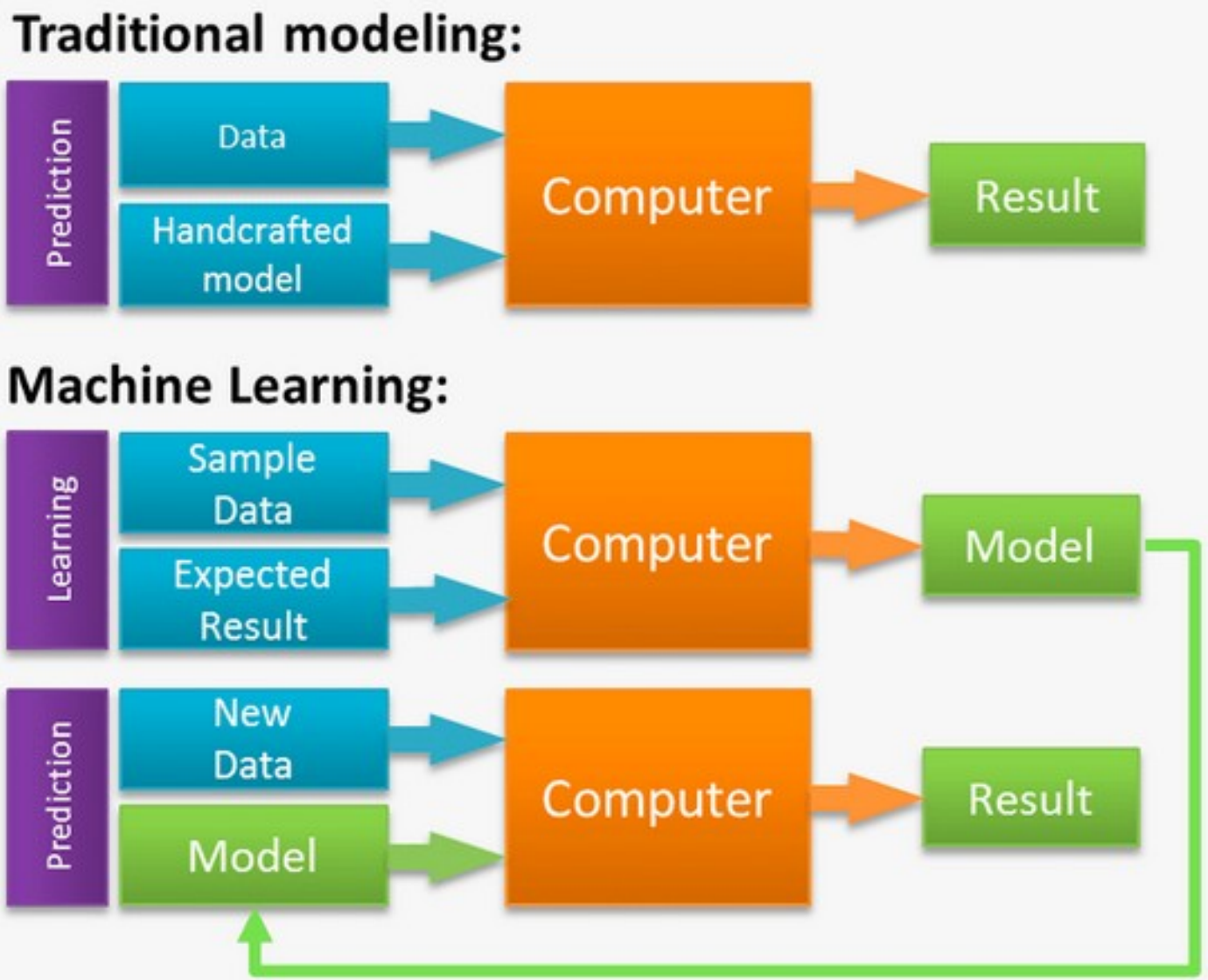
- 1990 – Robert Schapire introduced boosting algorithms for improving AI models. They consist of multiple weak classifiers that together create a strong learning model. Boosting algorithms are used today to analyze massive amounts of data and drive insights from the results.
- 1995 – Tin Kam Ho introduced a random forest algorithm that creates decision trees from multiple AI-powered predictions. Nowadays, it helps in driving accurate predictions from data and enhancing decision-making.
- 1997 – IBM's supercomputer beat Garry Kasparov in chess.

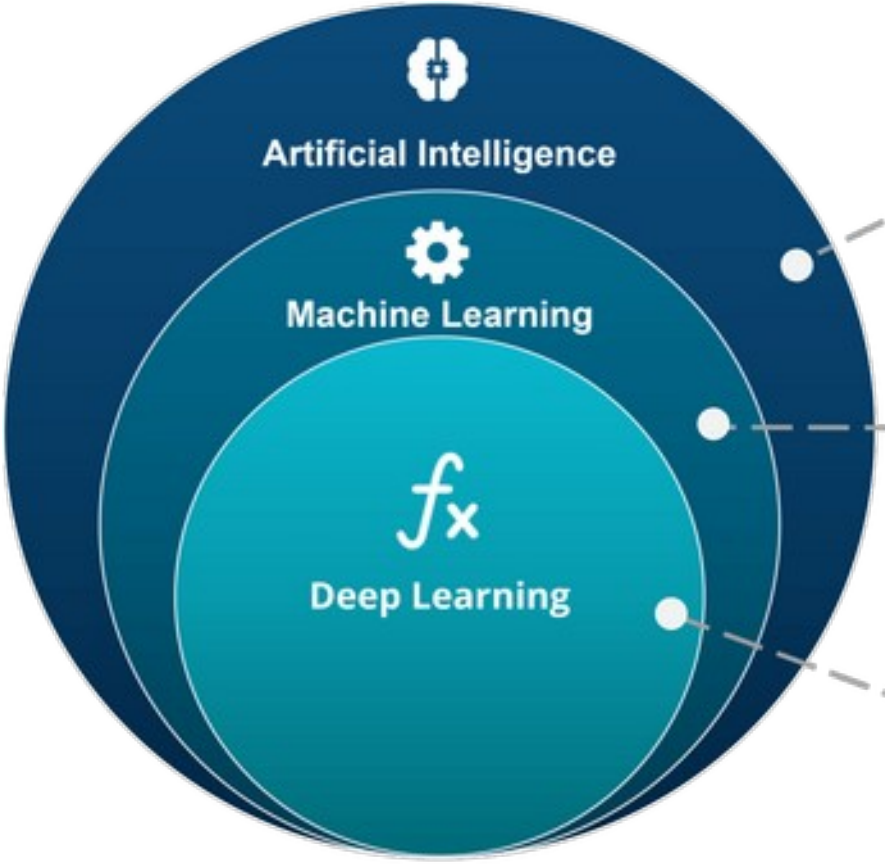
History of Machine Learning

- 2006 – Geoffrey Hinton invented fast-learning algorithms based on an RBM and came up with the term “Deep Learning” to explain how AI-based on ML can learn like a human.
- 2009 – Fei-Fei Li developed ImageNet, an image-based database for improving ML and AI, enabling them to learn from real-world data.
- 2011 – IBM’s Watson beats a human at Jeopardy, thanks to machine learning and natural language processing (NLP).
- 2012 – Google developed Google Brain, an ML algorithm for recognizing cats in images and videos. It marked a breakthrough in image processing.

- 2014 – Facebook created DeepFace, a facial recognition system capable of detecting faces in images, and accurately identifying humans.
- 2014 – Google introduced Sybil, an ML system for predicting user behavior, designed primarily for better advertising.
- 2014 – Chatbot Eugene Goostman passed the Turing Test, although it convinced only 33% of the competition judges that it was human.
- 2016 – Google's AI-powered AlphaGo beat a professional player in Go, an abstract strategy board game.

Traditional Programming v/s Machine Learning





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