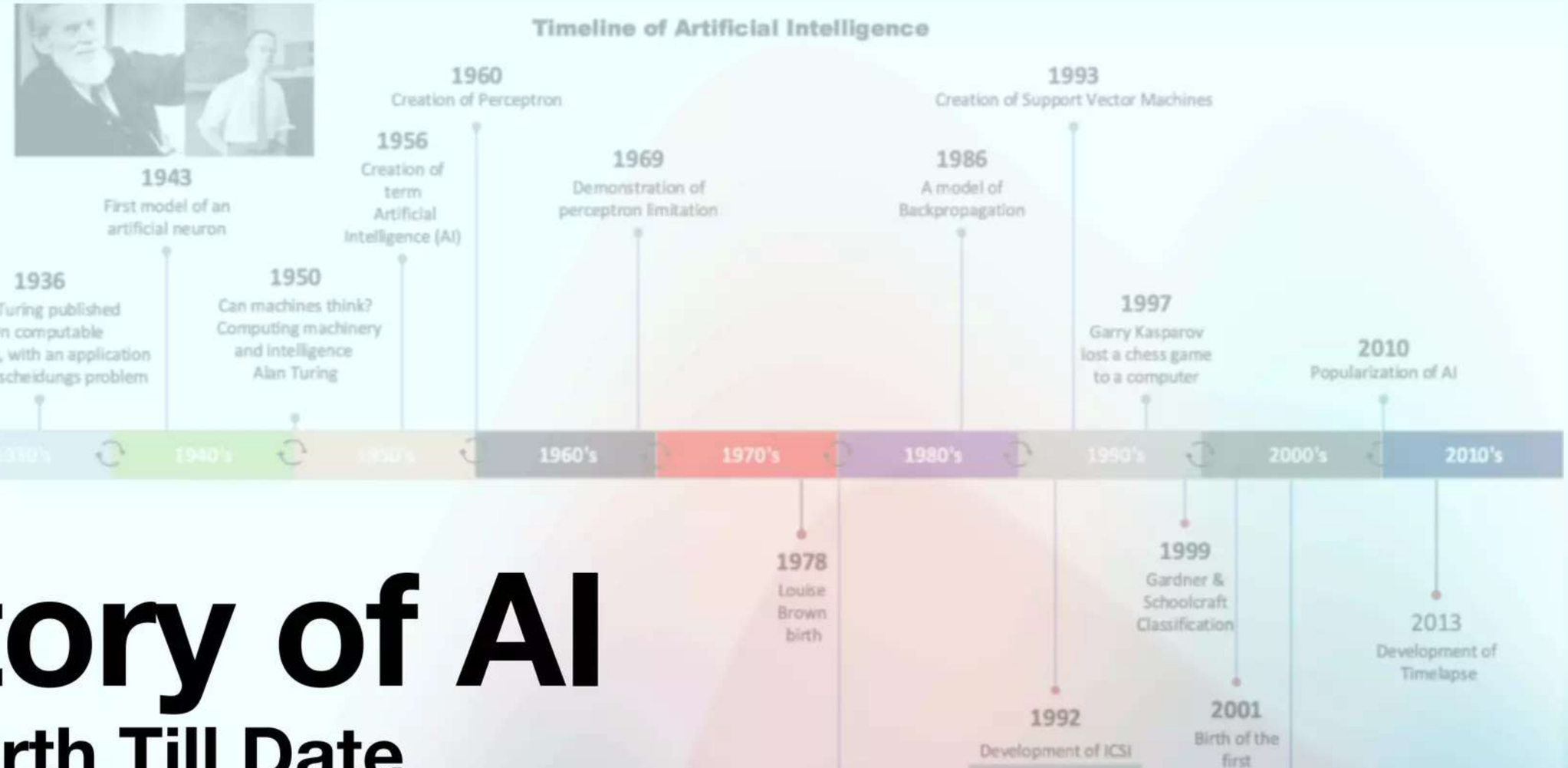


History of AI

From Birth Till Date

AI
SHORTS

AI Shorts - By Sanjay

Birth of AI

1952-1956

In the 1940s and 50s, a handful of scientists from a variety of fields (mathematics, psychology, engineering, economics and political science) began to discuss the possibility of creating an artificial brain.

Symbolic AI

- The programs developed in the years after the Dartmouth Workshop were,
- Computers were solving algebra word problems, proving theorems in geometry and learning to speak English.

1956-1974

1974-1980

AI Winter

- Limited Computer Power
- There are many problems that can probably only be solved in exponential time
- Can still only handle trivial versions of the problems.
- The end of funding

Boom

- Rise of Expert Systems
- The Knowledge Revolution
- The Money Return

1980-1987

1987-1993

Bust : 2nd AI Winter

The collapse was due to the failure of commercial vendors to develop a wide variety of workable solutions.As dozens of companies failed, the perception was that the technology was not viable

AI Renaissance

- AI was both more cautious and more successful than it had ever been.
- Deep Blue became the first computer chess-playing system

Deep learning, big data and artificial general intelligence (AGI)

1993-2011

2011- Present

2015
OpenAI is founded by a group of entrepreneurs

2017
OpenAI releases a language model known as GPT-1

2018
OpenAI releases a language model known as GPT-2

2019
Microsoft backed OpenAI with $1Billion

2020
- OpenAI releases a new version of GPT-3
- OpenAI releases a tool known as DALL-E

2021
OpenAI announces plans to develop and release GPT-3 under Open Source Licence

2022
OpenAI releases a new version of GPT-3 known as GPT-3 Prime

1936 - Alan Turing

Conception

Alan Turing publishes "On Computable Numbers, with an Application to the Entscheidungsproblem,"

Introduces the concept of a universal machine capable of performing any computation that a human being can.

230 [Nov. 12,

ON COMPUTABLE NUMBERS, WITH AN APPLICATION TO THE ENTSCHEIDUNGSPROBLEM

By A. M. Turing.

[Received 28 May, 1936.—Read 12 November, 1936.]

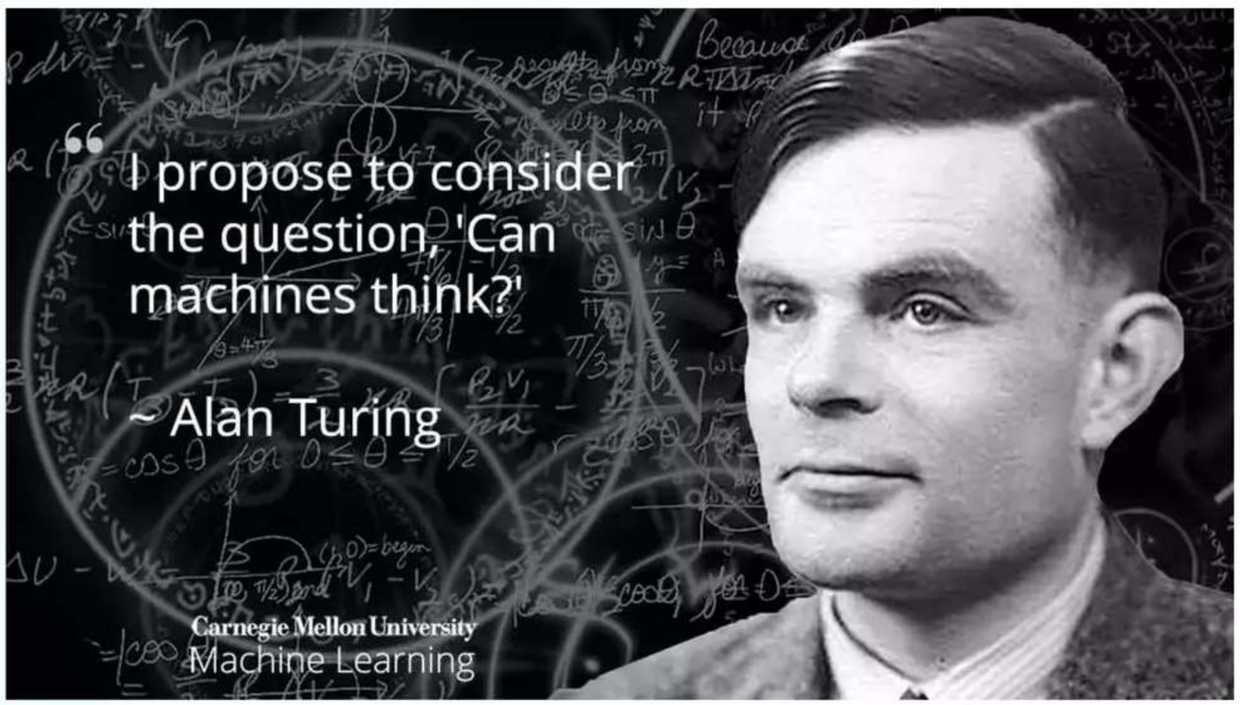
The "computable" numbers may be described briefly as the real numbers whose expressions as a decimal are calculable by finite means. Although the subject of this paper is ostensibly the computable *numbers*, it is almost equally easy to define and investigate computable functions of an integral variable or a real or computable variable, computable predicates, and so forth. The fundamental problems involved are, however, the same in each case, and I have chosen the computable numbers for explicit treatment as involving the least cumbrous technique. I hope shortly to give an account of the relations of the computable numbers, functions, and so forth to one another. This will include a development of the theory of functions of a real variable expressed in terms of computable numbers. According to my definition, a number is computable if its decimal can be written down by a machine.

https://www.cs.virginia.edu/~robins/Turing_Paper_1936.pdf

1950 - Alan Turing

Can Machine Think?

1950: Alan Turing publishes "Computing Machinery and Intelligence" which proposes the Turing Test, a method for determining whether a machine can exhibit intelligent behaviour equivalent to, or indistinguishable from, that of a human.



Computing Machinery and Intelligence

A. M. Turing

1950

1 The Imitation Game

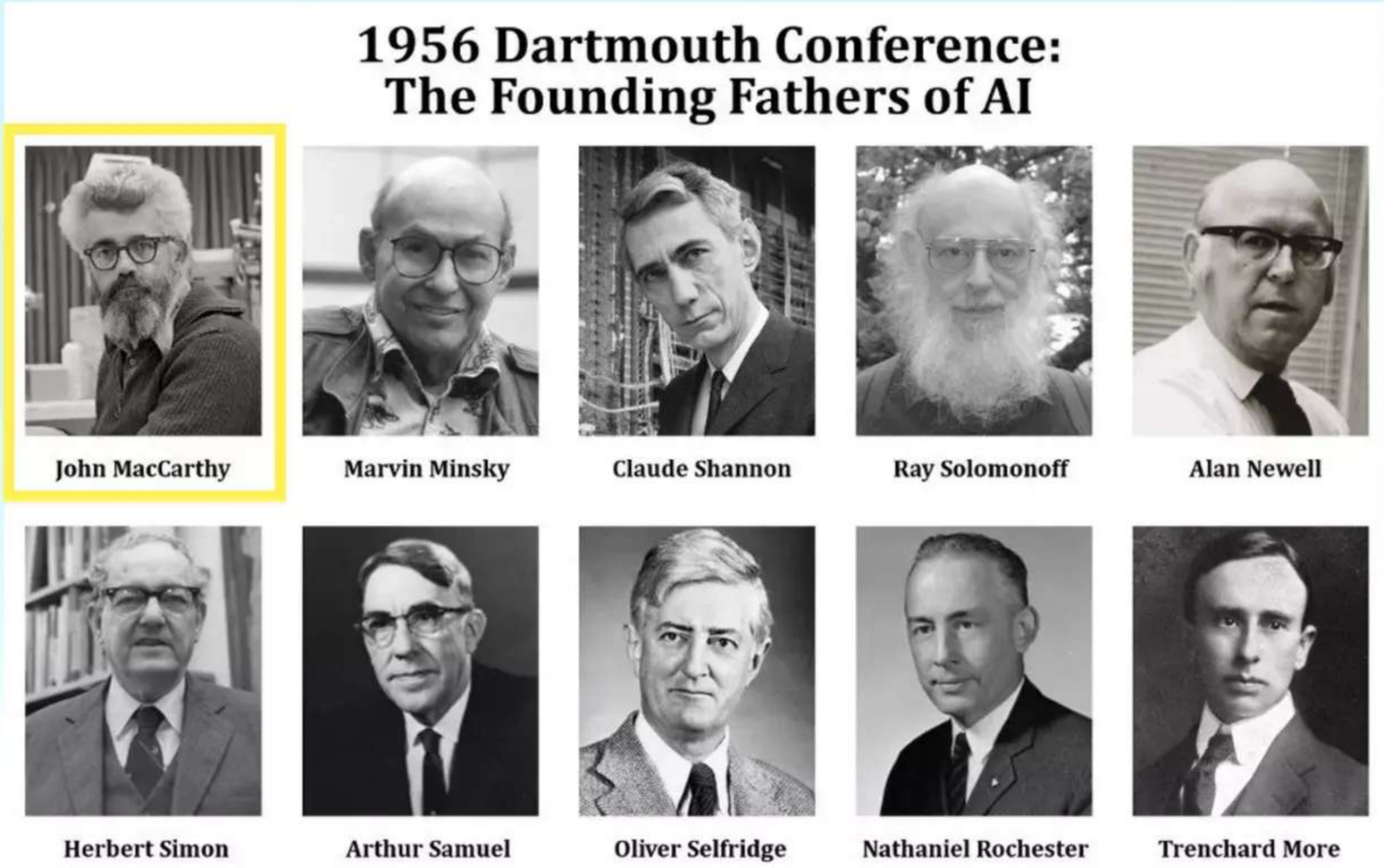
I propose to consider the question, “Can machines think?” This should begin with definitions of the meaning of the terms “machine” and “think.” The definitions might be framed so as to reflect so far as possible the normal use of the words, but this attitude is dangerous, If the meaning of the words “machine” and “think” are to be found by examining how they are commonly used it is difficult to escape the conclusion that the meaning and the answer to the question, “Can machines think?” is to be sought in a statistical survey such as a Gallup poll. But this is absurd. Instead of attempting such a definition I shall replace the question by another, which is closely related to it and is expressed in relatively unambiguous words.

https://web.iitd.ac.in/~sumeet/Turing50.pdf

1956 - John McCarthy

Birth of AI

1956: John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon organize the **Dartmouth** Conference, which is considered to be the birth of AI as a field. The conference defines the goals of AI research and lays the groundwork for the development of early AI systems.



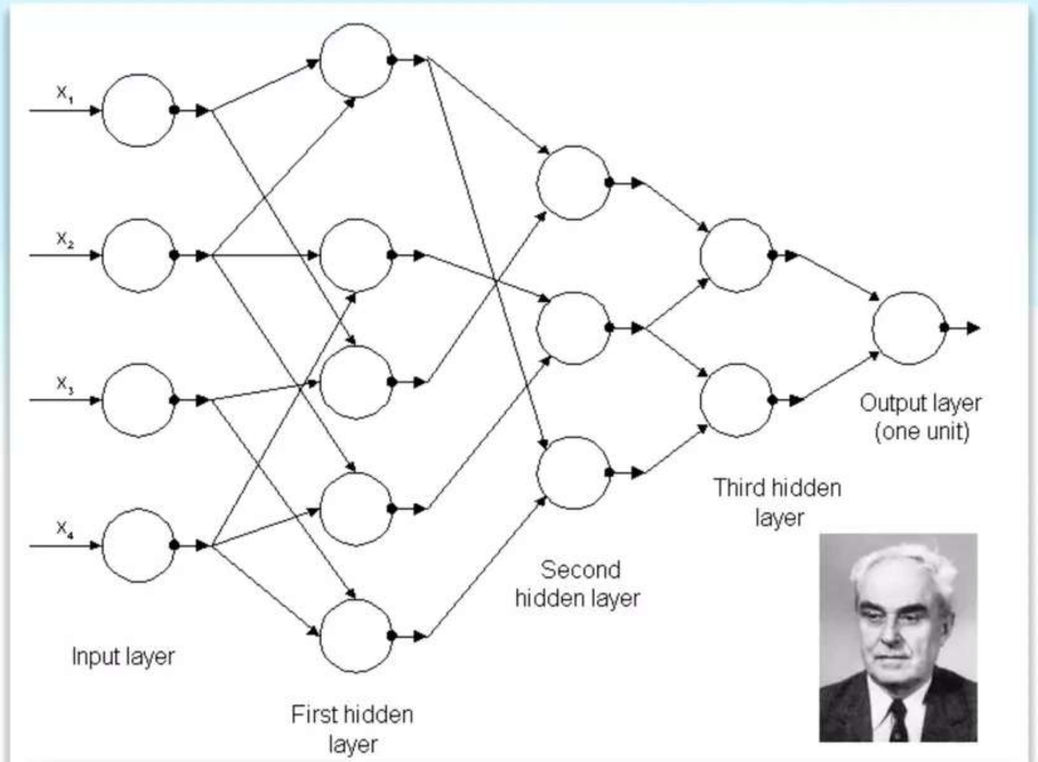
1965 - Anatolii Gershman, Alexey Ivakhnenko, Valentin Lapa

Deep Learning - Multi Layered Perceptron

1965 : **The Group Method of Data Handling** (GMDH) is a data-driven approach to modeling that is based on a multi-layered architecture of interconnected polynomial models.

A multi-layer perceptron (MLP) is a type of artificial neural network (ANN) that is composed of multiple layers of interconnected nodes, or "neurons". MLPs are typically used for supervised learning tasks, such as classification and regression.

Ivakhnenko is often considered as the father of **deep learning.**



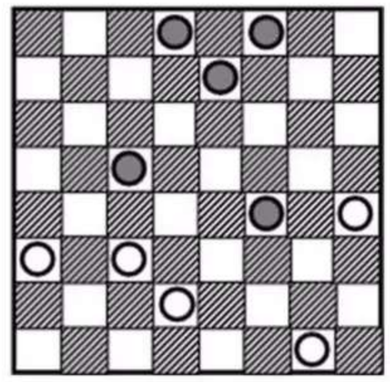
1966 - Arthur Samuel

Machine Learning

1966: Arthur Samuel is the first person to come up with and popularize the term "machine learning”.

He defines it as the "field of study that gives computers the ability to learn without being explicitly programmed."

- Arthur Samuel (1959) wrote a program that **learnt** to play checkers well enough to beat him.



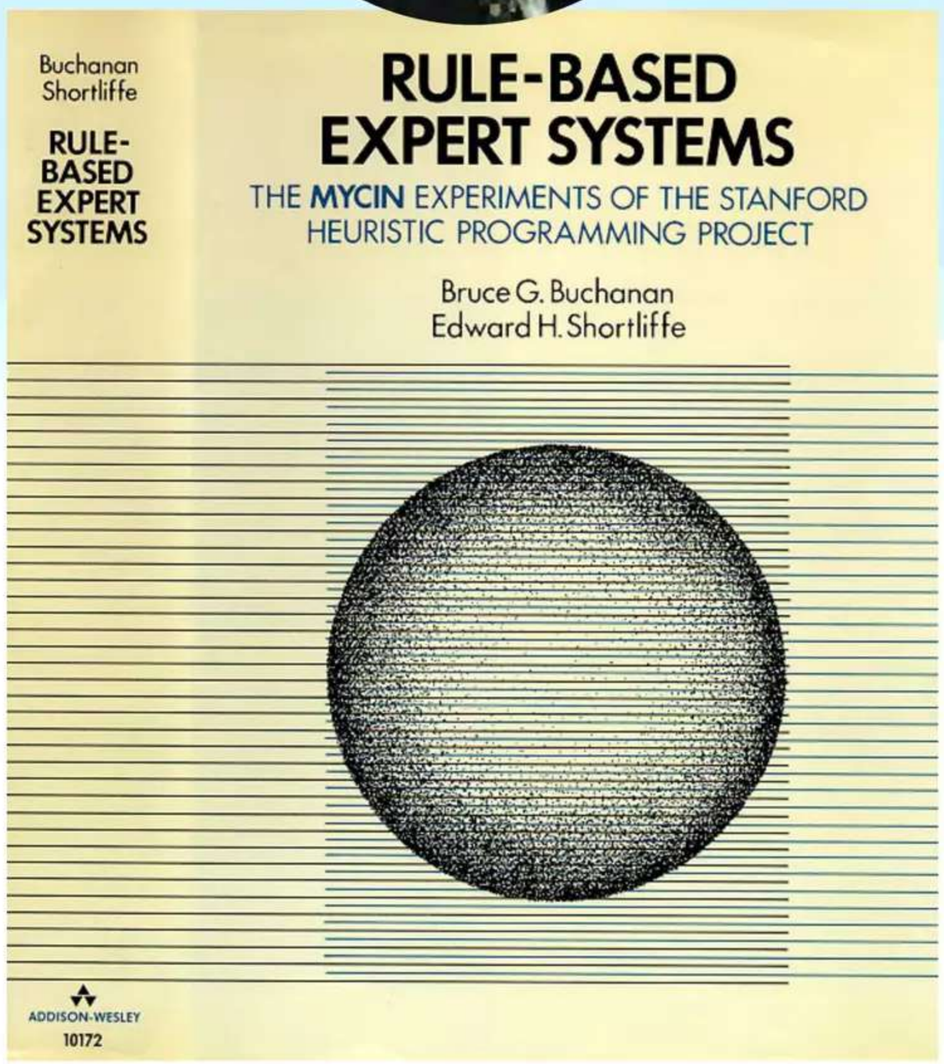
1974 - Edward Shortliffe

First Application of AI

1974: The first AI program, known as the MYCIN system, is developed to assist physicians in diagnosing bacterial infections.

It was one of the first successful applications of AI in the field of medicine, and it helped to inspire further research and development in this area.

1980s: Expert systems, which are AI systems designed to emulate the decision-making abilities of a human expert in a specific field, become popular in business and industry.



During AI Winter

1974 - 1980 — 1st AI Winter

1986 - Deep Neural Networks

Backpropagation Algorithm

1986: Geoffrey Hinton, David Rumelhart, and Ronald Williams publish a paper on the backpropagation algorithm, which revolutionizes the field of neural network research and makes it possible to train deep neural networks.

The Authors

- David E. Rumelhart
  - *Stanford University*
- Geoffrey E. Hintont
  - *University of Toronto*
- Ronald J. Williams
  - *Northeastern University*

in

- 1986

E/15/325 Chalani

Learning representations by back-propagating errors

David E. Rumelhart*, Geoffrey E. Hinton† & Ronald J. Williams*

* Institute for Cognitive Science, C-015, University of California, San Diego, La Jolla, California 92093, USA
† Department of Computer Science, Carnegie-Mellon University, Pittsburgh, Philadelphia 15213, USA

1987 - 1993 — 2nd AI Winter

2006 - Geoffrey Hinton

Improvement in Speech and Image Recognition

2006: Geoffrey Hinton and his team develop deep learning algorithms that significantly improve speech recognition and image recognition.

Deep Belief Networks, which allows for efficient and effective training of large-scale neural networks for machine learning tasks.

A fast learning algorithm for deep belief nets *

Geoffrey E. Hinton and **Simon Osindero**
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Abstract

We show how to use "complementary priors" to eliminate the explaining away effects that make inference difficult in densely-connected belief nets that have many hidden layers. Using complementary priors, we derive a fast, greedy algorithm that can learn deep, directed belief networks one layer at a time, provided the top two layers form an undirected associative memory. The fast, greedy algorithm is used to initialize a slower learning procedure that fine-tunes the weights using a contrastive version of the wake-sleep algorithm. After fine-tuning, a network with three hidden layers forms a very good generative model of the joint distribution of handwritten digit images and their labels. This generative model gives better digit classification than the best discrimi-

remaining hidden layers form a directed acyclic graph that converts the representations in the associative memory into observable variables such as the pixels of an image. This hybrid model has some attractive features:

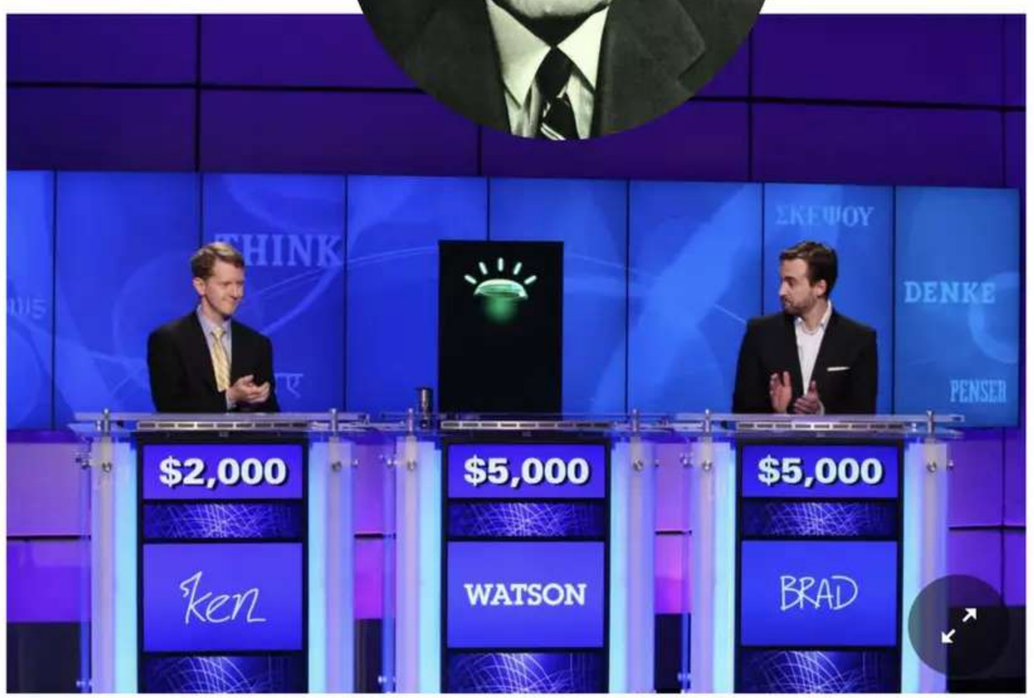
1. There is a fast, greedy learning algorithm that can find a fairly good set of parameters quickly, even in deep networks with millions of parameters and many hidden layers.
2. The learning algorithm is unsupervised but can be applied to labeled data by learning a model that generates both the label and the data.
3. There is a fine-tuning algorithm that learns an excellent generative model which outperforms discriminative methods on the MNIST database of hand-written digits.
4. The generative model makes it easy to interpret the dis-

2011 - Thomas J. Watson

Machine Beats Human in a game

2011: IBM's Watson defeats human champions in the game show Jeopardy!

Watson defeated Jennings and Rutter by a significant margin, winning a grand prize of $1 million.



Two “Jeopardy!” champions, Ken Jennings, left, and Brad Rutter, competed against a computer named Watson, which proved adept at buzzing in quickly. Carol Kaelson/Jeopardy Productions Inc., via Associated Press

2014-18 : Google acquires DeepMind

Development of Deep Learning Algorithms

2014: Facebook creates its AI research division, and Google acquires DeepMind, an AI company that later develops the AlphaGo system that beats the world champion in the game of Go.

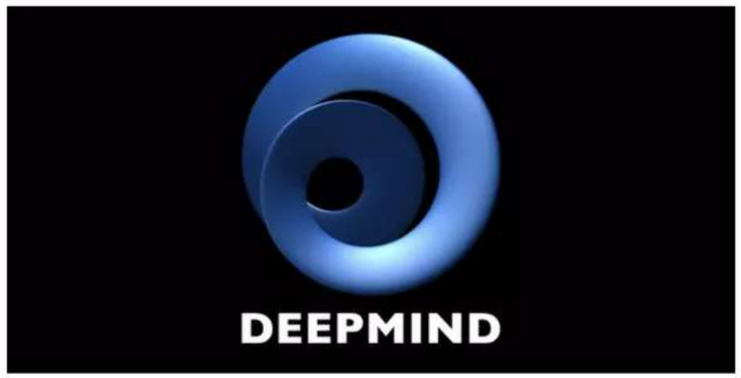
2016: Google's AlphaGo defeats world champion Lee Sedol in a five-game match.

2018: The development of deep learning algorithms for natural language processing leads to significant improvements in machine translation and other language-based AI applications.

AlphaGo's ultimate challenge: a five-game match against the legendary Lee Sedol

Google Acquires Artificial Intelligence Startup DeepMind For More Than $500M

Catherine Shu @catherineshu / 6:50 AM GMT+5:30 • January 27, 2014 Comment



Google will buy London-based artificial intelligence company DeepMind. The Information reports that the acquisition price was more than $500 million, and that Facebook was also in talks to buy the startup late last year. DeepMind confirmed the acquisition to us, but couldn't disclose deal terms.

https://techcrunch.com/2014/01/26/google-deepmind/

2015-2022 - Open API & ChatGPT3

Large Language Model

2015: OpenAI is founded by a group of entrepreneurs - Elon Musk, Sam Altman, Reid Hoffman etc - they pledged $1Billion

2017: OpenAI releases GPT-1

2018: OpenAI releases GPT-2

2019: Microsoft backed OpenAI with $1Billion

2020: OpenAI releases a new version of GPT-3

2020: OpenAI releases a tool known as DALL-E

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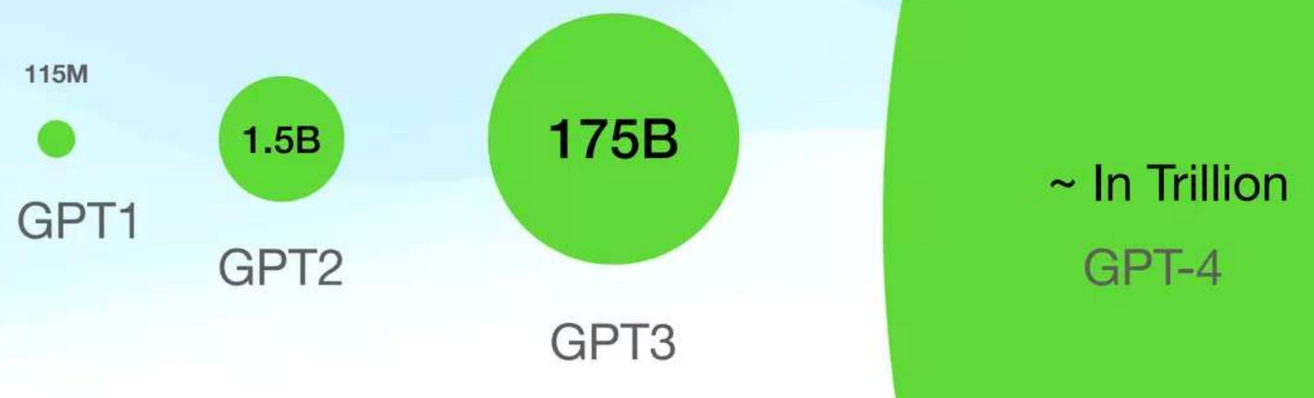

Significance of Number of Params

These are tuneable variables that the model has learned during the training process.

More params means more flexibility in the model's ability to generate diverse and coherent text output