Understanding The History of AI

1950 - Alan Turing introduced the "Turing Test"

Initially referred as the "imitation game" by Alan Turing, the Turing test is a set of guidelines to test whether the machine exhibits the behaviours of intelligent being similar to humans.

https://academic.oup.com/mind/article/LIX/236/433/986238

1956 - Term "Artificial Intelligence" was Born

Term 'artificial intelligence' is coined by computer scientist, John McCarthy to describe "the science and engineering of making intelligent machines"

1966 - First intelligent robot

The first intelligent robot named "Shakey" was able to visually interpret its surrounding environment.

1974 – 1980: AI Winter

Popularity
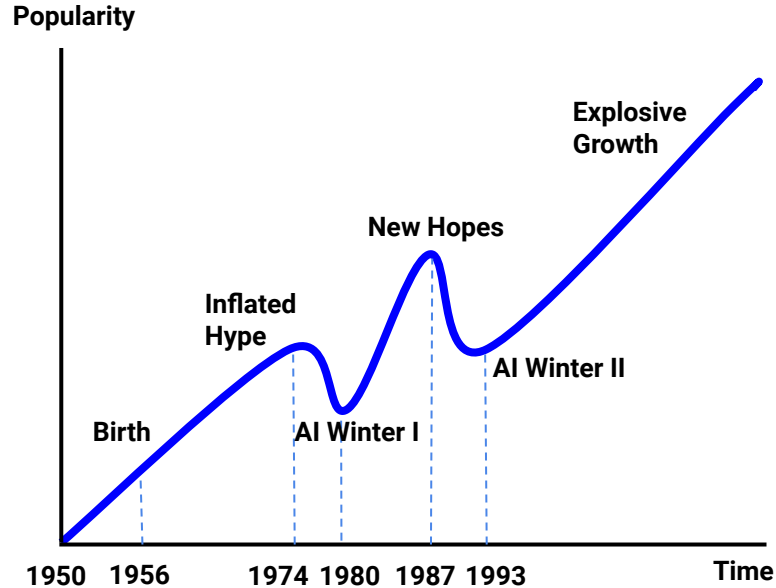
- After 1955, research in AI saw a surge of interest and was greatly hyped.

- Researchers were overpromising the potential of AI and failing to deliver significant results due to slow progress in computing power.

- This led to people losing interest in AI, and thus decline in research funding.

- Research activities were forced to a halt due lack of funding.

- This period where the research stopped is called the AI winter.

Source: http://introtodeeplearning.com

1980s - Deep Learning - The First Revolution

David Hubel and Torsten Wiesel made a breakthrough about information processing in the visual system. **Received Nobel prize in Physiology**

574

J. Physiol. (1959) 148, 574-591

RECEPTIVE FIELDS OF SINGLE NEURONES IN THE CAT'S STRIATE CORTEX

By D. H. HUBEL* AND T. N. WIESEL*

From the Wilmer Institute, The Johns Hopkins Hospital and University, Baltimore, Maryland, U.S.A.

(Received 22 April 1959)

In the central nervous system the visual pathway from retina to striate cortex provides an opportunity to observe and compare single unit responses at several distinct levels. Patterns of light stimuli most effective in influencing units at one level may no longer be the most effective at the next. From differences in responses at successive stages in the pathway one may hope to gain some understanding of the part each stage plays in visual perception.

By shining small spots of light on the light-adapted cat retina Kuffler (1953) showed that ganglion cells have concentric receptive fields, with an 'on' centre and an 'off' periphery, or vice versa. The 'on' and 'off' areas within a receptive field were found to be mutually antagonistic, and a spot restricted to the centre of the field was more effective than one covering the whole receptive field (Barlow, FitzHugh & Kuffler, 1957). In the freely moving light-adapted cat it was found that the great majority of cortical cells studied gave little or no response to light stimuli covering most of the animal's visual field, whereas small spots shone in a restricted retinal region often evoked brisk responses (Hubel, 1959). A moving spot of light often produced stronger responses than a stationary one, and sometimes a moving spot gave more activation for one direction than for the opposite.

The present investigation, made in acute preparations, includes a study of receptive fields of cells in the cat's striate cortex. Receptive fields of the cells considered in this paper were divided into separate excitatory and inhibitory ('on' and 'off') areas. In this respect they resembled retinal ganglion-cell receptive fields. However, the shape and arrangement of excitatory and inhibitory areas differed strikingly from the concentric pattern found in retinal ganglion cells. An attempt was made to correlate responses to moving stimuli

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1980s - Deep Learning - The First Revolution
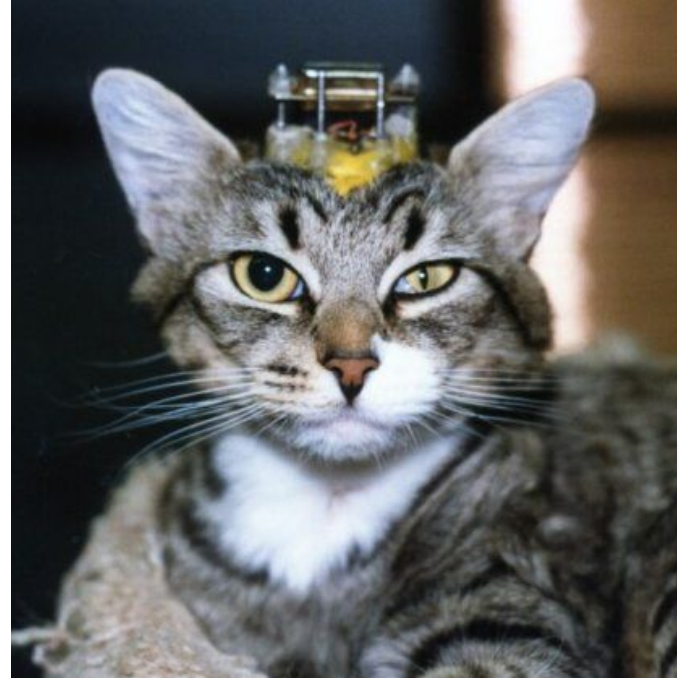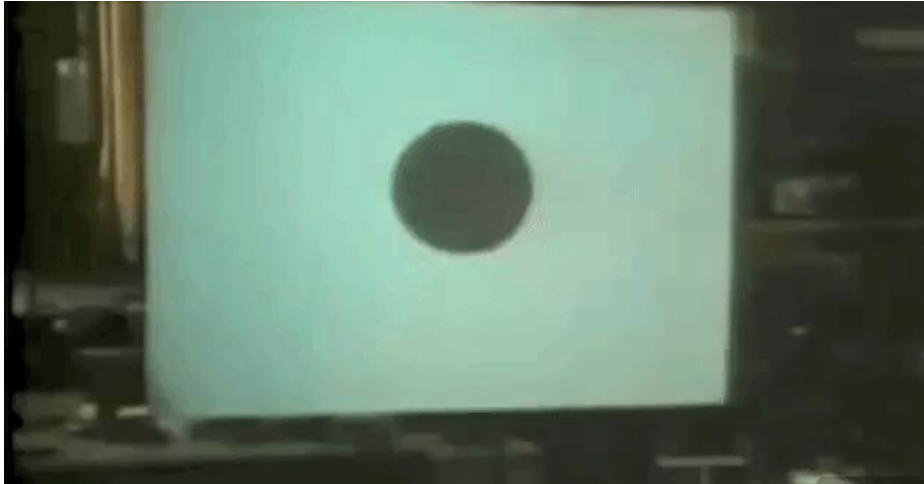
1980s - Deep Learning - The First Revolution

They found that the cat's brain will be stimulated by a certain pattern of light bar
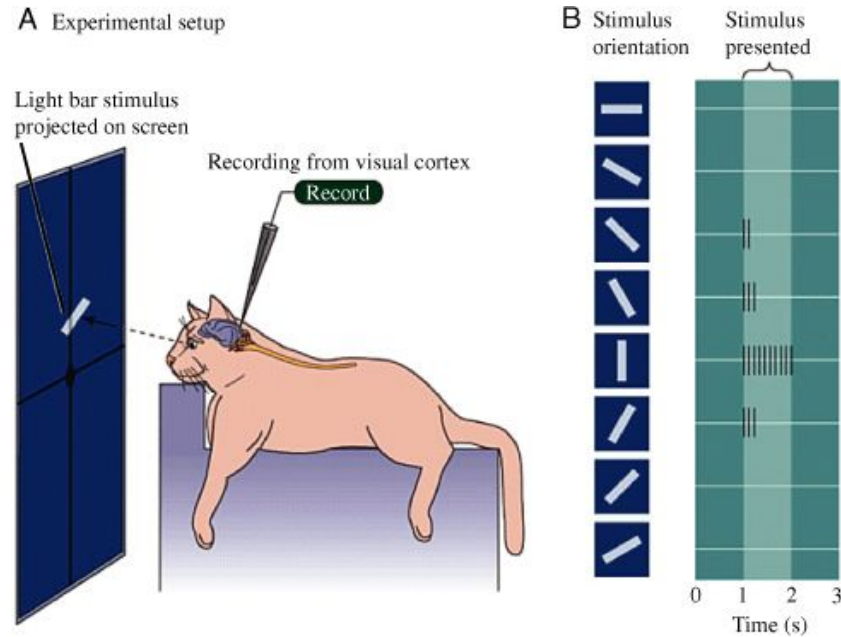
1997 - IBM Deep Blue vs Garry Kasparov

- Deep Blue is a chess playing computer

- Deep Blue beats 12-world chess title Garry Kasparov. Kasparov lost two games to one, with three draws

- Deep Blue could calculate as many as 100 billion to 200 billion moves in the three minutes (time allotted to a player per move in standard chess)

- During the last game, Kasparov resigned for the first time in his career, which considered he lose the game

https://www.youtube.com/watch?v=XA6kvQyZIQY

2002 - iRobot Roomba

2011 – IBM Watson's Jeopardy! Victory

- It is a question answering computer. Wins first place in 2011 Jeopardy! game

- Competed against the world's best Jeopardy! Champions.

- This milestone shows that computer can understand questions posed in natural language and answer them.

The History of AI

Deep Learning: The Second Revolution

The History of AI 1950 - 2010 (Recap)

1956	**1969**	**1980s**	**1997**	**2002**

The word 'artificial intelligence' coined by John McCarthy

'Shakey' was the first general purpose mobile robot built

The first deep learning revolution brought major insights into visual information processing

Supercomputer 'Deep Blue' was designed which defeated the world chess champion in a game

First commercially successful robotic vacuum cleaner 'iRobot Roomba' created

CERTIFAI
powered by Skymind

2010s - Deep Learning - The Second Revolution

- How does AI learn to see and understand the world that we are living?
- Needs a lot of data to achieve that.
- ImageNet is a large database contains over 14 million images with different types of common object around us.
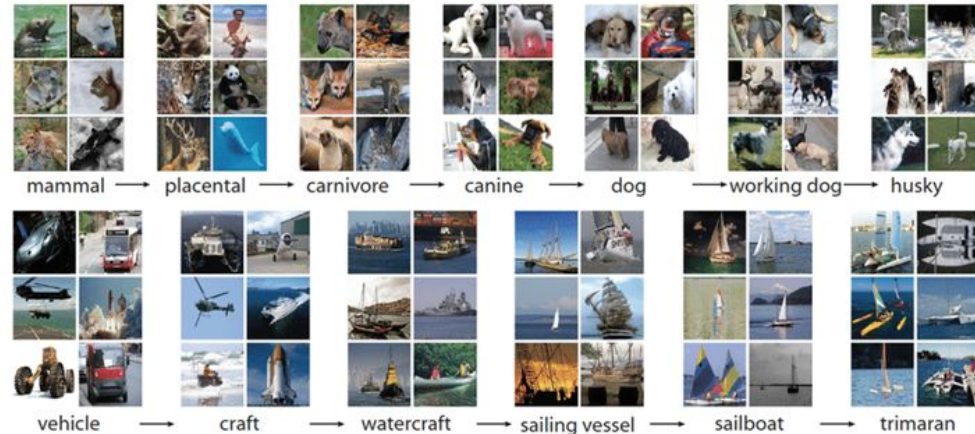
2010s - Deep Learning - The Second Revolution

ImageNet challenge since 2010

- Evaluate algorithm at object detection and recognition

- Unleash the power of training processes with GPU (since 2012)

- **By 2015, an AI algorithm surpassed human accuracy for image recognition...**

2011
26% errors

Humans
5% errors

2016
3% errors

2012 − True power of Deep Learning is unveiled to the world

- Deep learning neural network was exposed to 10 million randomly selected YouTube video thumbnails.

- The neural network was fed with information over the course of three days.

- After being presented with a list of 20,000 different items, it began to recognize pictures of cats using a "deep learning" algorithm.

CERTiFAI
powered by Skymind

2011 - 2014: Personal Assistants

- Use speech recognition to answer questions and perform simple tasks.

- Apple integrates Siri, an intelligent virtual assistant with a voice interface, into the iPhone 4S.

- Amazon launches Alexa, virtual assistant that can complete shopping tasks
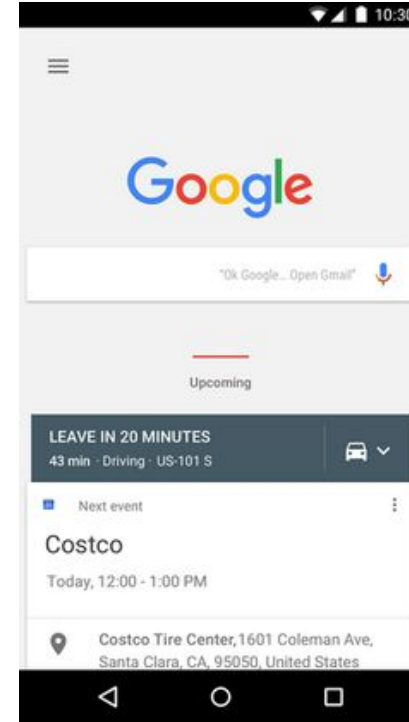
2016 - AlphaGo beats Lee Sedol in Final Match

AlphaGo seals 4-1 victory over Go grandmaster Lee Sedol

DeepMind's artificial intelligence astonishes fans to defeat human opponent and offers evidence computer software has mastered a major challenge

▲ The world's top Go player, Lee Sedol, lost the final game of the Google DeepMind challenge match. Photograph: Yonhap/Reuters

It's a strategic board game

2016 - AlphaGo beats Lee Sedol in Final Match

The History of AI

Beyond AlphaGo

2017 - AlphaGo Zero
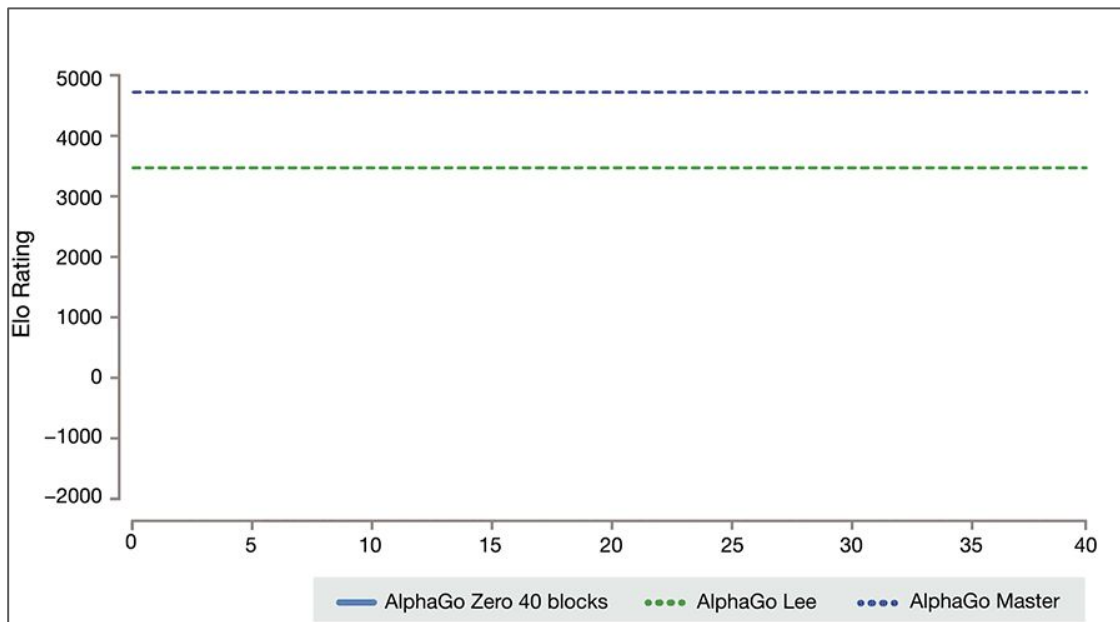
2019 - AlphaStar in StarCraft 2

DeepMind AI AlphaStar goes 10-1 against top 'StarCraft II' pros

The AI beat 'StarCraft' pros TLO and MaNa thanks to more than 200 years worth of game knowledge.

AJ Dellinger, @ajdell
January 24, 2019

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Comments

https://www.engadget.com/2019-01-24-deepmind-ai-starcraft-ii-demonstration-tlo-mana.html

2019 - AlphaStar in StarCraft 2

Timeline of AI History

1642 — First mechanical calculating machine built by French mathematician and inventor Blaise Pascal.

1837 — First design for a programmable machine, by Charles Babbage and Ada Lovelace.

1943 — Foundations of neural networks established by Warren McCulloch and Walter Pitts, drawing parallels between the brain and computing machines.

1950 — Alan Turing introduces a test—the Turing test—as a way of testing a machine's intelligence.

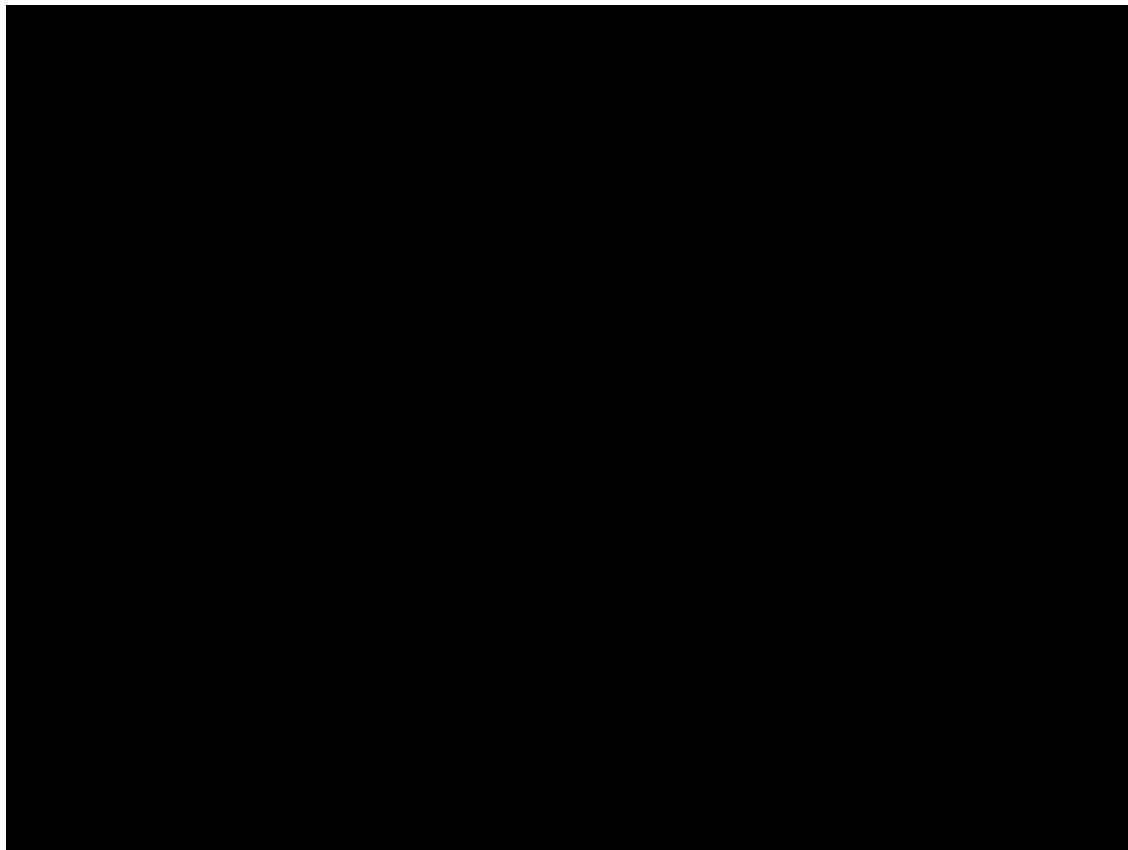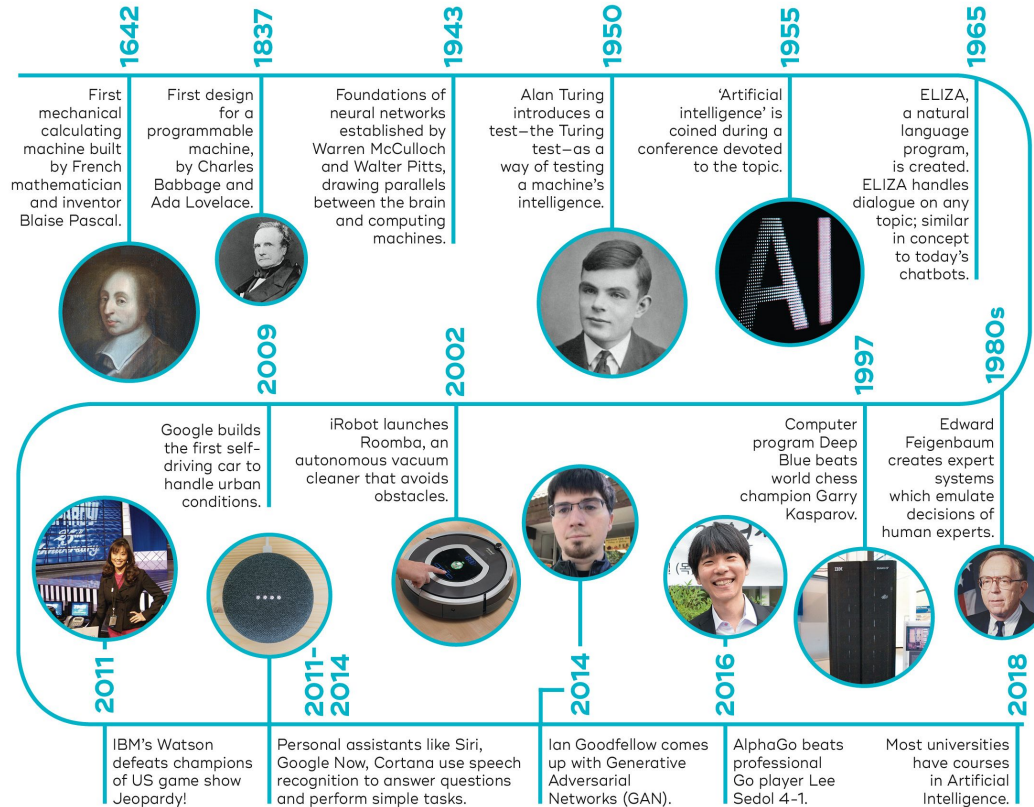**1955** — 'Artificial intelligence' is coined during a conference devoted to the topic.

1965 — ELIZA, a natural language program, is created. ELIZA handles dialogue on any topic; similar in concept to today's chatbots.

1980s — Edward Feigenbaum creates expert systems which emulate decisions of human experts.

1997 — Computer program Deep Blue beats world chess champion Garry Kasparov.

2002 — iRobot launches Roomba, an autonomous vacuum cleaner that avoids obstacles.

2009 — Google builds the first self-driving car to handle urban conditions.

2011 — IBM's Watson defeats champions of US game show Jeopardy!

2011-2014 — Personal assistants like Siri, Google Now, Cortana use speech recognition to answer questions and perform simple tasks.

2014 — Ian Goodfellow comes up with Generative Adversarial Networks (GAN).

2016 — AlphaGo beats professional Go player Lee Sedol 4-1.

2018 — Most universities have courses in Artificial Intelligence.

https://qbi.uq.edu.au/brain/intelligent-machines/history-artificial-intelligence