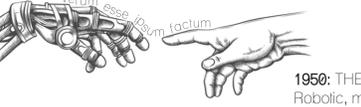


A brief history of Artificial Intelligence

starting around the cybernetics movement

From cybernetics to AI

The idea that humans and machines are essentially the same gives rise to a project where scientists began to seriously consider what it would take to develop machines with human-like intelligence.



The "birth of AI" in the wake of the cybernetics movement

Bringing together the functioning of machines and organic beings



1942: Accelerated code breaking Alan Turing used the Bombe machine to decode messages encrypted using the Enigma machine at an accelerated pace during WWII

1949: "The Manchester Baby" runs its first program

1940's

1948: "Cybernetics" the study of control and communication in the animal and the machine by Norbert Wiener

1948: Mark 1 Prototype The first stored program computer also known as the "Manchester Baby" A proof of concept to test the first electronic random-access memory (RAM) device Built by Tom Kilburn & Freddie Williams

1949: "Giant Brains: Or Machines That Think" Edmund Berkeley compares machines to human brains if it were made of "hardware and wire instead of flesh and nerves."

1943: Machines and behavior "Behavior, Purpose, and Teleology" by Rosenblueth, Wiener, & Bigelow

1943: "Artificial Neurons" A Logical Calculus of the Ideas Immanent in Nervous Activity by McCulloch & Pitts

The birth of neural networks

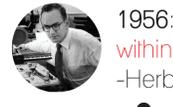
"Artificial Intelligence"

Introduced into the nomenclature by John McCarthy

"The construction of computer programs that engage in tasks that are currently more satisfactorily performed by human beings because they require high-level mental processes such as: perceptual learning, memory organization and critical reasoning." - Marvin Minsky



1970: "From three to eight years we will have a machine with the general intelligence of an average human being" -Marvin Minsky



1956: "AI will beat a human at chess within the next 10 years" -Herbert Simon

1958: Mechanisation of Thought Processes The 1st International Symposium on Artificial Intelligence held in England.

1966: SHAKEY First robot to perceive its surroundings, navigate, plan a route, adjust for errors, and improve its abilities using English language communication Stanford Research Institute

1955: First AI Workshop Proposed to be held at Dartmouth in 1956 McCarthy, Minsky, Rochester, Shannon

1957: The term "Computer Science" was coined by Louis Fein

1965: DENDRAL Expert System: hypothesis formation and science Inferences & Logical Conclusions Feigenbaum & Lederberg

1950: THESEUS Robotic, maze-solving mouse that could "remember" its path. Claude Shannon, Bell Labs

1950: The Imitation Game Computing Machinery and Intelligence by Alan Turing

1957: The Perceptron learns to identify shapes; an early form of machine learning Created by Frank Rosenblatt

1964: ELIZA Chatbot Natural Language Processing Created by Weizenbaum

1958: LISP (List Processing) First Programming Language Created by: John McCarthy



1950's

1961: UNIMATE First Industrial Robotic arm available commercially Created by George Devol

"Machine Learning"

Introduced into the nomenclature by Arthur Samuel at IBM

1956: The first AI program Logic Theorist - prove theorems in symbolic logic from Whitehead and Russell's Principia Mathematica Created by Newell & Simon

1964: Facial Recognition Used "landmarking" techniques to identify facial features Created by Bledsoe, Wold, & Bisson

1957: General Problem Solver Means-End Problem Solving Newell, Simon, & Shaw

1961: SAINT (Symbolic Automatic INtegrator) heuristic problem-solving program for symbolic integration in calculus Created by James Slagle

1955: Introduced into the nomenclature by John McCarthy

1968: SHRDLU Natural language processing program that controlled a block world using English language instructions created by Terry Winograd

1961: "The Stanford Cart" first autonomous vehicle created by James Adams

1968: Artist Vera Molnar uses punch card instructions to create digital art using the Fortran program- the first "dehumanized art"

AI Boom

1972: WABOT-1 The first "android" Walked, communicated in Japanese and gripped objects Waseda University

1976: Physical Symbol System Hypothesis "Computer science as empirical inquiry Symbols and Search" by Newell & Simon

1973: Reduced funding for AI due to lack of promised progress in Britain

1979: Gammanoid beats champion at back-gammon Created by: Hans Berliner

1970's

1983: The problem of "knowledge acquisition" acknowledged as a barrier to AI progress

1980's

1979: The Stanford Cart successfully navigates a room without human assistance

1984: "Winter is Coming" -Schank & Minsky

1980: XCON First expert system on the commercial market Used to configure customer orders and reduce shipping times

1975: SAM Program meant to "understand" stories run on scripts Created by Roger Schank

1986: Back-Propogation for networks of neuron-like units "Learning representations by back-propogating errors" by Rumelhart, Hinton, & Williams

1989: WABOT-2 Humanoid robot that communicated with people, read music, and played music on an electronic organ Waseda University

1986: First Driverless Car Could drive up to 55 mph Mercedes-Benz

1987-1994 Expert Systems AI Winter Limitations of F-then reasoning apparent Expert systems based on F-then reasoning failed because software was hard to maintain and couldn't handle novel information

1971: Microprocessor Invented by Ted Hoff Ushering in the "Golden Age" of Expert Systems Hoff received the national medal of technology & Innovation in 2010

1st AI Winter

Perceptions failed to live up to expectations Discoveries made failed to make the promised impact

"Augmented Reality"

Introduced into the nomenclature by Tom Caudell

1987: VPL Data Glove A VR glove that controlled a virtual hand

1989: CYBERFACE VR glasses created LeapVR

1990: 5th Generation Computer Project Japan spends \$850 million to create computers that could translate and use human language + express human-level reasoning

1988: Eigenface Linear Algebra is used to advance facial recognition programs Sirovich & Kirby

1989: The "web" is invented by Tim Berners-Lee

1988: Shift from rule-based to probabilistic methods of machine translation IBM T.J. Watson Research Center

1990: WorldWideWeb The first web browser is launched Created by Tim Berners-Lee

1990's

1992: TD-Gammon Artificial Neural Net trained to play backgammon IBM

1987: A new architecture of cognition: Parallel Distributed Processing Vol. 1 & 2 "Foundations" & "Psychological and Biological Models" by James L. McClelland & David E. Rumelhart

1988: JABBERWACKY Amusing chatbot Created by: Rollo Carpenter,

1997: Deep Blue beats Grand Master at Chess IBM Expert System that used a systematic brute force system 41 years after Simon's prediction

1998: COMPAS Software that assigns an algorithmic score for recidivism risk is used across several states to determine sentencing In 2016, it was shown that the algorithm was giving biased assessments based on race

1997: KISMET "Lifelike" social robot inspired by child developmental psychology that could recognize and display emotions

1999: The terms "Hyperlink" and "hypertext" are coined by Tim Berners-Lee

1987: Market for specialized LISP-based hardware collapses Low consumer, public, and private interest in AI

"Deep Learning"

coined by Geoffrey Hinton to explain new algorithms that can be trained to recognize objects and text in images and videos

1997: LSTM RNN used for handwriting and speech recognition Created by Hochreiter & Schmidhuber

1997: Six Degrees First social media platform

1998: FURBY First pet robot By Coleb Chung

2002: ROOMBA i-Robot

2002: Digital information storage surpasses non-digital information storage

2003: Mars Rover Navigates Mars without human intervention

1997: Speech Recognition Software

1997: Deep Blue beats Grand Master at Chess IBM Expert System that used a systematic brute force system 41 years after Simon's prediction

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1997: KISMET "Lifelike" social robot inspired by child developmental psychology that could recognize and display emotions

2004: BigDog Boston Dynamics creates dynamically stable quadruped military robot

2007: ImageNet Visual Database designed to use in visual recognition software research 20,000 categories

2005: Mechanical Turk Service that recruited humans to hand label over 3 million images across 5k categories for computer vision tasks

2000: da Vinci First robot surgical system

2004: STANLEY first autonomous vehicle to win the Defense Advanced Research Projects Agency's "Grand Challenge" by successfully navigating a 132-mile course in the Mojave Desert on it's own Stanford AI Lab

The Rise Of DEEP LEARNING:

2010: XBOX 360 Kinect First gaming hardware to track body movements and translate it into gaming directions

2011: Video Recognition Google X uses a neural network of 16,000 computer processors with 1 billion connections to browse YouTube. The AI identifies cats as a common image.

2013: Word2Vec program that converts language into math is created by Google In 2015 it was discovered that the model produced biased results such as refusing to categorize women as doctors generating concerns about biased training data

2017: UX Algorithms Used to enhance advertising and user experience

2011: WATSON created & wins on Jeopardy!

2013: Atlas First iteration of the humanoid robot is created for search and rescue tasks Boston Dynamics

2017: AlphaGo Zero beats AlphaGo using a self-training model

2011: SIRI Apple releases virtual assistant

2015: DeepDream Convolutional Neural Net that using deep learning produced hallucinogenic imagery

2016: SOPHIA Humanoid Robot becomes the first "robot citizen" Created by David Hanson Jr.

2010: "AlexNet" Convolutional Neural Network achieves 15.3% error rate with image recognition using deep learning In 2015 it was discovered that the AI mislabels images featuring people with dark skin as "Gorilla" As a solution, Google+ removes the Gorilla label entirely. As of 2023, the label is still removed from the database

2016: The Next Rembrandt Deep learning algorithm creates realistic portrait style painting using 3D printing

2015: MASSIVE DATA Access to massive volumes of data made training systems on image classification and recognition possible

2017: Dialog Agents Chatbots programmed in English and designed to negotiate with each other invented their own language Facebook AI Research Lab

2015: SWARM AI A real-time online tool that makes predictions based on converging information from various sources within a network predicted the winning horse at the Kentucky Derby Unanimous AI

AlexNet

Developed by Alex Krizhevsky et al., a convolutional neural network architecture developed for image classification tasks

2017: Google Deep Mind AI avatar teaches itself how to walk

2014: Generative Adversarial Networks produce completely new images for the first time rather than working on pre-existing images. developed by Ian Goodfellow

2016: Google AI's AlphaGO beats Lee Sedal at GO

2020: AlphaFold OpenAI deep learning system identifies three-dimensional structures of proteins

2023: GEMINI First AI to outperform humans at massive multi-task language understanding tasks. Google DeepMind

2023: GPT-4 The next iteration of OpenAI's GPT system A large multimodal model that accepts images and texts as inputs. Passed the Bar Exam scoring in the top 10%

2023: Alibaba's limproved AI Updated version that can interpret images, carry on complex conversations, and answer open ended questions

2024: Noble Prize: Hopfield & Hinton are awarded the nobel prize for using tools from physics to construct methods that helped by the foundation for today's powerful machine learning

2022: Is LaMDA Sentient? Blake Lemoine ignites the AI consciousness debate

2021: DALL-E OpenAI's diffusion model generative AI that can process images to create accurate captions

2021: GPT-3 introduced: massive scale-up, (175 billion parameters)

2018: BERT First bidirectional unsupervised learning model for natural language tasks Created by GOOGLE

2018: Language processing AI beats human intellect on a Stanford reading and comprehension test for the first time Created by e-commerce giant Alibaba

2018: Generative Pre-trained Transformer 1 (GPT-1) was the first of OpenAI's large language models following Google's invention of the transformer architecture in 2017. Introduced the concept of a pre-trained transformer.

2020: The Rise Of GENERATIVE AI

Information collected and poster designed by Danielle J. Williams, PhD