History and Foundations of Artificial Intelligence

Introduction

Artificial Intelligence is now an old concept that has evolved from merely being a term in the realm of science fiction to being our everyday reality that affects every facet of our lives. Researchers have been working on this technology for years, and it has witnessed several milestones and breakthroughs over the years. AI history and its timeline reflect its theoretical foundation, implementation, and advancements.

Who Invented Artificial Intelligence (AI)?

Artificial intelligence (AI) has evolved over time through the work of many researchers and scientists. It doesn't have a single inventor, but rather, it has developed gradually through the contributions of numerous individuals and milestones.

Here are some key figures and moments in the history of AI:

- **Alan Turing**

While not directly related to AI as we know it today, Alan Turing's concept of a theoretical computing machine, known as the Turing machine, laid the theoretical foundation for modern computers and computational processes, which are essential for AI.

- **John McCarthy**

John McCarthy is often credited with coining the term "artificial intelligence" and organizing the Dartmouth Workshop, where AI as a field was launched in the summer of 1956. McCarthy is considered one of the founding fathers of AI.

- **Marvin Minsky and John McCarthy**

These two researchers, along with others, made significant early contributions to AI research, including the development of the first AI programming language, LISP, by McCarthy.

- **Arthur Samuel**

Arthur Samuel is known for his work in machine learning and the development of the first self-learning program, which played checkers and improved its performance through experience.

- **Herbert A. Simon and Allen Newell**

They developed the Logic Theorist, a program that could prove mathematical theorems, and the General Problem Solver (GPS), a problem-solving program. Their work contributed to the development of AI problem-solving techniques.

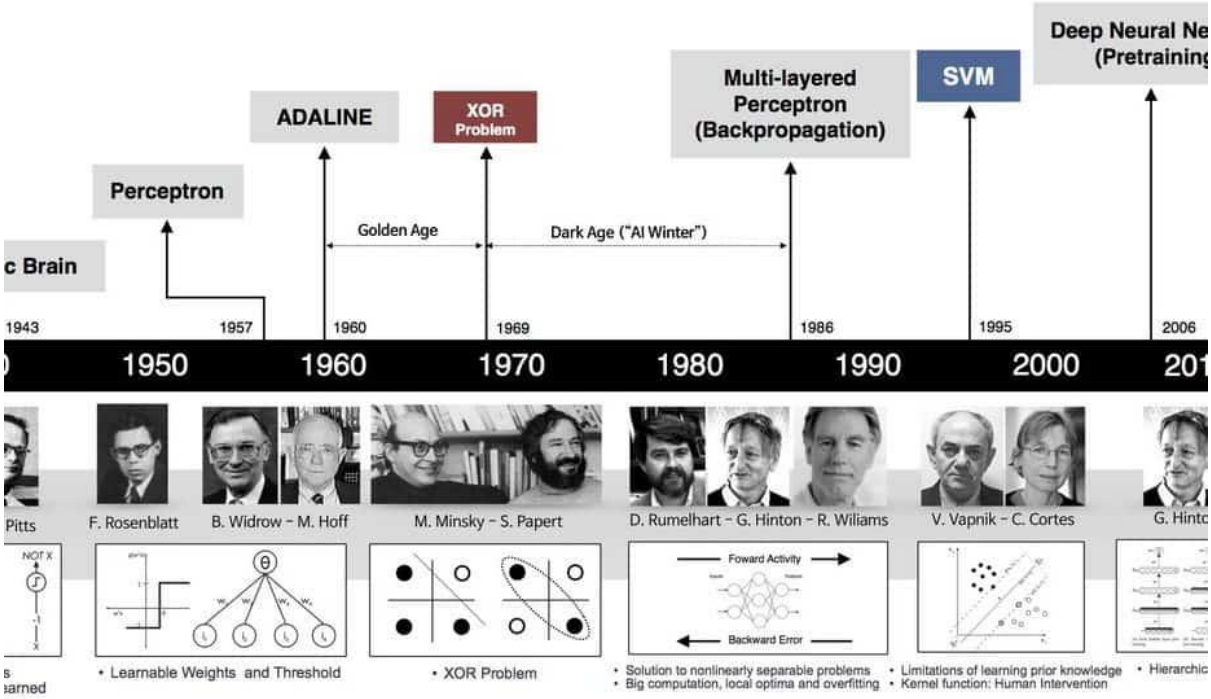
- **Joseph Weizenbaum**

He created the ELIZA program, a natural language processing program that simulated conversation with a human. ELIZA is considered one of the early chatbots.

- **Ray Kurzweil**

While not an inventor of AI, Ray Kurzweil is a notable figure in AI and futurism. He has made significant contributions to speech recognition and is known for his predictions about the future of AI and human-machine convergence.

Quick History of AI



- 1943 – The inaugural Mathematical representation of Neural Network
- 1949 – The organization of behavior: A neuropsychological theory
- 1951 – First Artificial Neural Network
- 1952 – The foresight of machine learning
- 1952 – Arthur Samuel coins the term Machine Learning
- 1956 – The Dartmouth Workshop
- 1957 – Planting the seeds for deep neural networks
- 1959 – Discovery of cells in visual cortex
- 1960 – Basics of a continuous backpropagation
- 1965 – Multi-Layer Perceptron
- 1967 – Nearest Neighbor Algorithm

- 1979 – Neural Network learns to recognize images
- 1982 – Associative Neural Networks
- 1985 – Program pronounces the English words in the identical way a baby does
- 1986 – Learning Representations by Back-propagating Errors
- 1986 – Restricted Boltzmann machine (RBM)
- 1989 – Handwritten digit recognition with a Backpropagation network
- 1989 – Q-learning
- 1995 – Support Vector Machine (SVM)
- 1995 – Random Decision Forests
- 1997 – Long short-term memory (LSTM)
- 1997 – Computer beats Garry Kasparov
- 2009 – ImageNet
- 2012 – AlexNet
- 2012 – Google Brain learns to identify cats on photos
- 2014 – Generative Adversarial Networks (GAN)
- 2014 – DeepFace
- 2014 – Chatbot
- 2016 – Face2Face
- 2018: BERT

In today's world, we often hear about stuff like AI, ML, DL, etc. and, if we try to know about the technical products around us, you will find that they are very heavily dependent on concepts of AI, ML, DL, etc. Due to the advancements in new algorithms and technology, there is a huge industrial demand for these domains. Thus, many are trying to catch the trend. You might be wondering that these are very new technologies that exploded.

But, you would be surprised to know that these are rooted back in the early 1940s. It would be somewhat inappropriate to ask who invented these domains. It is a combination of many individuals, who contributed with distinct inventions of algorithms, methods, frameworks, etc.

Starting with the early history of AI, this was the time when the theoretical foundation of Artificial Intelligence was formed. Philosophers were trying to explain the human mind as a symbolic system. The modern field of AI started shaping up in the mid-20th century.

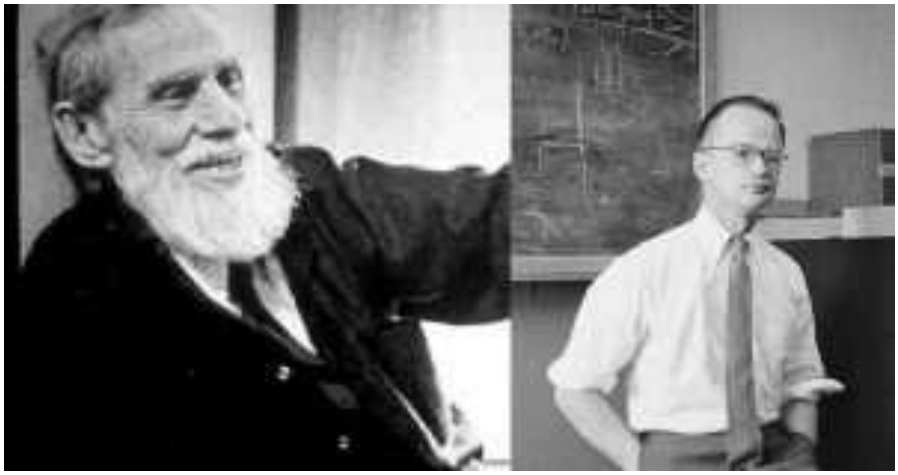
1843

The world's first computer programmer, **Ada Lovelace**, proposed an idea explaining that machines can manipulate symbols, which marked the foundation of the fundamental concept of AI.

1936

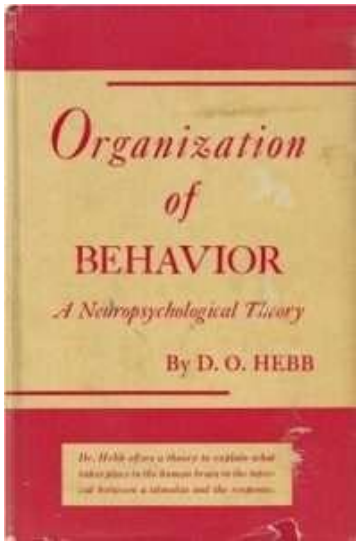
Alan Turing introduced the concept of a **universal machine**, which later became the **Turing Machine**, a theoretical device capable of solving computations if provided with enough time and resources. This laid down the foundation of digital computers and the principle of computability.

1943 – The inaugural Mathematical representation of Neural Network



Sturgis McCulloch, a neurophysiologist, and **Walter Harry Pitts**, a logician, proposed the first mathematical model of a neural network. You can read about their work in the article by the ref. "McCulloch, W. S., & Pitts, W. (1943). A logical calculus of the ideas immanent in nervous activity. *The bulletin of mathematical biophysics*, *5*(4), 115-133." Their work aimed to mimic human thought processes. The proposed model was also known as McCulloch-Pitts neurons.

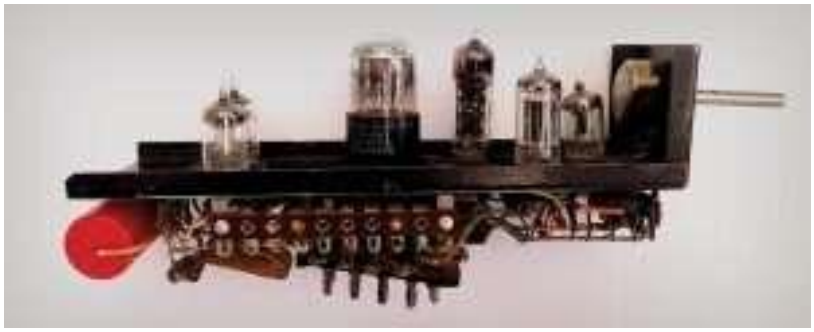
1949 – The organization of behavior: A neuropsychological theory



The book **"*The Organization of Behavior*"** by **Donald Olding Hebb**, a psychologist, was published in 1949. The book discussed how behavior relates to neural networks and brain activity. Later it became one of the foundation stones of Machine Learning. This was an important year in the history of artificial intelligence as **Donald Hebb** introduced a learning theory known as **Hebbian learning**. It updated the rule for modifying the connection strength between neurons. Also, it became the fundamental concept in the development of artificial neural networks.

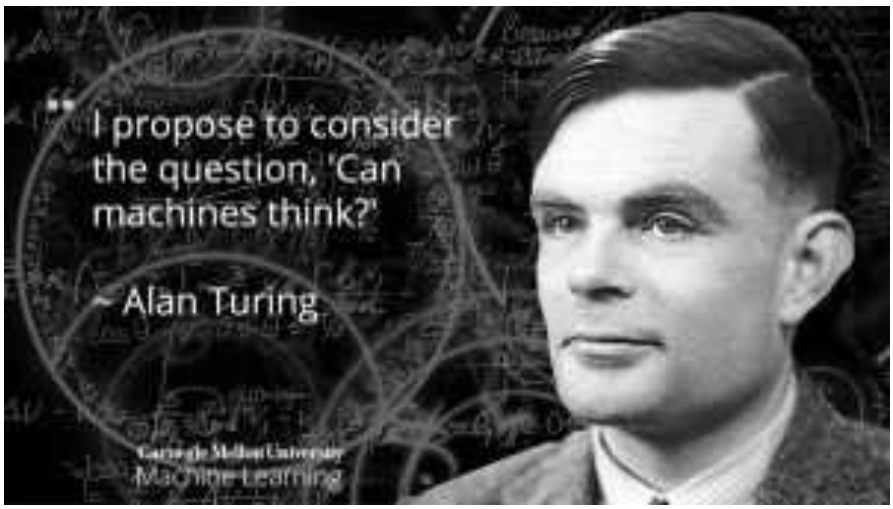
You can read about the book by the ref. "Hebb, D. O. (2005). *The organization of behavior: A neuropsychological theory*. Psychology Press."

1951 – First Artificial Neural Network



Marvin Minsky, a computer scientist, and **Dean Edmonds** formulated the first artificial neural network. The neural network consisted of 40 interconnected neurons with short- and long-term memory. To have an insight about their work, you can go through the link:- https://cyberneticzoo.com/mazesolvers/1951-maze-solver-minsky-edmonds-american/.

1952 – The foresight of machine learning



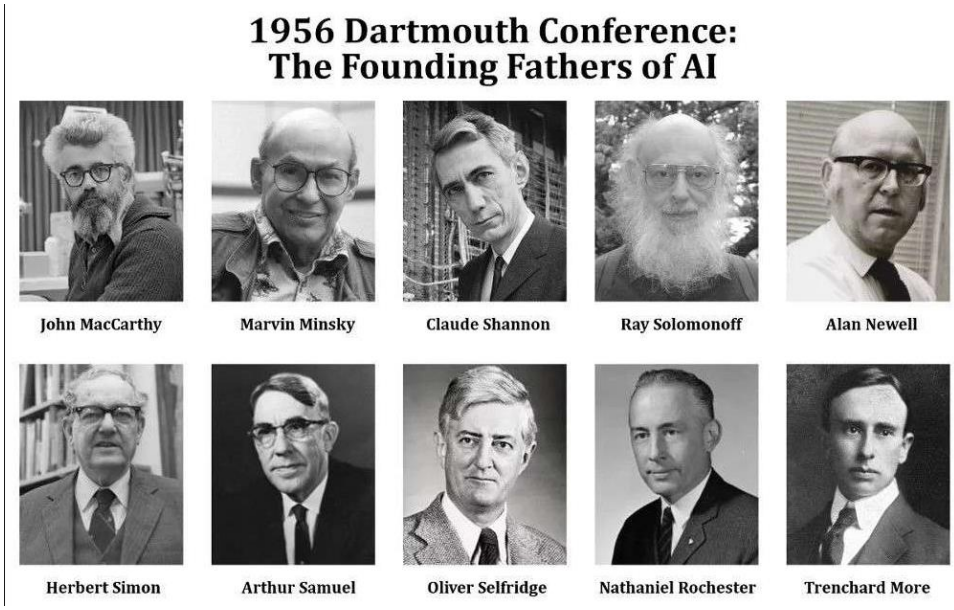
Alan Turing was a mathematician famous for decoding the encryption of German Enigma machines during the Second World War and describing a method known as the **Turing Test**, forming the basis for artificial intelligence. Later on in his work, he predicted

the development of machine learning. He wrote a paper on Computing Machinery and Intelligence, where he mentioned the Turning Test. The test aimed to conclude whether a machine can think. You can read about his work in the article by the ref. “Turing, A. M. (2009). Computing machinery and intelligence. Springer, Dordrecht.”

1952 – Arthur Samuel coins the term Machine Learning

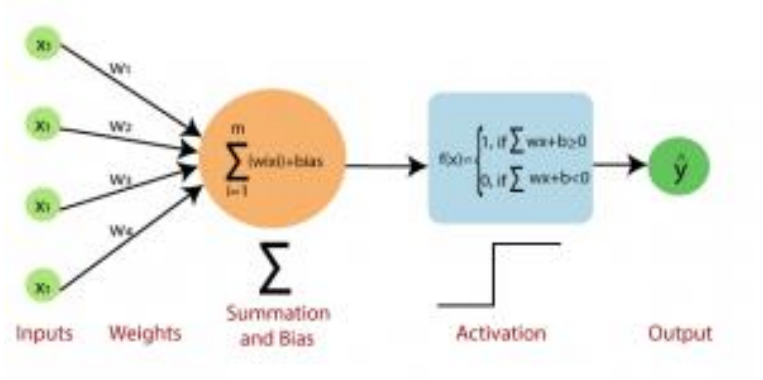
Arthur Lee Samuel, a computer scientist, was a pioneer of artificial intelligence. He managed to make computers learn from their experience. While at IBM, he formulates the **first machine learning algorithms**. The algorithms **aimed to play a game of checkers**. The algorithm was a special one that with each move, the computer would be better and better, correcting its errors and finding more reliable ways to win from that data. This game was one of the first examples of learning by machines. You can have a look at the article by the ref. “Samuel, A. L. (1959). Some studies in machine learning use the game of checkers. *IBM Journal of research and development*, *3*(3), 210-229.”

1956 – The Dartmouth Workshop



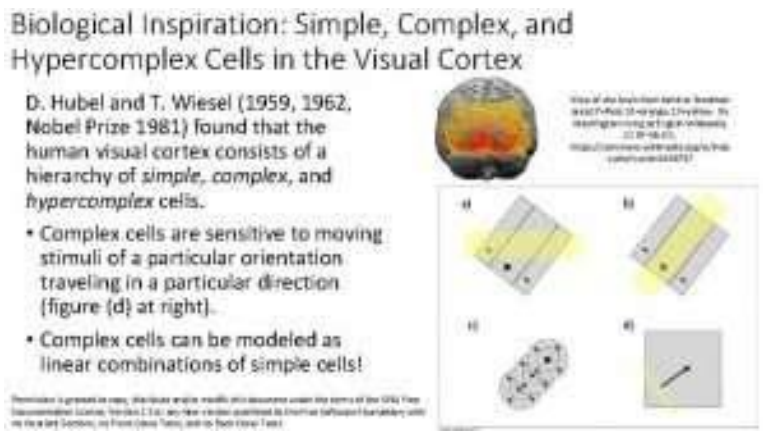
The **Dartmouth Summer Research Project** on Artificial Intelligence was a 1956 summer workshop widely considered to be **the founding event of artificial intelligence** as a field. The project lasted approximately **six to eight weeks**. In this workshop, prominent scientists from Mathematics, Engineering, Computer, and Cognitive Sciences had a brainstorming session on AI and ML research. You can have a look at the article by the ref. "McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (2006). A proposal for the Dartmouth summer research project on artificial intelligence, August 31, 1955. *AI magazine*, *27*(4), 12-12."

1957 – Planting the seeds for deep neural networks



Frank Rosenblatt, a psychologist notable in the field of artificial intelligence. He authored a paper about "The Perceptron: A Perceiving and Recognizing Automaton" in 1957. Here, he discussed the **construction of an electronic or electromechanical system**. The system aimed to learn and understand the similarities or correspondences between patterns of optical, electrical, or tonal data in a way that is nearly comparable to the processing of a biological brain. You can have a look at the article by the ref. "Rosenblatt, F. (1957). *The perceptron, a perceiving and recognizing automaton Project Para*. Cornell Aeronautical Laboratory."

1959 – Discovery of cells in visual cortex



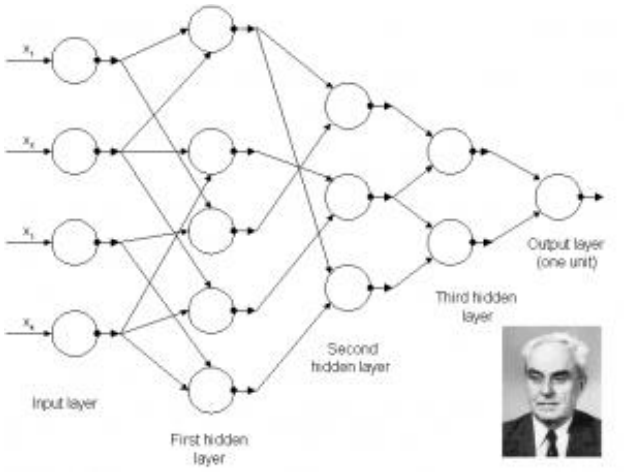
Two neurophysiologists **David Hunter Hubel and Torsten Nils Wiesel**, worked together to discover two types of cells in the primary visual cortex: simple cells and complex cells. Their research **inspired the formulation of various forms of Artificial Neural Networks**. You can have a look at the article by the ref. “Hubel, D. H., & Wiesel, T. N. (1959). Receptive fields of single neurons in the cat’s striate cortex. *The Journal of Physiology*, *148*(3), 574-591.”

1960 – Basics of a continuous backpropagation

MEMORIAL FOR HENRY J. KELLEY

Henry J. Kelley is a **professor in the fields of aerospace and ocean engineering**. He authored a paper about “Gradient Theory of Optimal Flight Paths”. In the research paper, he discussed the **behavior of systems with inputs and how that behavior is updated based on feedback.** This concept led to the foundation of **continuous Backpropagation** that is used as an essential feature to reduce the loss in Neural Networks over the years. You can read the article by the ref. “Kelley, H. J. (1960). Gradient theory of optimal flight paths. *Ars Journal*, *30*(10), 947-954.”

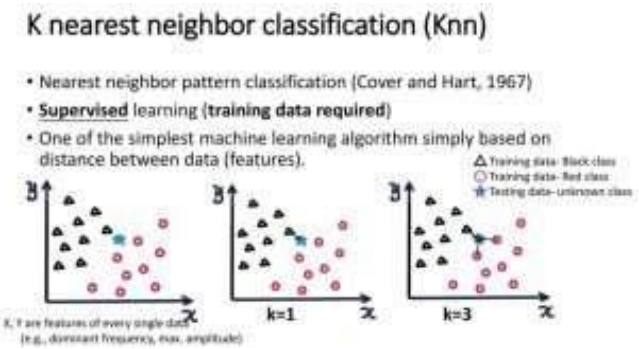
1965 – Multi-Layer Perceptron



Alexey Ivakhnenko, a mathematician, and **Valentin Lapa built a working deep learning network.** The network is sometimes also called the first-ever multilayer perceptron. This network uses a polynomial activation function and is trained by utilizing the **Group Method of Data Handling (GMDH).**

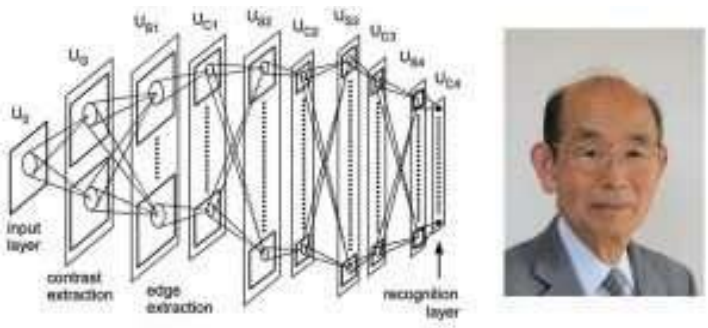
GMDH referred to a group of inductive algorithms concerning computer-based mathematical models of multiple parameters which are fully automatic in their structure. The algorithm uses deep feed-forward multi-layer perceptron using statistical approaches at every layer to obtain the optimum features and forward them within the network. You can read the article by the ref. "Ivakhnenko, A. G., & Ivakhnenko, G. A. (1995). The review of problems solvable by algorithms of the group method of data handling (GMDH). *Pattern recognition and image analysis c/c of raspoznavaniye obrazov i analiz izobrazhenii*, *5*, 527-535."

1967 – Nearest Neighbor Algorithm



Thomas M. Cover, an information theorist, and **Peter E. Hart** is a computer scientist who **published a paper** on **Nearest Neighbor Algorithm** in IEEE 1967. One of the fundamental decision procedures used for classification is the Nearest Neighbour (NN) rule. It **classifies a sample based on the category of its Nearest Neighbor**. You can read the article by the ref. "Cover, T., & Hart, P. (1967). Nearest neighbor pattern classification. *IEEE transactions on information theory*, *13*(1), 21-27."

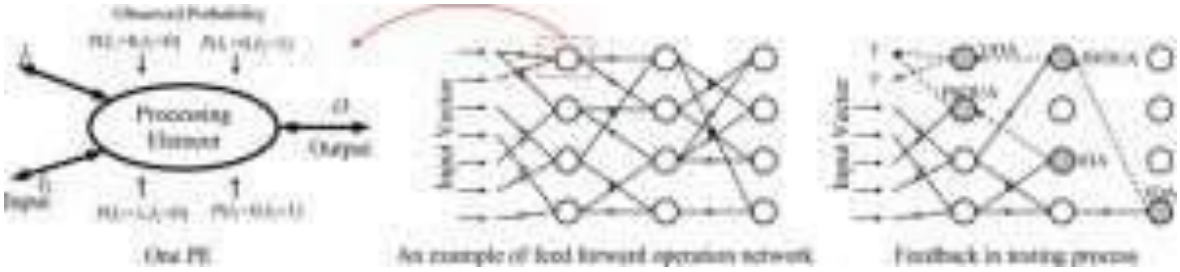
1979 – Neural Network learns to recognize images



Kunihiko Fukushima, a computer scientist, is widely recognized for his **work on Neocognitron.** It is a multilayered neural network that is utilized to identify patterns in

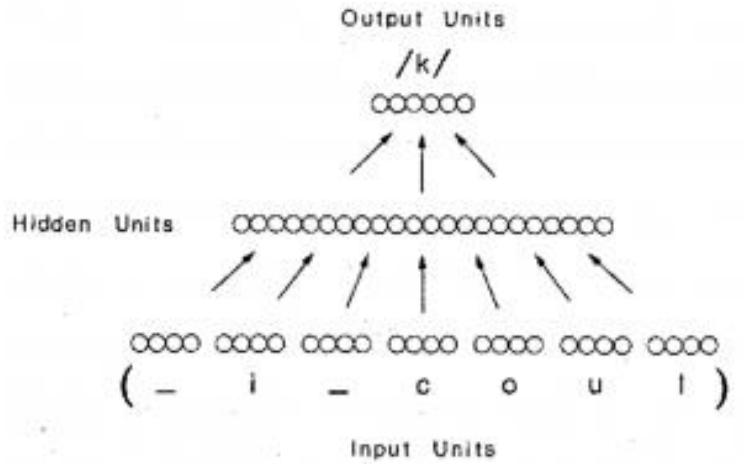
images. This framework has been **used for recognizing handwritten patterns, recommendation systems, and natural language processing.** In the coming years, his work helped to build the first Convolutional Neural Networks (CNNs). You can read the article by the ref. "Fukushima, K. (1979). A neural network model for a mechanism of pattern recognition unaffected by shift in position-Neocognitron. *IEICE Technical Report, A*, *62*(10), 658-665." and "Fukushima, K., & Miyake, S. (1982). Neocognitron: A self-organizing neural network model for a mechanism of visual pattern recognition. In *Competition and cooperation in neural nets* (pp. 267-285). Springer, Berlin, Heidelberg."

1982 – Associative Neural Networks



John Joseph Hopfield, a scientist, is widely recognized for his **work on Associative Neural Network.** It is an ensemble-based method inspired by the function and structure of neural network correlations in the brain. The method **operates by simulating the short- and long-term memory of neural networks**. You can go through the article by the ref. "Hopfield, J. J. (1982). Neural networks and physical systems with emergent collective computational abilities. *Proceedings of the national academy of sciences*, *79*(8), 2554-2558."

1985 – Program pronounces the English words in the identical way a baby does



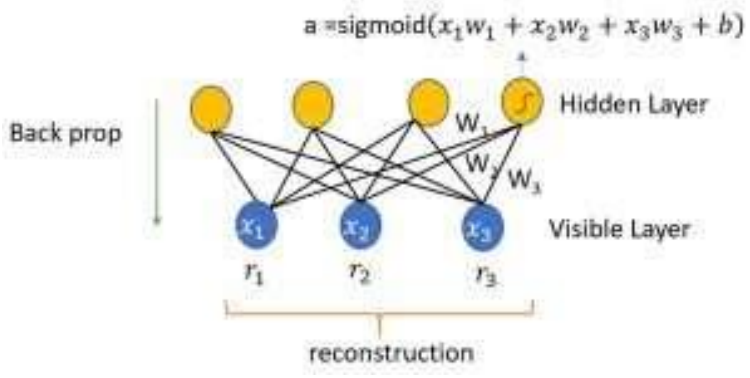
Terry Sejnowski, a computer researcher, is famous for coupling his expertise in biology and neural networks. In 1985 **he built NETtalk, a program aimed to pronounce English words similarly a baby** does and improve its efficiency over time. You can go

through the article by the ref. “Sejnowski, T. J., & Rosenberg, C. R. (1987). Parallel networks that learn to pronounce English text. *Complex systems*, *1*(1), 145-168.”

1986 – Learning Representations by Back-propagating Errors

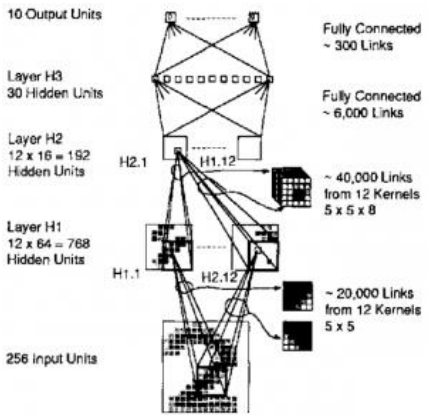
David Rumelhart, a psychologist, **Geoffrey Hinton**, a computer scientist, and **Ronald J. Williams,** a professor. Together they **authored a paper on “Learning Representations by Back-propagating Errors”** in 1985. The paper **discusses backpropagation** in much greater detail. They **explained how it could enhance neural networks like ANNs, CNNs, etc. for many tasks**. You can read the article by the ref. “Rumelhart, D. E., Hinton, G. E., & Williams, R. J. (1986). Learning representations by back-propagating errors. *nature*, *323*(6088), 533-536.”

1986 – Restricted Boltzmann machine (RBM)



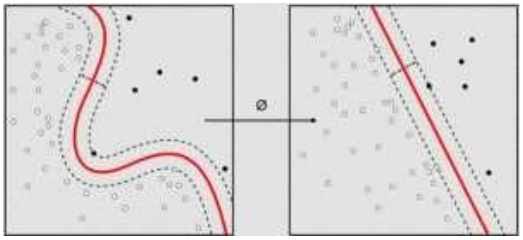
Paul Smolensky, a cognitive scientist, **introduces the concept of the Restricted Boltzmann machine.** A restricted Boltzmann machine is **a generative stochastic artificial neural network that can learn a probability distribution over its set of inputs**. This algorithm is **useful for dimensionality reduction, classification, regression, collaborative filtering, feature learning, and topic modeling**. You can read the article by the ref. “Zhang, N., Ding, S., Zhang, J., & Xue, Y. (2018). An overview of restricted Boltzmann machines. *Neurocomputing*, *275*, 1186-1199.”

1989 – Handwritten digit recognition with a Backpropagation network



Yann André LeCun, a computer scientist, utilized the **concepts of Convolutional Neural Networks and Backpropagation to read and recognize patterns in handwritten digits** in 1989. You can read the article by the ref. "LeCun, Y., Boser, B., Denker, J. S., Henderson, D., Howard, R. E., Hubbard, W., & Jackel, L. D. (1989). Backpropagation applied to handwritten zip code recognition. *Neural computation*, *1*(4), 541-551."

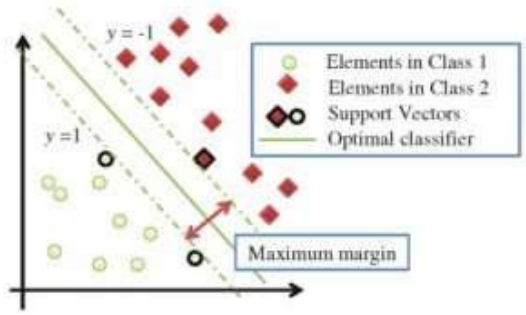
1989 – Q-learning



Christopher Watkins wrote a **thesis on Learning from Delayed Rewards** in 1989. He presented the theory of Q-learning, which considerably improves the practicality *and* usefulness of Reinforcement Learning.

The algorithm has the potential to learn optimal control directly without representing the transition possibilities of the Markov Decision Process. You can have a look at the article by the ref. "Watkins, C. J., & Dayan, P. (1992). Q-learning. *Machine learning*, *8*(3-4), 279-292."

1995 – Support Vector Machine (SVM)



Though SVM has been present since the 1960s, **Corinna Cortes**, a computer scientist, **Vladimir Naumovich Vapnik** developed the current **standard model of SVM** in 1995. Support Vector Machine (SVM) is **a linear model for classification and regression problems**. It can solve linear and non-linear problems and work well for many practical problems. The idea of SVM is simple: The algorithm creates a line or a hyperplane which separates the data into classes. You can go through the article by the ref. "Cortes, C., & Vapnik, V. (1995). Support vector machine. *Machine learning*, *20*(3), 273-297."

1995 – Random Decision Forests

Tin Kam Ho is a computer scientist who **introduced the concept of Random decision Forests** in 1995. Random forests or random decision forests are **an ensemble learning method for classification, regression, and other tasks** that generates multiple decision trees at training time. For classification tasks, the output of the random forest is the class selected by most trees. You can go through the article by the ref. "Ho, T. K. (1995, August). Random decision forests. In *Proceedings of 3rd international conference on document analysis and recognition* (Vol. 1, pp. 278-282). IEEE." and "Ho, T. K. (1998). The random subspace method for constructing decision forests. *IEEE transactions on pattern analysis and machine intelligence*, *20*(8), 832-844."

1997 – Long Short-Term Memory (LSTM)

Long short-term memory (LSTM) was introduced by two computer scientists **Jürgen Schmidhuber and Josef Sepp Hochreiter**, in 1997. They improve both the effectiveness and practicality of recurrent neural networks by excluding the long-term dependency problem. Long short-term memory is **an artificial recurrent neural network architecture** used in the field of deep learning. Unlike standard feedforward neural networks, **LSTM has feedback connections**. It can process not only single data points but also entire sequences of data. You can read the article by the ref. "Hochreiter, S., & Schmidhuber, J. (1997). Long short-term memory. *Neural computation*, *9*(8), 1735-1780."

1997 – Computer beats Garry Kasparov

IBM computer, *Deep Blue*, defeated GM Garry Kasparov in a chess game. This event gave proof that machines' intelligence was catching up to human intelligence. You can read about the game by the ref. https://bit.ly/3nnrMY0.

2005

Stanford's DARPA Grand Challenge sees autonomous vehicles navigate a desert course.

The Grand Challenge was launched by the Defense Advanced Research Projects Agency DARPA in 2003 to spur innovation in unmanned ground vehicle navigation. The goal of the Challenge was to develop an autonomous robot capable of traversing unrehearsed off-road terrain. The first competition, which carried a prize of $1M, took place on March 13, 2004. It required robots to navigate a 142-mile long course through the Mojave desert in no more than 10 h. 107 teams registered and 15 raced, yet none of the participating robots navigated more than 5% of the entire course. The challenge was repeated on October 8, 2005, with an increased prize of $2M. This time, 195 teams registered and 23 raced. Of those, five teams finished. Stanford's robot "Stanley" finished the course ahead of all other vehicles in 6 h, 53 min, and 58 s, and was declared the winner of the DARPA Grand Challenge

2009 – ImageNet

Fei-Fei Li, a computer scientist, **launched an extensive visual database of labeled images "ImageNet"**. She **expanded the data available for training algorithms** as she assumed that AI and ML required big training data that matches the real-world scenario. The database consists of **14 million (14,197,122 at last count) *labeled* images** to researchers, educators, and students. You can have a look at the database by the link https://www.kaggle.com/c/imagenet-object-localization-challenge.

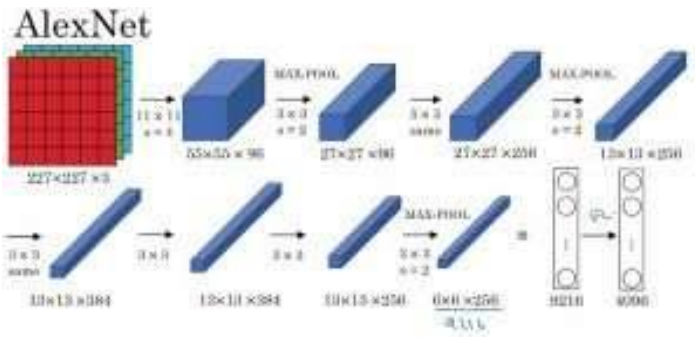
2011

IBM's Watson wins the quiz show Jeopardy!, showcasing natural language processing capabilities.

Intelligent, non-human agents can do well at what have always been thought as only doable by humans. Specifically, Watson accomplished natural language processing and understanding, search of large bodies of textual information to find potential responses, reasoning over possible answers, probabilistic weighting of these options, phrasing of questions to the answers, and then human-sounding speech production of the best response.

So after 3 nights of competition against 2 all-time human champions, Watson won $77,147 – more than three times the next highest score of the two opponents, one with $24,000 and the other with $21,600. After watching the 3rd round, I thought proudly of my friends on the IBM DeepQA team, including the project lead, Dave Ferrucci, and fellow IBM researchers from my field – John Prager, Bran Boguraev, Eric Brown, Jennifer Chu-Carroll, Michael McCord, amongst others, whom I have worked both with and in competition against over many years of NLP and QA research. Hats off to them and their whole teams, for having accomplished that which many researchers such as myself and teams in labs like our Center for Natural Language Processing, have worked on and continue to work on for computer-supported intelligence and decision-making for applications in areas such as medicine, government, and law.

2012 – AlexNet

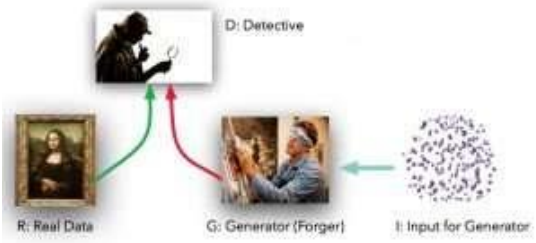


Alex Krizhevsky is a computer scientist most noted for his **work on artificial neural networks and deep learning**. In 2012 he introduced AlexNet that improved upon LeNet-5. It initially contained only **eight layers – five convolutional followed by three fully connected layers using rectified linear units**. You can read about the architecture by the ref. "Krizhevsky, A., Sutskever, I., & Hinton, G. E. (2012). Imagenet classification with deep convolutional neural networks. *Advances in neural information processing systems*, *25*, 1097-1105."

2012 – Google Brain learns to identify cats on photos

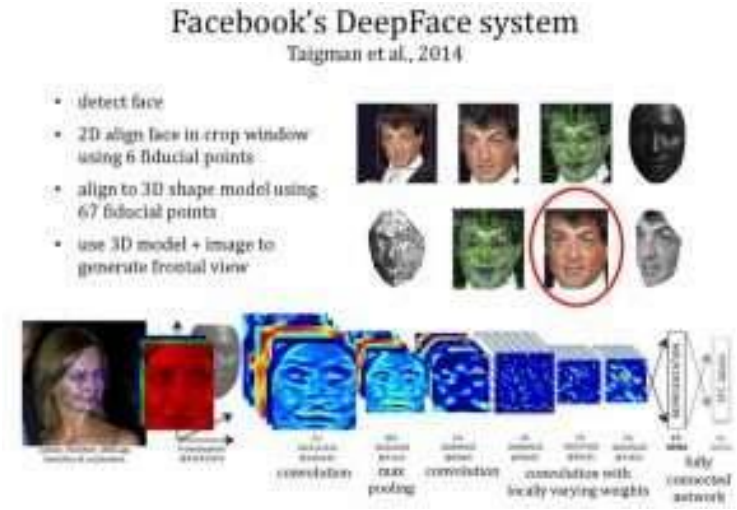
Having a comprehensive machine learning environment, **Google X Lab has built an artificial intelligence algorithm, Google Brain.** In 2012 the architecture became famously good at image processing, capable of recognizing cats in pictures. Their network trained on randomly taken 10,000,000 unlabeled images. The network was able to identify cat images with 74.8 percent accuracy. This was another step in image recognition. You can read the article by the link: – https://bit.ly/2ZAOYKu.

2014 – Generative Adversarial Networks (GAN)



Ian J. Goodfellow is a researcher, and his team **introduced Generative Adversarial Networks (GAN)** in 2014. The Generative Adversarial Networks could be one of the most powerful algorithms in AI. A generative adversarial network (GAN) is **a machine learning model in which two neural networks compete with each other to become more accurate in their predictions.** GANs typically **run unsupervised and use a cooperative zero-sum game framework to learn**. You can read more about GAN by the ref. "Goodfellow, I., Pouget-Abadie, J., Mirza, M., Xu, B., Warde-Farley, D., Ozair, S., … & Bengio, Y. (2014). Generative adversarial nets. *Advances in neural information processing systems*, *27*."

2014 – DeepFace



In 2014, the Facebook research team built DeepFace. *It is* **a deep learning facial recognition system consisting of a nine-layer neural network trained on 4 million images of Facebook users.** The neural network can spot a human face in images with an accuracy of 97.35%. You can read more about DeepFace by the ref. "Taigman, Y., Yang, M., Ranzato, M. A., & Wolf, L. (2014). DeepFace: Closing the gap to human-level performance in face verification. In *Proceedings of the IEEE conference on computer vision and pattern recognition* (pp. 1701-1708)."

2014 – Chatbot

In 2014 **Vladimir Veselov, Eugene Demchenko, and Sergey Ulasen** developed the **first chatbot** and named **Eugene Goostman**. Some regard it as having passed the Turing

test, a test of a computer's ability to communicate indistinguishably from a human. Goostman is portrayed as a 13-year-old Ukrainian boy with characteristics that are intended to induce forgiveness in those with whom it interacts for its grammatical errors and lack of general knowledge. You can read more about chatbot by the link:- https://en.wikipedia.org/wiki/Eugene_Goostman.

2016 – Face2Face

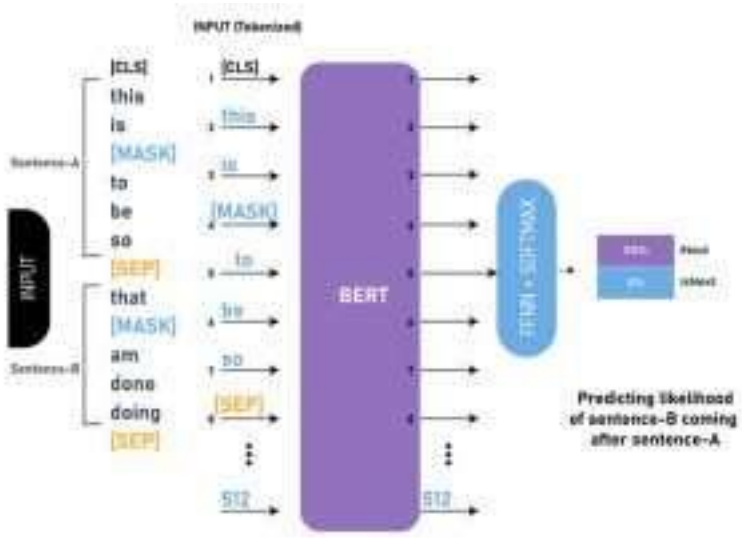
A group of scientists presented Face2Face during the Conference on Computer Vision and Pattern Recognition in 2016. It is **an approach for a real-time facial reenactment of a monocular target video sequence.** The source sequence is also a monocular video stream, captured live with a commodity webcam. You can read more about Face2Face by the ref. "Thies, J., Zollhofer, M., Stamminger, M., Theobalt, C., & Nießner, M. (2016). Face2face: Real-time face capture and reenactment of RGB videos. In *Proceedings of the IEEE conference on computer vision and pattern recognition* (pp. 2387-2395)."

2016

AlphaGo program by Google beat the world champion Go player, Lee Sedol, which is a significant moment in the evolution of AI as it showcased the ability to learn and make decisions.

Go isn't just a game—it's a living, breathing culture of players, analysts, fans, and legends. Over the last 10 days in Seoul, South Korea, we've been lucky enough to witness some of that incredible excitement firsthand. We've also had the chance to see something that's never happened before: DeepMind's AlphaGo took on and defeated legendary Go player, Lee Sedol (9-dan professional with 18 world titles), marking a major milestone for artificial intelligence.

2018: BERT



In 2018 Google developed BERT, **the first bidirectional unsupervised language**. It **can perform several natural language processing tasks using transfer learning**. You can read more about BERT by the ref. "Devlin, J., Chang, M. W., Lee, K., & Toutanova, K. (2018). Bert: Pre-training of deep bidirectional transformers for language understanding. *arXiv preprint arXiv:1810.04805*."

2018

This year marked the beginning of the journey of Generative pre-trained transformers (GPT) as OpenAI, a renowned AI company in the USA, introduced the first-ever GPT model. This was a prominent moment in the field of generative artificial intelligence.

Also, **IBM's Project Debater** debated on different complex topics with two master debaters and performed great.

Google showcased an AI program known as Duplex, a virtual assistant that took a hairdresser appointment on call, and the lady on the other side didn't even realize she was talking to a machine.

The 2020s: GPT-3 and Beyond

The evolution of artificial intelligence over the years has made the impossible possible today in the 21st century. Let's know about the latest developments in the history of AI timeline:

- **GPT Characteristics**

GPT is a type of large language model (LLM) that uses the transformer architecture. These models are trained on a large number of unlabelled text data, so they can generate

content that closely resembles human writing. As of 2023, LLMs that share these features are broadly referred to as GPTs.

- **GPT-n Series**

OpenAI has launched a series of advanced GPT models called the GPT-n series. Every model in the series is more capable than its predecessor due to its increased size and training.

These advanced models form the basis for task-specific GPT systems, which include fine-tuned models for following instructions. One of the applications of these models is ChatGPT chatbot services.

- **March 2023**

The latest development in the AI evolution is GPT-4, which represents the current success of GPT development by OpenAI.

- **Other GPT Models**

Many organizations have adopted the term GPT. For example, EleutherAI developed a series of GPT foundation models, and Cerebras recently developed seven models. Also, companies from different industries have developed varied GPT models customized according to their requirements, such as Bloomberg's "BloombergGPT" for finance and Salesforce's "EinsteinGPT" for customer relationship management (CRM).

Artificial intelligence evolution is extensive, and the technology has witnessed major changes over the years. It’s still growing and evolving, and you can expect several AI developments