History of Artificial Intelligence (AI)

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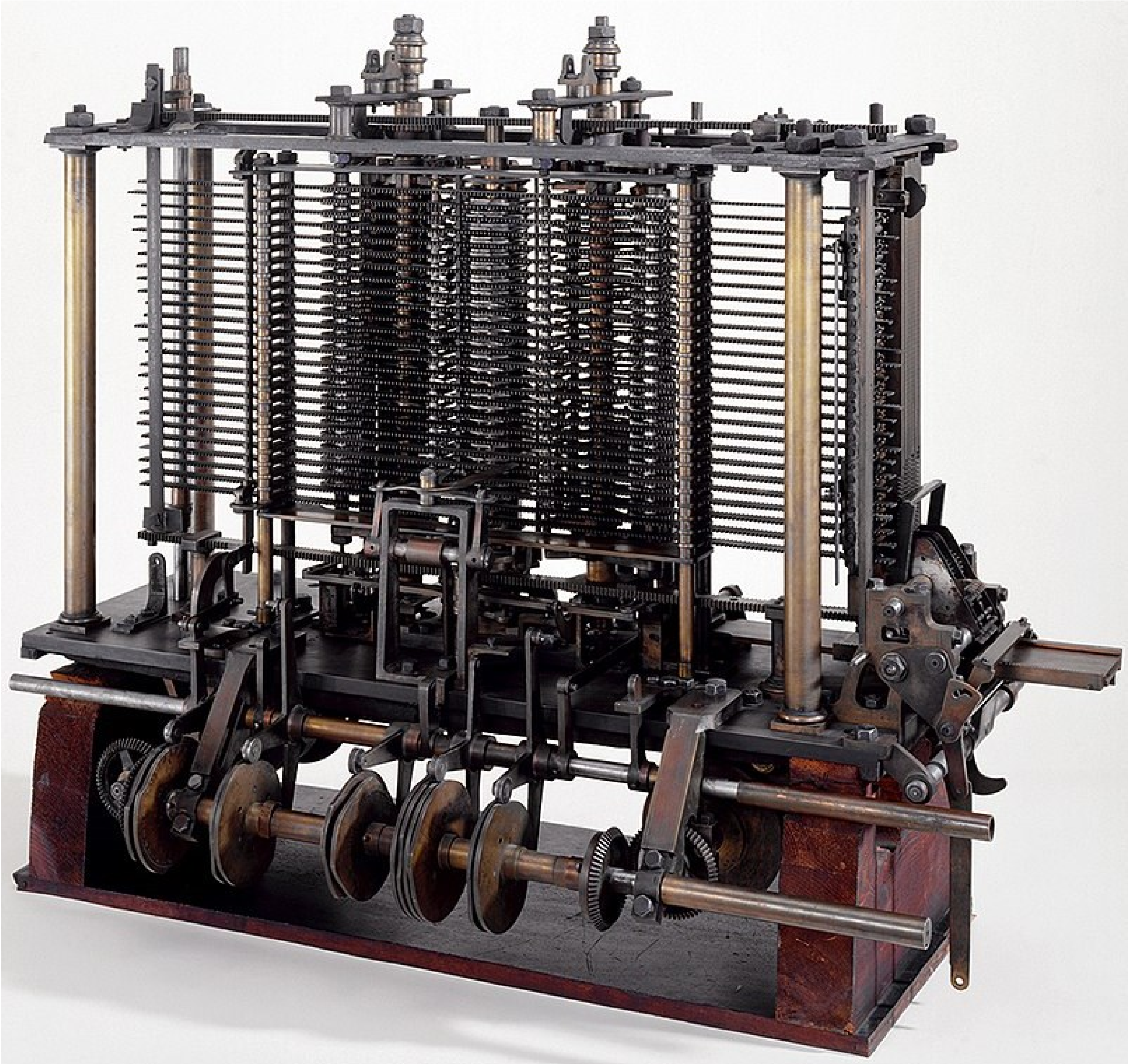
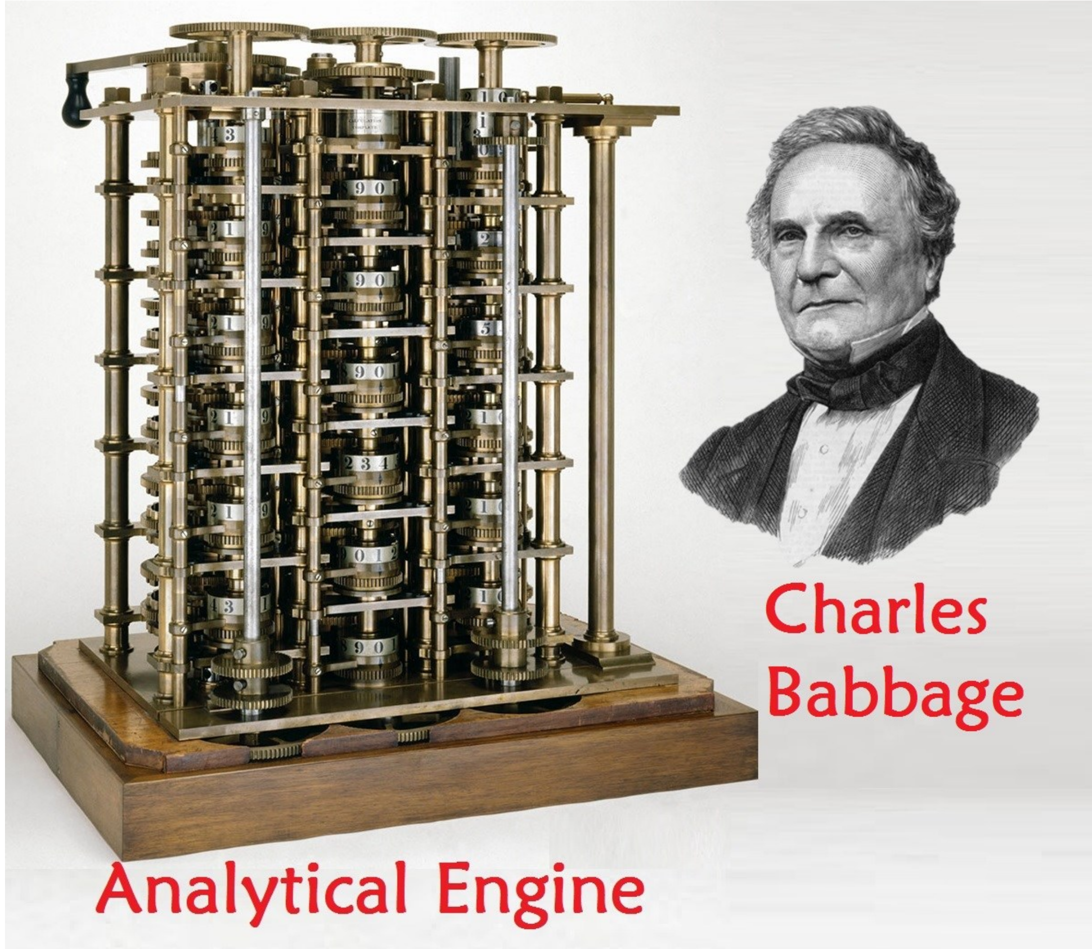
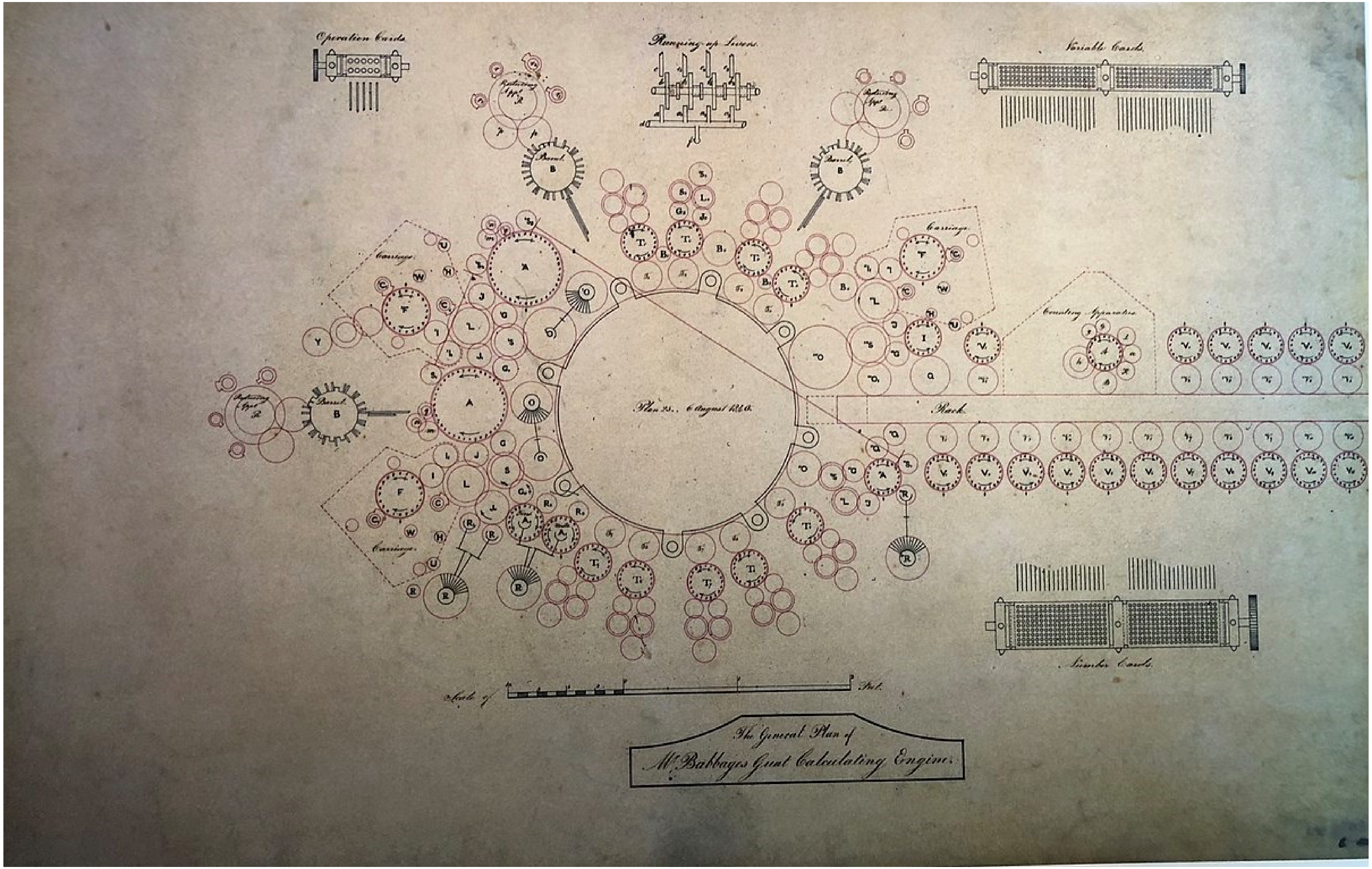
PhD: IIT Indore MTech: IIITDM Jabalpur

History of Classical AI

1837: Analytical Engine

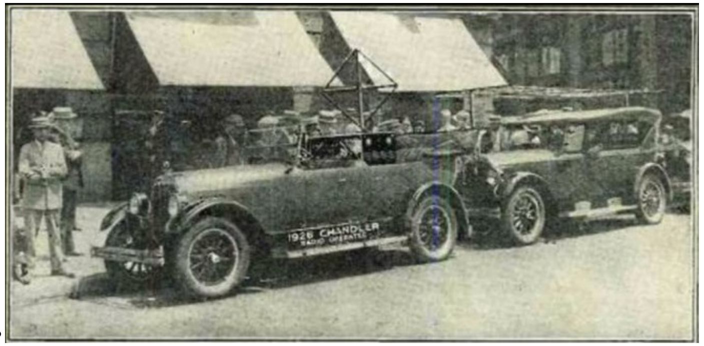




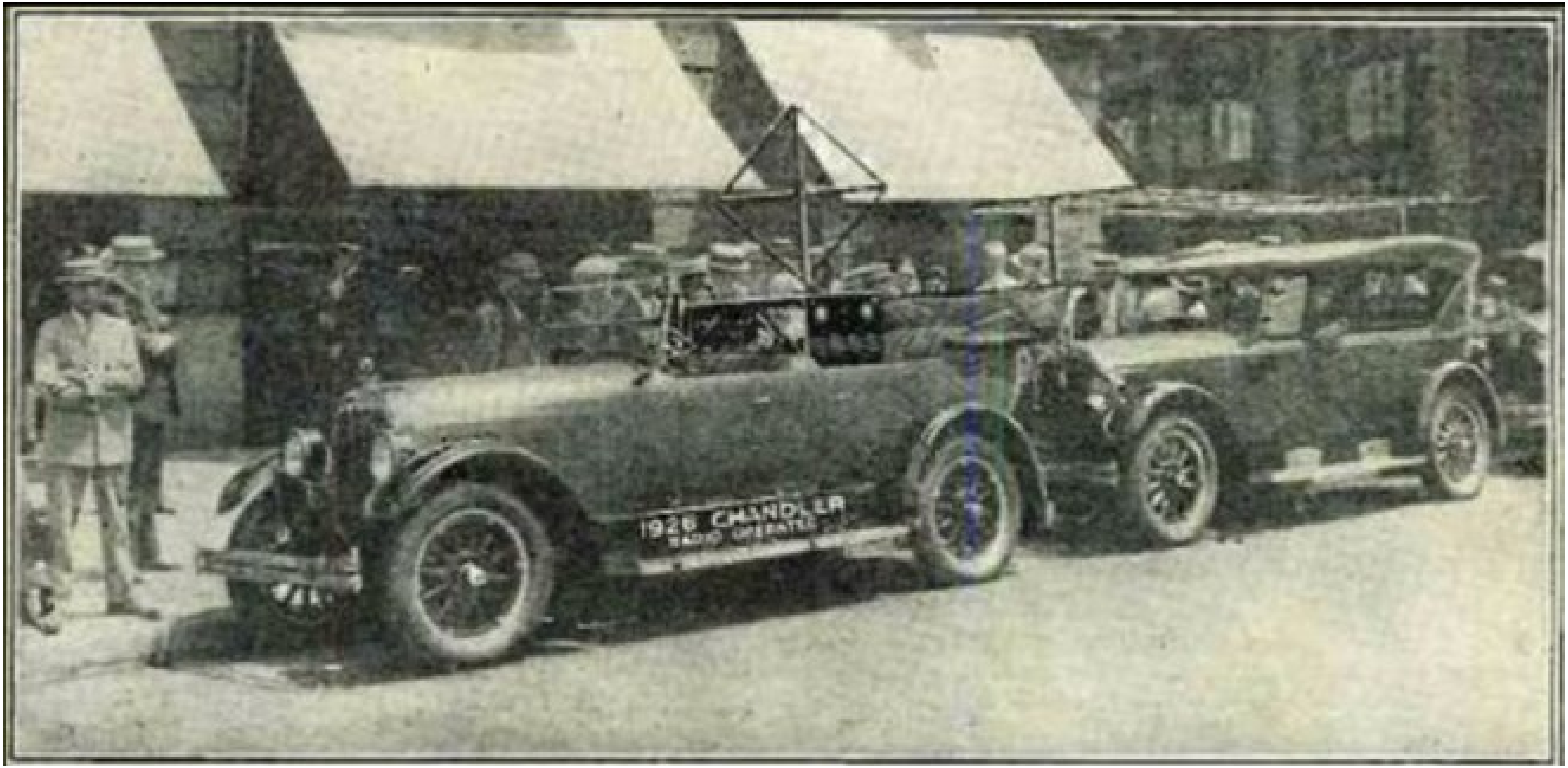


Plan diagram of the Analytical Engine from 1840

1925: Houdina Radio Control



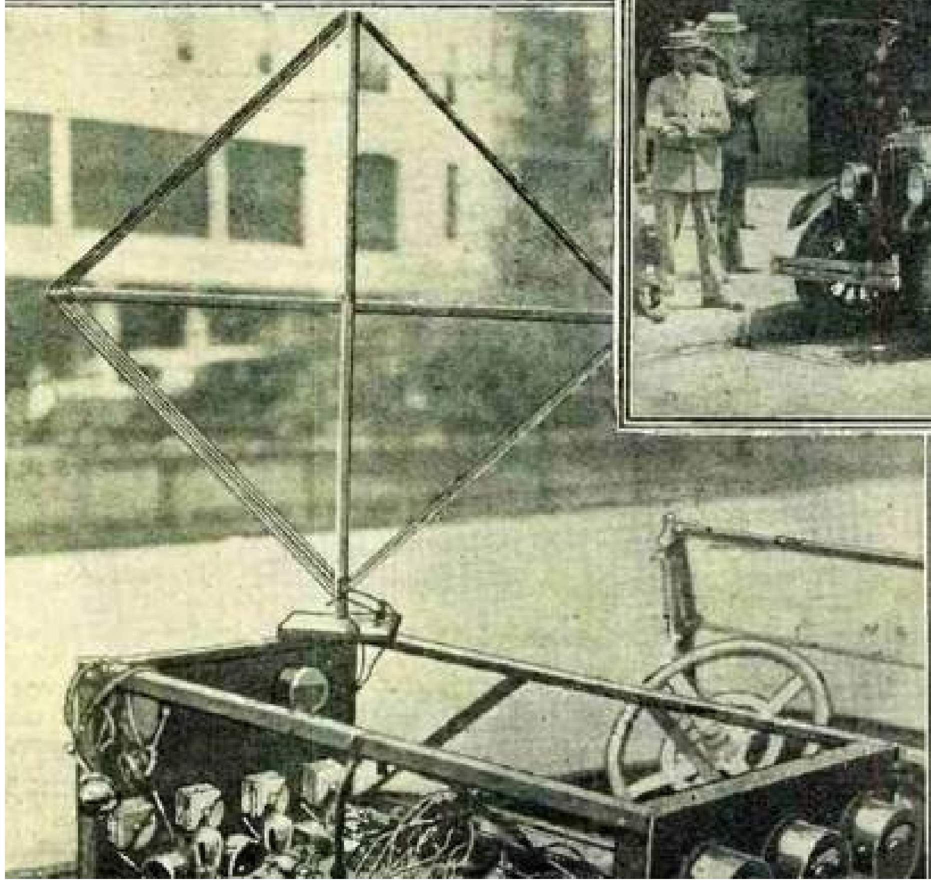
- Francis P Houdina developed a radio-operated automobile.
- He equipped a 1926 Chandler with a transmitting antenna on the tonneau and operated from a second car that followed it with a transmitter.
- The radio signals operated small electric motors that directed every movement of the car.
- In 1925, he publicly demonstrated his radio-controlled driver-less car American Wonder in New York City streets, traveling up Broadway and down Fifth Avenue through thick traffic

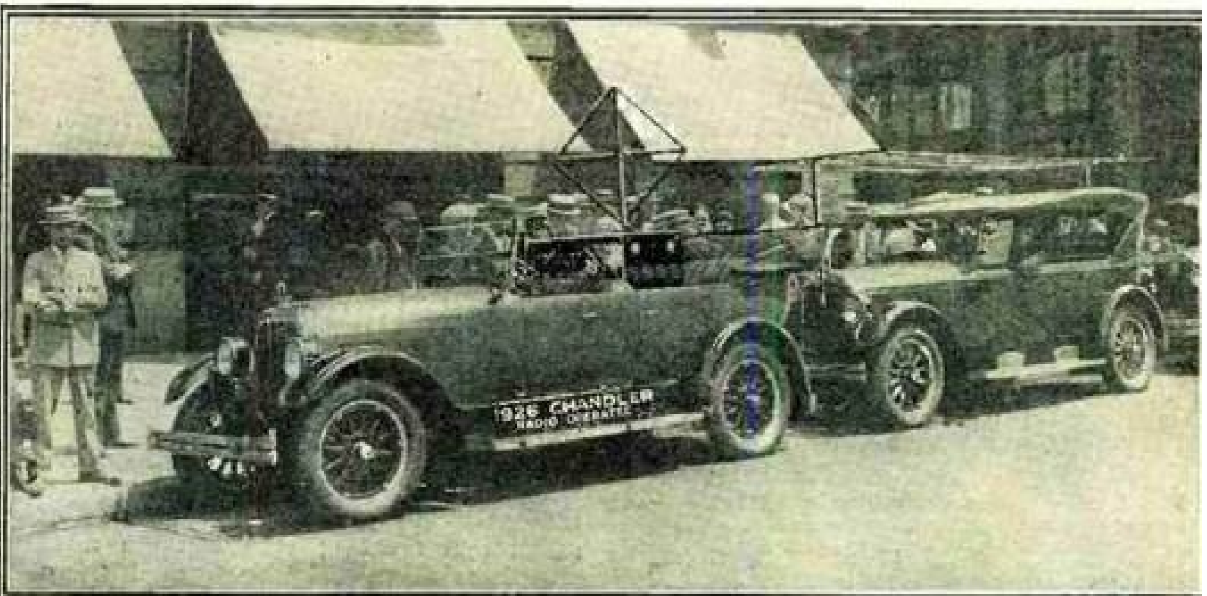

1926 CHANDLER
RADIO OPERATED

Radio-Controlled Automobile

By HERNDON GREEN

adio is to control a car in transcontin-ntal tour. The system, which is ex-remely simple and effective, is fully described here.





Above is shown the two cars used in the transcontinental tour by Mr. Francis P. Houdina. The front car has no driver but is controlled by radio from the second car. Note the transmitting antenna and the receiving loop.

THE DIAGRAM

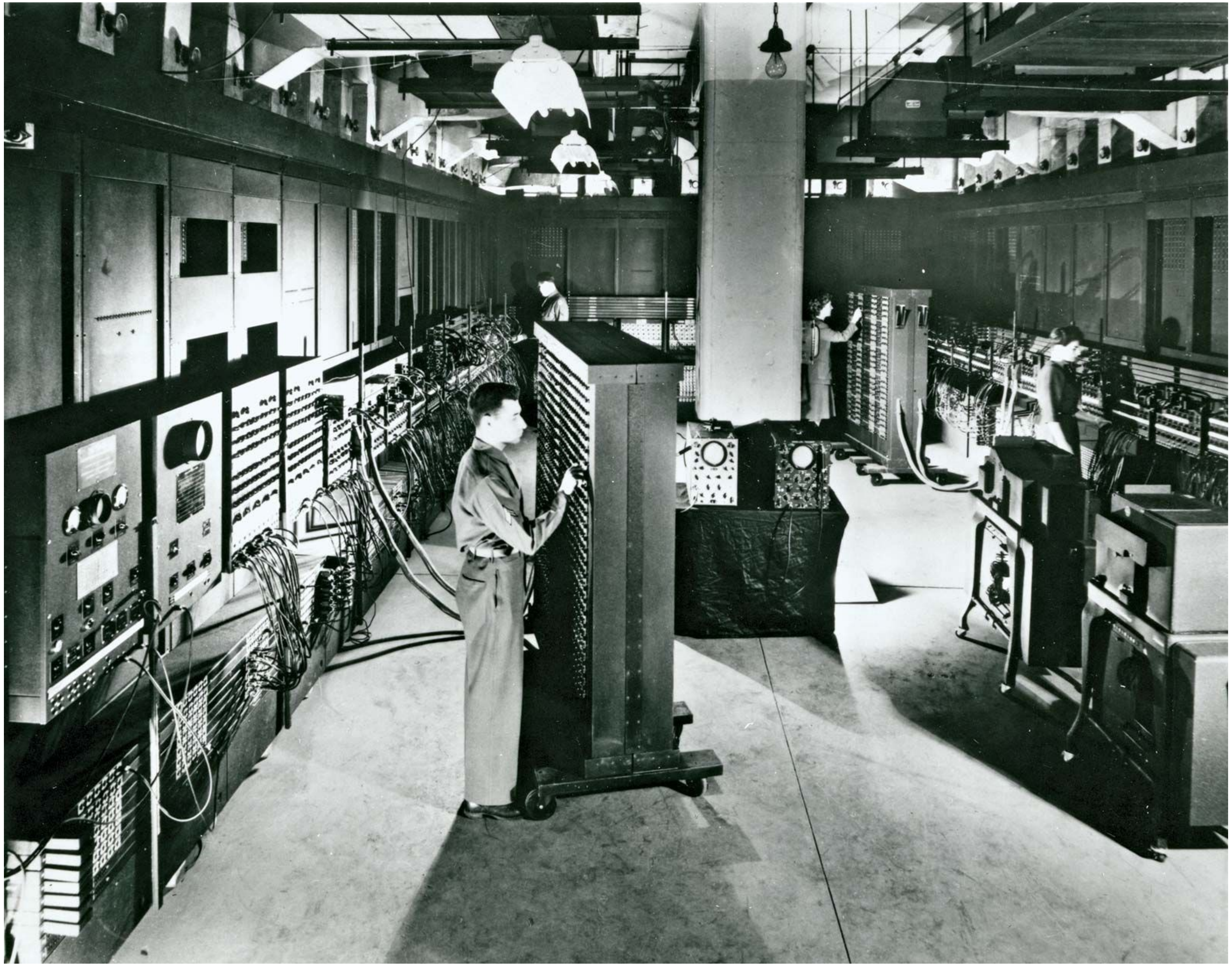
A glance at the wiring diagram given i an accompanying illustration will show th circuit in its simplest form. Some of th amplifying relays are left out in order t simplify the circuits.

The two transmitters are of the usua 10-watt type, using storage battery suppl for the filaments and plates. They ar housed in the tonneau of the control car to gether with the power units. The keys con trolling them are placed on a small shel at the right side of the dash.

The receivers are the usual type, employ

1946-1960

- 1946: ENIAC heralds the dawn of Computing



1946-1960

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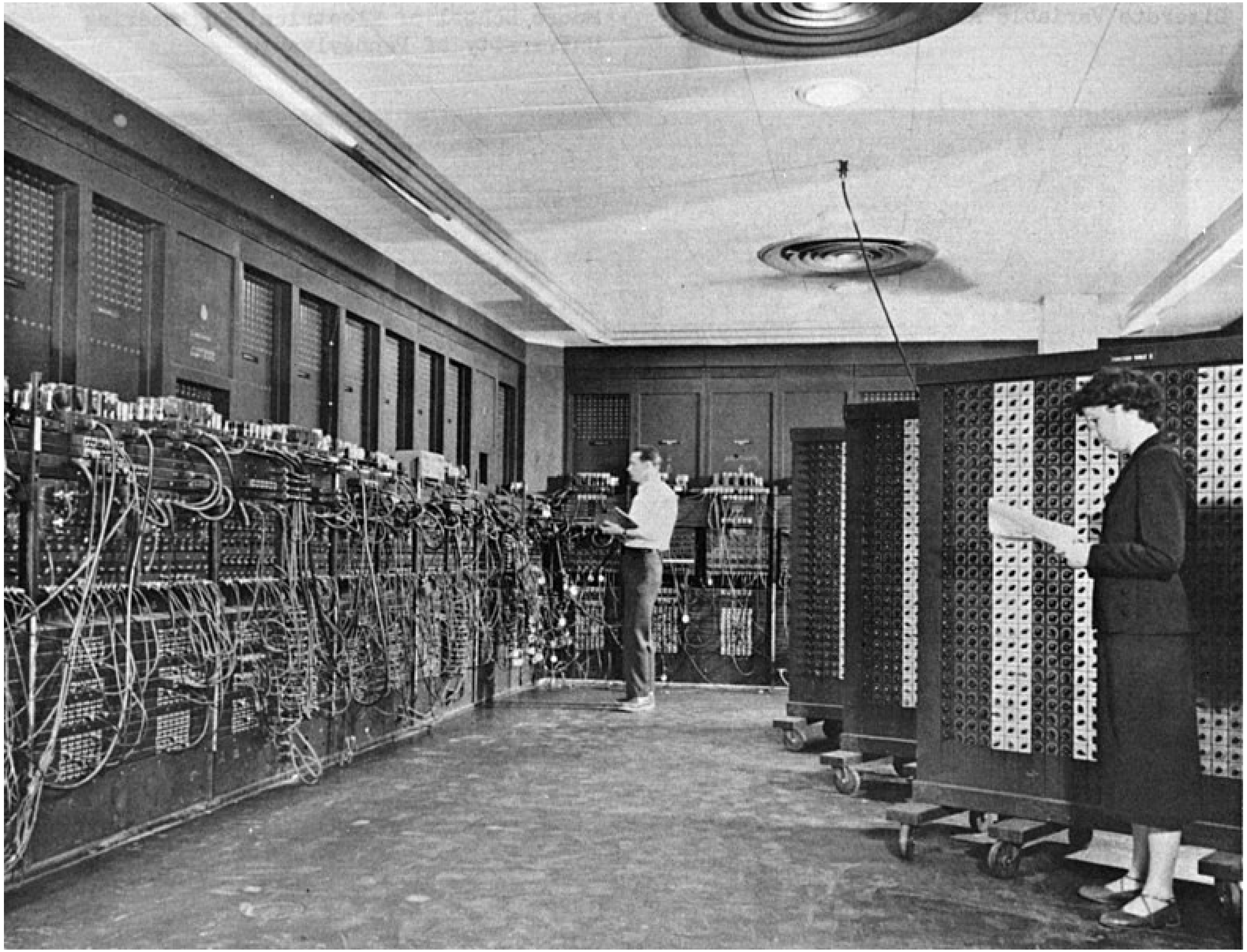
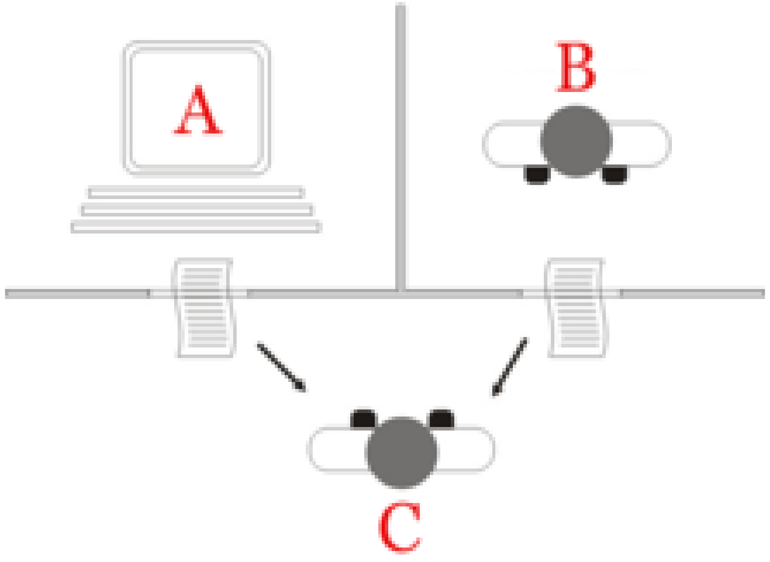
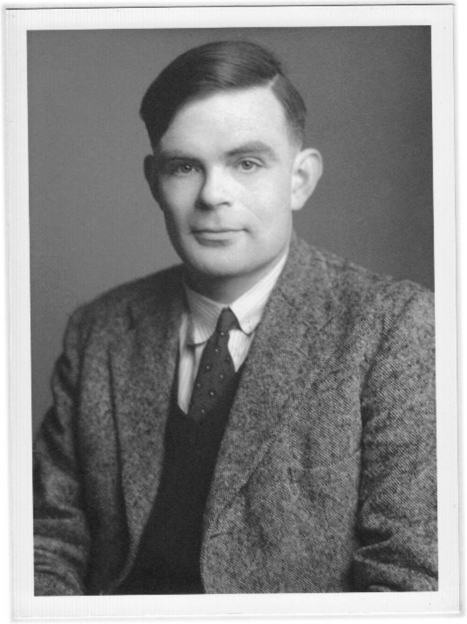


1950: Turing Test



- 1950: Turing asks the question "**Can machines think**?"
- 'imitation game' is played with three people,
  - a man (A),
  - a woman (B), and
  - an interrogator (C)
- 'What will happen when a machine takes the part of A in this game?' Will the interrogator decide wrongly as often when the game is played like a man and a woman?
- Player C, the interrogator, is given the task to determine which player – A or B – is a computer and which is a human.
- The interrogator is limited to using the responses to written questions to make the determination.



1950: Turing Test

- Turing defined "intelligent behavior as the ability to achieve human-level performance in all cognitive tasks, sufficient to fool an interrogator."
- Intelligent computer
  - interrogated by a human via invisible communication channel,
  - pass the test
    - "if the interrogator fails to guess there is a computer or a human at the other end"
- Popular Science Fictions
  - Small Wonders
  - Karishma ka Karishma

1956: DARTMOUTH RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE

A PROPOSAL FOR THE DARTMOUTH SUMMER RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE

J. McCarthy, Dartmouth College
M. L. Minsky, Harvard University
N. Rochester, I.B.M. Corporation
C.E. Shannon, Bell Telephone Laboratories

August 31, 1955

We propose that a 2 month, 10 man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves. We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it together for a summer.

1956: DARTMOUTH RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE

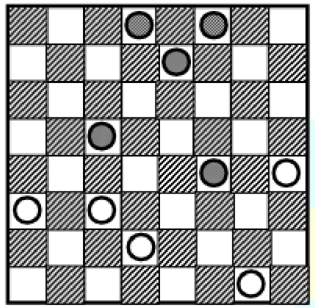
- The following are some aspects of the artificial intelligence problem:
  1. Automatic Computers
  2. How Can a Computer be Programmed to Use a Language
  3. Neuron Nets
  4. Theory of the Size of a Calculation
  5. Self-Improvement
  6. Abstractions
  7. Randomness and Creativity
- Application of information theory concepts to computing machines and brain models.
- The matched environment - brain model approach to automata.

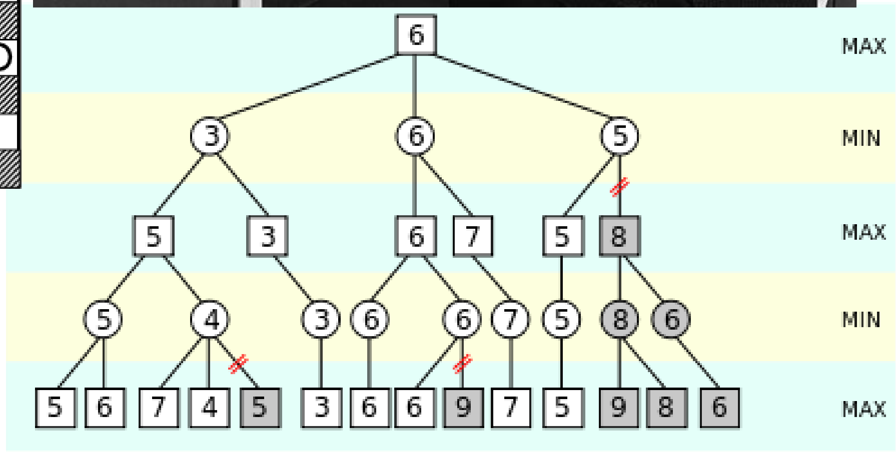
1956: DARTMOUTH RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE

- The stage of programming in a computer.
- Originality in Machine Performance
- The Process of Invention or Discovery
  1. The environment provides data from which certain abstractions are formed.
  2. The abstractions together with certain internal habits or drives provide:
     1. A definition of a problem in terms of desired condition to be achieved in the future, a goal.
     2. A suggested action to solve the problem.
     3. Stimulation to arouse in the brain the engine which corresponds to this situation.
  3. Then the engine operates to predict what this environmental situation and the proposed reaction will lead to.
  4. If the prediction corresponds to the goal the individual proceeds to act as indicated.
- The Machine With Randomness

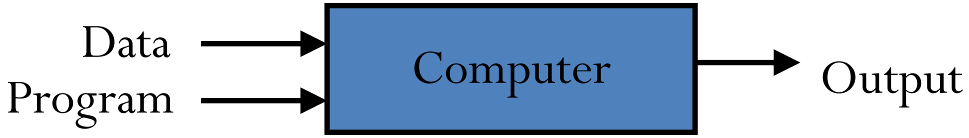
1959: Machine Learning

- Arthur Samuel: Automated Game for "Computer checkers" development
- Ability to learn without explicit programming.
  - Samuel implemented alpha-beta pruning
  - Grayed-out subtrees don't need to be explored (when moves are evaluated from left to right),
  - the group of subtrees yields the value of an equivalent subtree or worse, and
  - as such cannot influence the final result.

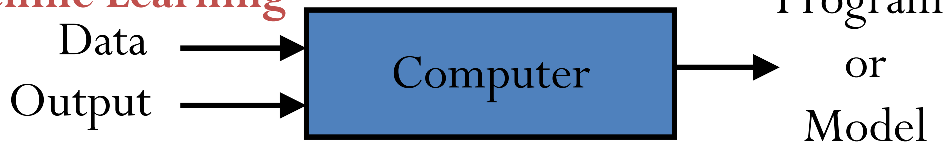




Traditional Programming



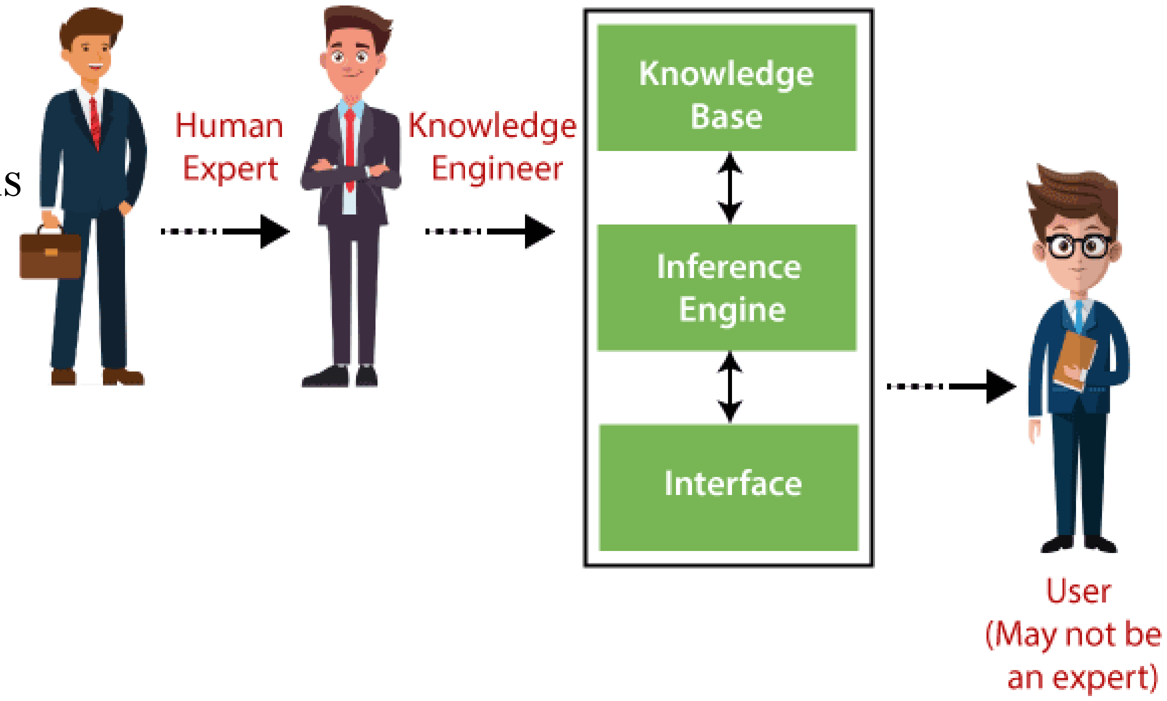
Machine Learning



1960: Expert Systems

Expert Systems are created using following techniques

- Explicit, rules, programs
- Playing Games
- Organic models, Biology recommendations
- Solving word problem in Algebra
- Natural Language processing
- Mobile Robot



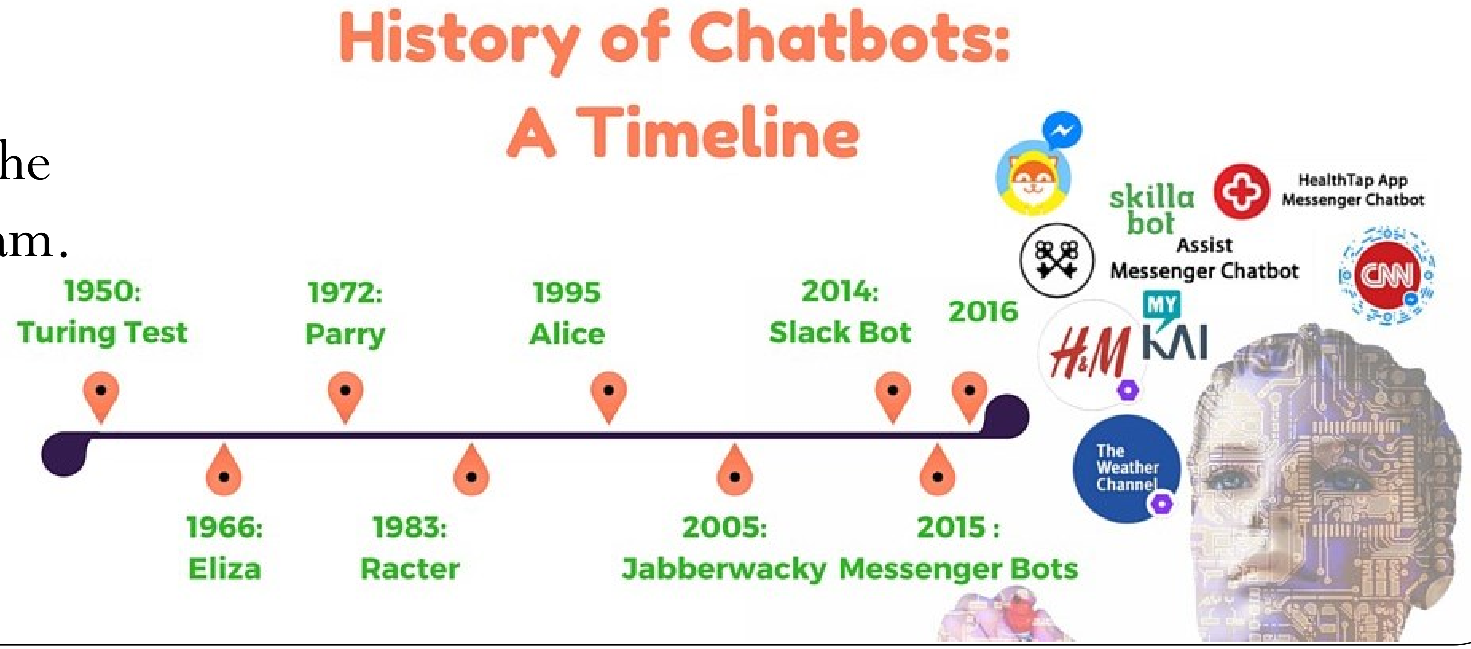
1964: Eliza Chatbot

- The chatbot psychotherapist
- Using "pattern matching" and substitution methodology, the program gives canned responses.
- It made early users feel they were talking to someone who understood their input.
- The program was limited by the scripts that were in the program.

Talk to Eliza by typing your questions and answers in the input box.

```
> Hello, I am Eliza. I'll be your therapist today.
* What is your name?
> Does that question interest you?
* Are you intelligent?
> Why are you interested in whether or not I am intelligent?
* To do Turing Test.
> I'm not sure I understand you fully.
* Do you know Turing Test?
> Oh... Let's move on to something else for a bit.  know Turing Test?
```

TYPE HERE



https://web.njit.edu/~ronkowit/eliza.html

1966: Shakey general purpose mobile robot

- First mobile robot with the ability to perceive and reason about its surroundings
- Tasks required planning, route-finding, and the rearranging of simple objects.

https://www.sri.com/hoi/shakey-the-robot/

AI Winter (1974-80)

- Abandonment of AI: There were two major winters in 1974–1980 and 1987–1993
- 1966: failure of machine translation
- 1970: abandonment of connectionism
- Period of overlapping trends:
  - 1971–75: DARPA's frustration with the Speech Understanding Research program at Carnegie Mellon University
  - 1973: large decrease in AI research in the United Kingdom in response to the Lighthill report
  - 1973–74: DARPA's cutbacks to academic AI research in general
- 1974 – 1980: AI Winter #1

  – Failure of machine translation

  – Negative results in Neural nets

  – Poor speech understanding

AI Winter (1974-80)

- Problem with A.I.
- Applications were primarily for toy problems
- Low computational power
- Combinatorial explosion too many exhaustive Rules
- Common-sense is nearly impossible to program
- Minsky's book = Perceptron showed limitations of simile neural network
- Loss of government funding in A.I.

AI Spring and Summer

AI Spring (1980-87)

- Expert systems used in several real-world applications
- Driverless car
- Hopfield network popularization of backpropogation
- Minsky (1984) – “Winter is coming!”

AI Winter (1987-93)

- 1987 – 1993: AI Winter #2
- 1987: collapse of the LISP machine market
  - Decline of LISP
- 1988: cancellation of new spending on AI by the Strategic Computing Initiative
- 1990s: end of the Fifth Generation computer project's original goals
- 1993: resistance to new expert systems deployment and maintenance
  - Decline of specialized hardware for expert systems

AI Winter (1987-93)

- Popularity of the P.C.
- Lack of attractive results
- Funding cuts
- Lasting effects
  – "Artificial Intelligence is associated with systems that have all too often failed to live up to their promises."
  – "Some believe the word 'robotics' actually carries a stigma that hurts a company's chances at funding."
- Winter over due to
- 1993: Association Rule Mining by Rakesh Agrawal and Srikant Ramakrishnan

AI Spring and Summer

AI Summer (1994-2000)

- Apriori algorithm: Association Rule Mining by Rakesh Agarwal in 1993 and 1995
- 1997 Deep Bule beats Kasparov in chess
- Theory – Including probability, information theory, optimization etc.
- Moore's Lay – Rapid growth of processing power.
  - "Number of transistor doubles every two years"

History of Modern AI

1993: Apriori algorithm (Association Rule Mining)

- Let I = $\{i_1, i_2, \ldots\ldots i_m\}$ be a set of literals, called items.
- *Support* of a rule $X \rightarrow Y$ is the percentage of transactions that contain both X and Y.
- *Confidence* of a rule is percentage the if-then statements ($X \rightarrow Y$) are found true
- Find all rules that satisfy a user-specified *minimum support* and *minimum confidence*

TID	Transaction Items
1	Bread, Jelly, PeanutButter
2	Bread, PeanutButter
3	Bread, Milk, PeanutButter
4	Beer, Bread
5	Beer, Milk

{Bread} → {PeanutButter} (Sup = 60%, Conf = 75%)
{PeanutButter} → {Bread} (Sup = 60%, Conf = 100%)
{Beer} → {Bread} (Sup = 20%, Conf = 50%)
{PeanutButter} → {Jelly} (Sup = 20%, Conf = 33.33%)
{Jelly} → {PeanutButter} (Sup = 20%, Conf = 100%)
{Jelly} → {Milk} (Sup = 0%, Conf = 0%)

Rakesh Agrawal, Tomasz Imieliński, and Arun Swami. "Mining association rules between sets of items in large databases." SIG-MOD. 1993.
Ramakrishnan Srikant, and Rakesh Agrawal. "Mining Generalized Association Rules.“ VLDB 1995.

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- Find all rules that satisfy a user-specified *minimum support* and *minimum confidence*
  - 90% of transactions that purchase *Bread* and *Butter* (antecedent) also purchase *Milk* (consequent). The number 90% is the confidence factor of the rule
    - [*Bread*], [*Butter*] → [Milk] 90%
  - 98% of customers who purchase *Tires* and *Auto accessories* also buy some *Automotive services*; here 98% is called the confidence of the rule.
    - [*Auto Accessories*], [*Tires*] → [*Automotive Services*] 98%

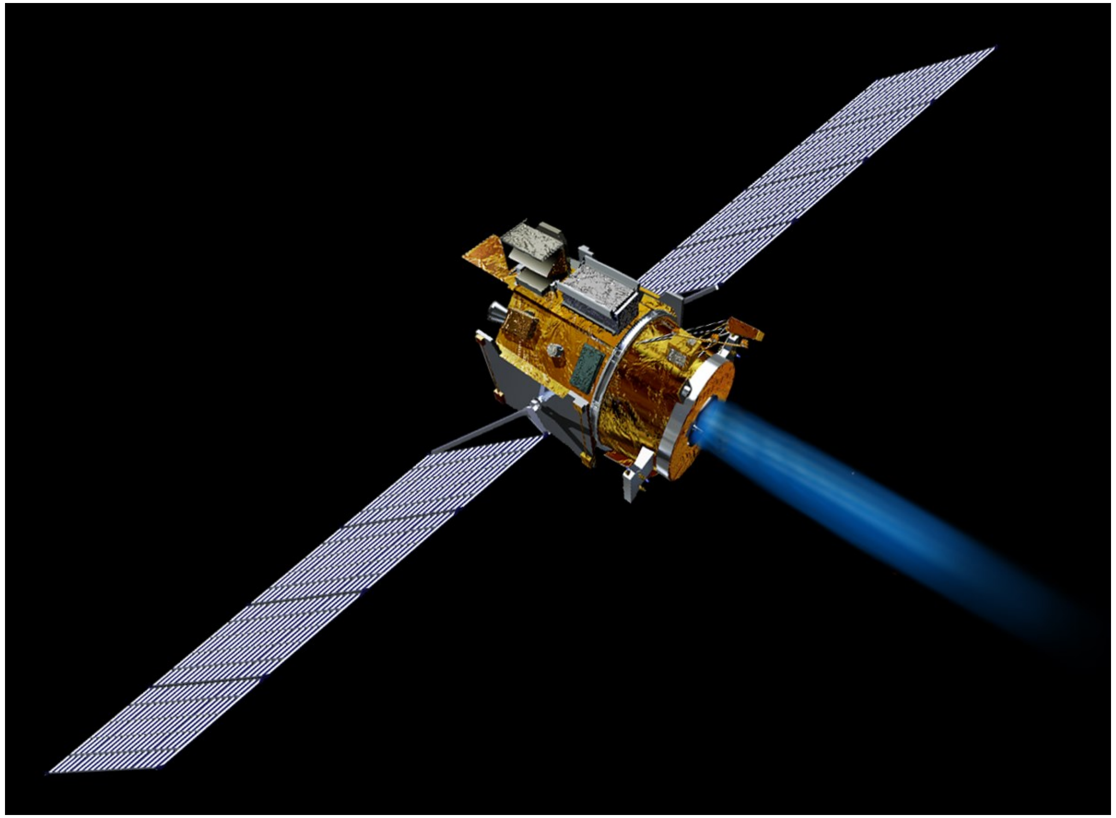
Rakesh Agrawal, Tomasz Imieliński, and Arun Swami. "Mining association rules between sets of items in large databases." SIG-MOD. 1993.
Ramakrishnan Srikant, and Rakesh Agrawal. "Mining Generalized Association Rules." VLDB 1995.

1997: Deep Blue ends Human Supremacy in Chess

- I could feel human-level intelligence across the room -Gary Kasparov, World Chess Champion (human)
- In a few years, even a single victory in a long series of games would be the triumph of human genius.
- Does Deep Blue use AI? "If it works, its not AI!"
- "Saying Deep Blue doesn't really think about chess is like saying an airplane doesn't really fly because it doesn't flap its wings". – Drew McDermott

1998: Deep Space 1

- 1998: Deep Space 1
- For two days in May 1999, an AI program called "Remote Agent" autonomously ran Deep Space 1 (some 60,000,000 miles from earth)
- The spacecraft's main goal was to test 12 high-risk technologies including
  - ion propulsion,
  - autonomous optical navigation,
  - a solar power concentration array, and
  - a combination miniature camera-imaging spectrometer.



Key Dates
Oct. 24, 1998: Launch
July 29, 1999: DS1 passed by asteroid 9660 Braille
Sept. 18, 1999: Primary mission ended
Sept. 22, 2001: DS1 entered the coma of Comet Borrelly
Dec. 18, 2001: DS1's ion engine is finally turned off

https://solarsystem.nasa.gov/missions/deep-space-1/in-depth/

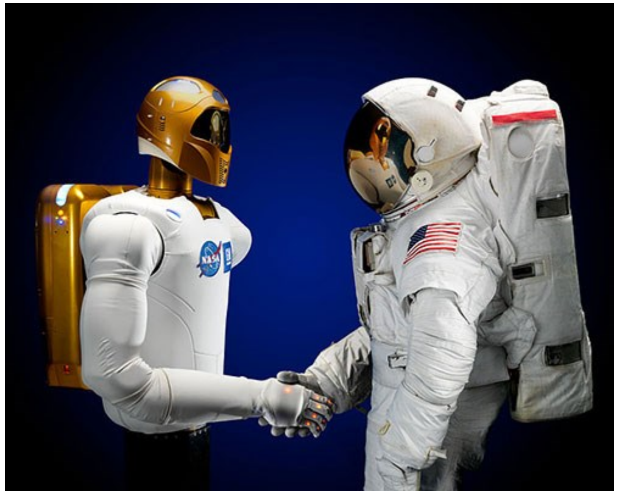
Space AI progress

- Image analysis for Road paths, large-object detection, galaxy, planet or star classification

https://www.wiley.com/edge/media/artificial-intelligence-for-space-exploration/

Space AI progress

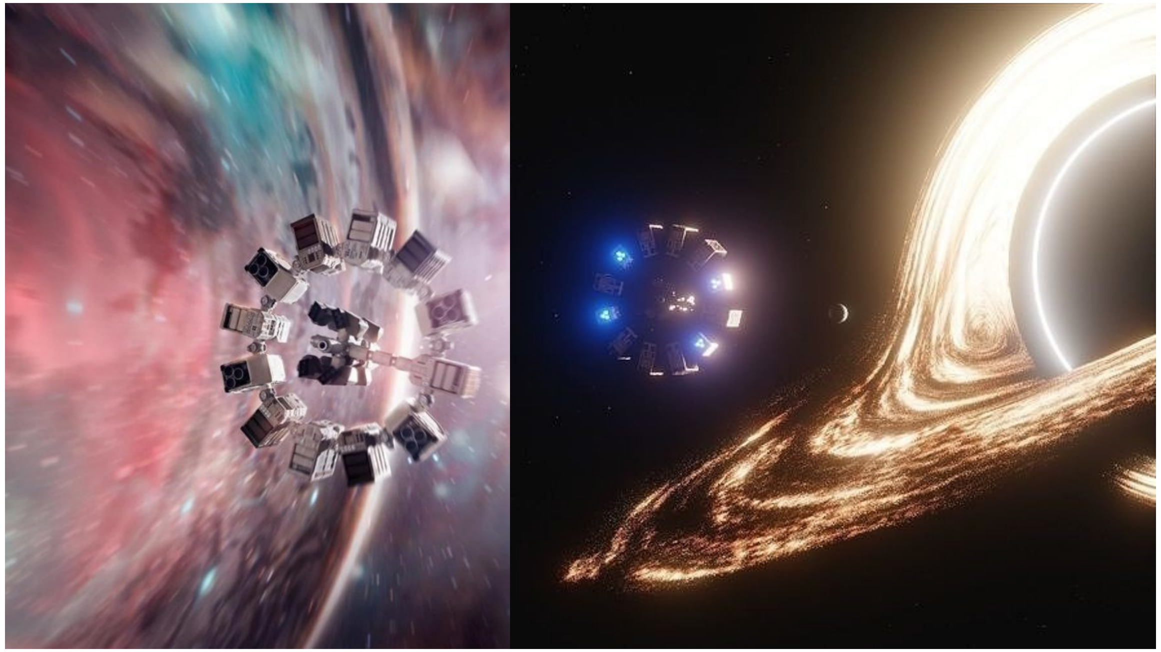
- INTELLIGENT NAVIGATION SYSTEM to help astronauts find their way on the planets
- AI-BASED ASSISTANTS AND ROBOTS to help astronomers in their long space travel
- AUTONOMOUS ROVERS that roam the surface of other planets (currently the surface of Mars).



https://www.wiley.com/edge/media/artificial-intelligence-for-space-exploration/

Space AI progress

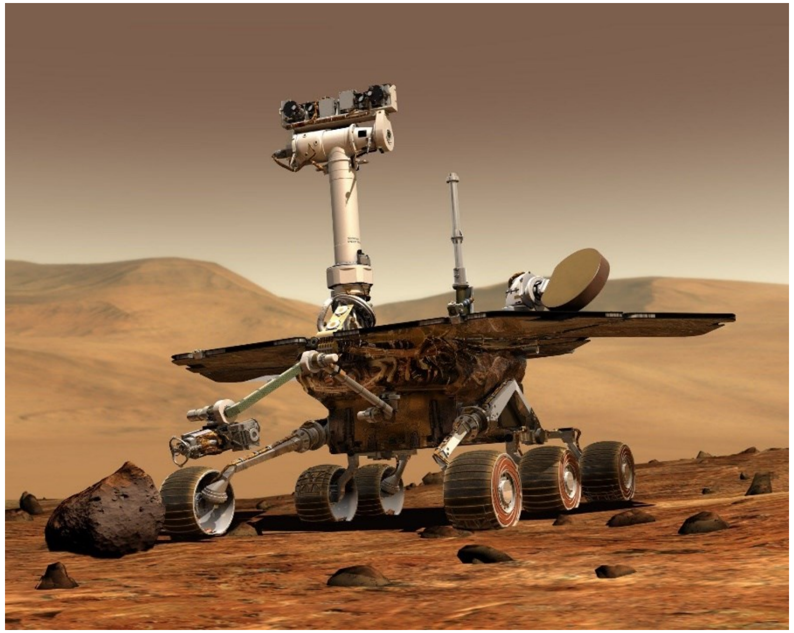
- AI'S ROLE IN SPACE EXPLORATION such as charting unnoted galaxies, stars, black holes, and studying cosmic events, as well as communication, autonomous StarCraft navigation, monitoring and system control.



https://www.wiley.com/edge/media/artificial-intelligence-for-space-exploration/

Space AI progress

- Other Use Cases: Astronaut assistants, Mission design and planning, Satellite data processing, Space debris, Navigation systems
- To make decisions and avoid obstacles on the rough surface.
- Determining the best route without specific commands from the mission control.
- AI4Mars project to outline and identify different rock and landscape features.



https://www.wiley.com/edge/media/artificial-intelligence-for-space-exploration/

2005 onward: Driverless Cars

- DARPA Grand Challenge
- 2005 Autonomous driving for 135 miles in mountain road of desert
- Stanley and three other cars drive themselves

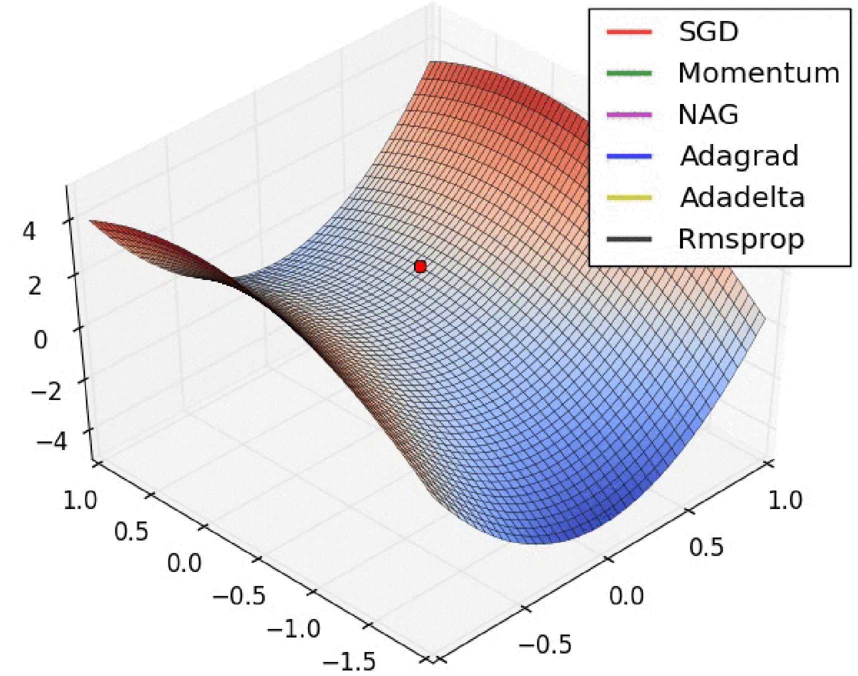
Now

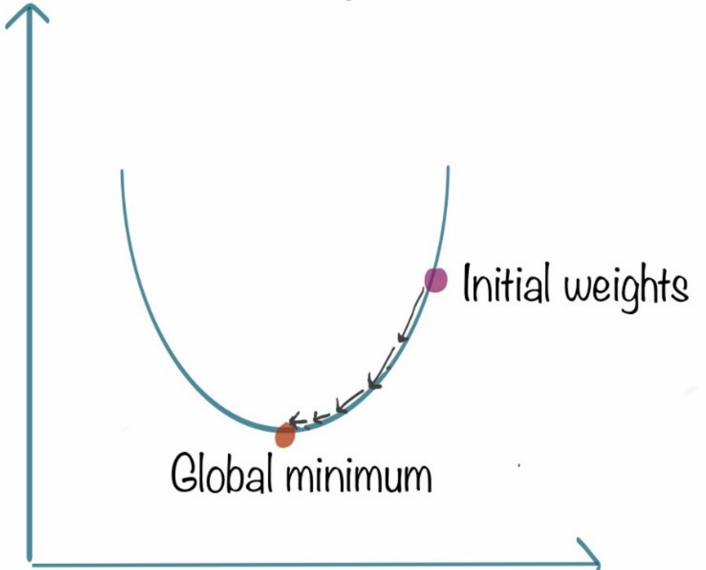
2000-12: Big Data, GPU, Deep Learning, NLP

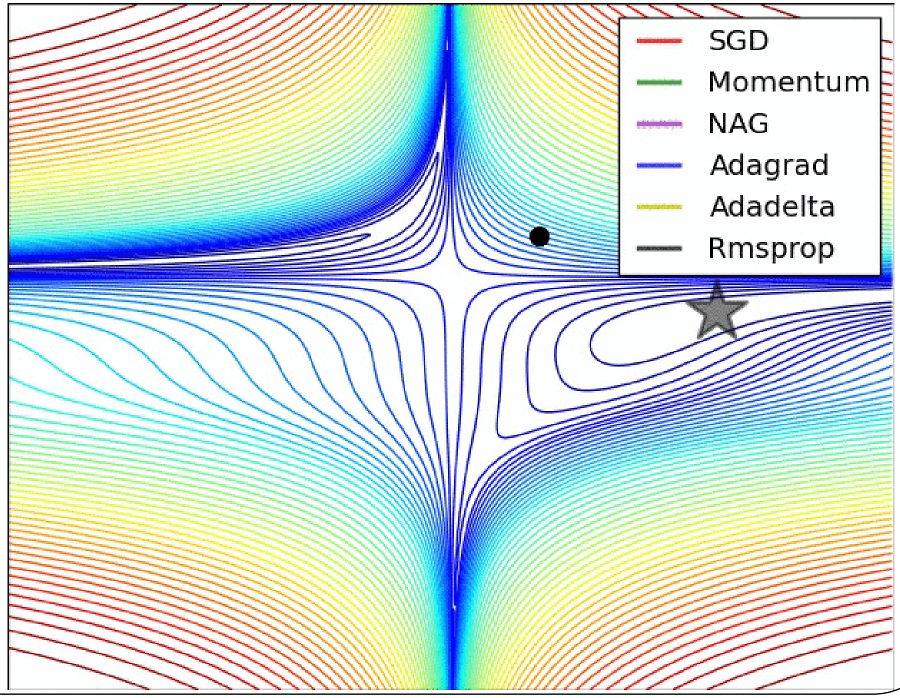
- Google is popular (Big File, Google File Systems, Page Rank Algorithm etc.)
- Internet boom
- Shifted emphasis to big data – statistical techniques
- Graphical Processing Units (GPUs) inventions
- Spectacular results in Deep Neural Networks
- Specific goal oriented research expectations (Speech, Text, Image, Video etc)
- IBM's Watson beat the Jeopardy champions.
    - Due to Advance Natural Language Processing (NLP) and Q&A.

2000 onward: Deep Learning

- For the Probabilities and Expectation equations
  - an optimization algorithm finds the value of the parameters (weights) that minimize the error when mapping inputs to outputs.
  - Optimization algorithms affect the accuracy and the speed of the training a deep learning model.





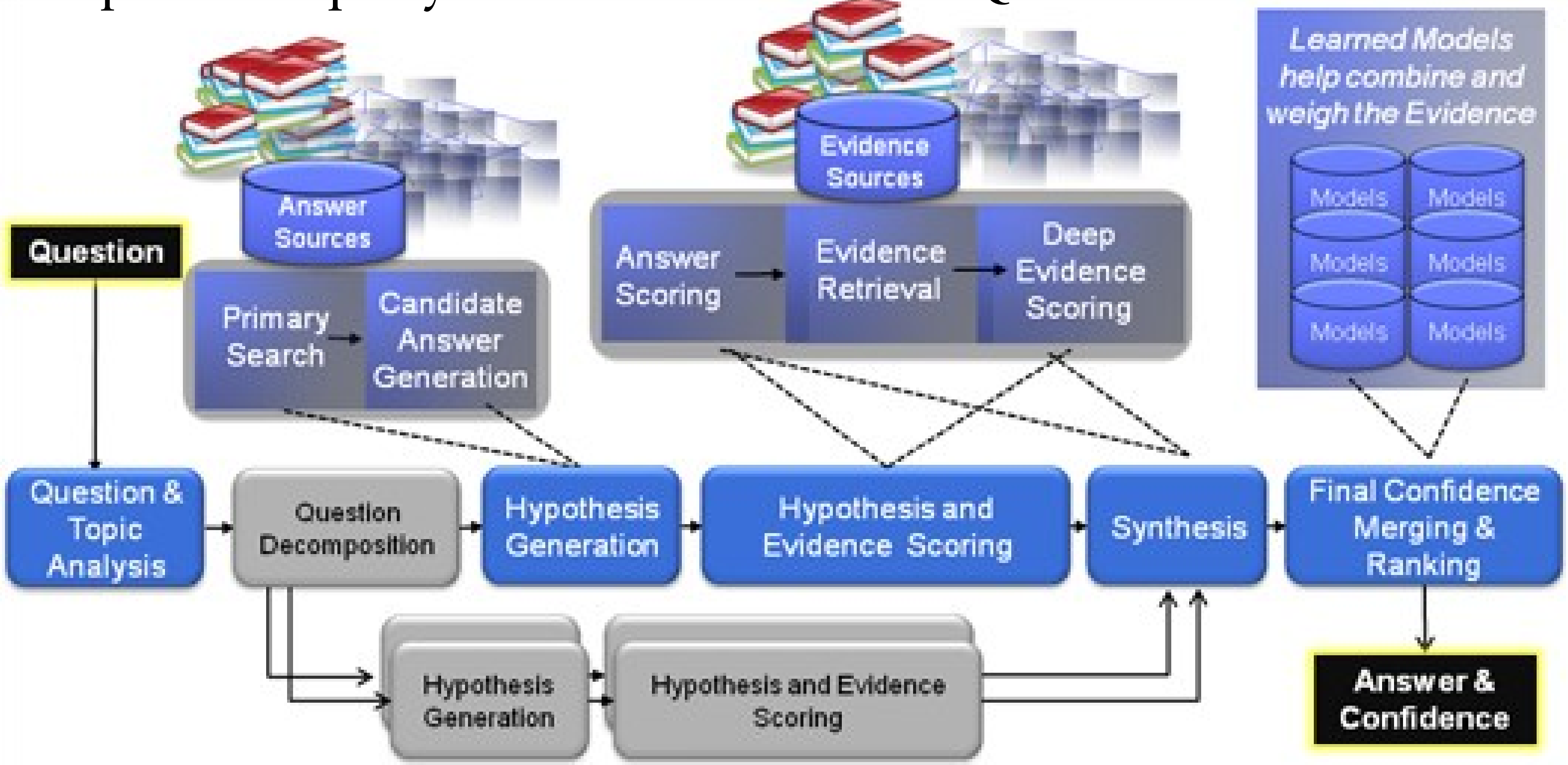


https://awesomeopensource.com/project/Jaewan-Yun/optimizer-visualization

2011: IBM Watson beaten Human in Jeopardy

- Watson is performing at human expert levels in terms of precision, confidence, and speed at the Jeopardy quiz show.
- DeepQA architecture for combining, deploying, evaluating, and advancing a wide range of algorithmic techniques to rapidly advance the field of QA.

https://researcher.watson.ibm.com/researcher/view_group_subpage.php?id=2159

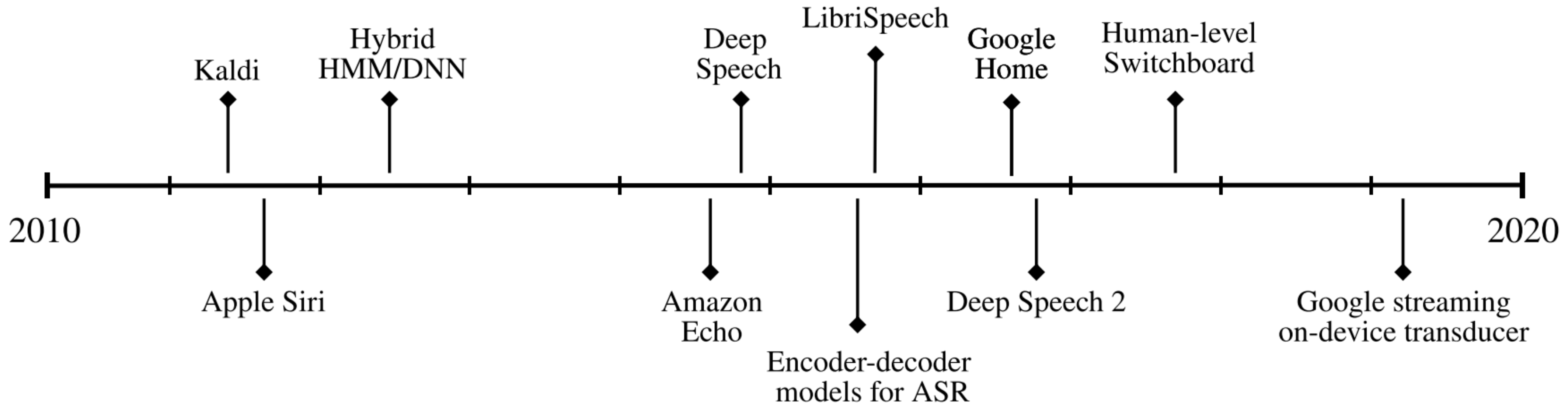


2010 onward: Natural Language - Speech

- Amazon Alexa
- Apple Siri
- Microsoft Cortana
- Google translate
- Voice recognition on Google Search, Whatsapp, etc.

Open-source and speech recognition software like Kaldi, and larger benchmarks like LibriSpeech are widely used.

ChaptGPT (2023)



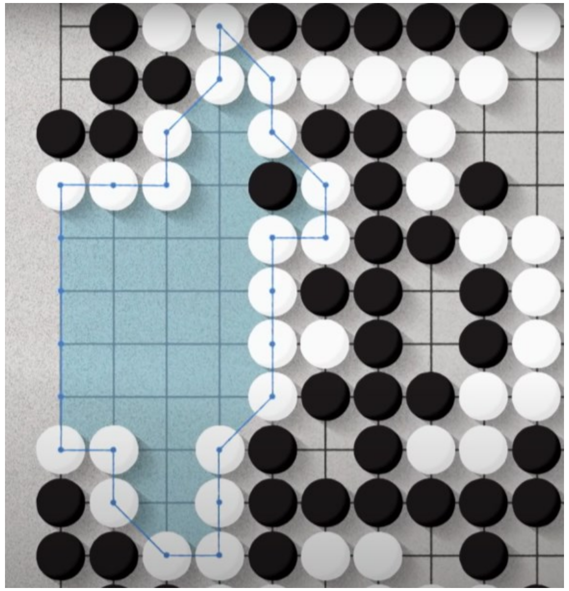
Hannun, Awni. "The history of speech recognition to the year 2030." *arXiv preprint arXiv:2108.00084* (2021).

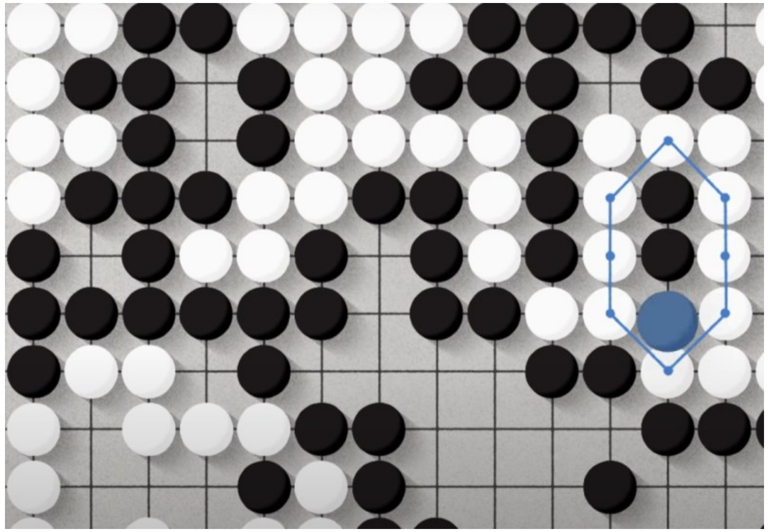
2012 onward: AI Spring

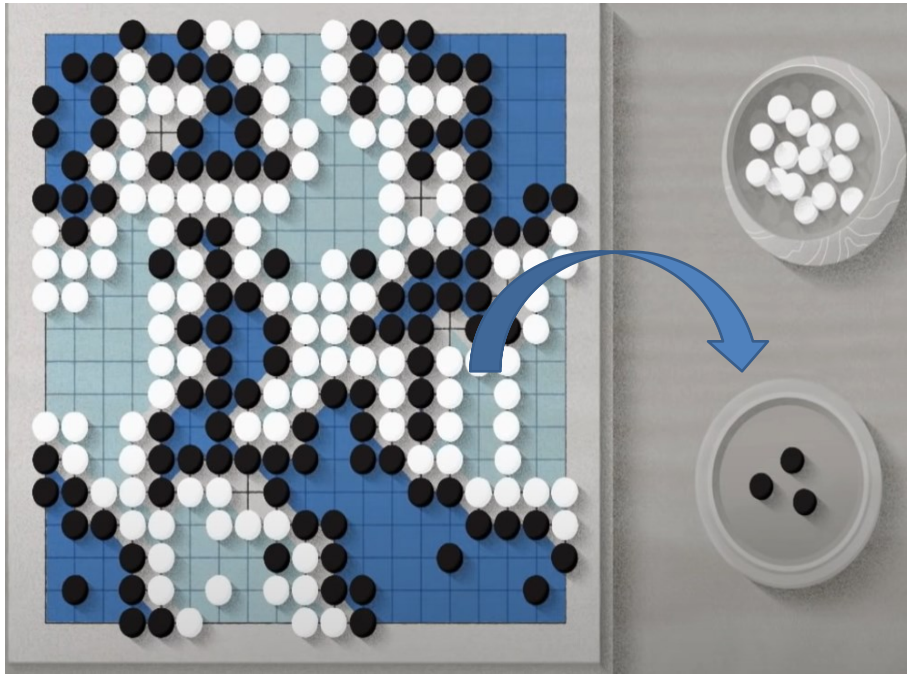
- Private funding companies: Microsoft, Google, Facebook, IBM, AWS etc
- Fast development of computational power
- Large volume of data generation
- Availability of Big data: Growth of data
- Better data science, data mining, deep learning, and machine learning
- Better automated gaming due to Reinforcement Learning
- Better technology and huge computational power
- Cloud based Shared resources (Software and Hardware)
- Better algorithms, Self-supervised Learning, Open source software development

2016: Alpha Go

- Make territories
- Capture opponent pieces
- Largest territory

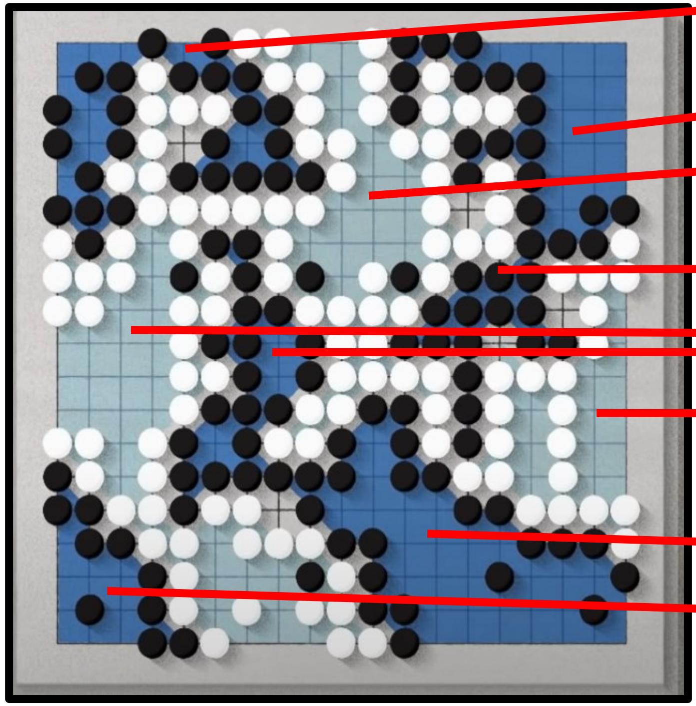


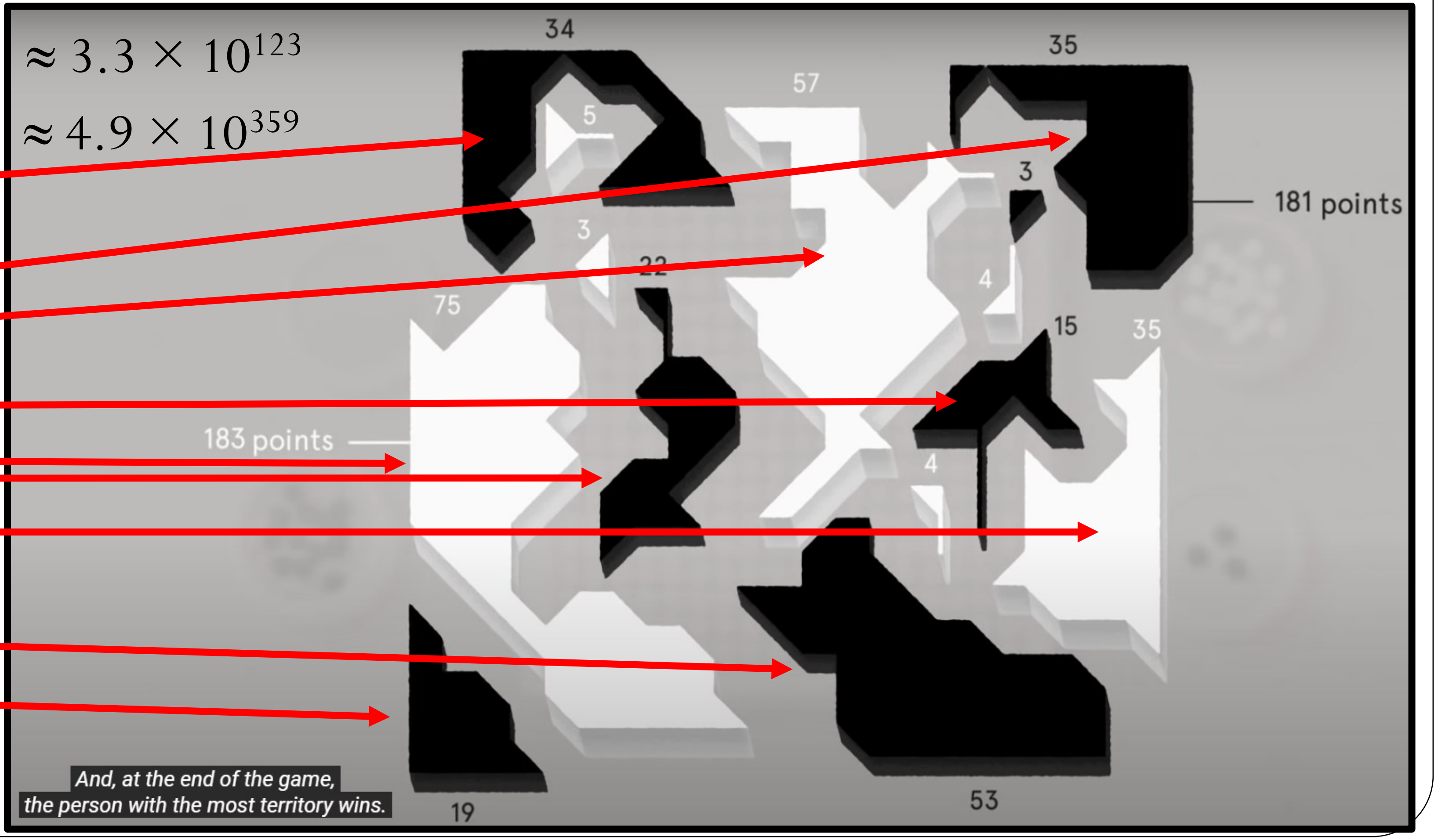




2016: Alpha Go

- Large games, search tree containing approximately b^d possible sequences of moves
  - exhaustive search is infeasible because
  - Chess ($b \approx 35$, $d \approx 80$) $\approx 3.3 \times 10^{123}$
  - Go ($b \approx 250$, $d \approx 150$) $\approx 4.9 \times 10^{359}$





2016: Alpha Go

- AlphaGo achieved a 99.8% winning rate against other Go programs, and defeated the human European Go champion by 5 games to 0.
- This is the first time that a computer program has defeated a human professional player in the full-sized game of Go.

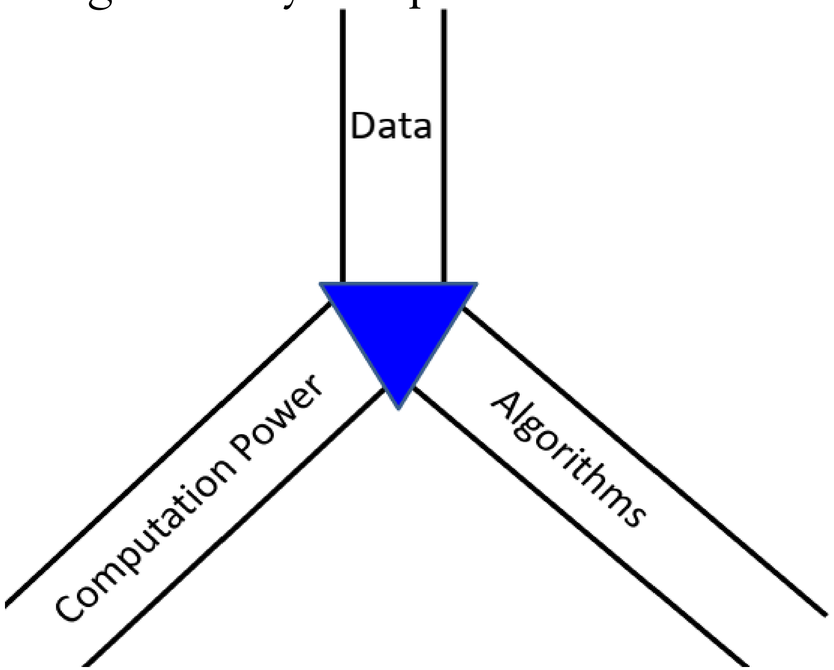
Improvement resulted better AI

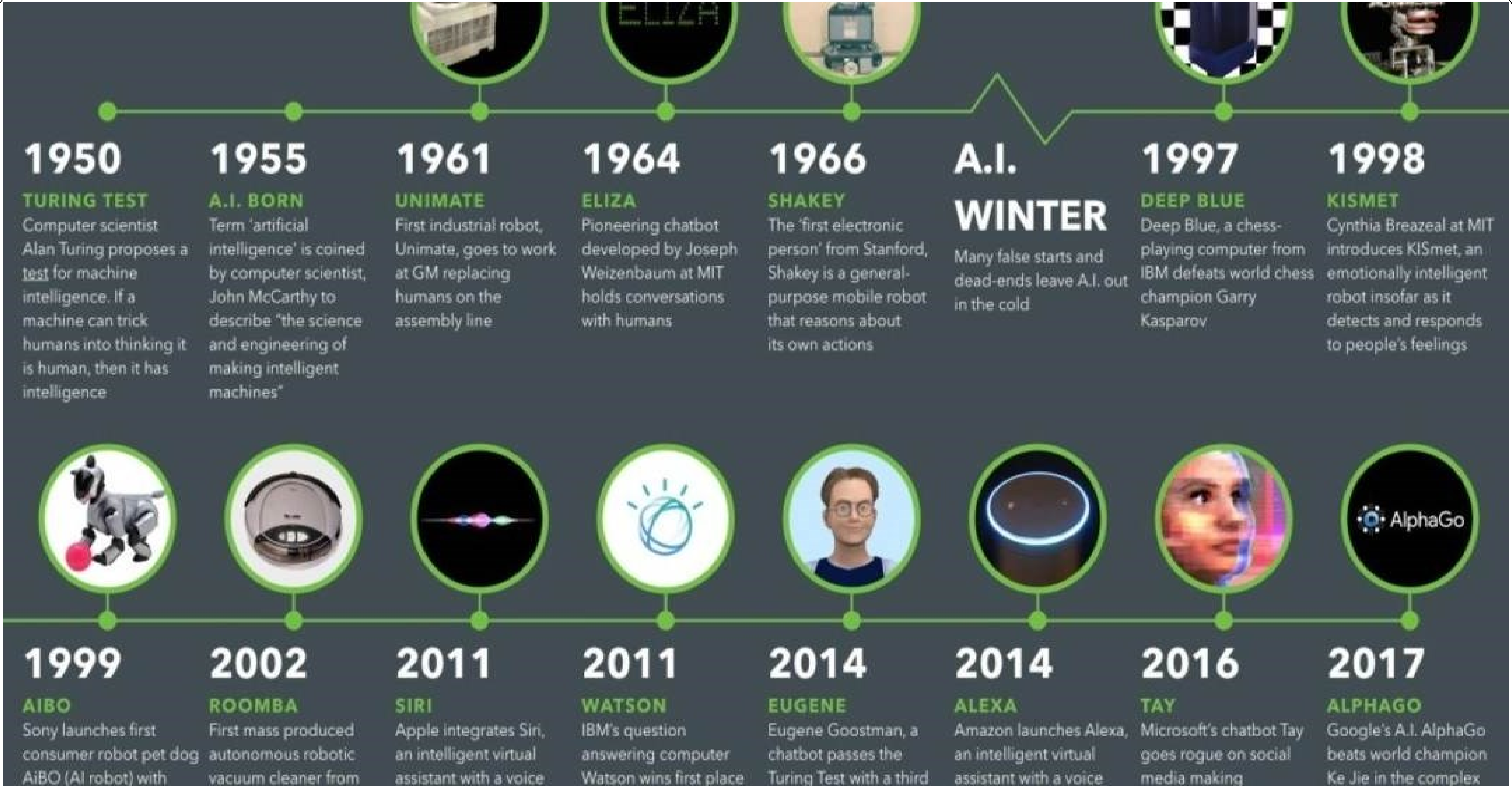
Problems

- sharp minima (leading to overfitting), non-robustness
  - analysis corresponds too closely or exactly to a particular set of data
  - therefore, fail to fit to additional data or predict future observations reliably
- numerical instability (vanishing/exploding gradients)
  - generally desirable property of numerical algorithms for solving ordinary and partial differential equations by discrete approximation

Why does AI work so well because

- high capacity (susceptible to overfitting)
- Better and more training Data
- Better, large, scalable, parallel Computational Power
- Better, parallel and distributed Algorithms
- Slowly but steadily increasing emphasis on
  - Explainability and Interpretability
  - Theoretical justifications



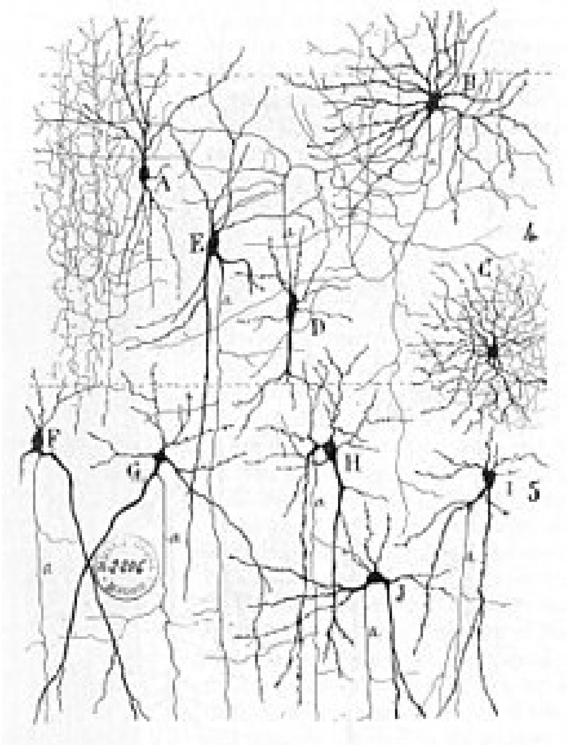


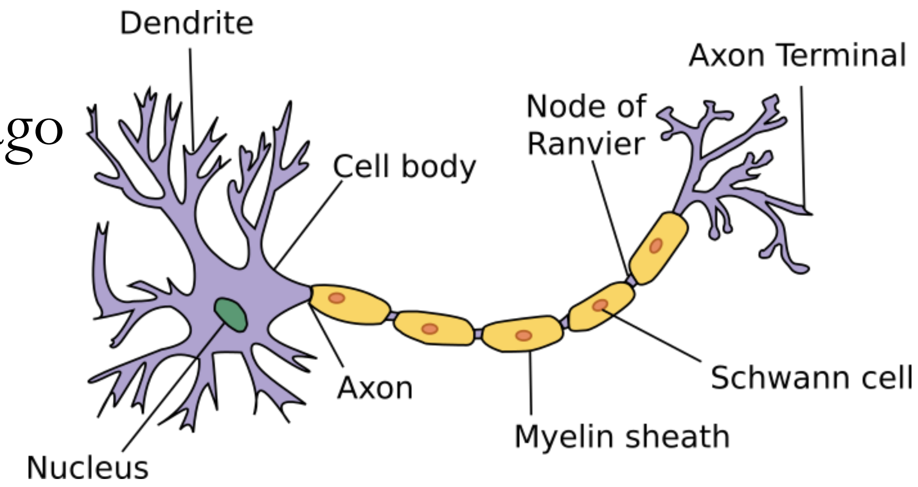
https://whataftercollege.com/robotics-embedded-system/chronological-history-of-mobile-robotics/

History of Artificial Neural Network (ANN)

Neural Network (Anatomy)

- **1870s:** Reticular Theory “nervous system and brain is a single continuous network, all nerve cells in the nervous system constituted a continuous, interconnected network”
- **1888:** Neurons “fundamental units of the brain and nervous system, each nerve cell is an independent entity and nerve synapses transfer nerve impulses from one cell to another”
- **1906:** Nobel prize to both Camillo Golgi and Santiago Ramón y Cajal "in recognition of their work on the structure of the nervous system."

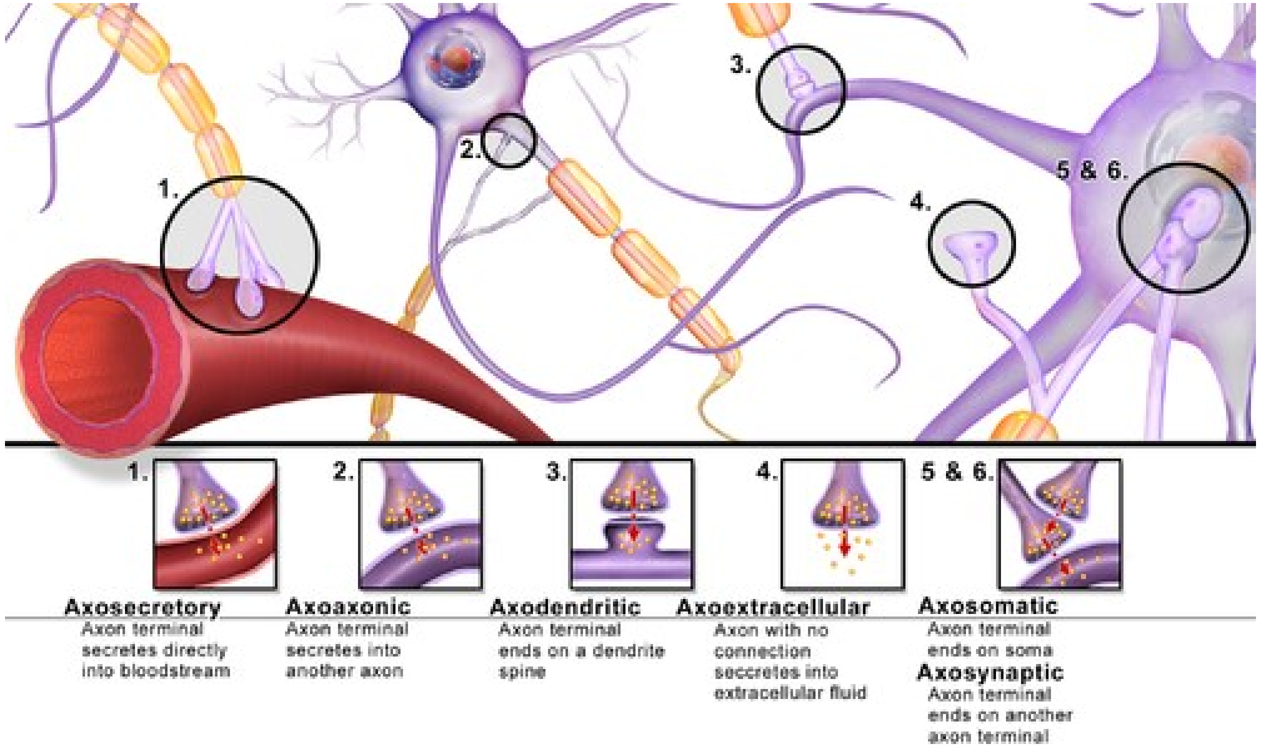




https://www.nobelprize.org/prizes/medicine/1906/summary/

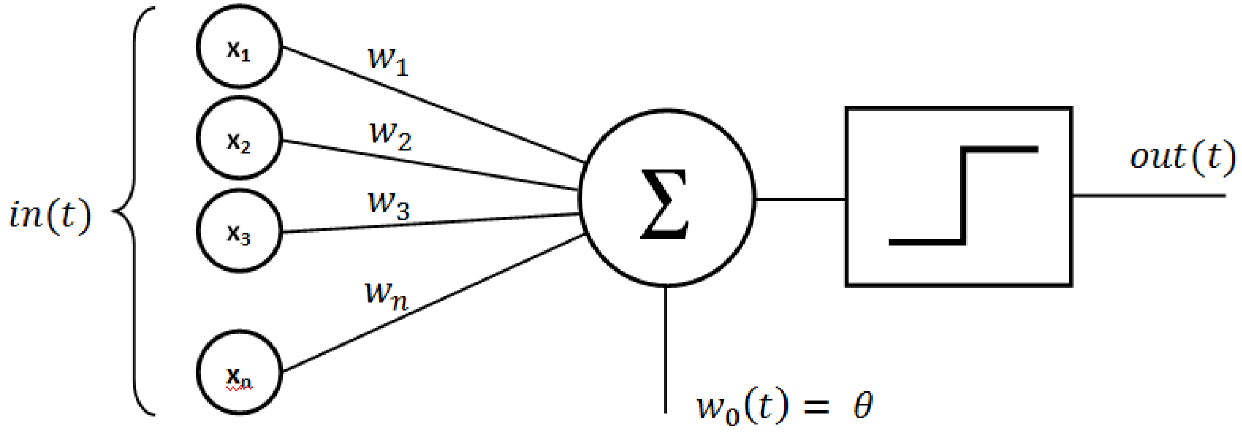
Neural Network (Anatomy)

- Synapse is a structure that permits a neuron (or nerve cell) to pass an electrical or chemical signal to another neuron or to the target effector cell.
- Synapses are essential to the transmission of nervous impulses from one neuron to another.
- Different types of synapses



Perceptron

- **1943 Perceptron** was invented by **McCulloch and Pitts**
- **1958 Mark I Perceptron** hardware developed and constructed by **Frank Rosenblatt**



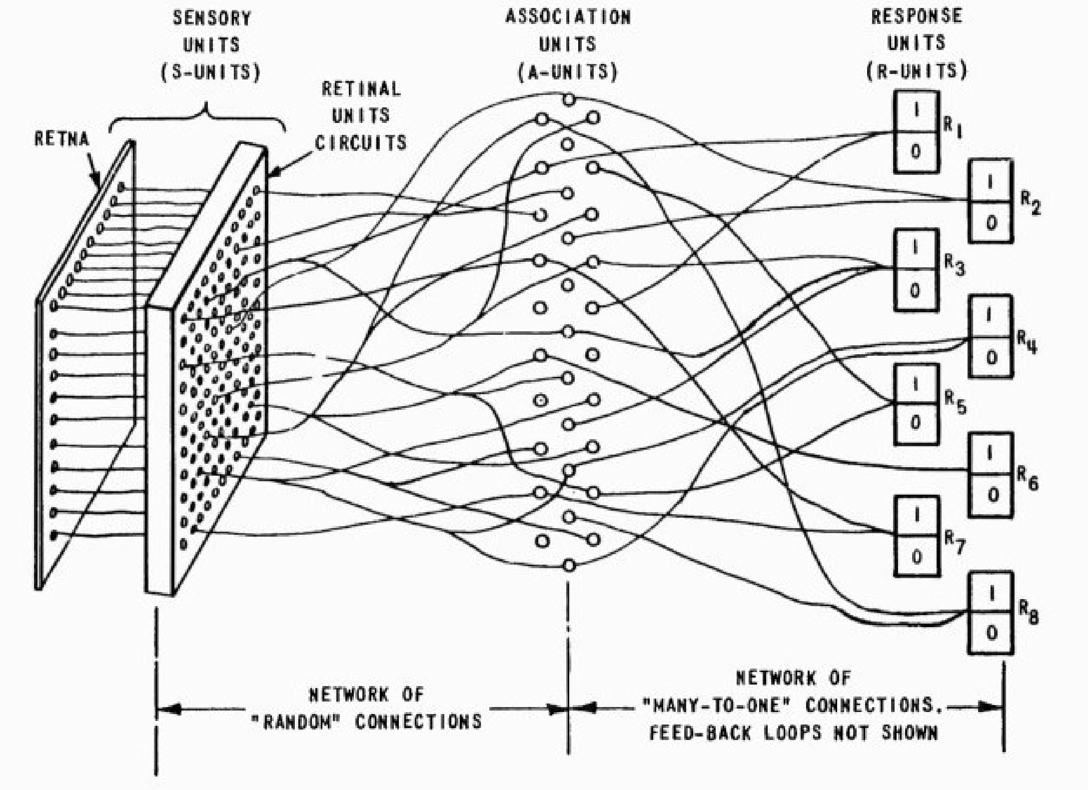
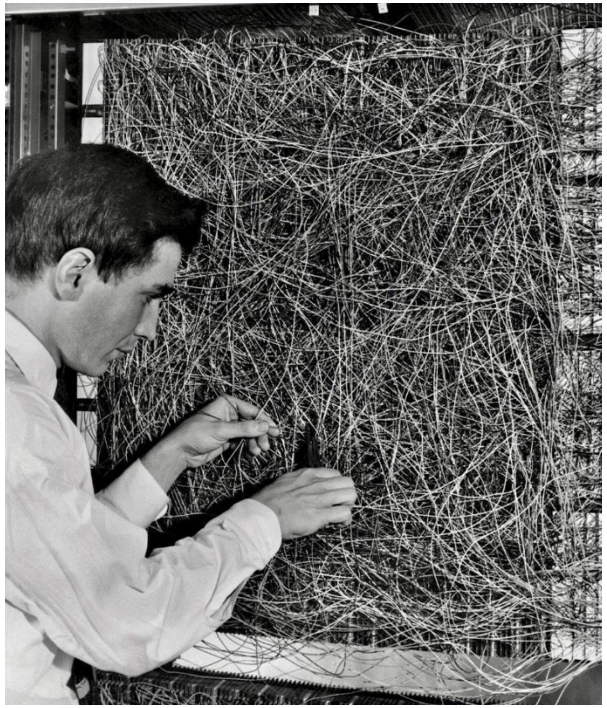
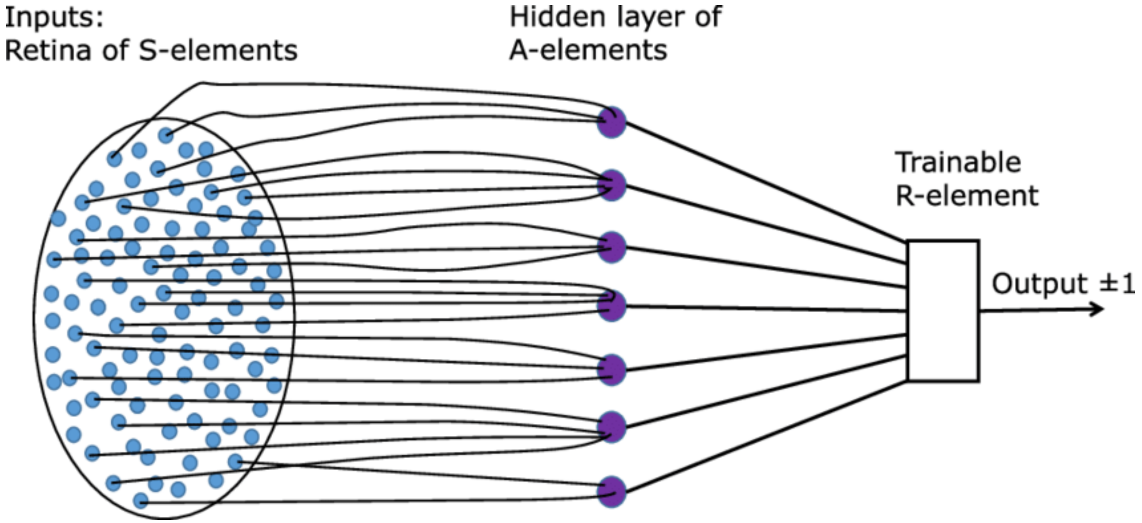


Figure I ORGANIZATION OF THE MARK I PERCEPTRON

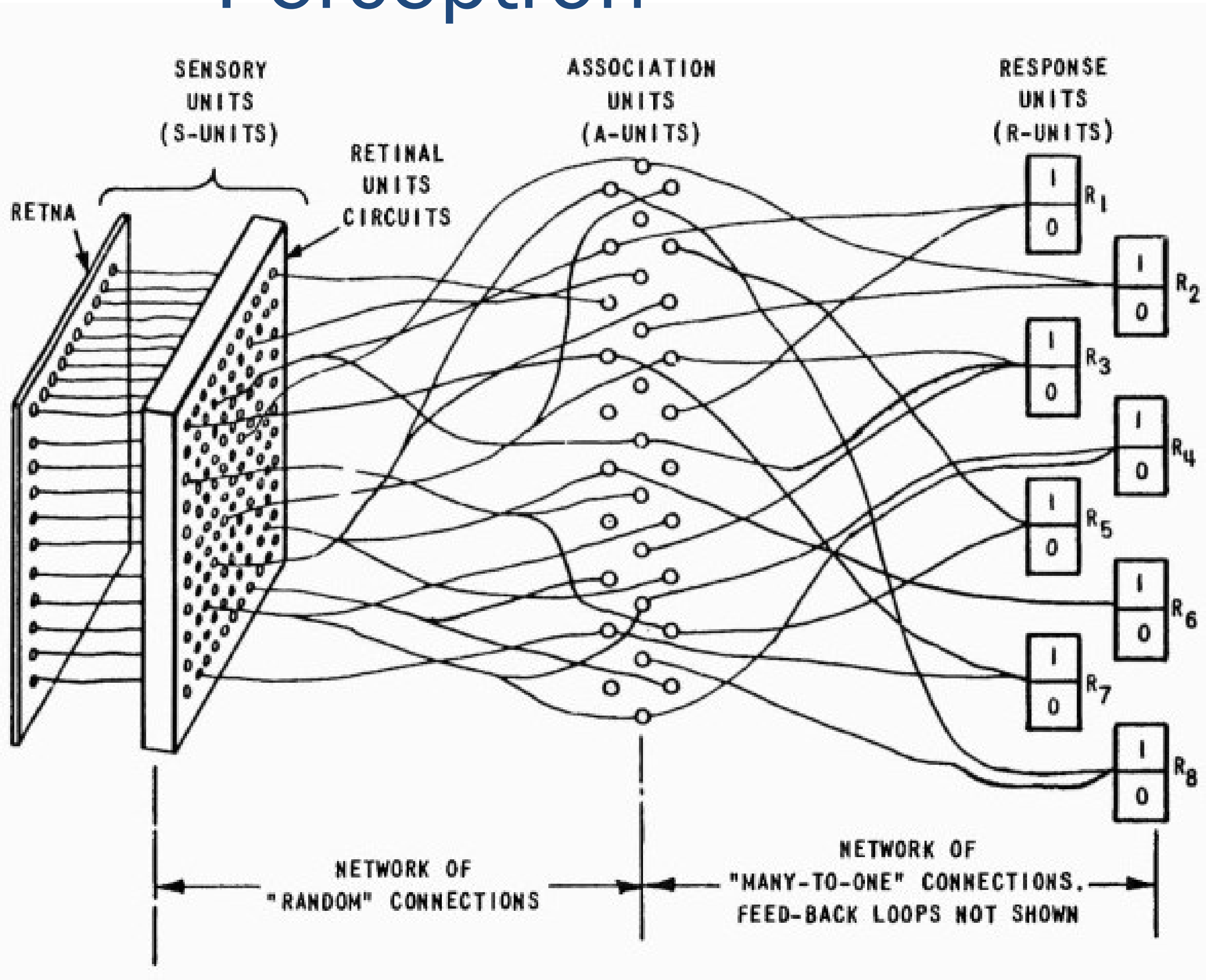
Perceptron

- **1958** Frank Rosenblatt development and hardware construction of the "**Mark I Perceptron**"
  - the first computer that could learn new skills by trial and error, using a type of neural network that simulates human thought processes.
  - at the Cornell Aeronautical Laboratory funded by the United States Office of Naval Research.

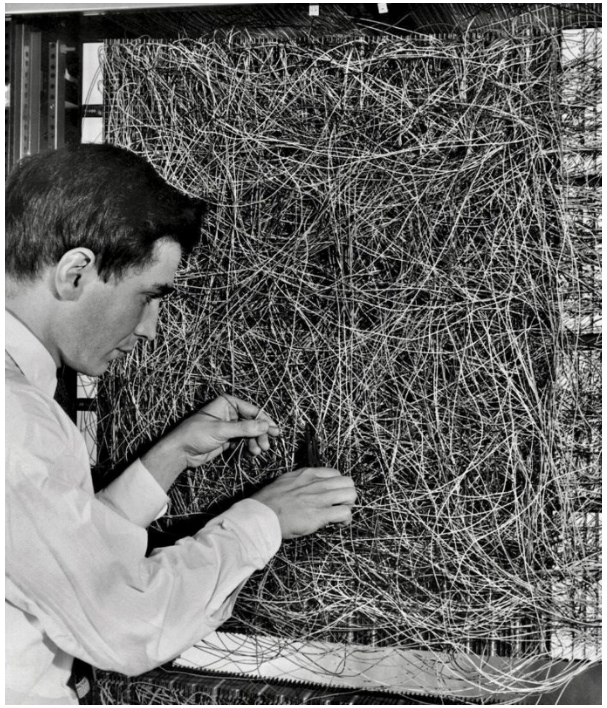


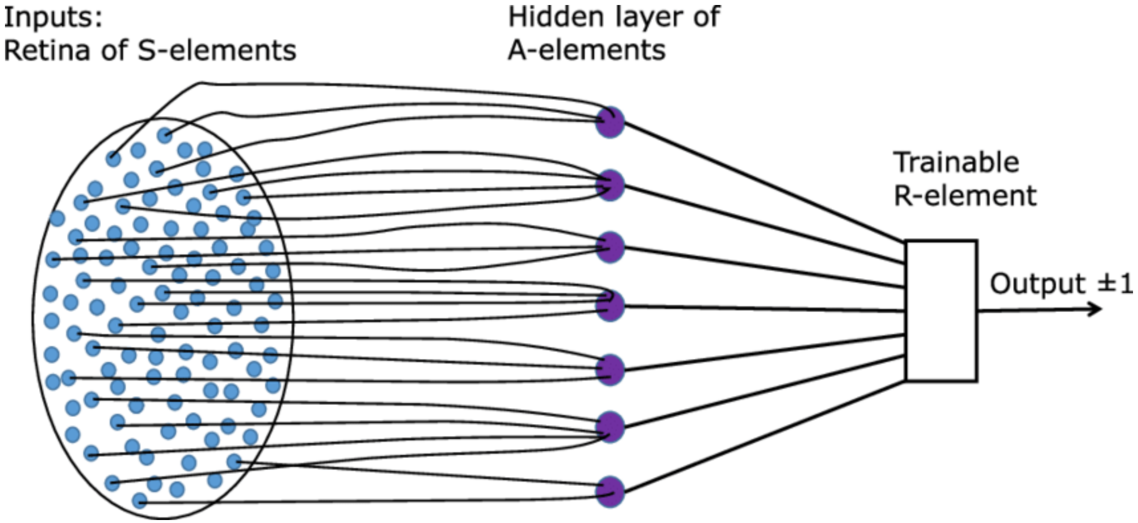


Perceptron



SENSORY UNITS (S-UNITS)
RETNA
RETINAL UNITS CIRCUITS
ASSOCIATION UNITS (A-UNITS)
RESPONSE UNITS (R-UNITS)
R_1
R_2
R_3
R_4
R_5
R_6
R_7
R_8
NETWORK OF "RANDOM" CONNECTIONS
NETWORK OF "MANY-TO-ONE" CONNECTIONS, FEED-BACK LOOPS NOT SHOWN

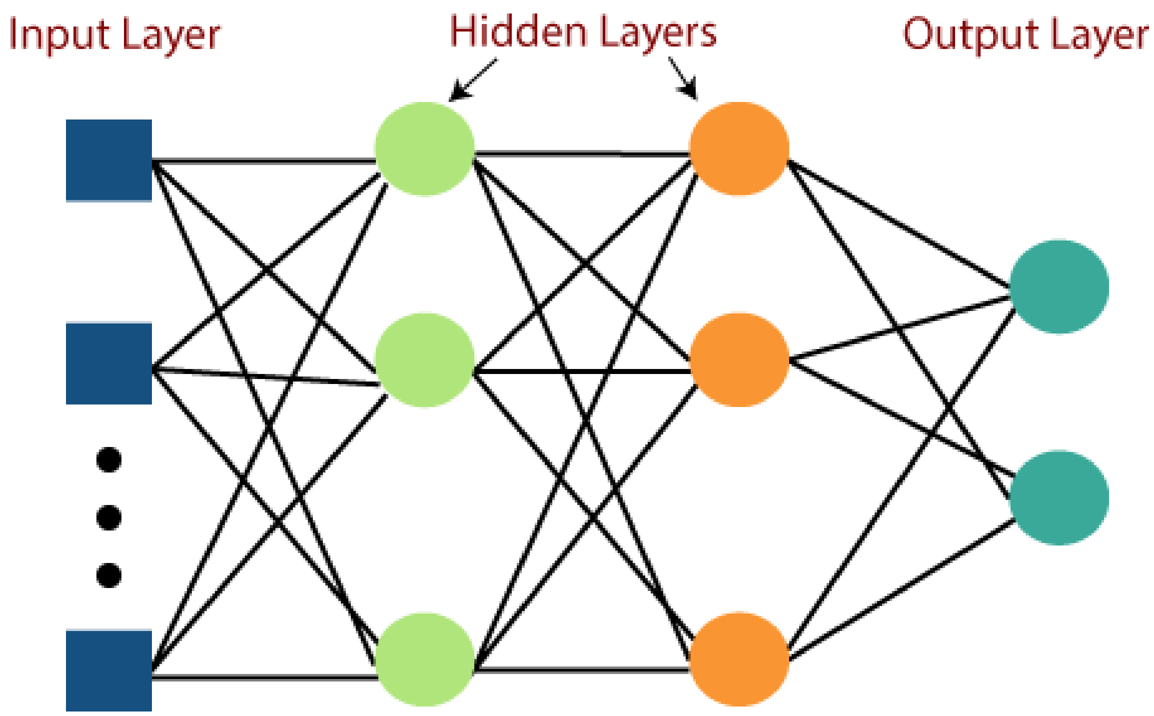


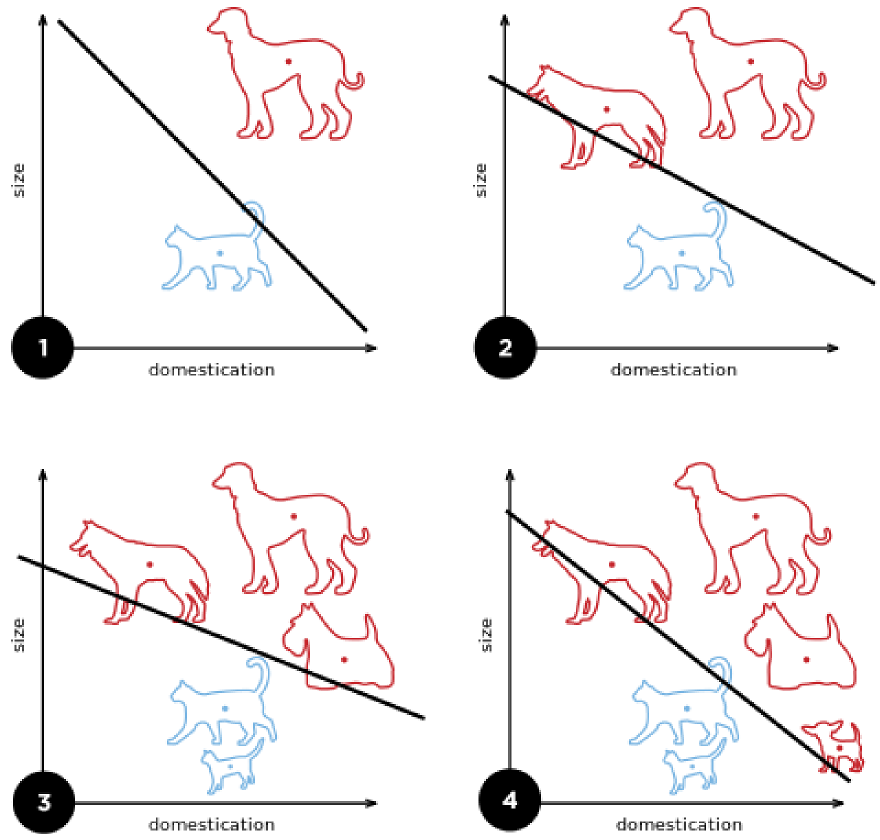


Inputs:
Retina of S-elements
Hidden layer of
A-elements
Trainable
R-element
Output ±1

Multi-layer Perceptron

- **1960s** Limitation of Perceptron: Failed to classify basic problems
- Ivakhnenko et. al. introduced Multilayer Perceptrons

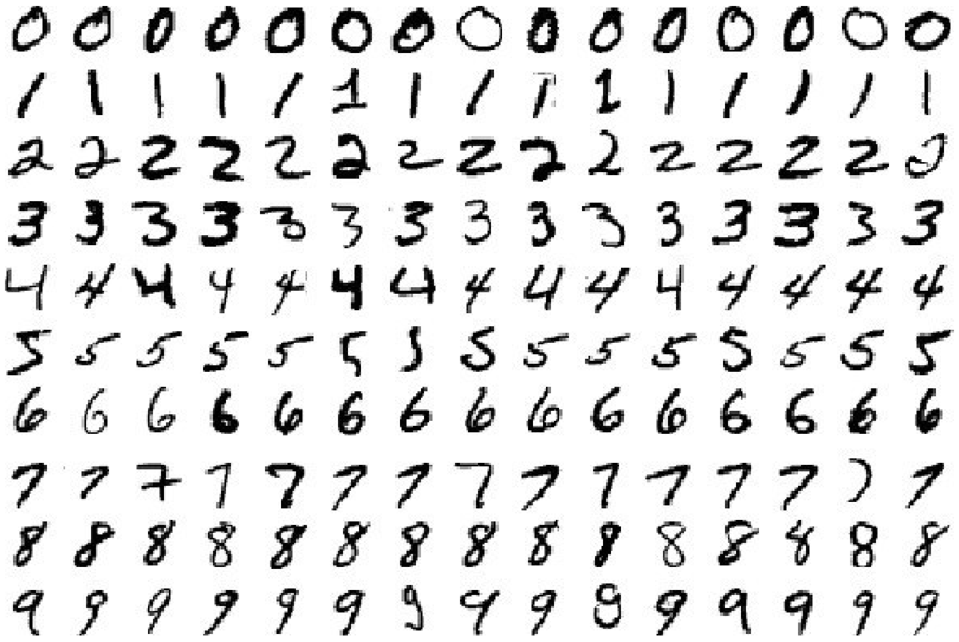




Artificial Neural Network and Backpropagation

- 1982: Werbos introduced Backpropagation first used it in the context of Artificial Neural Networks
- 1986: Rumelhart et. al. popularized the Backpropagation
- Use of Cauchy discovered theories of Gradient Descent on Convex function for Optimization
- 1989: Universal Approximation Theorem "A multilayered network of neurons with a single hidden layer can be used to approximate any continuous function to any desired precision"

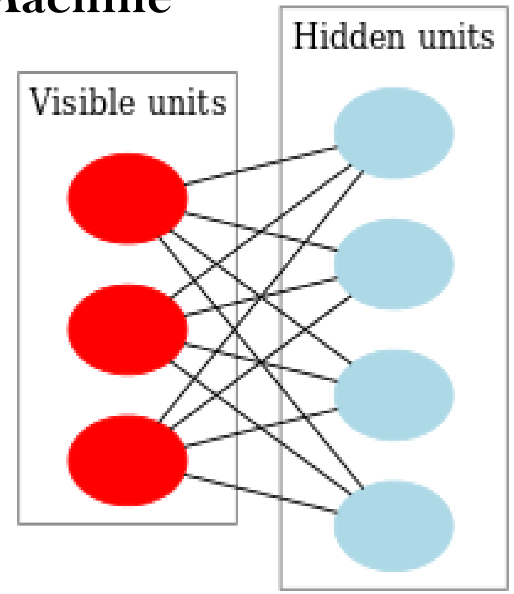
Deep Learning



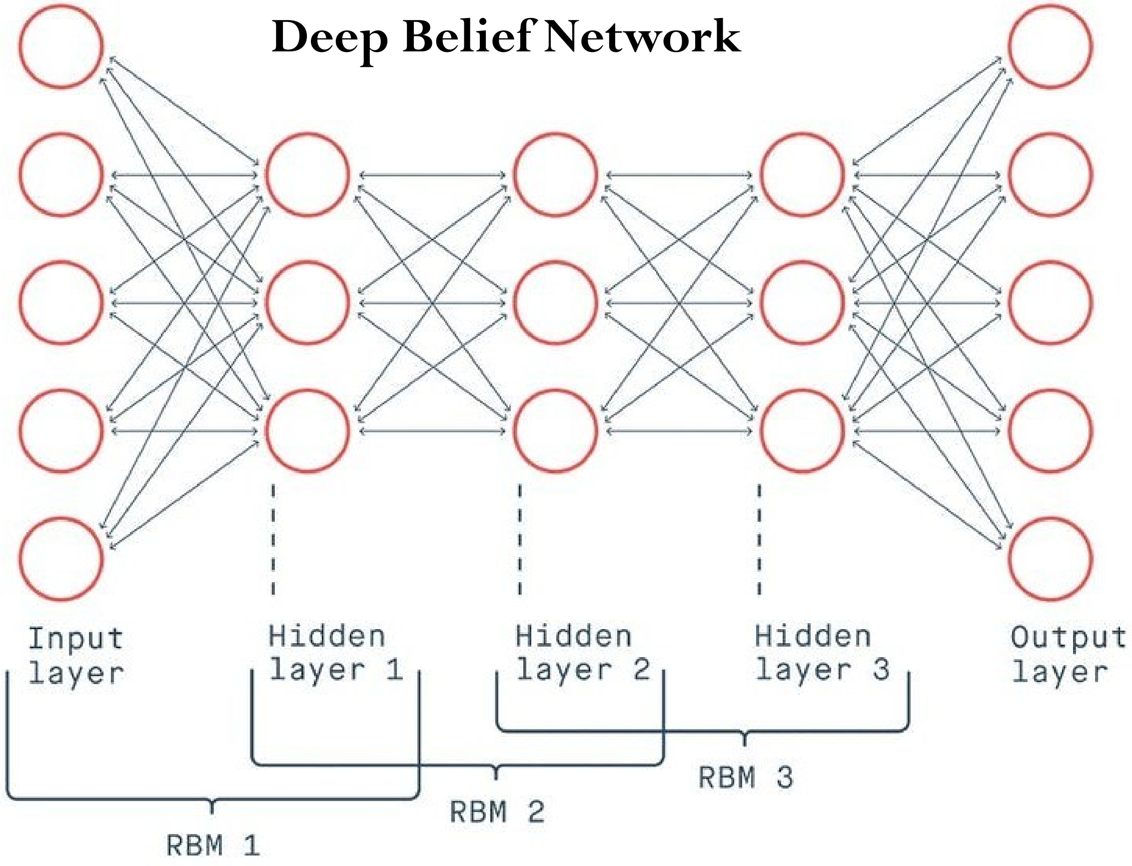
- Unsupervised Pre-Training
  - 1991-1993: J. Schmidhuber “Very Deep Learner”
  - 2006: Hinton and Salakhutdinov
- 2009: Handwriting Recognition
  - MNIST dataset
- 2010: Speech Recognition
  - Dahl et. al. achieved error reduction of 16.0% to 23.2% over previous works
- Traffic Sign Recognition Competition
  - D. C. Ciresan et. al. got only 0.56% error rate

Restricted Boltzmann Machine and Deep Belief Network

Restricted Boltzmann Machine

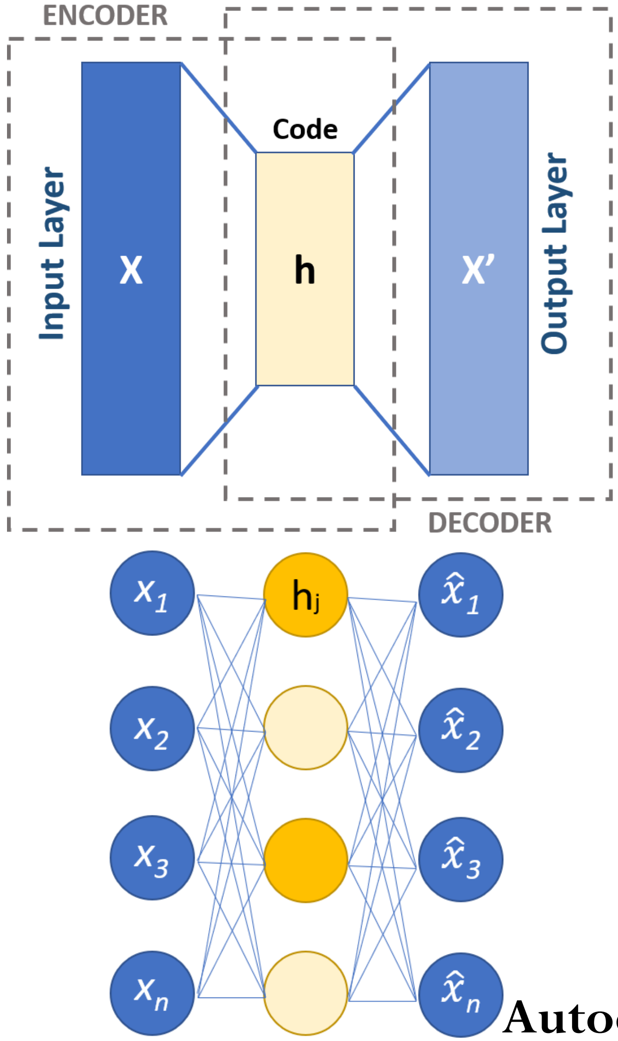


Deep Belief Network

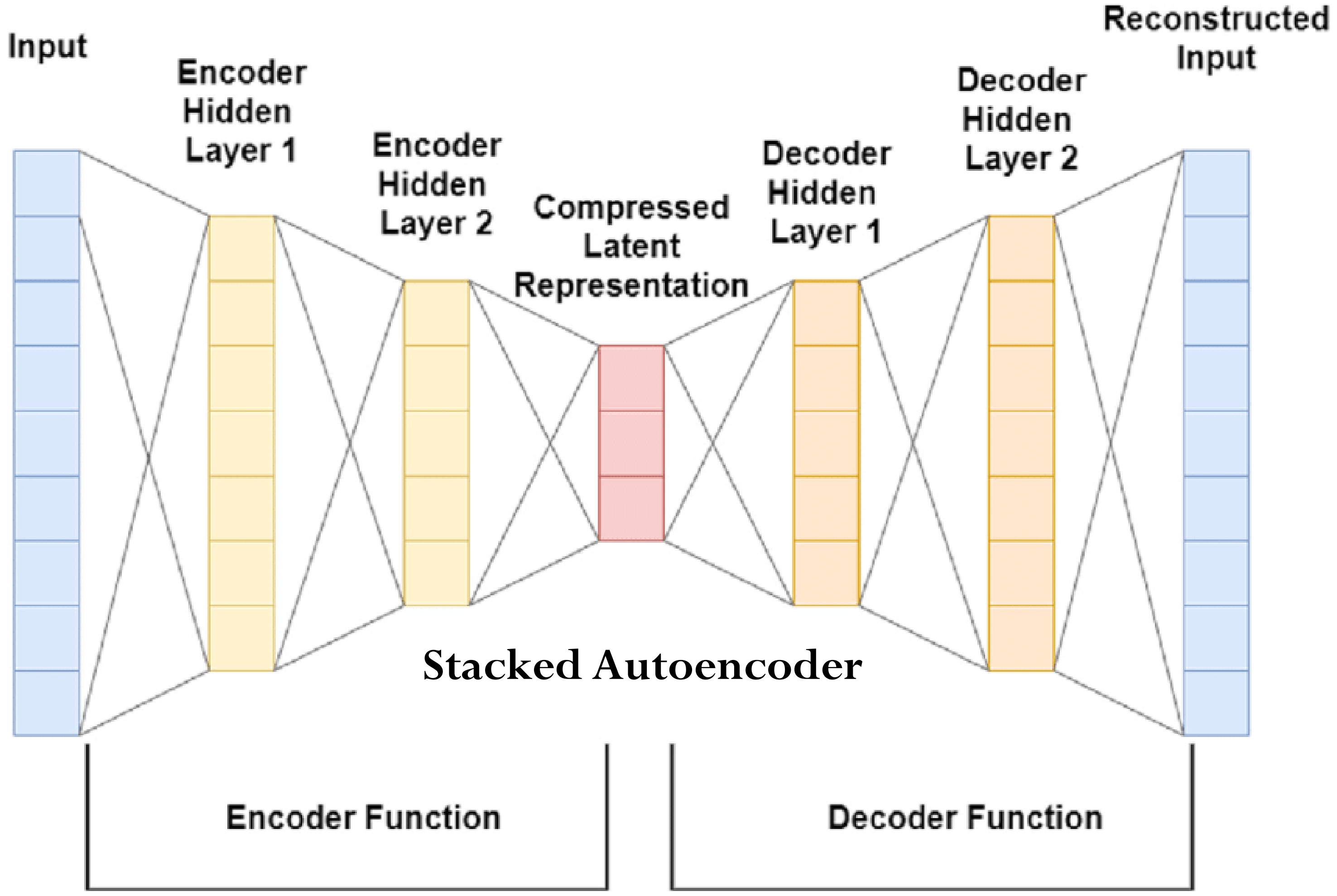


Ruslan Salakhutdinov, Andriy Mnih, and Geoffrey Hinton. "Restricted Boltzmann machines for collaborative filtering." Proceedings of the 24th International Conference on Machine learning. 2007.
Geoffrey E. Hinton, Simon Osindero, and Yee-Whye Teh. "A fast learning algorithm for deep belief nets." Neural computation 18.7 (2006): 1527-1554.

Autoencoder and Stacked Autoencoder



Autoencoder



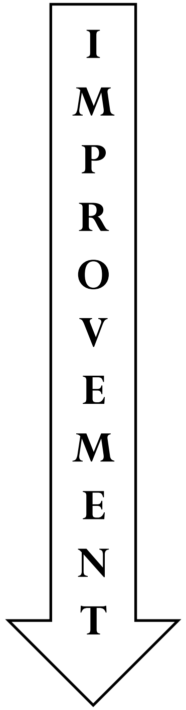
Stacked Autoencoder

Pascal Vincent, et al. "Stacked denoising autoencoders: Learning useful representations in a deep network with a local denoising criterion." Journal of Machine Learning Research 11.12 (2010).

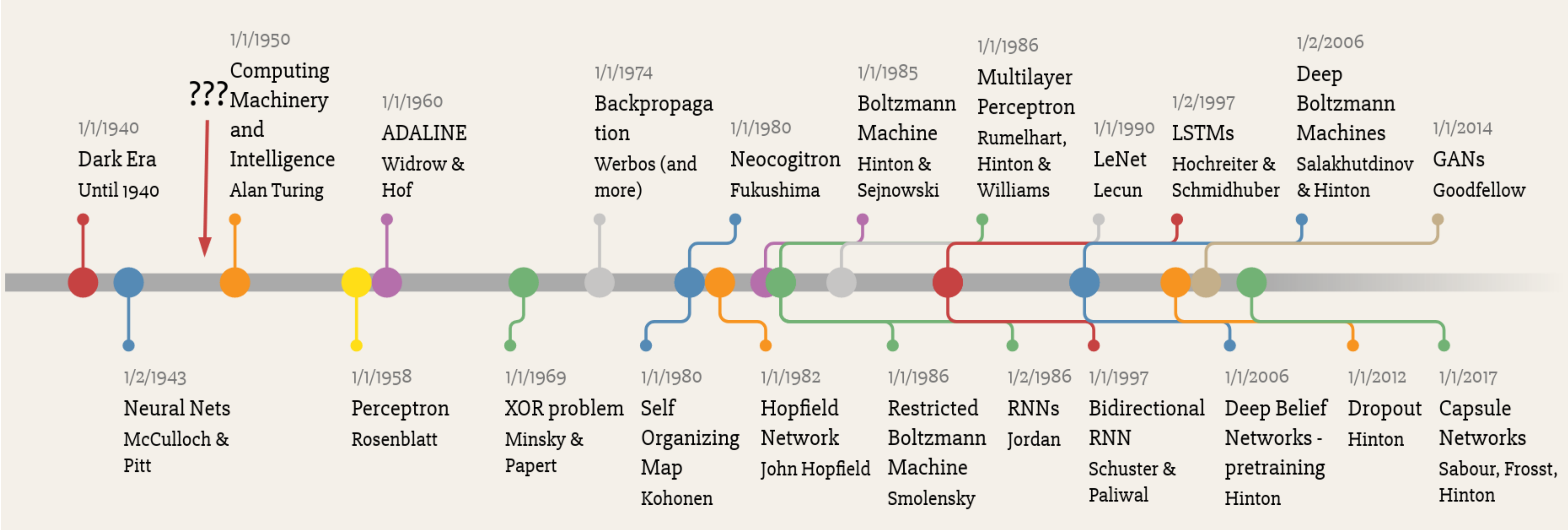
Visual Recognition Challenges

- ImageNet challenge successful 2012-2016

Network	Error	Layers
• AlexNet	16.0%	8
• ZFNet	11.2%	8
• VGGNet	7.3%	19
• GoogLeNet	6.7%	22
• MS ResNet	3.6%	152!!



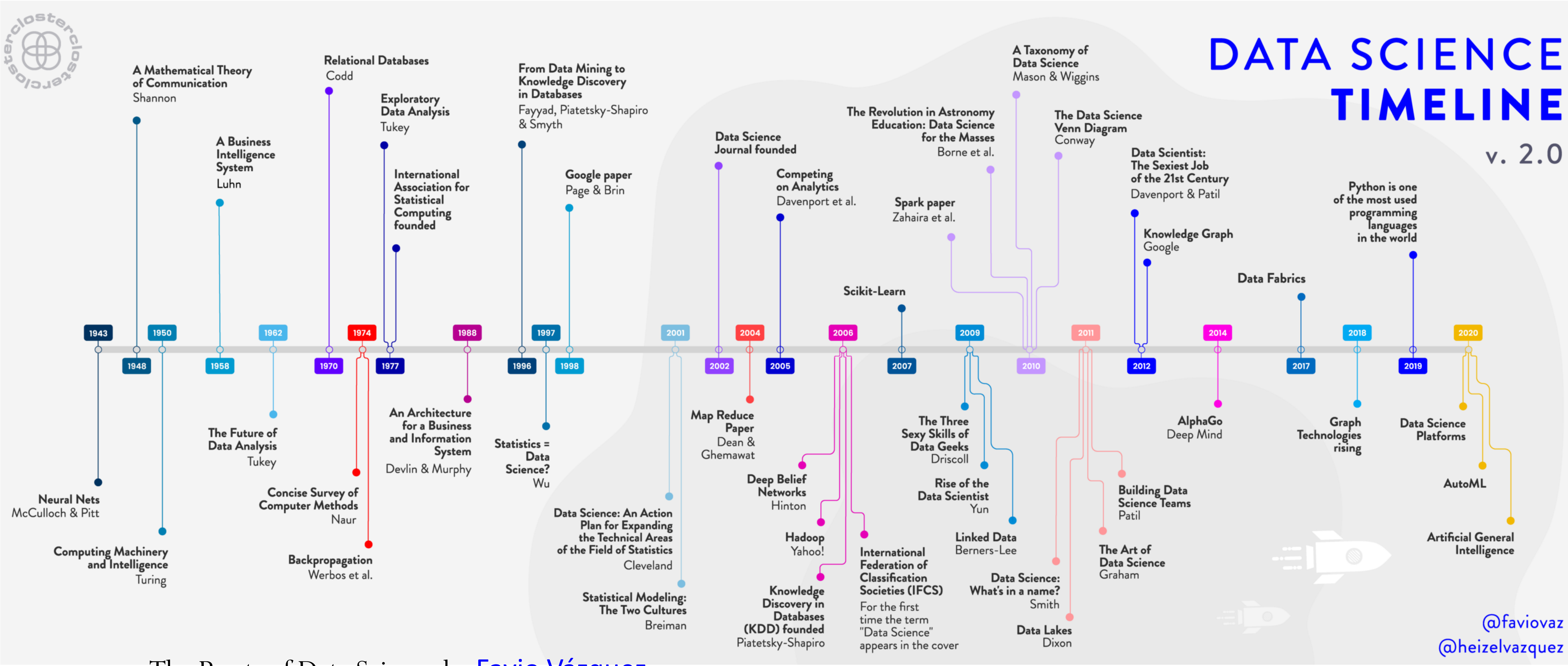
Artificial Neural Network (ANN) Timeline



Deep Learning for the Masses (… and The Semantic Layer), Deep Learning timeline by Favio Vazquez
https://www.kdnuggets.com/2018/11/deep-learning-masses-semantic-layer.html

History of Data Science

Data Science



The Roots of Data Science by [Favio Vázquez](https://towardsdatascience.com/the-roots-of-data-science-77c71115229)

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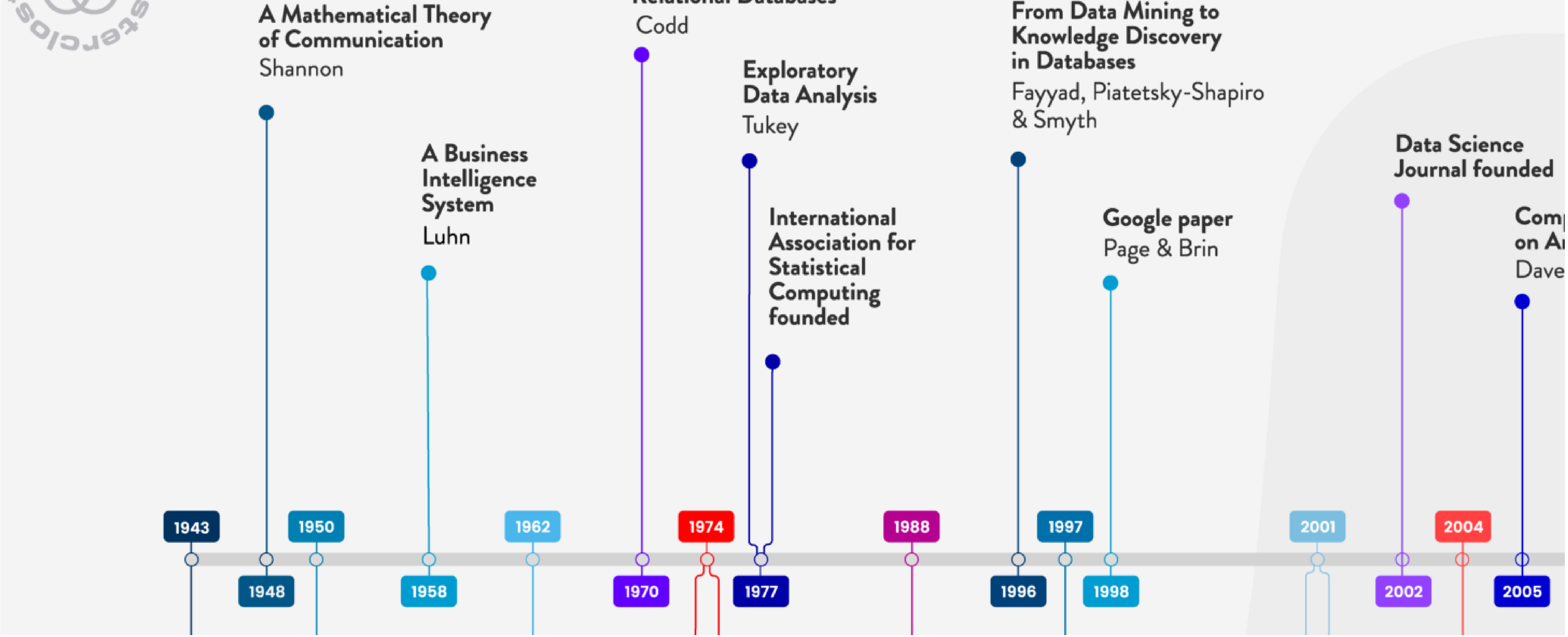
Data Science



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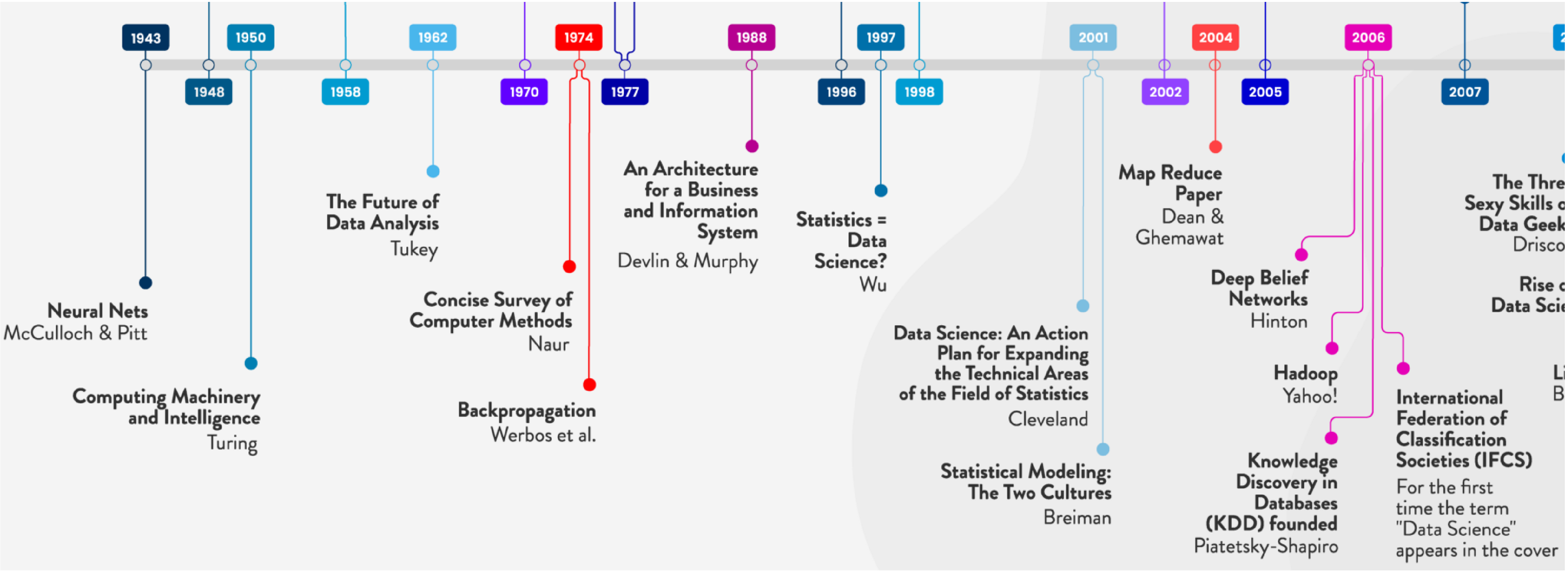
Data Science



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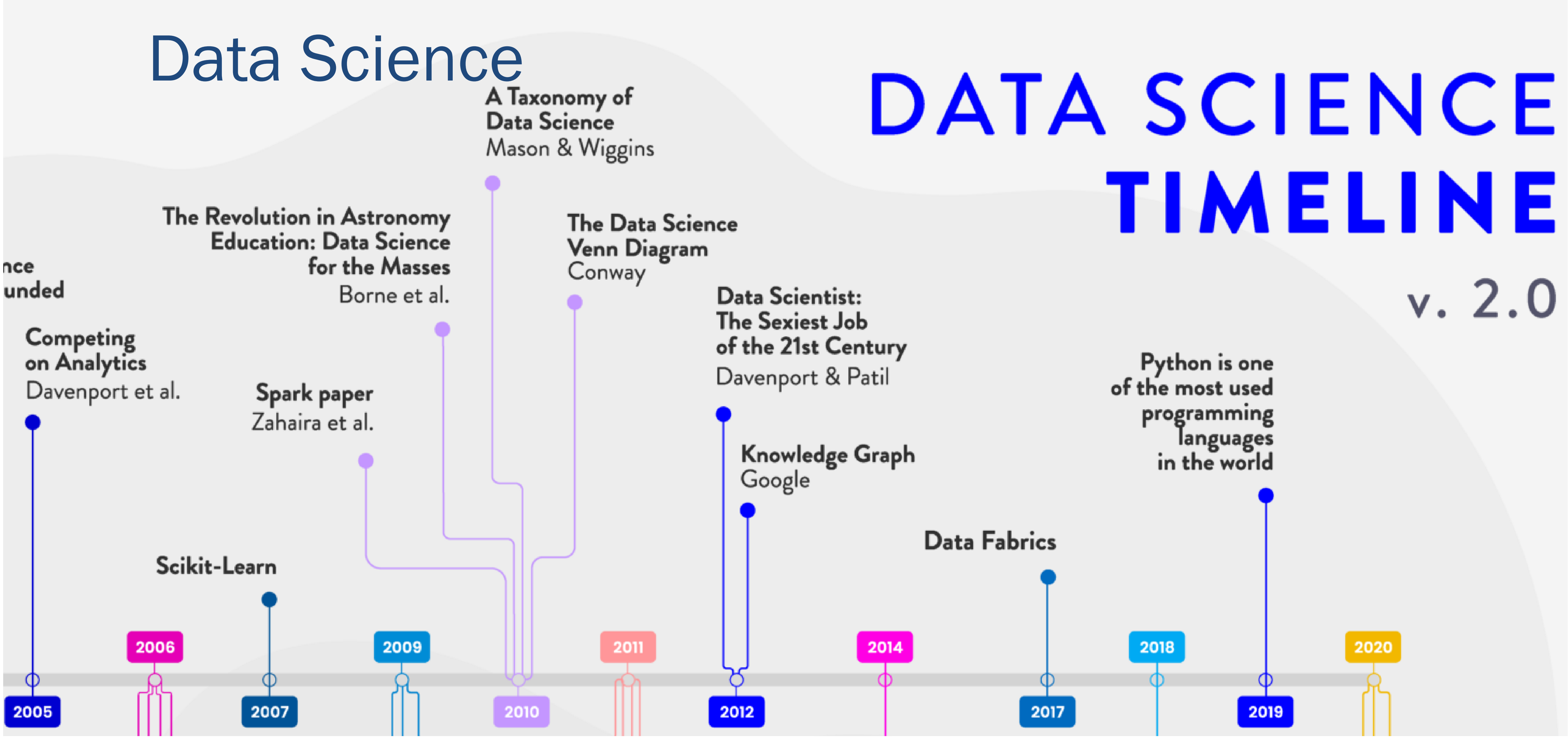
Data Science



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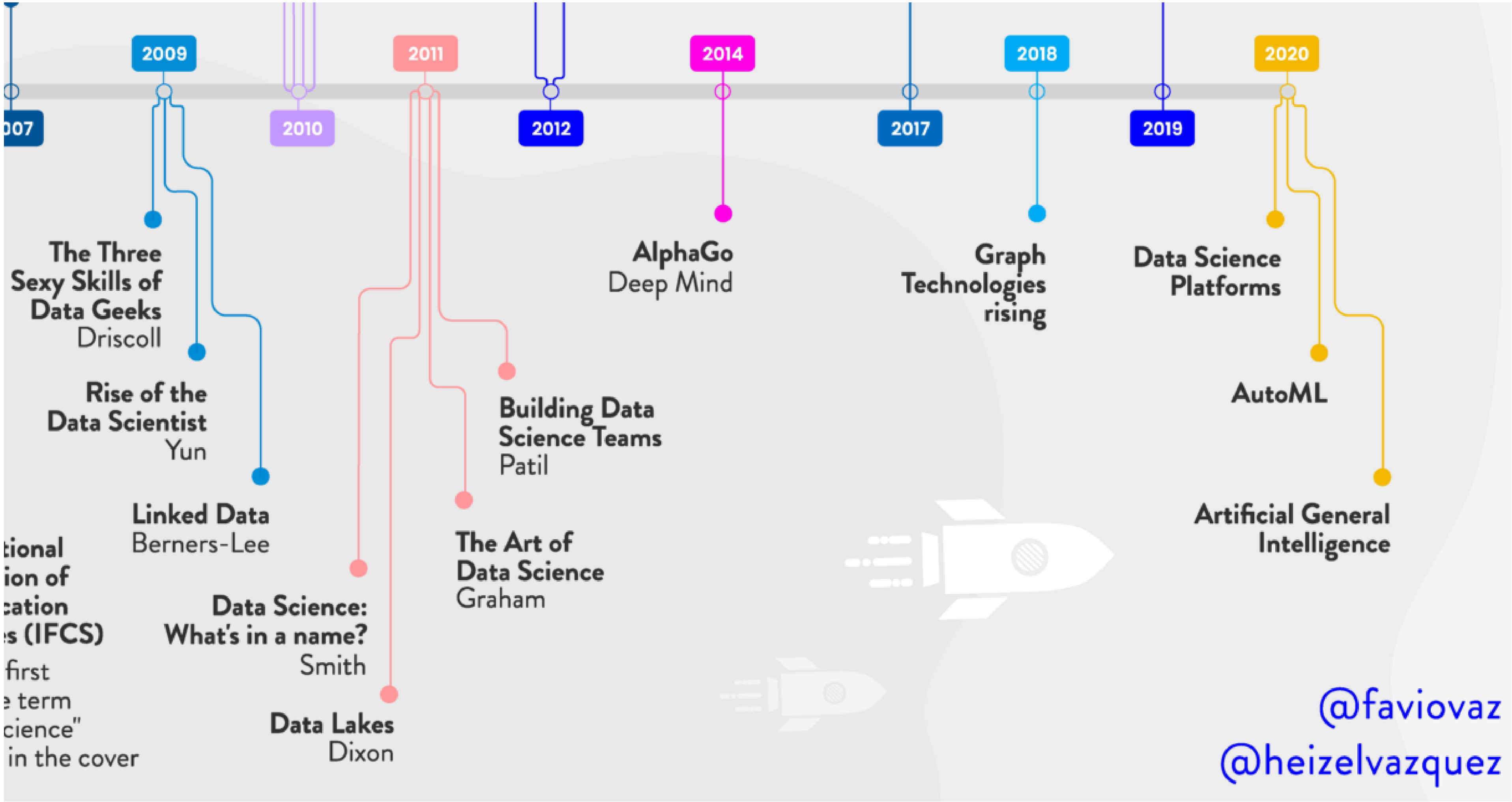
Data Science



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Summary

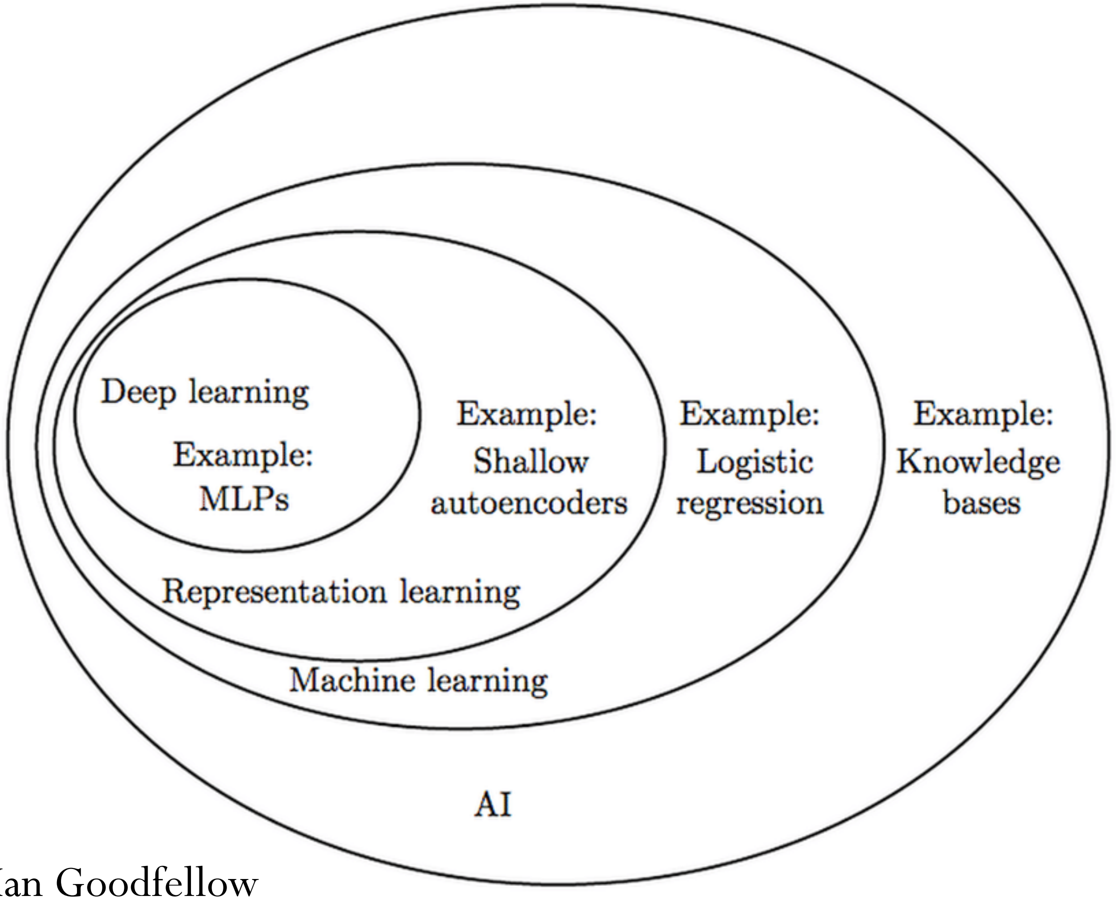
Artificial Intelligence

- Founded in 1956 (Dartmouth Research Project on Artificial Intelligence).
- Ancient History shows that AI was an active field of studies since ancient times.
- Simulating the brain, modeling human problem solving, formal logic, large databases of knowledge and imitating human behavior
- Search, Optimization, Formal logic,
- Artificial Neural Networks, Deep learning,
- Classifiers, Reasoning, Knowledge Representation,
- Planning, Learning, Robotics,
- Natural Language Processing, Computational Social Scienc, etc.

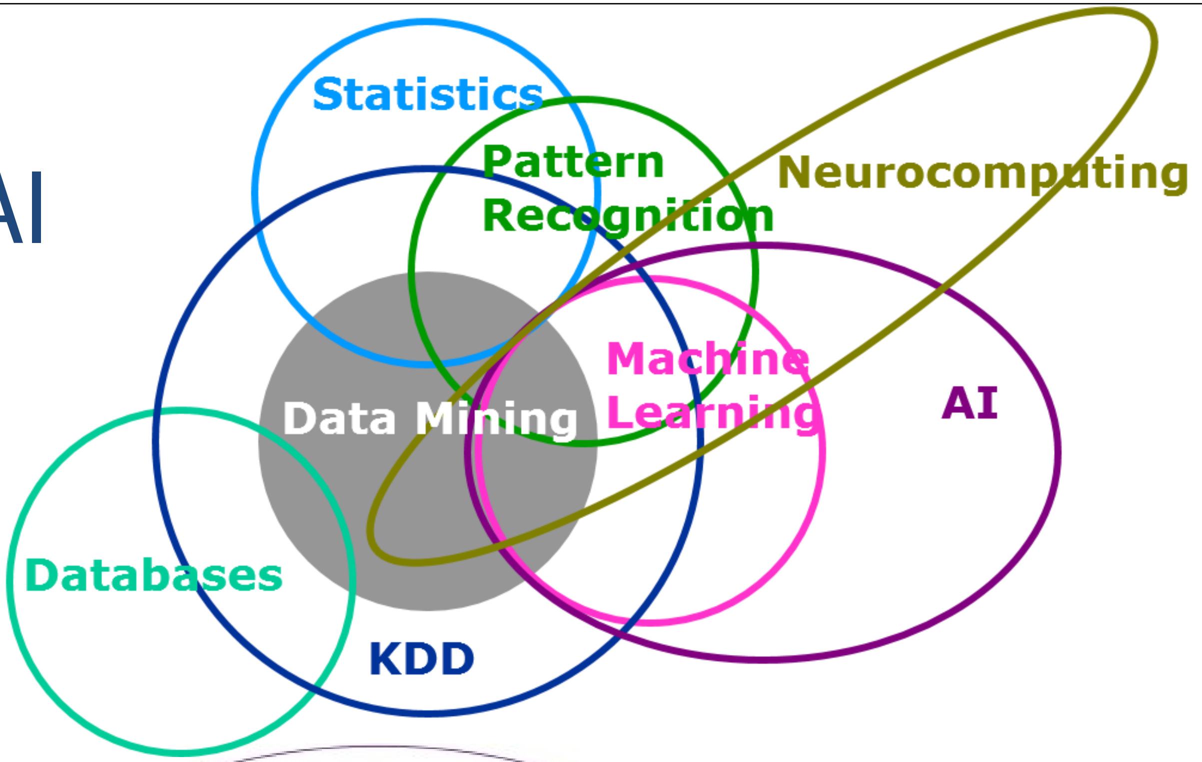
Artificial Intelligence

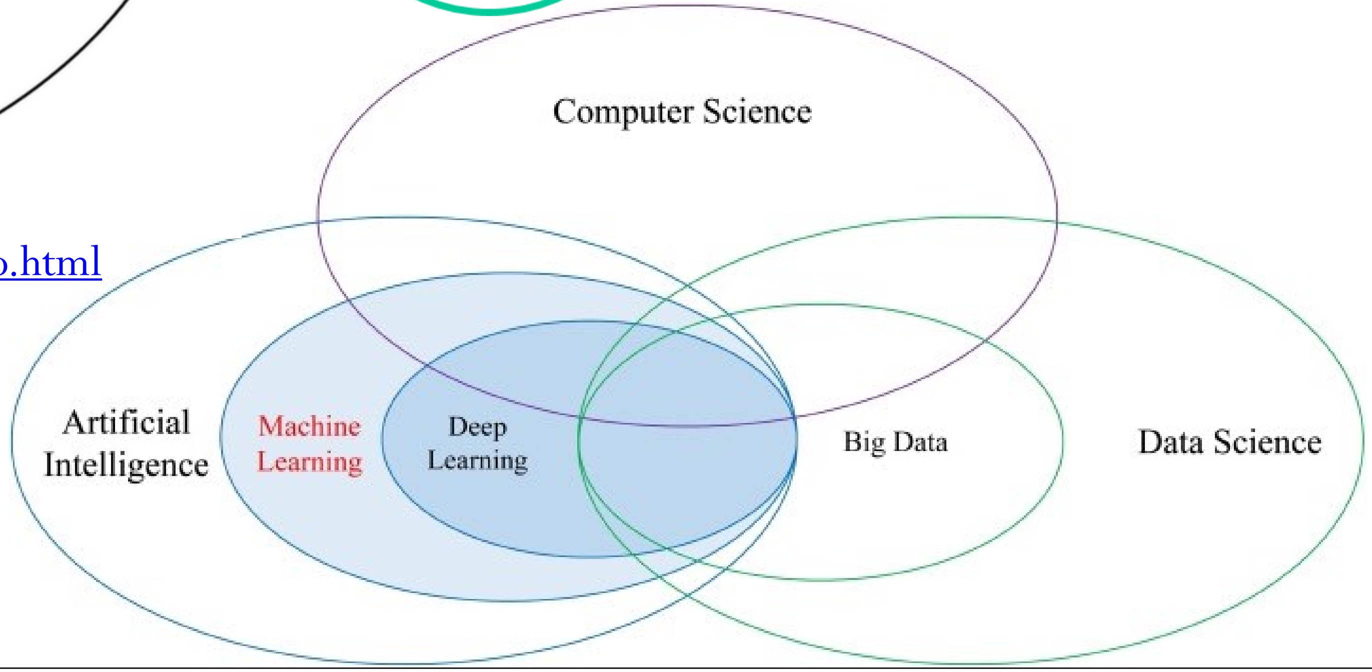
- (1837) Analytical Engine, (1925) Houdina Radio Control,
- (1946-1960) ENIAC heralds the dawn of Computing,
- (1946-1960) Turing Test, (1959) Machine Learning,
- (1964) Eliza Chatbot, (1966) Shakey general purpose mobile robot,
- (1960-74) Expert Systems,
- AI Winter (1974-80), AI Spring (1980-87), AI Winter (1987-93),
- (1993) Apriori algorithm: Association Rule Mining,
- (1997) Deep Blue ends Human Supremacy in Chess,
- (1998) Deep Space, (2005) Driverless Cars,
- (2011) IBM Watson beaten Human in Jeopardy,
- (2016) Alpha Go

AI



Ian Goodfellow
https://www.deeplearningbook.org/contents/intro.html





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- Vedas Tantra , The Ancient Indian Secret Of Artificial Intelligence, https://www.youtube.com/watch?v=RAPK-RstuWI
- Raja Bhoja – The Polymath Monarch, D.K.Hari & D.K.Hema Hari https://bharathgyanblog.files.wordpress.com/2017/12/raja-bhoja.pdf
- Subbarao Kambhampati, Arizona State University, https://rakaposhi.eas.asu.edu/cse471/
- Artificial Intelligence, Prof. Mausam https://www.cse.iitd.ac.in/~mausam/courses/col333/autumn2019/

תודה רבה
Hebrew

Ευχαριστώ
Greek

Спасибо
Russian

Danke
German

धन्यवादः
Sanskrit

Merci
French

ধন্যবাদ
Bangla

நன்றி
Tamil

شكراً
Arabic

ಧನ್ಯವಾದಗಳು
Kannada

Thank You
English

നന്ദി
Malayalam

Grazie
Italian

多謝
Traditional Chinese

ధన్యవాదాలు
Telugu

આભાર
Gujarati

ਧੰਨਵਾਦ
Punjabi

धन्यवाद
Hindi & Marathi

Gracias
Spanish

多谢
Simplified Chinese

https://sites.google.com/site/animeshchaturvedi07

Obrigado
Portuguese

ありがとうございました
Japanese

ขอบคุณ
Thai

감사합니다
Korean