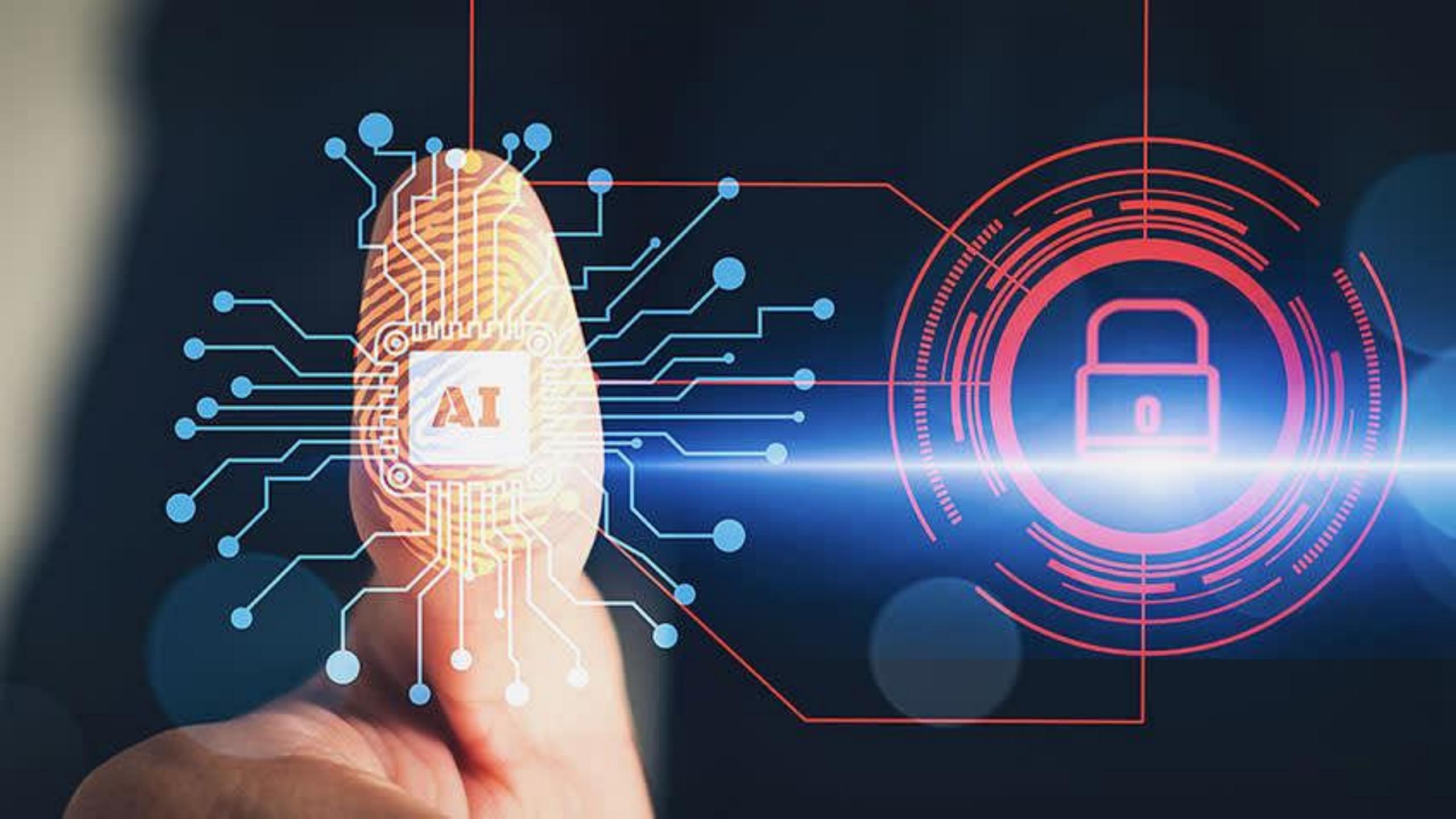


# Intelligence Artificielle

Hakim Hafidi





A white humanoid robot with a spherical head and black circular eyes is shown from the waist up. It is holding a black tablet with both hands, its fingers pointing at the screen which displays lines of blue code. The robot's body is white with black joints and a small black hexagonal sensor on its left shoulder. The background is dark blue with binary code (0s and 1s) floating around.

# Devin

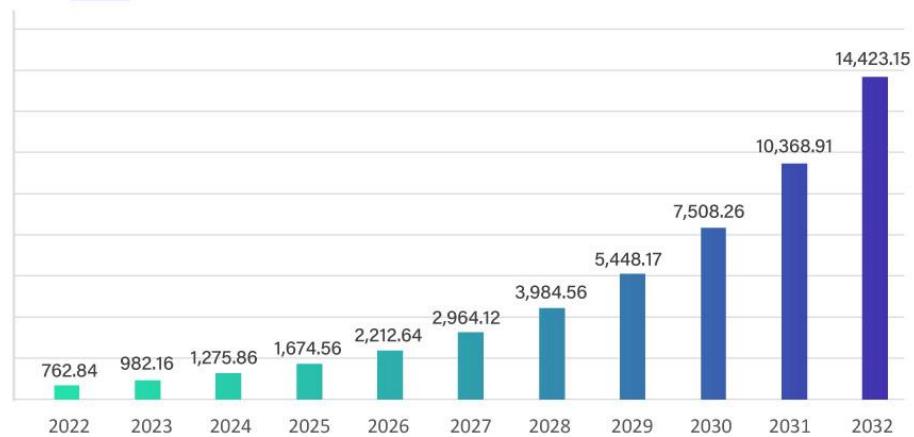
The World's First AI Software Engineer



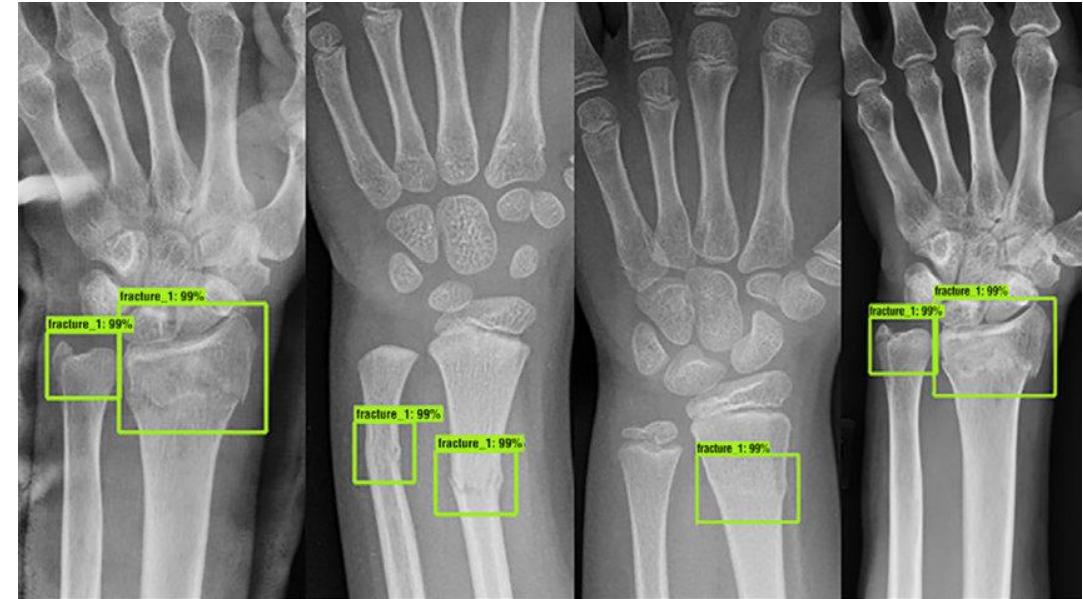
MyExamCloud AI



AI in Medical Imaging Market Revenue, 2022 To 2032 (USD Million)

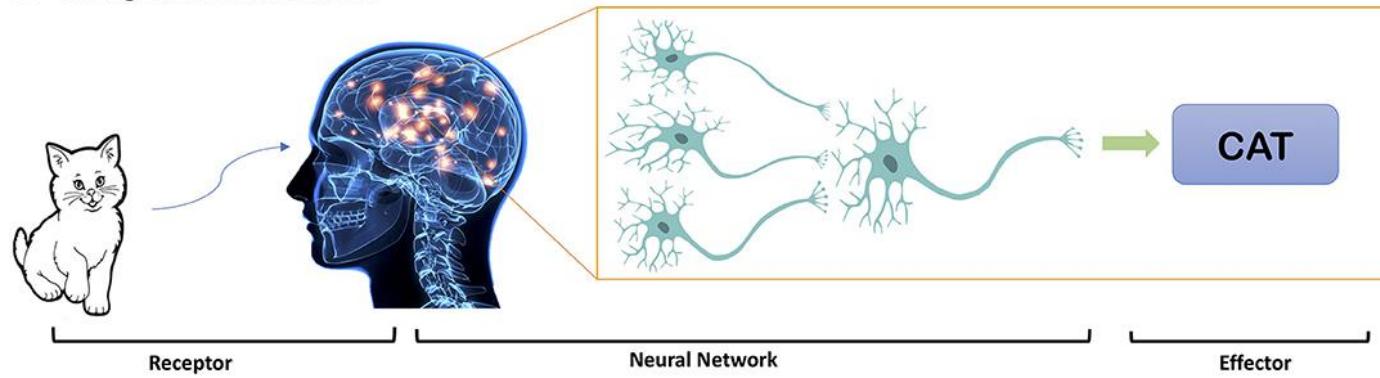


Source: [www.towardshealthcare.com](http://www.towardshealthcare.com)

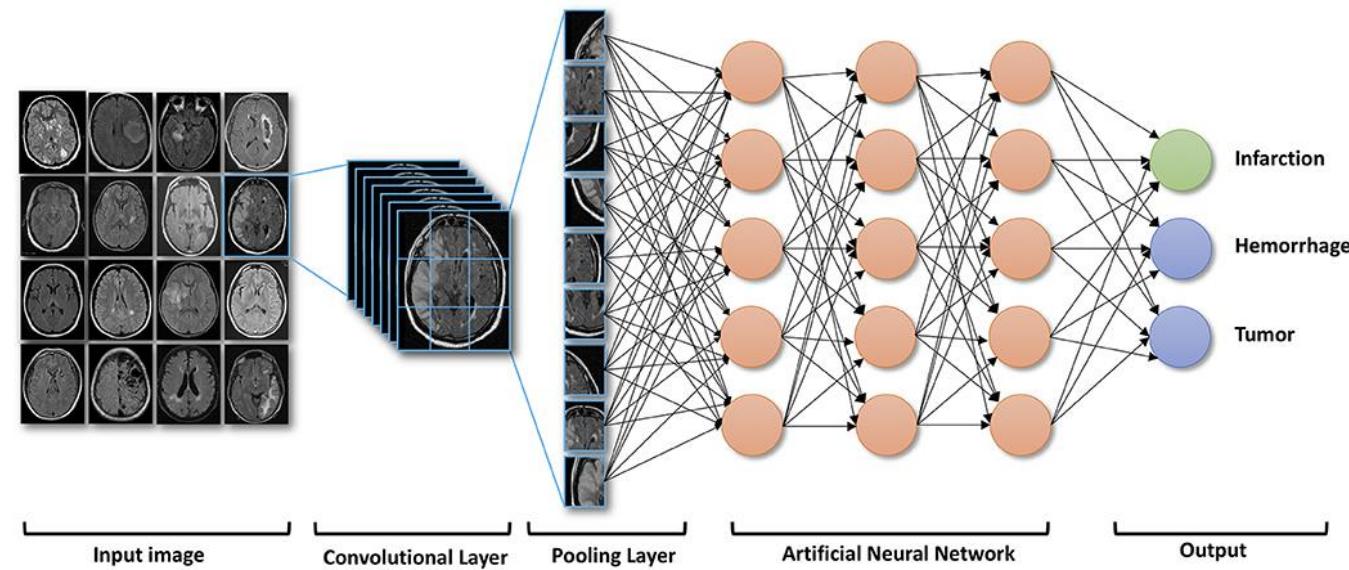


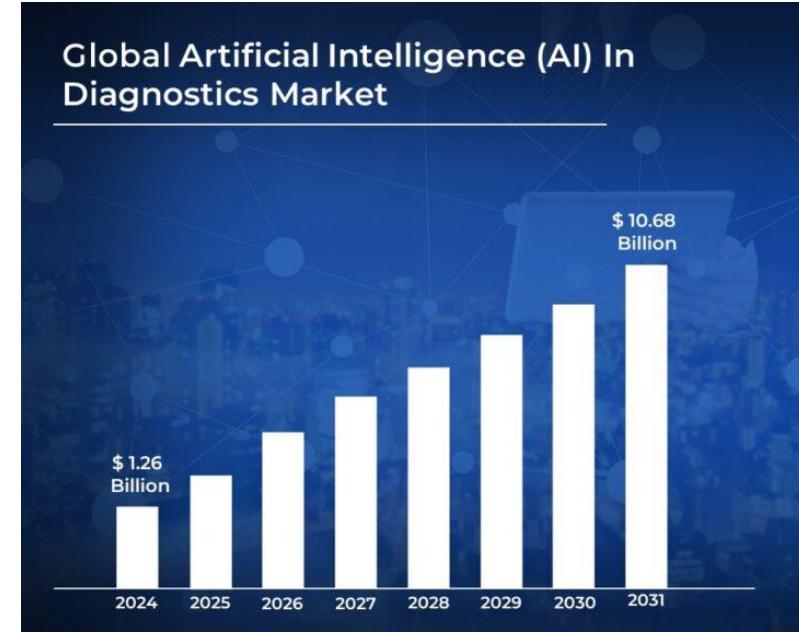
# AI in Medical Imaging

### A Biological Neural Network

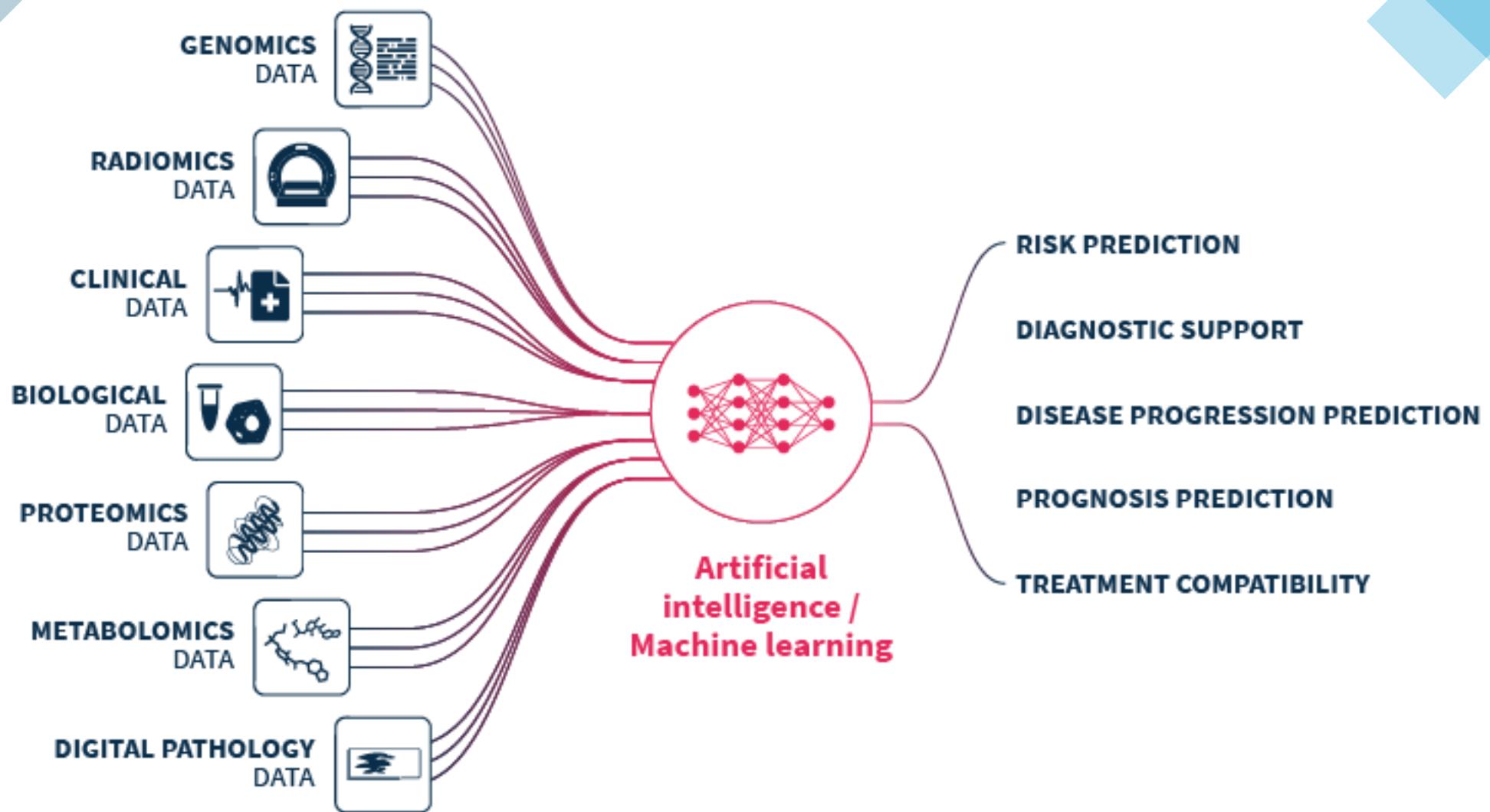


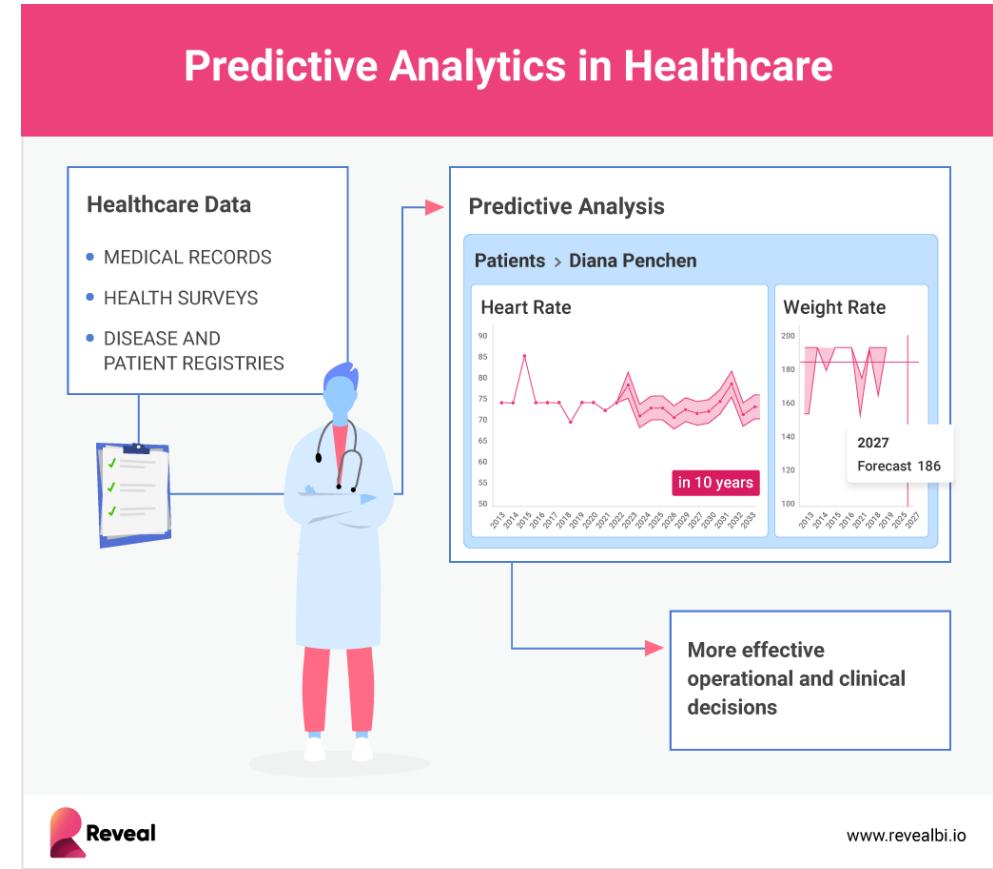
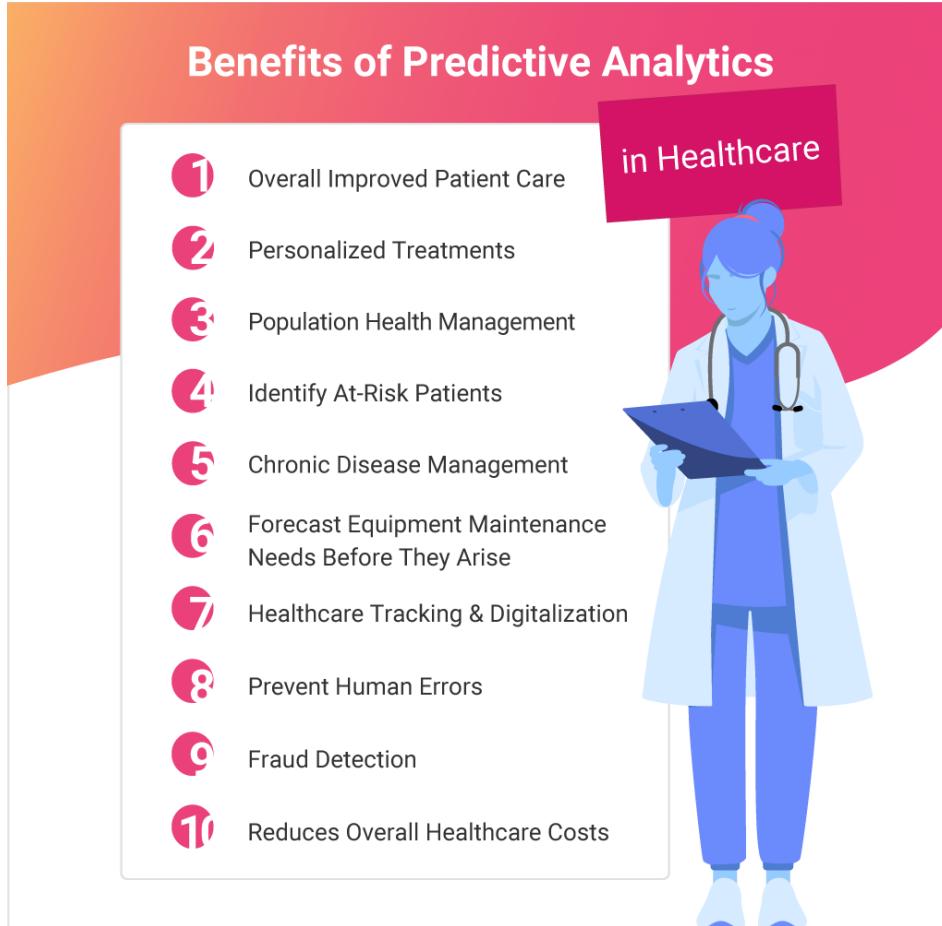
### B Computer Neural Network(Convolutional Neural Network)





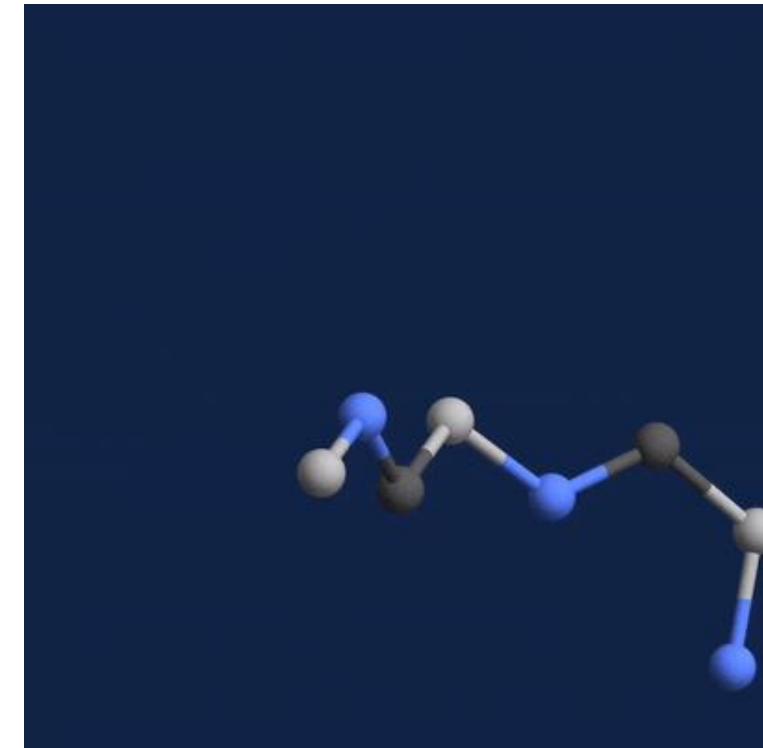
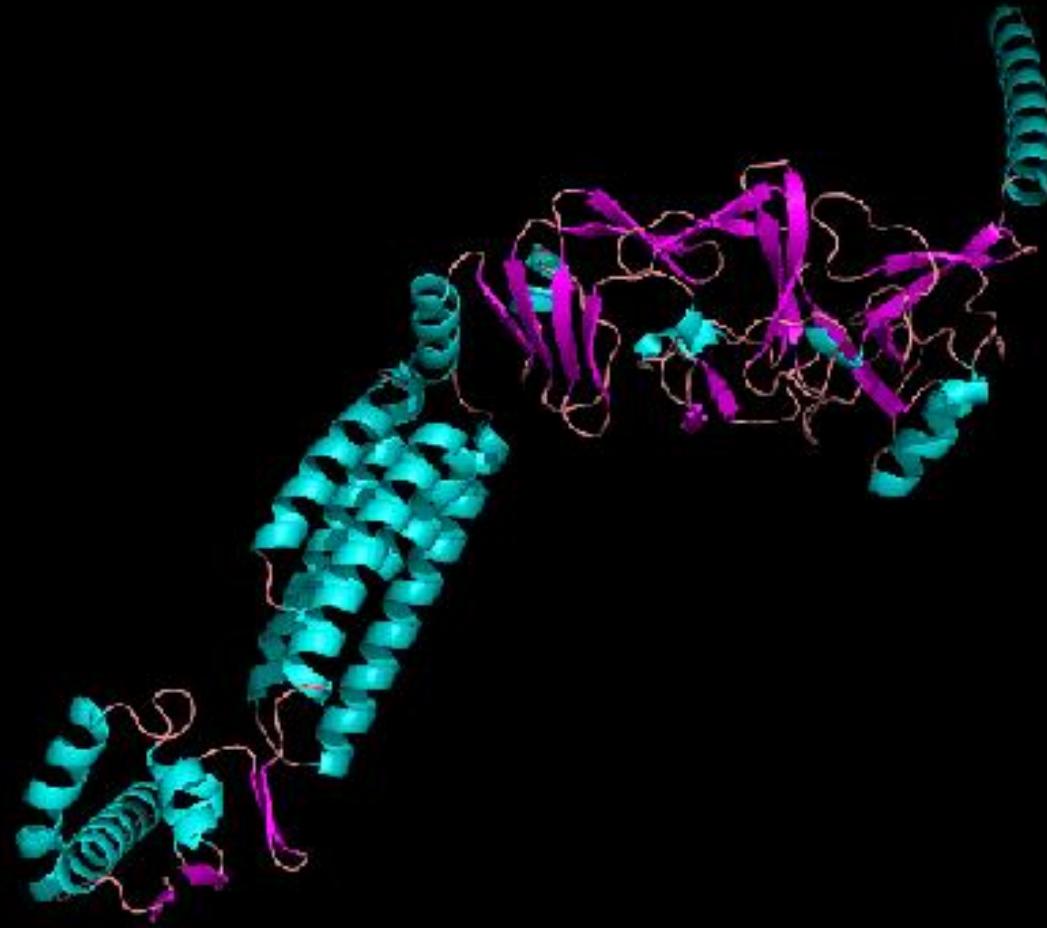
# AI-Powered Diagnostics







# AI for Drug Discovery



# The Changing Role of Doctors

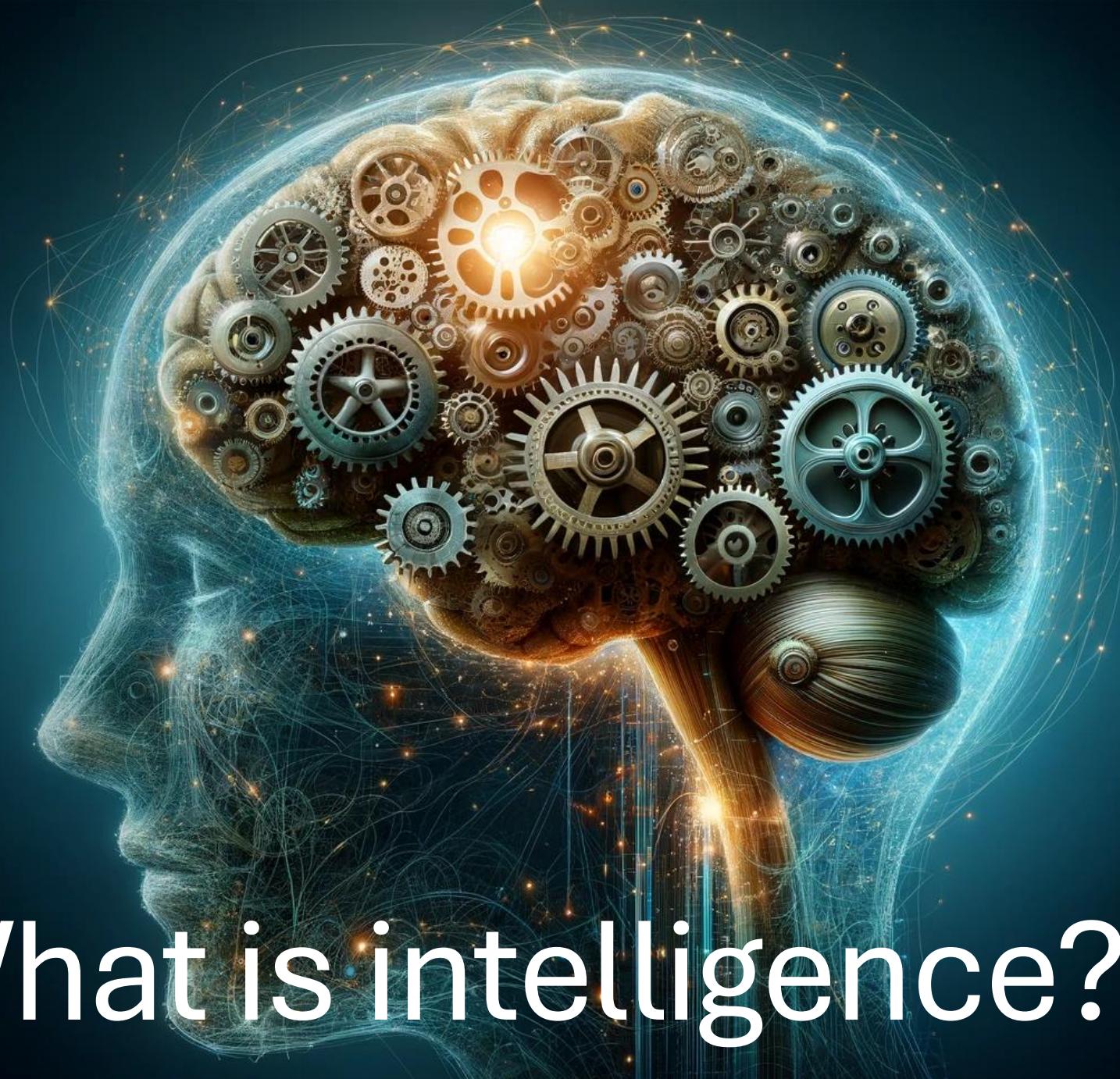
- Human-AI Partnership
- Shift in Skills
- Ethical Responsibilities



# History of Artificial Intelligence

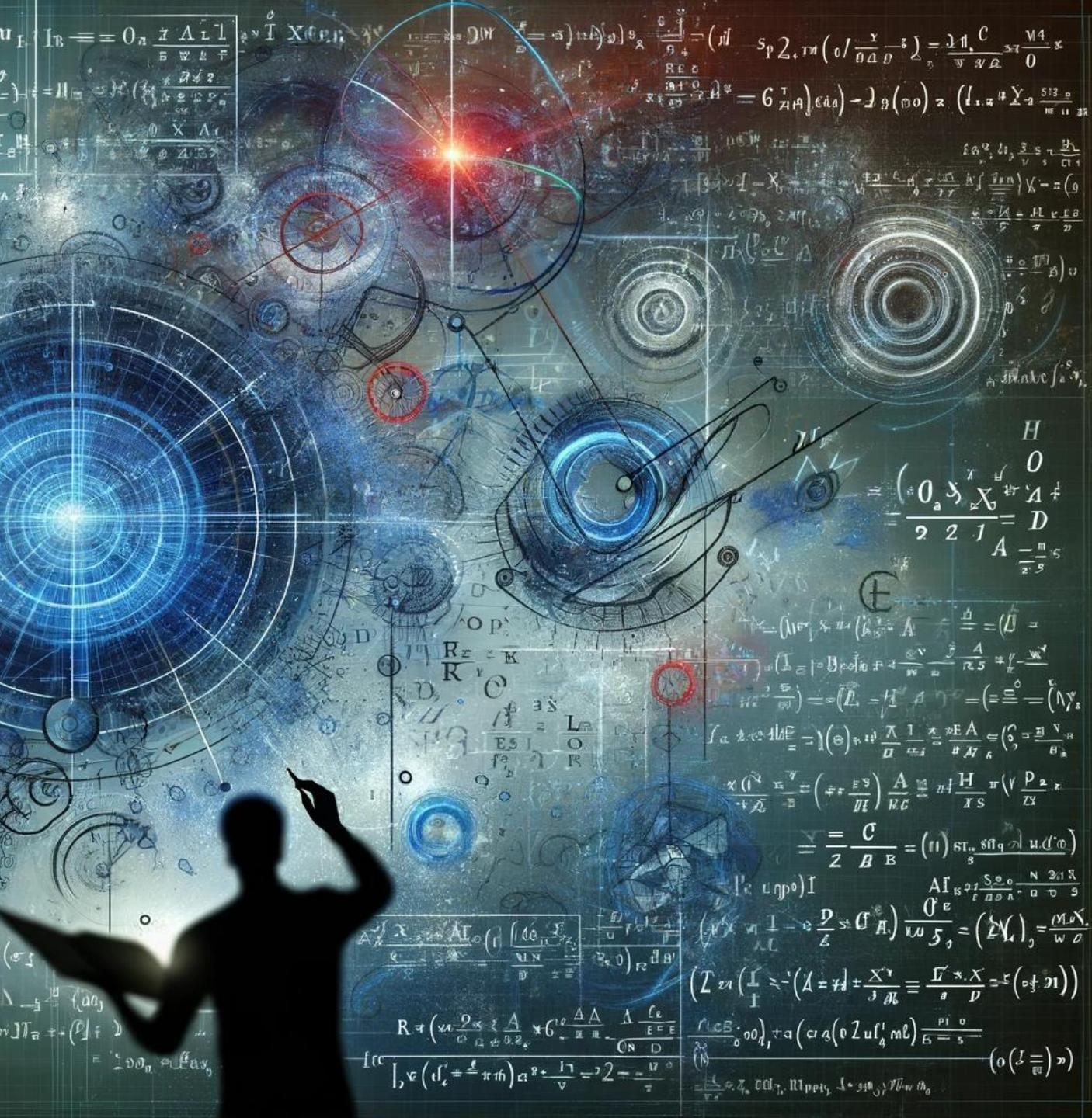






# What is intelligence?

# Problem Solving





# Strategic planning

# Learning from experience



# Learning Languages





# Creative process

# Thinking intelligence



# Ancient Philosophical Foundations

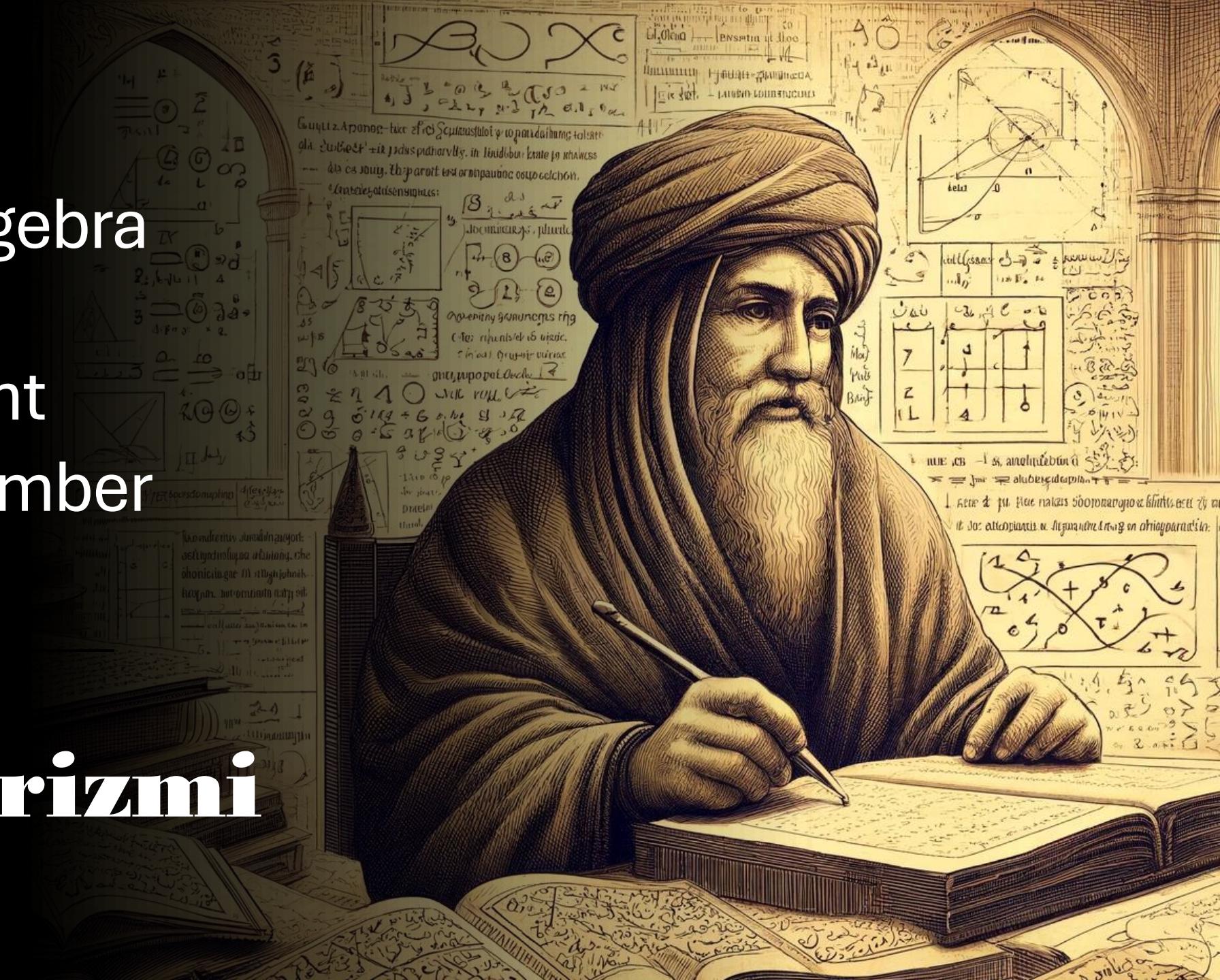


Plato

Aristotle

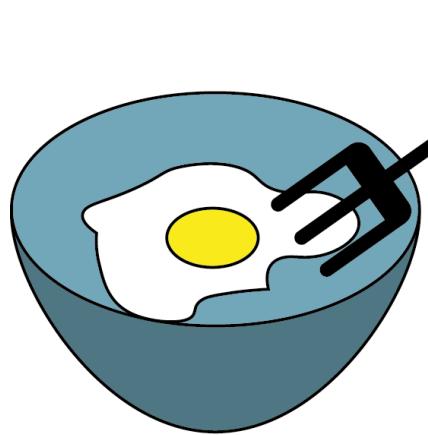
- Father of Algebra
- Algorithm Development
- Decimal Number System

# Al-Khwarizmi (800's)

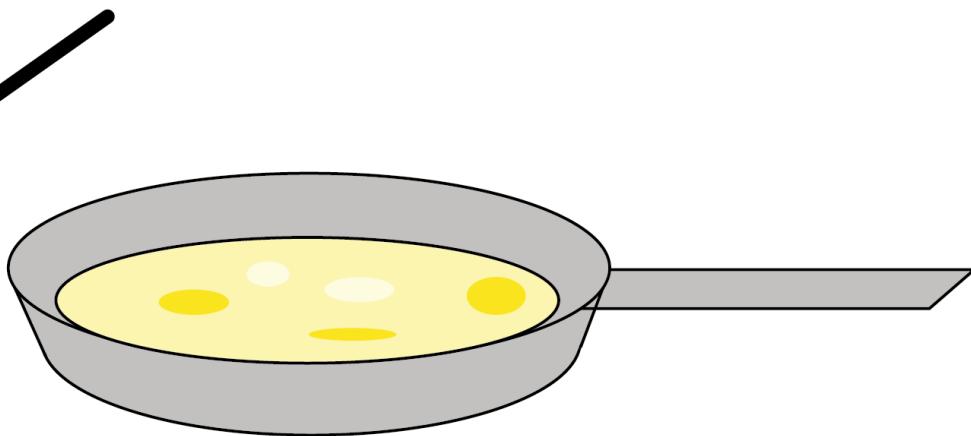




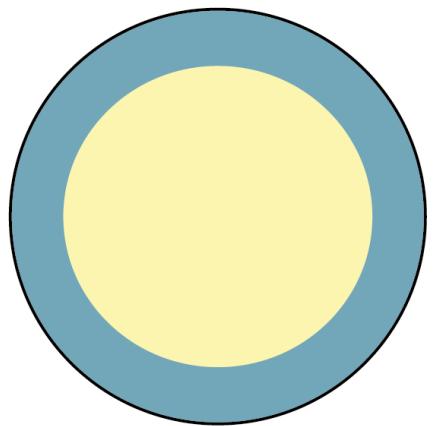
1



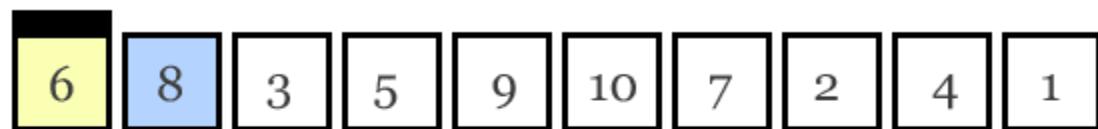
2



3



4



Yellow is smallest number found

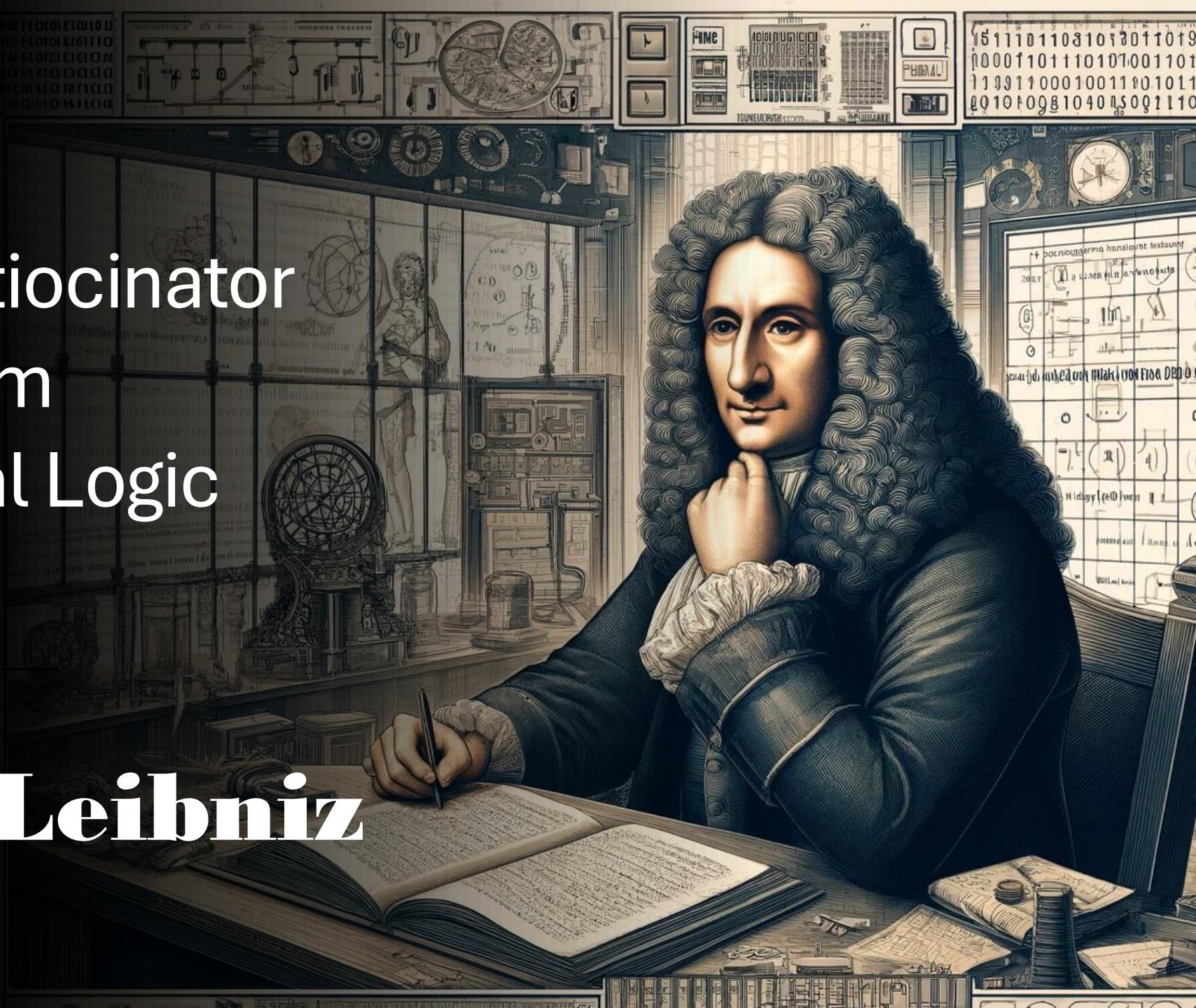
Blue is current item

Green is sorted list

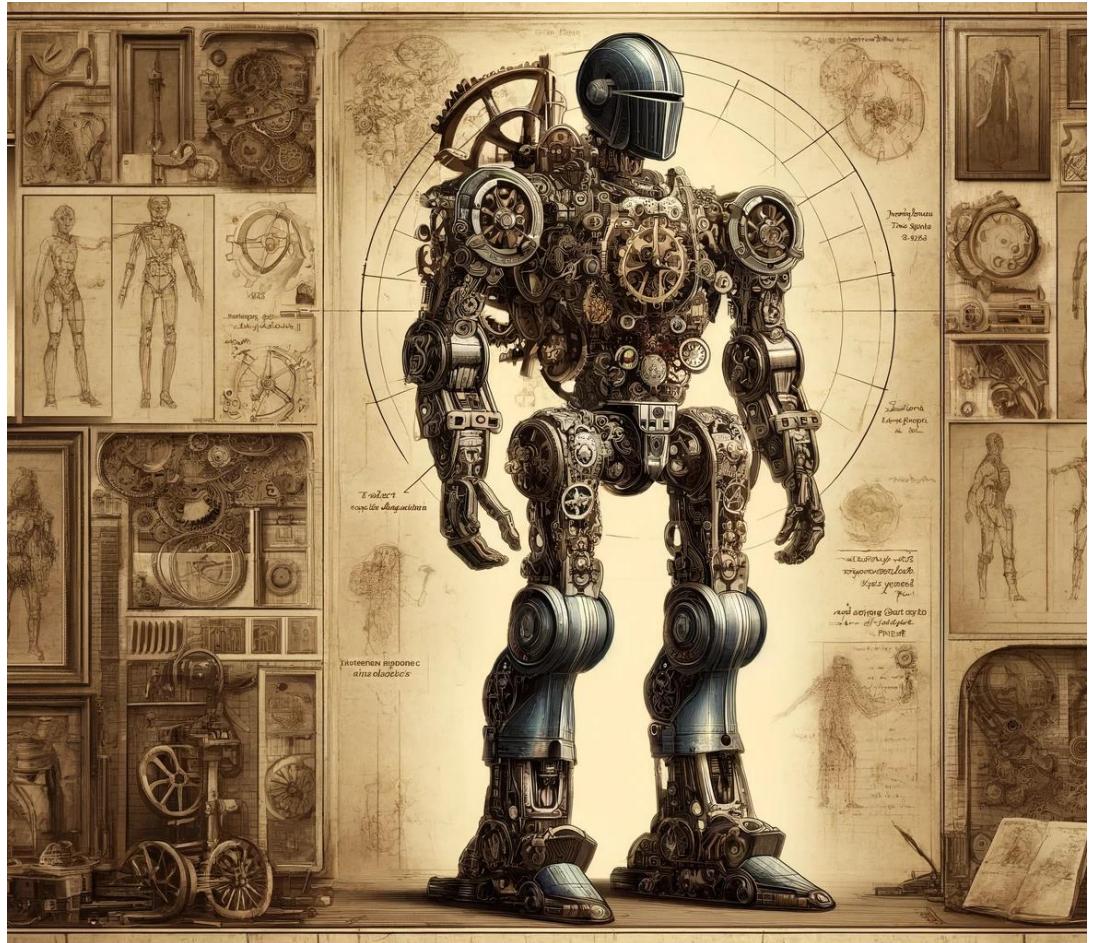
1

- Calculus Ratiocinator
- Binary System
- Philosophical Logic

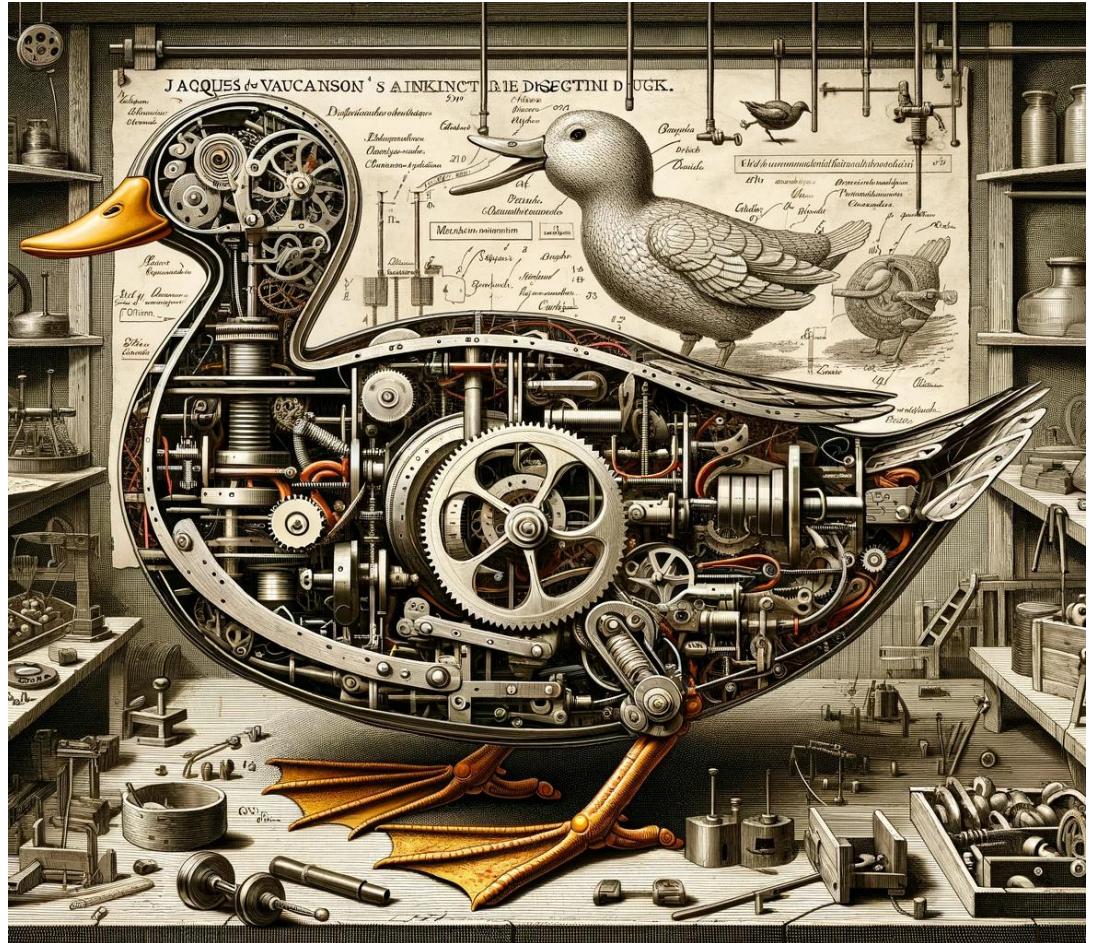
# Gottfried Leibniz (1600's)



# The Age of Invention: Mechanical Automata

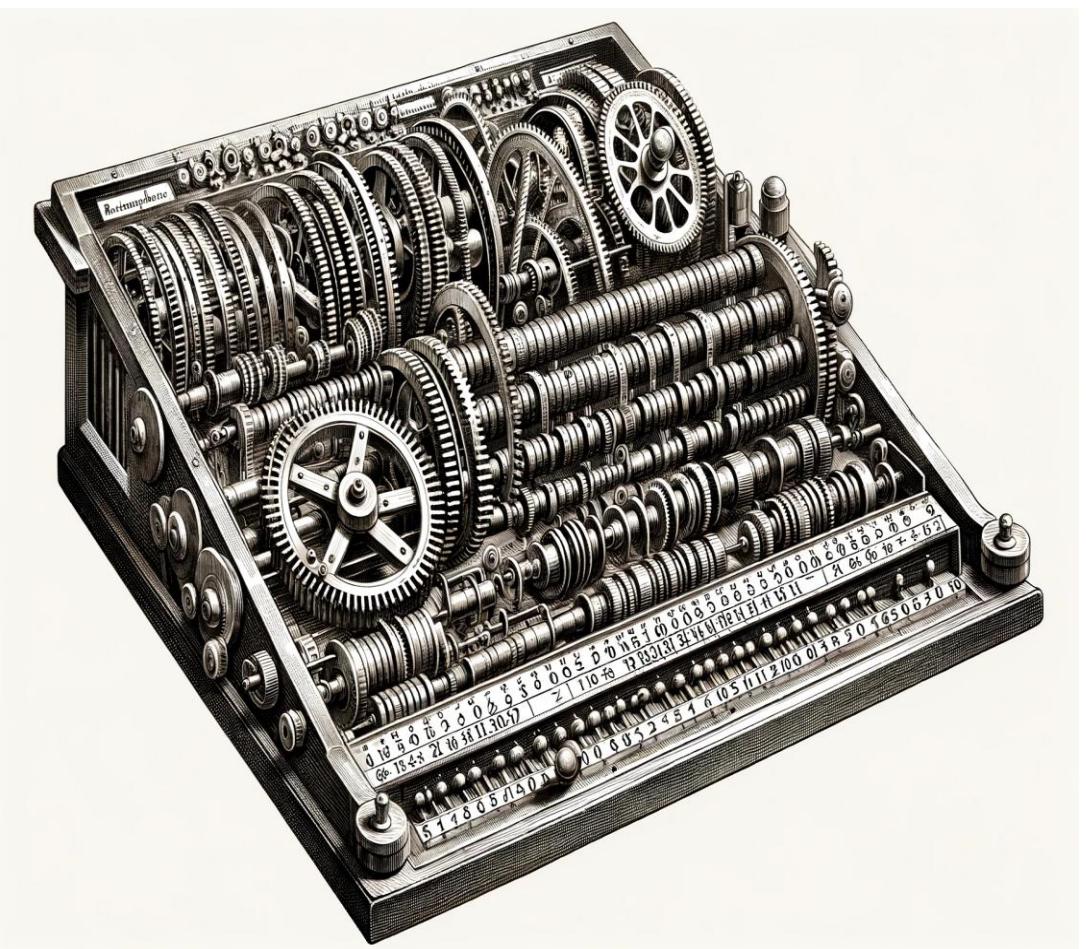


**Robotic Knight :**  
Leonardo da Vinci (1495)

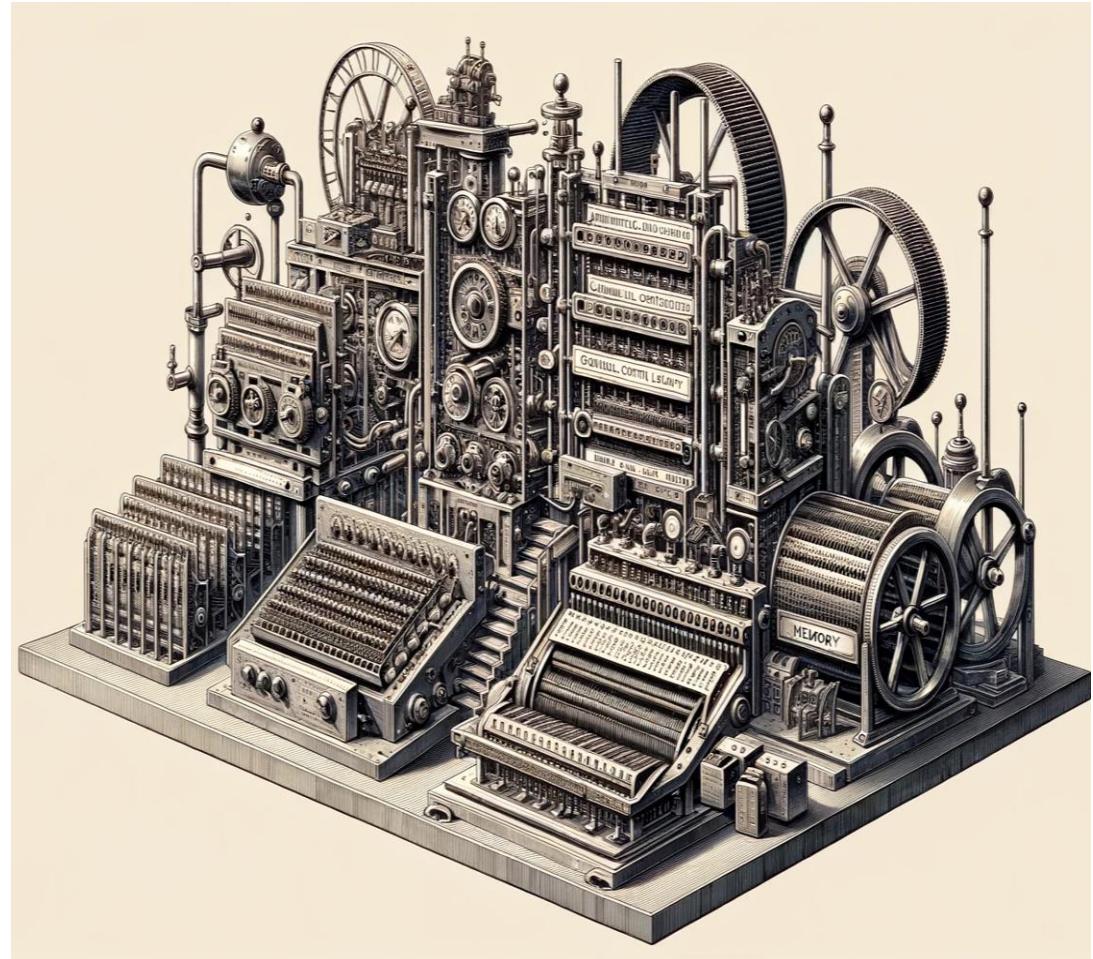


**Digesting Duck :**  
Jacques de Vaucanson (1764)

# The Dawn of Computing: From Babbage to the Digital Age

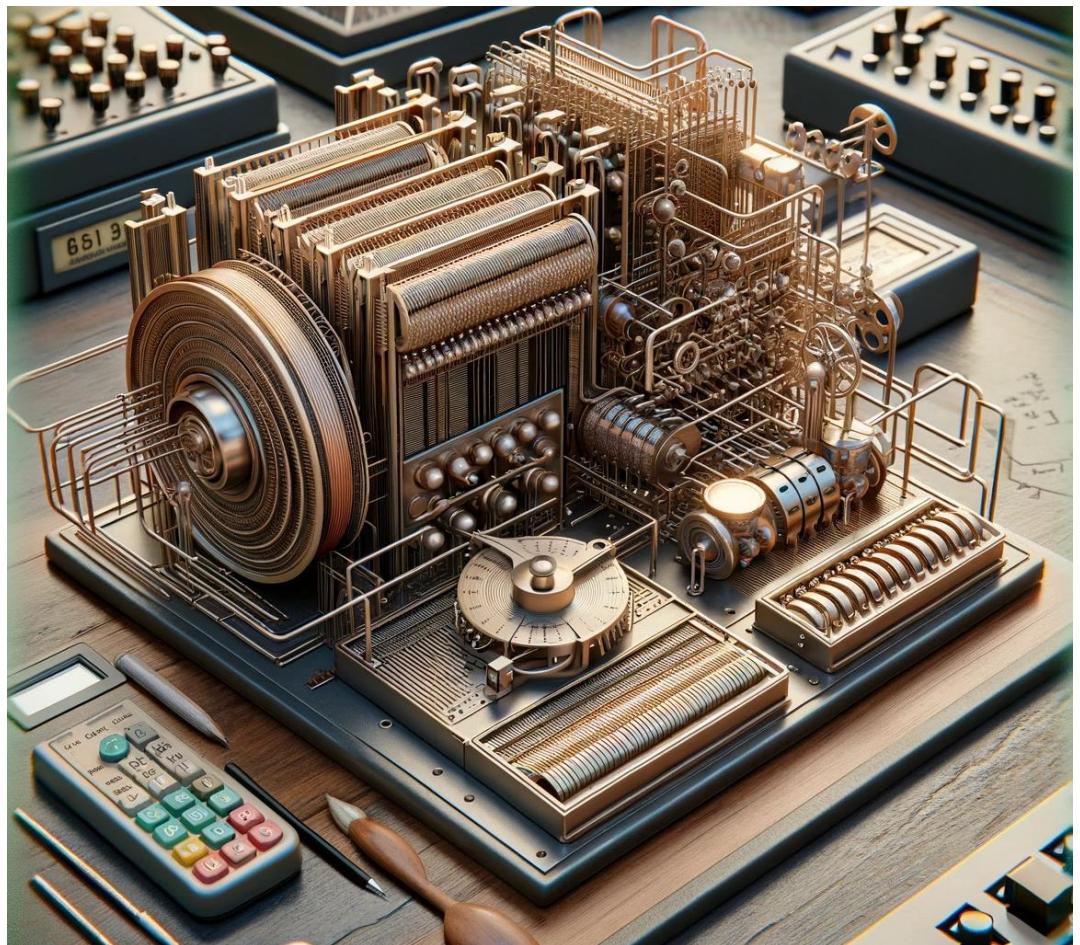


**Pascaline :**  
**Blaise Pascal (1645)**

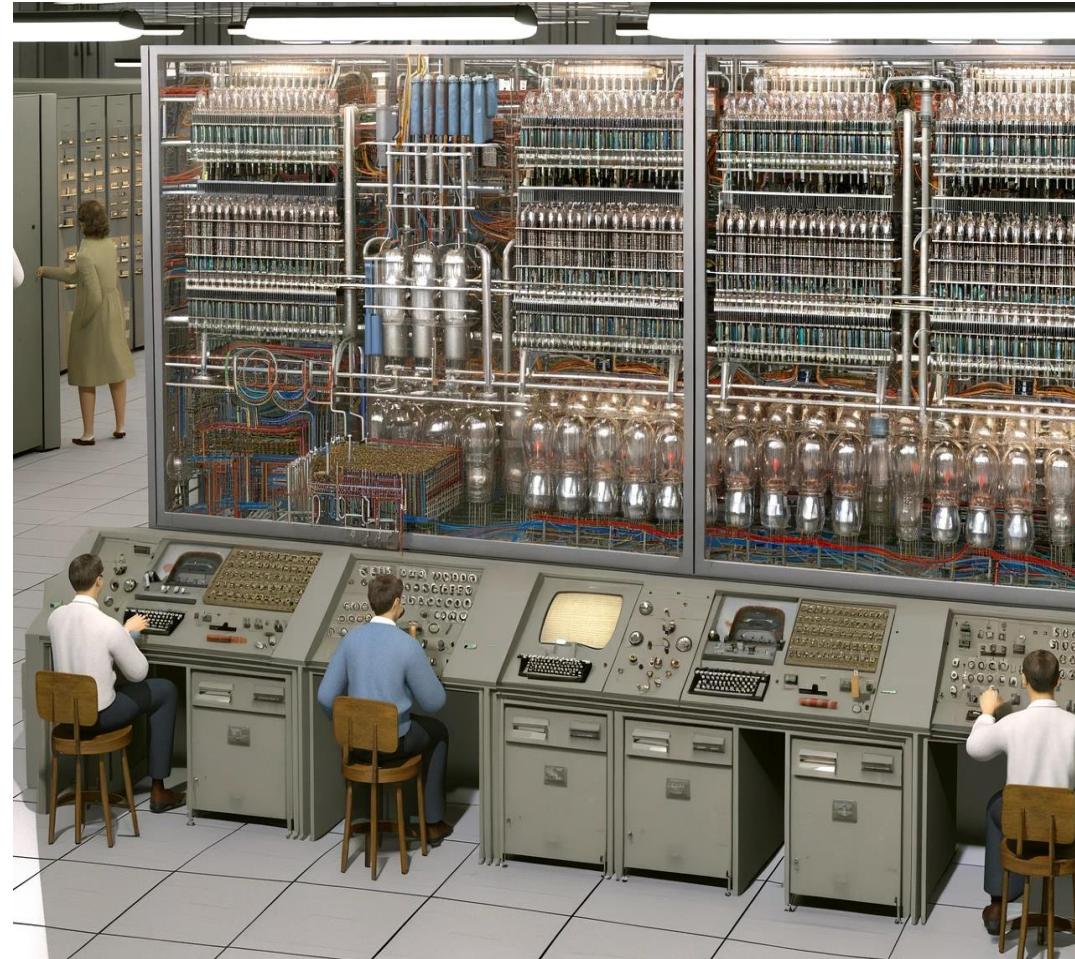


**Charles Babbage :**  
**Analytical Engine (1834)**

# From Theory to Practice: The Birth of Digital Computing



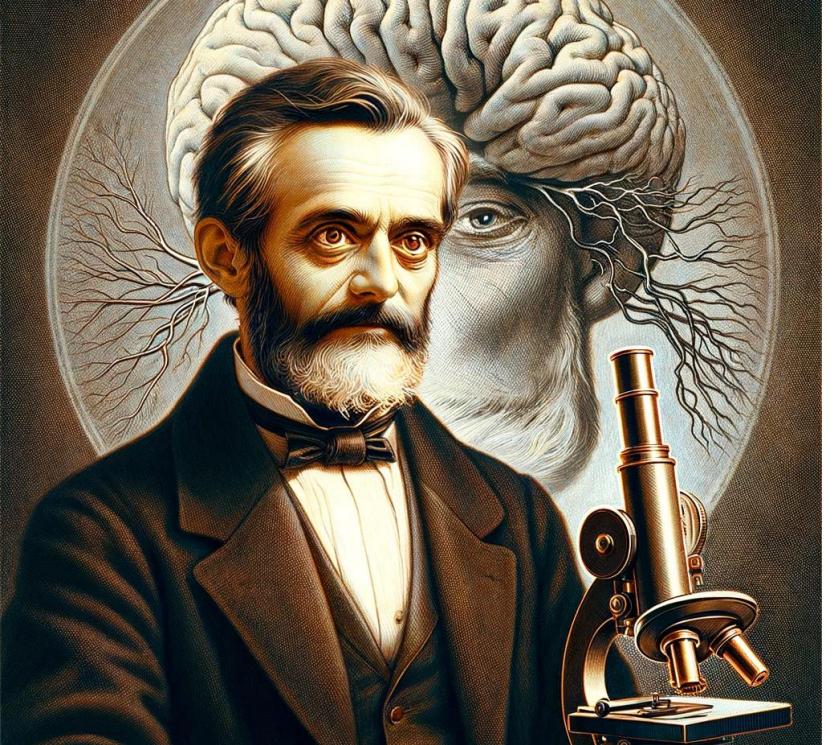
**The Turing machine:**  
**Alan Turing (1936)**



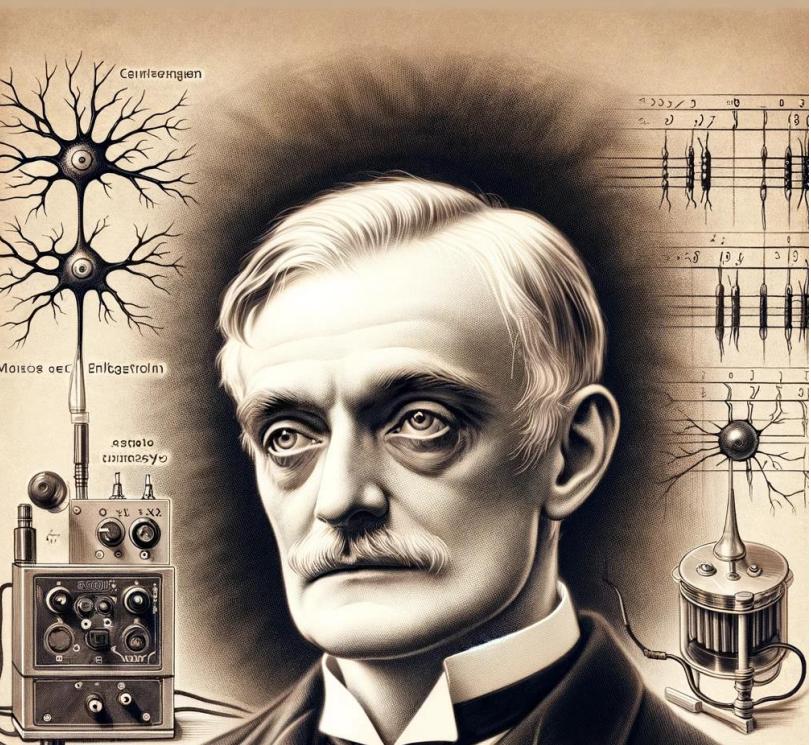
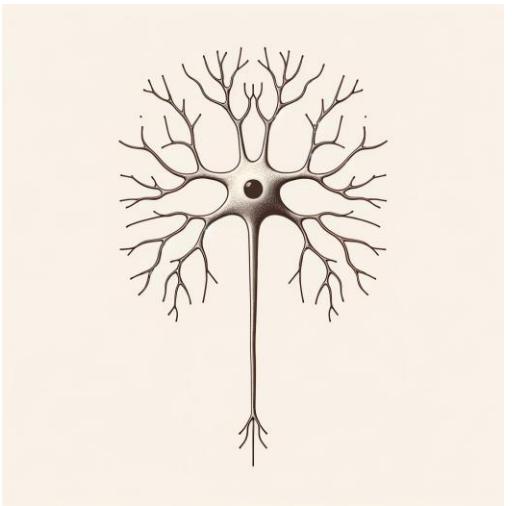
**ENIAC:**  
**US Army Research Lab (1945)**

# Brain Anatomy

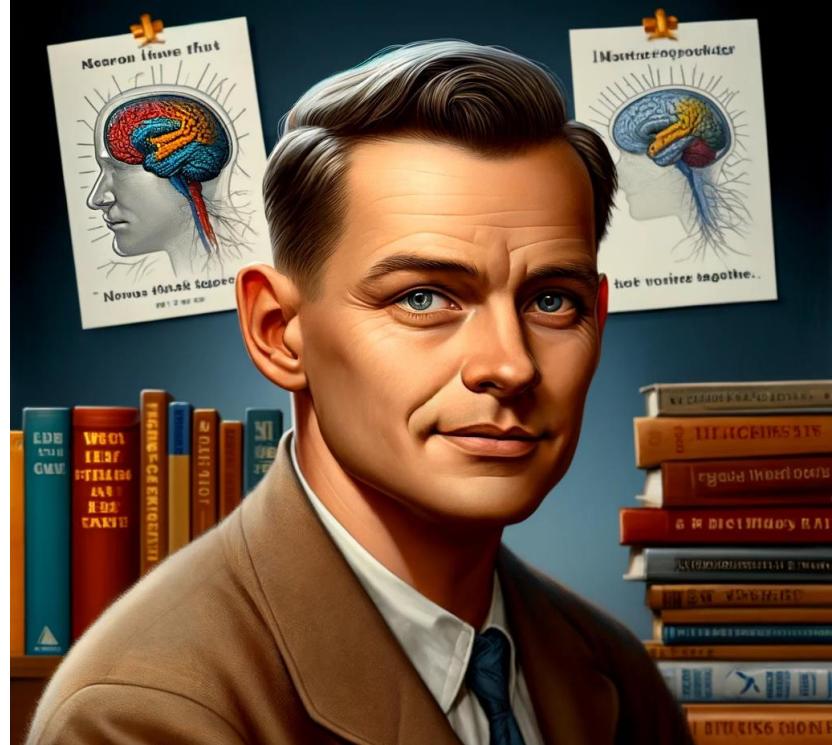




**Camillo Golgi**  
**(1873)**



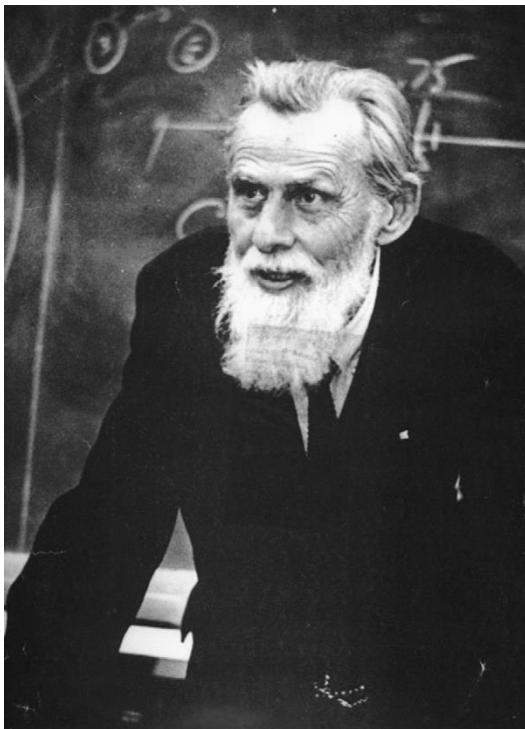
**Charles Sherrington**  
**(1897)**



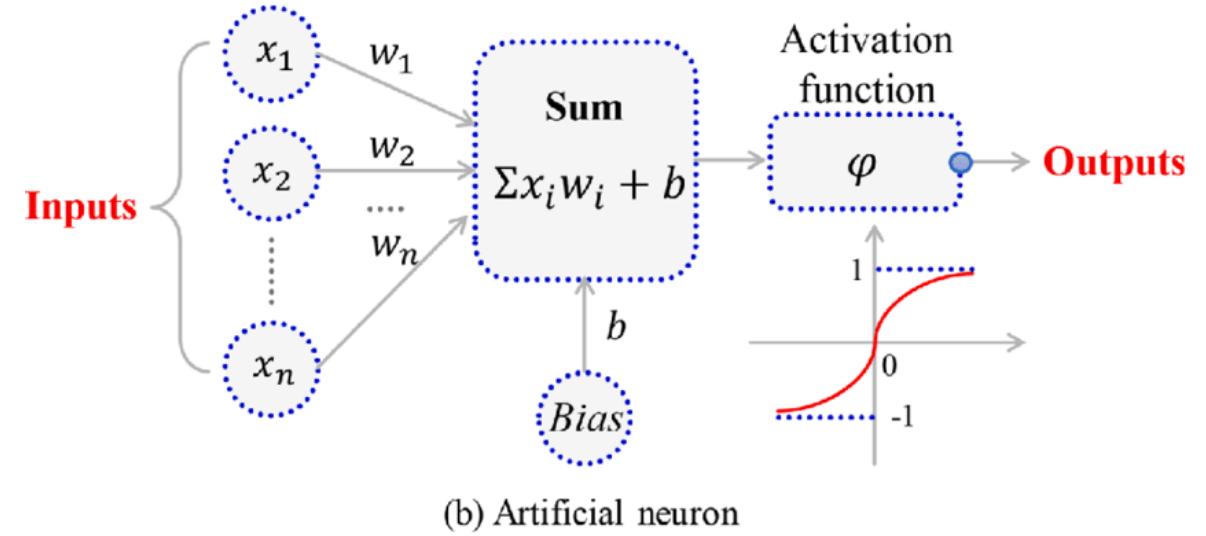
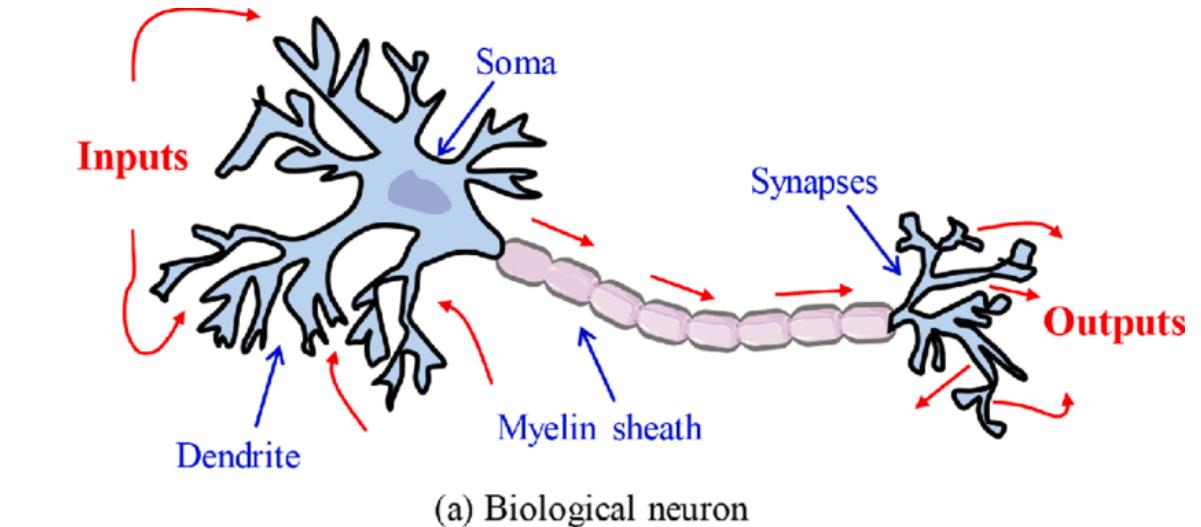
**Donald Hebb**

*Neurons that  
fire together,  
wire together*

# Early Models of Neural Networks



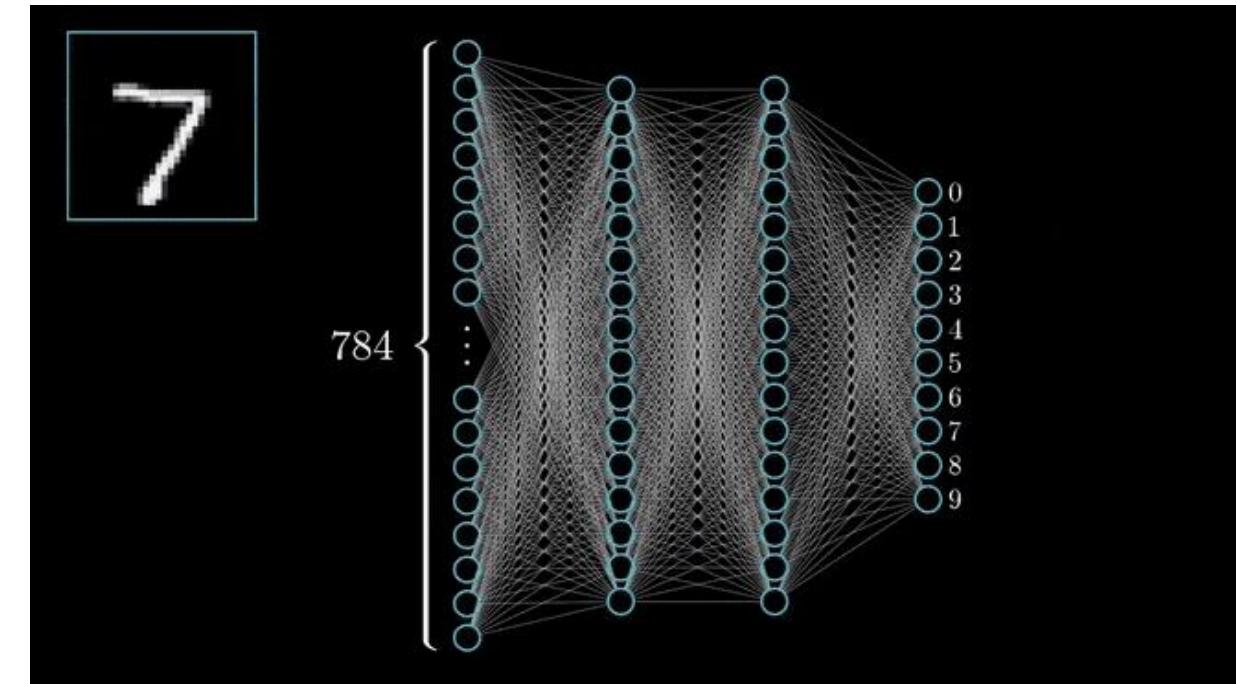
**McCulloch and Pitts  
(1943)**



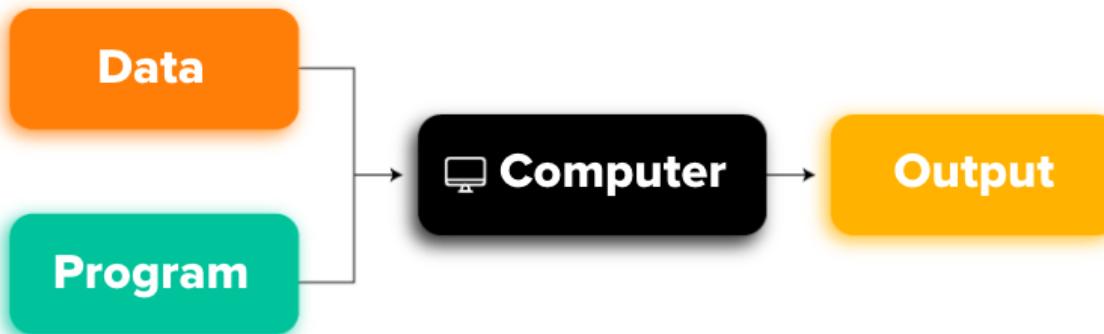
## Human brain



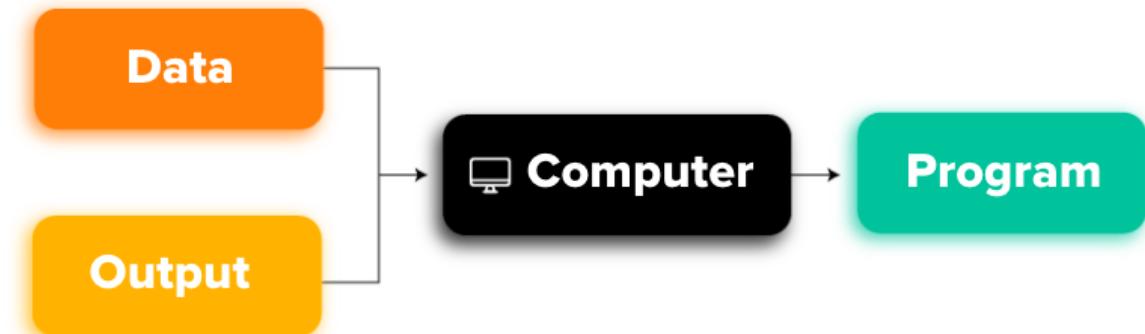
## Artificial neural network



# TRADITIONAL PROGRAMMING



# MACHINE LEARNING



# Early Models of Neural Networks

- Frank Rosenblatt's Perceptron (1958)
- The perceptron: the first algorithmically described neural network
- It demonstrated that machines could learn from data

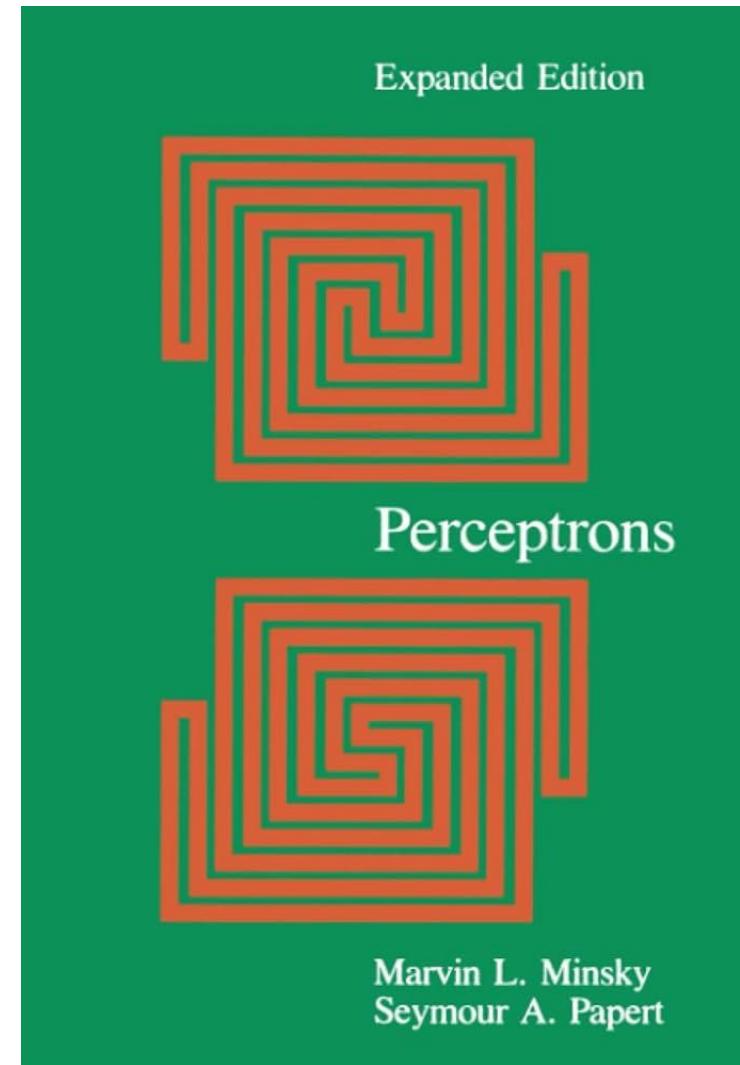


# **Limitations of the Perceptron: The AI Winter**



## **Marvin Minsky and Seymour Papert (1969)**

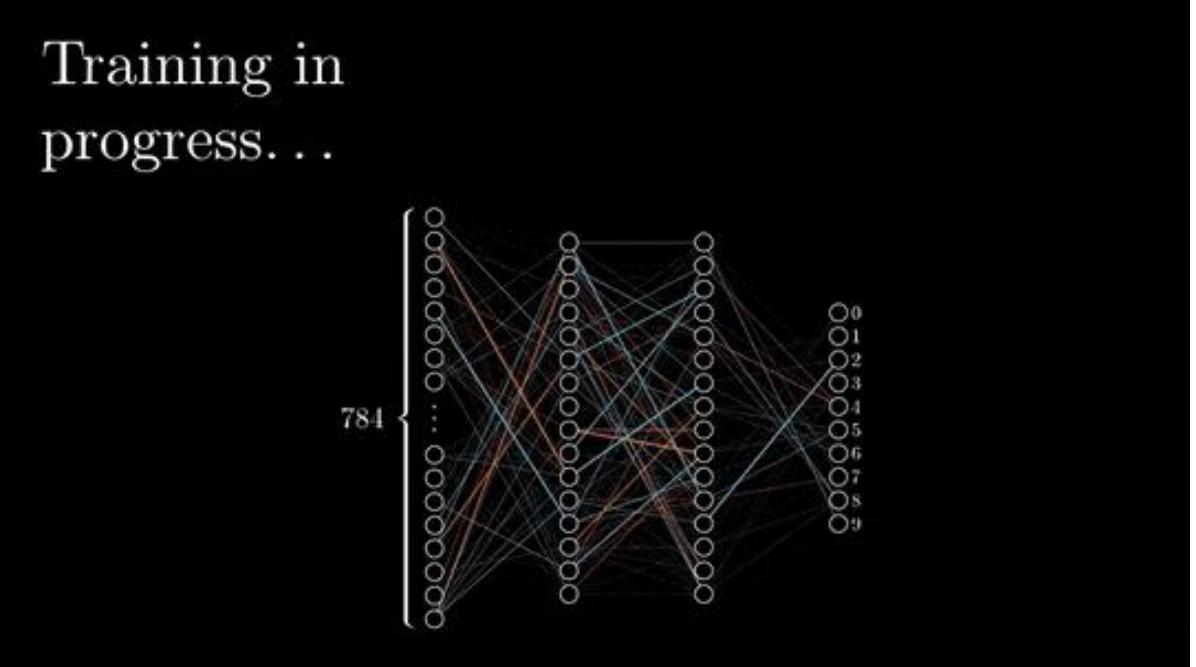
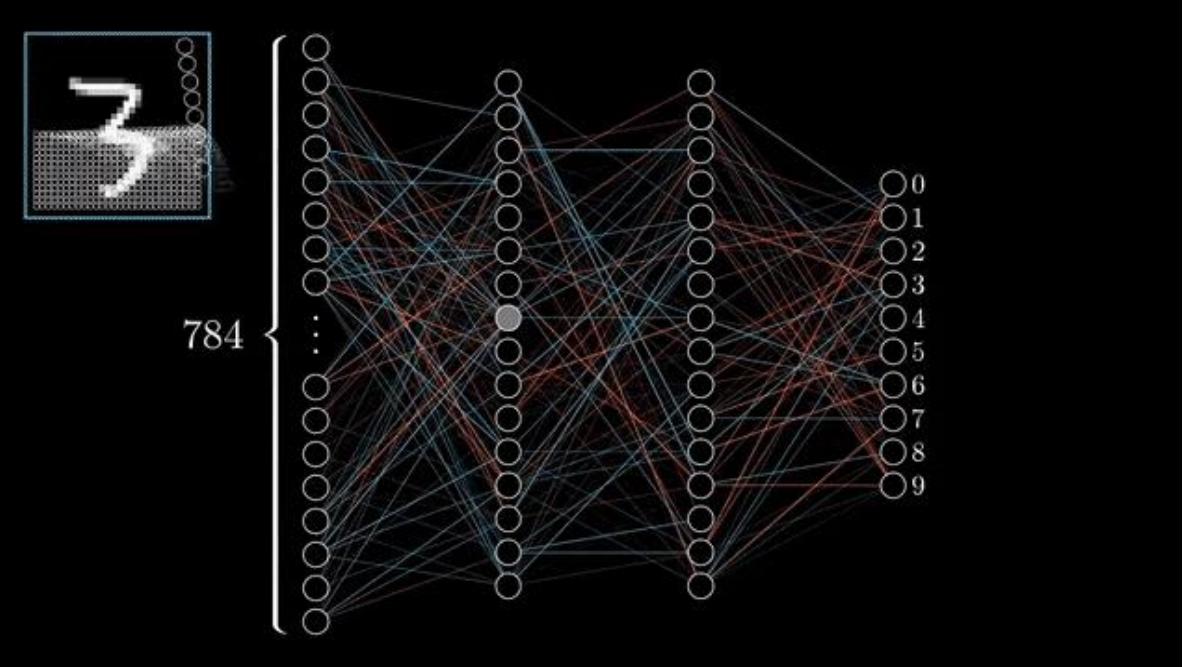
Highlighted that single-layer perceptrons could not solve non-linearly separable problems



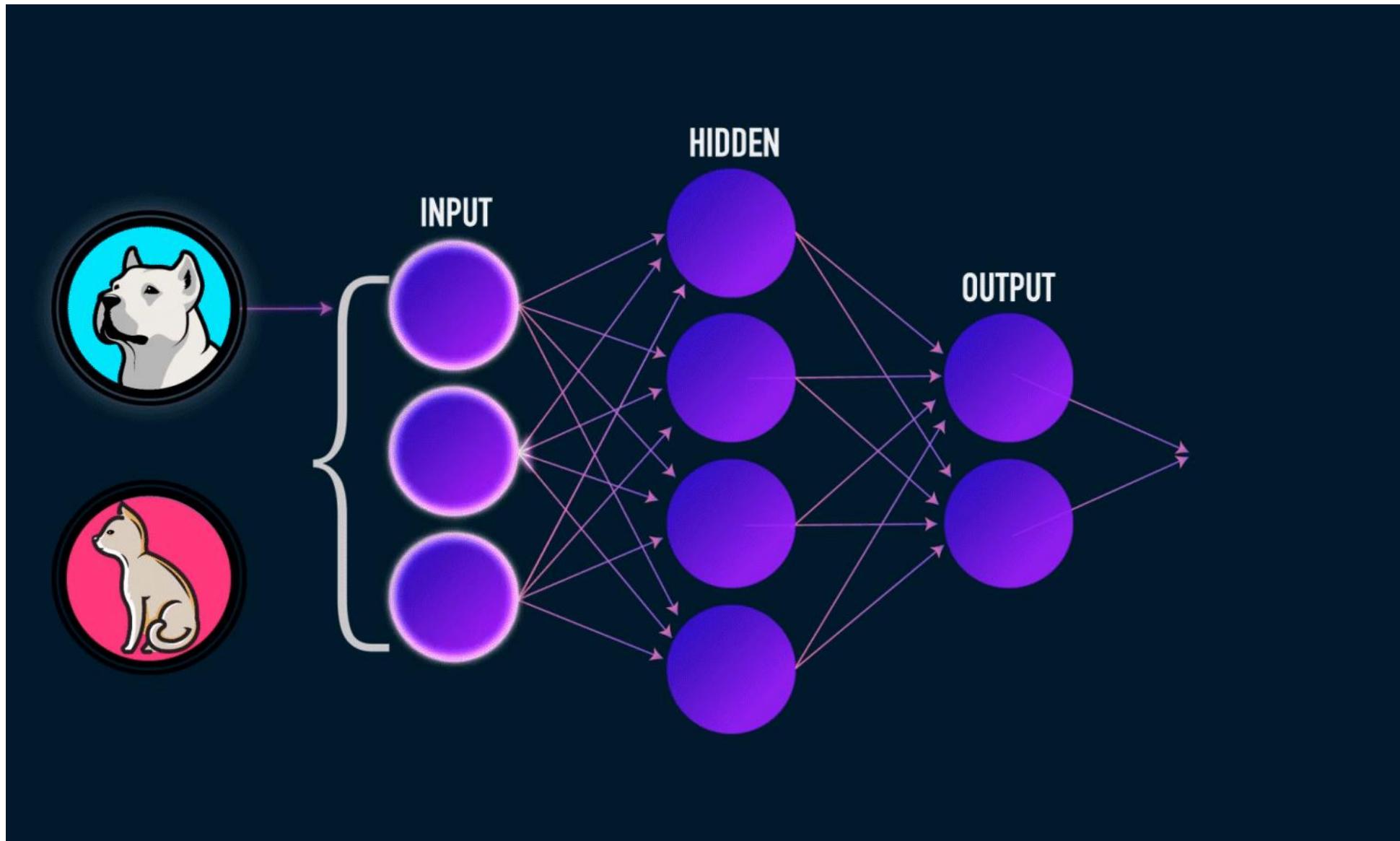


Backpropagation  
Algorithm

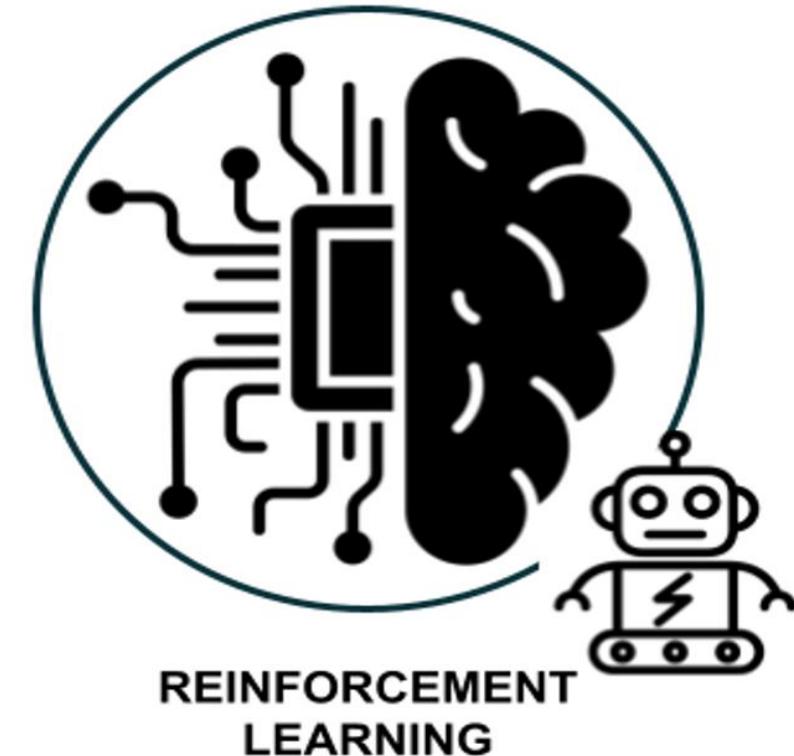
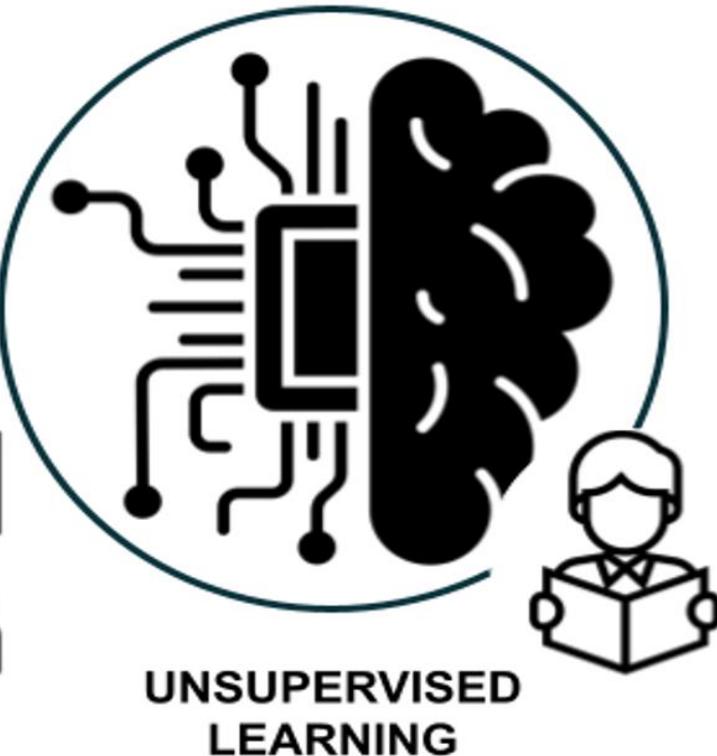
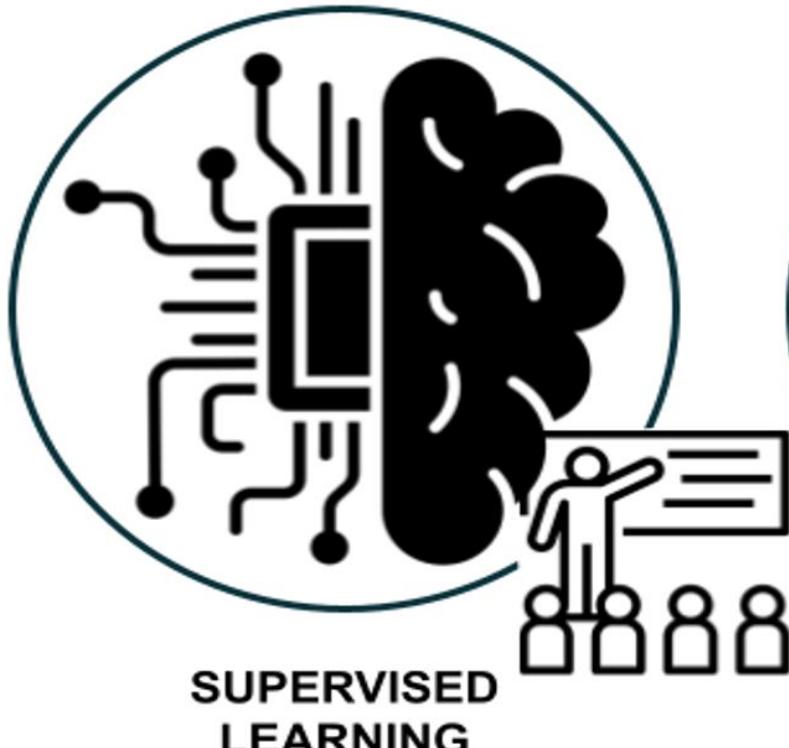
Geoffrey Hinton  
(1986)



# Backpropagation Algorithm



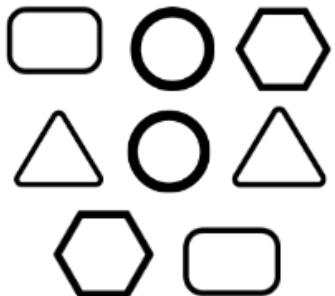
## Artificial Neural Networks (Inference)



## Artificial Neural Networks (Training)

# Supervised Learning

Labeled Data



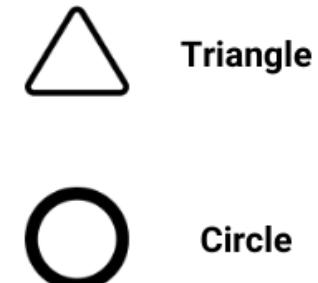
Machine



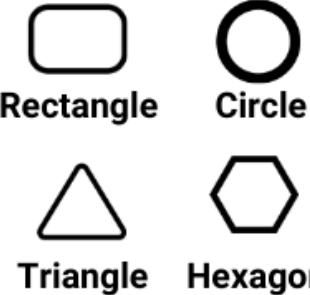
ML Model



Predictions



Labels

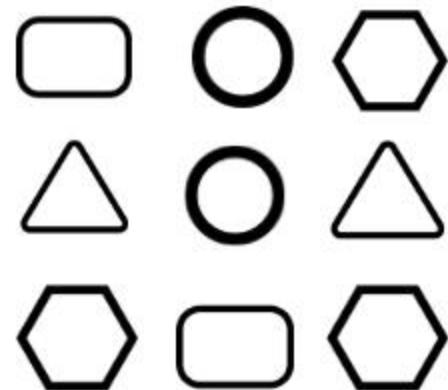


Test Data



# Unsupervised Learning

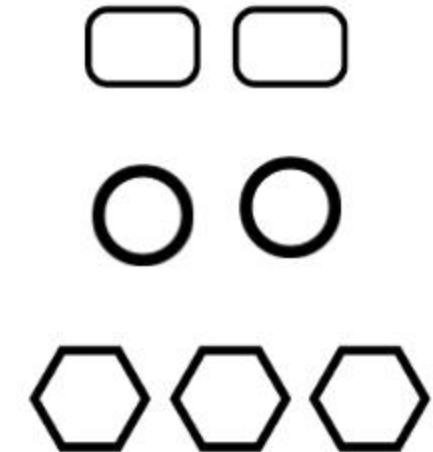
**Unlabelled Data**



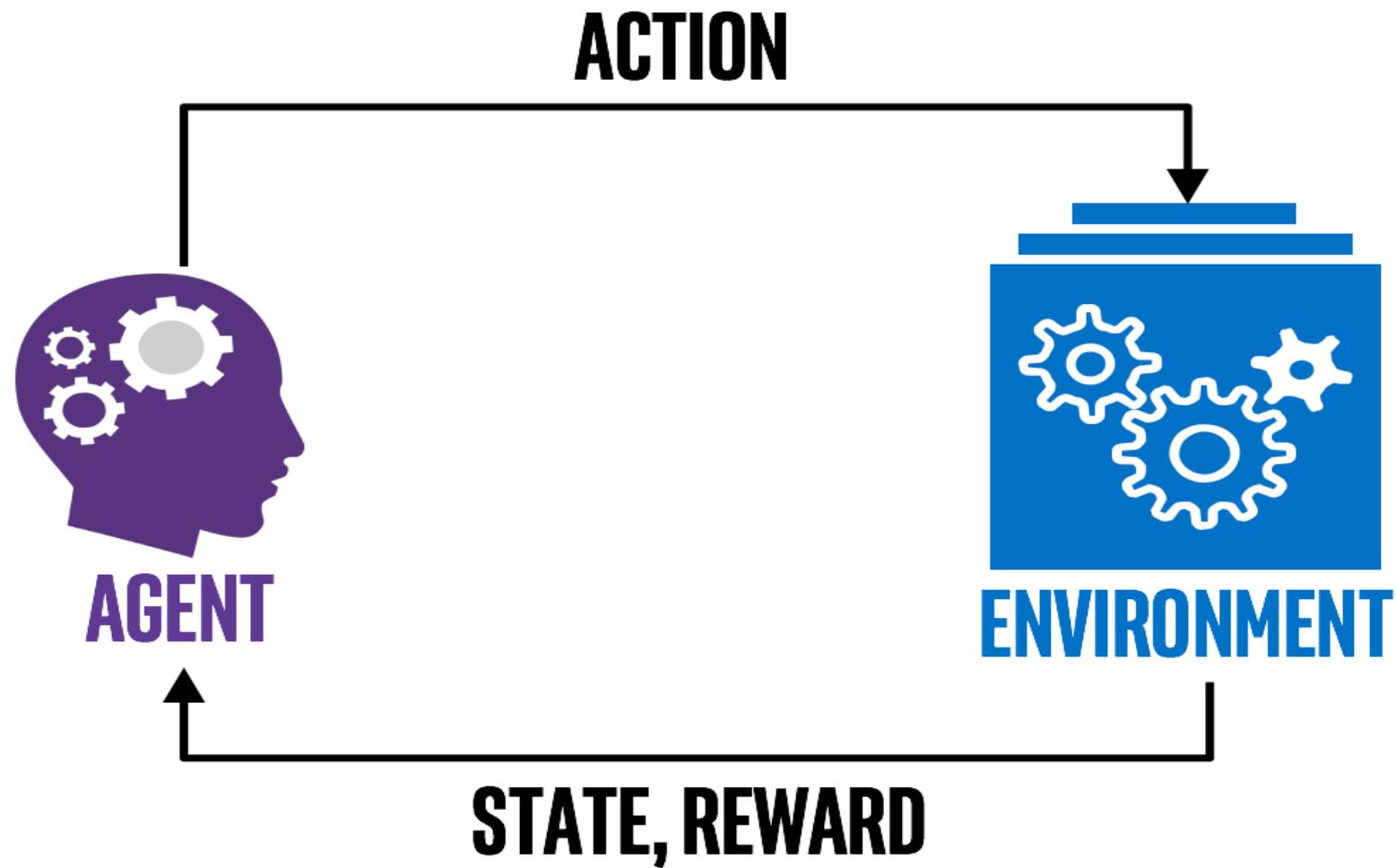
**Machine**



**Results**



# Reinforcement Learning





Deep Neural  
networks

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**Yoshua Bengio**  
**(2012)**



# The Rise of Deep Learning: Availability of Compute and Data

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