MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

"

Success in creating Artificial Intelligence will be the biggest event in human history.

"

Stephen Hawking

UNDERSTANDING BIG PICTURE

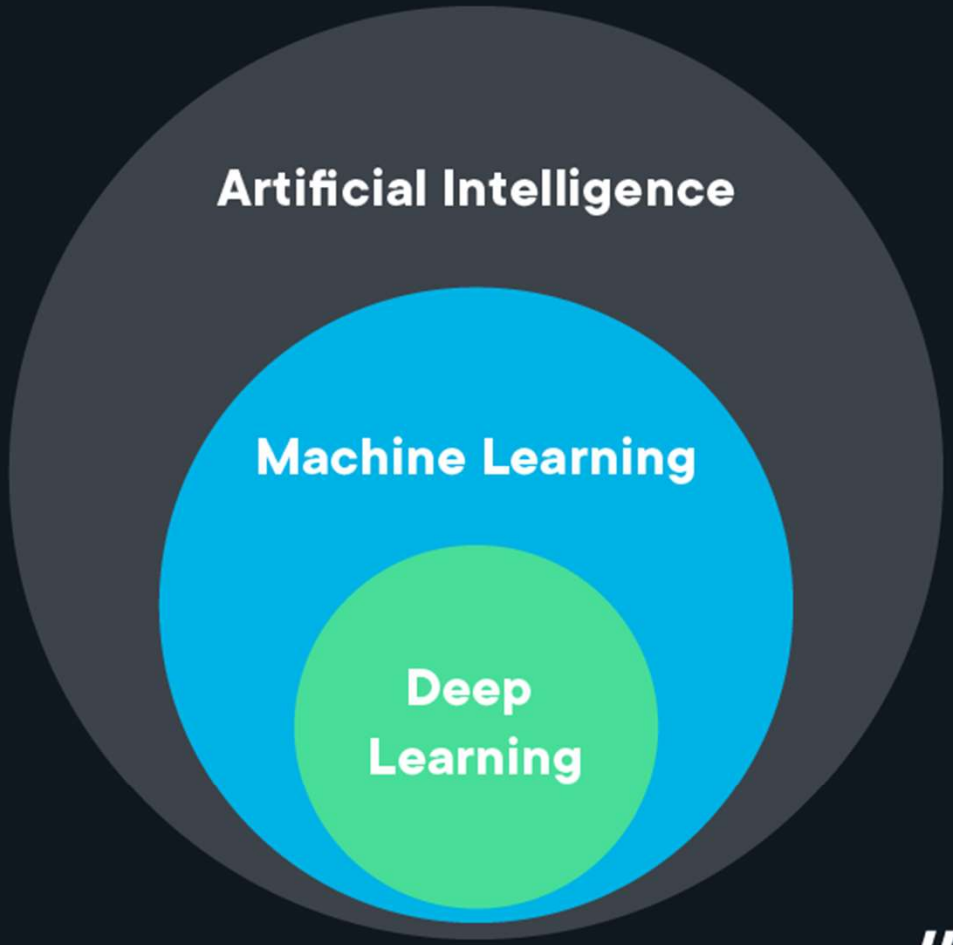
A BRIEF HISTORY OF ARTIFICIAL INTELLIGENCE

- In 1956, a group of avant-garde experts from different backgrounds decided to organize a summer research project on AI.
- The four bright minds that led the project are John McCarthy (Dartmouth College), Marvin Minsky (Harvard University), Nathaniel Rochester (IBM), and Claude Shannon (Bell Telephone Laboratories)
- The primary purpose of the research project was to tackle "every aspect of learning or any other feature of intelligence that can in principle be so precisely described, that a machine can be made to simulate it."

Artificial Intelligence
A science devoted to making machines think and act like humans.

Machine Learning
Focuses on enabling computers to perform tasks without explicit programming.

Deep Learning
A subset of machine learning based on artificial neural networks.



https://flatironschool.com/blog/deep-learning-vs-machine-learning

ARTIFICIAL INTELLIGENCE

- Artificial Intelligence is the science of training machine to imitate human behaviour.
- AI is the simulation of human intelligence processes by machines, especially computer systems. This process includes learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusion) and self-connection.

ARTIFICIAL INTELLIGENCE DEFINITION

- An intelligent entity created by humans.
- Capable of performing tasks intelligently without being explicitly instructed.
- Capable of thinking and acting rationally and humanely.

AI ROADMAP


Programming Language
Mathematical Knowledge
Machine Learning Algorithm
Machine Learning Tool

MACHINE LEARNING

- Machine Learning is the art of study of algorithms that learn from examples and experiments.
- ML based on the idea that there exist some patterns in the data that were identified and used for future prediction.
- No explicit programming involved.

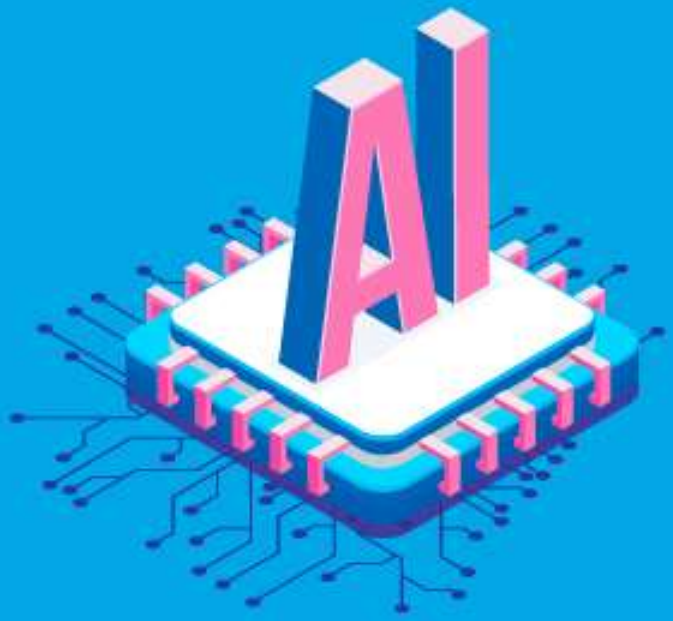
MACHINE LEARNING

- ML teaches a machine how to make inferences and decisions based on past experience.
- It identifies patterns, analyses past data to infer the meaning of these data points to reach a possible conclusion without having to involve human experience.
- This automation to reach conclusions by evaluating data, saves a human time for businesses and helps them make a better decision.

DEEP LEARNING

- Deep Learning is an ML technique.
- It teaches a machine to process inputs through layers in order to classify, infer and predict the outcome.

APPLICATIONS OF AI IN BUSINESS



Applications

- Deep Learning Applications
- Predictive Analytics
- Translation
- Classification and Clustering
- Information Extraction
- Speech to Text
- Text to Speech
- Image Recognition
- Machine Vision
- Planning, Scheduling and Optimization
- Robotics
- Expert Systems


AI
in Healthcare
1 Administration
2 Tele-medicine
3 Assisted Diagnosis
4 Robot Assisted Surgery
5 Monitor of Vital Stats
6 Virtual Nurse Assistants
7 Error Reductions
8 Fraud Detection
9 Research and Study
10 Chronic Care Management

E-COMMERCE

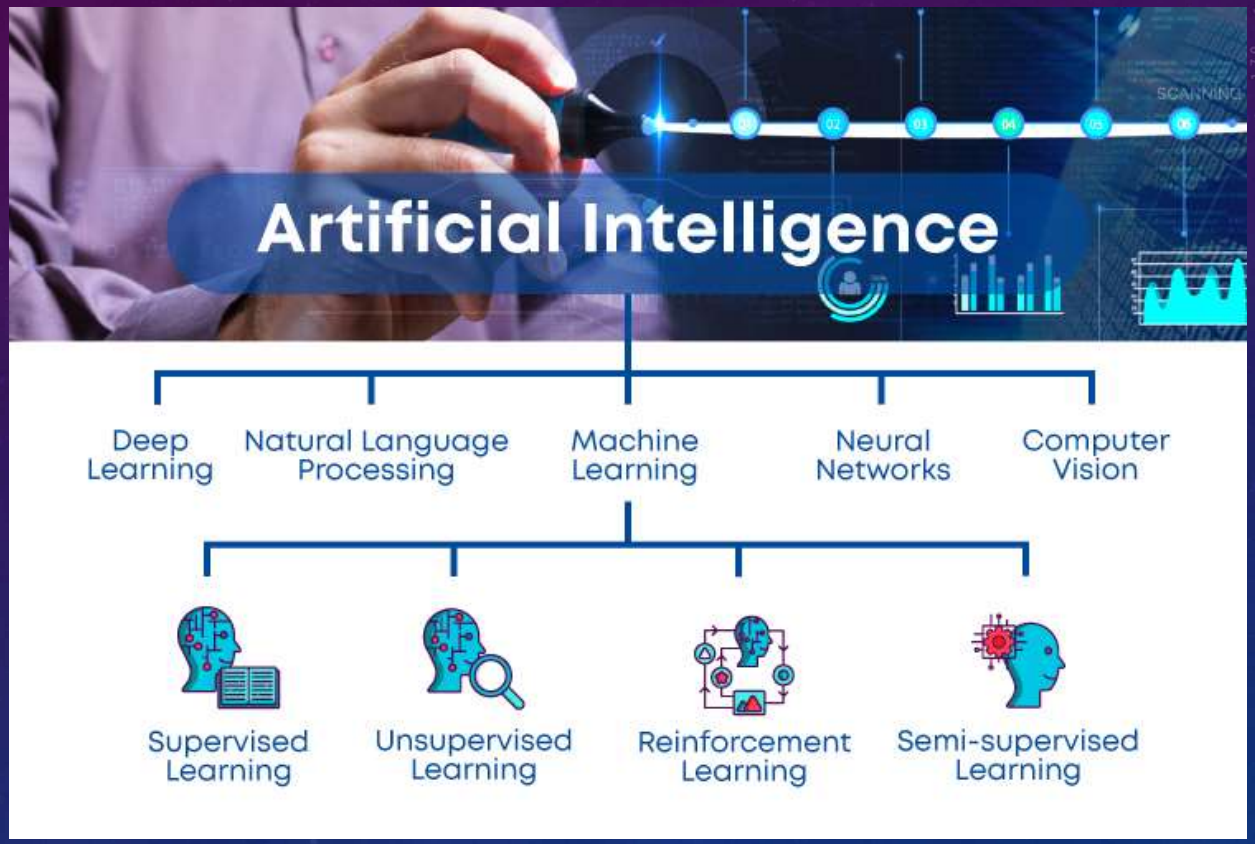
- Better recommendations
- Chatbots
- Filtering spams and fake reviews
- Optimizing search
- Supply-chain

HUMAN RESOURCES

- Building work culture
- Hiring

ROBOTS IN AI

- Assembly
- Customer Service
- Packaging
- Open Source Robotics


Artificial Intelligence
Deep Learning
Natural Language Processing
Machine Learning
Neural Networks
Computer Vision
Supervised Learning
Unsupervised Learning
Reinforcement Learning
Semi-supervised Learning

TOP USED APPLICATIONS IN AI

- Google's AI-powered predictions (e.g. Google Maps)
- Ride-sharing applications (e.g. Uber, Lyft)
- AI Autopilot in Commercial Flights
- Spam filters in emails
- Plagiarism checkers and tools
- Facial recognition
- Search recommendations
- Voice-to-text features
- Smart personal assistants (e.g. Siri, Alexa)
- Fraud protection and prevention

HOW AI FITS WITH BIG DATA

- There's a reciprocal relationship between big data and AI: The latter depends heavily on the former for success, while also helping organizations unlock the potential in their data stores in ways that were previously cumbersome or impossible.
- "Today, we want as much [data] as we can get – not only to drive better insight into business problems we're trying to solve, but because the more data we put through the machine learning models, the better they get," Gruber says. "It's a virtuous cycle in that way."

HOW AI USES BIG DATA

- It's not as if storage and other issues with big data and analytics have gone bye-bye.
- Gruber, for one, notes that the pairing of big data and AI creates new needs (or underscores existing ones) around infrastructure, data preparation, and governance, for example.
- But in some cases, AI and ML technologies might be a key part of how organizations address those operational complexities.

5 WAYS AI FUELS BETTER INSIGHTS

1. AI is creating new methods for analyzing data
2. Data analytics is becoming less labour-intensive
3. Humans still matter plenty
4. AI/ML can be used to alleviate common data problems
5. Analytics become more predictive and prescriptive

AI IS CREATING NEW METHODS FOR ANALYZING DATA

- "Historically, when it comes to analyzing data, engineers have had to use a query or SQL (a list of queries). But as the importance of data continues to grow, a multitude of ways to get insights have emerged. AI is the next step to query/SQL," says Steven Mih, CEO at Alluxio. "What used to be statistical models now has converged with computer science and has become AI and machine learning."

DATA ANALYTICS IS BECOMING LESS LABOUR-INTENSIVE

- As a result, managing and analyzing data depends less on time-consuming manual effort than in the past.
- People still play a vital role in data management and analytics, but processes that might have taken days or weeks (or longer) are picking up speed thanks to AI.
- "AI and ML are tools that help a company analyze their data more quickly and efficiently than what could be done [solely] by employees," says Sue Clark, senior CTO architect at Sungard AS.

HUMANS STILL MATTER PLENTY

- "AI and machine learning, among other emerging technologies, are critical to helping businesses have a more holistic view of all of that data, providing them with a way to make connections between key data sets," Tutuk says. But, she adds, it's not a matter of cutting out human intelligence and insight.
- "Businesses need to combine the power of human intuition with machine intelligence to augment these technologies – or augmented intelligence. More specifically, an AI system needs to learn from data, as well as from humans, in order to be able to fulfill its function," Tutuk says.

AI/ML CAN BE USED TO ALLEVIATE COMMON DATA PROBLEMS

- Here's something that hasn't changed: The value of your data is inextricably linked to its quality. Poor quality means low (or no) value. This is something that so-called big data has in common with AI.
- "Every conversation about machine learning always comes back to the quality of the company's data. If the data is dirty, any insights derived from it cannot be trusted," says Moshe Kranc, CTO at Ness Digital Engineering. "The 'dirty' secret of ML projects is that 80 percent of the time is spent cleansing and preparing the data."

ANALYTICS BECOME MORE PREDICTIVE AND PRESCRIPTIVE

- In the past, data analytics was more postmortem than anything else: "Here's what happened." Future predictions were still essentially historical analyses. AI and ML are helping open a new front: "Here's what's going to happen." (Or at least "here's what likely going to happen.") Moreover, an ML algorithm can also be taught to decide or take an action based on that forward-looking insight.

"Today, AI is moving big data decisions to points further down the timeline, in more accurate ways, by using predictive analytics," says Sean Werick, managing director of analytics at Sparkhound. "Traditionally, big data decisions were based on past and present data points, generally resulting in linear ROI. With AI, this has grown to epic and exponential proportions. Prescriptive analytics, leveraging AI, has the potential to provide company-wide, forward-looking strategic insights helping to advance the business."

THE END