Machine Learning

Credit Hours: (2+1)

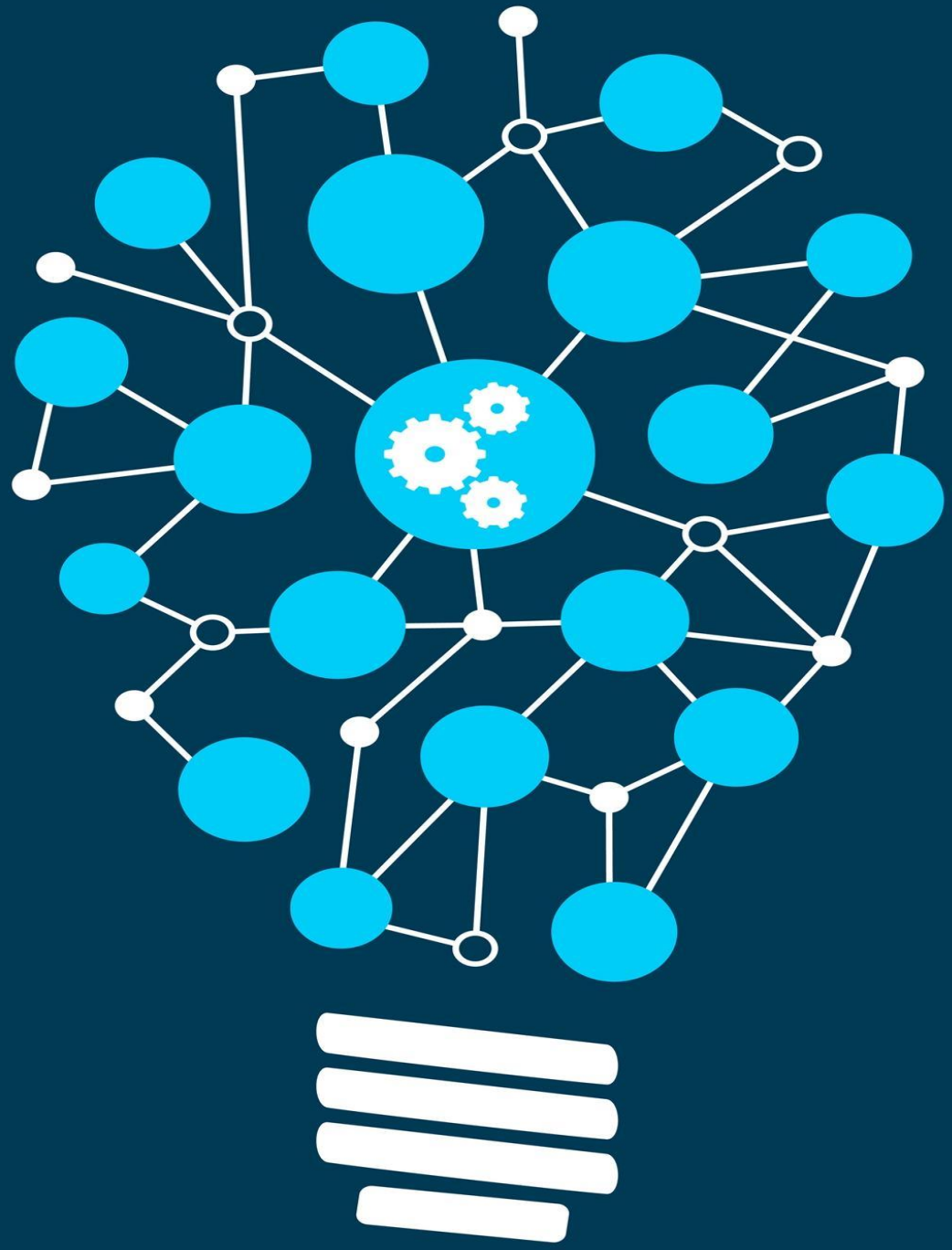
Presenter
Ms. Qurat-ul-Ain Raja

Ms. Qurat Ul Ain Raja
(Verbal Introduction)

BSAI-5

(Verbal Introduction)

MACHINE LEARNING



Course Information

Marks Distribution:

- Quizzes – 10%
- Assignments – 10%
- Mid Term Exam – 25%
- Final Exam – 50%
- Project – 5%

→ *75% attendance is mandatory.*

Course Description

Machine learning is one of the fastest growing areas of computer science, with far-reaching applications. The aim of this course is to: a) Present the basic machine learning concepts; b) Present a range of machine learning algorithms along with their strengths and weaknesses; c) Apply machine learning algorithms to solve problems of moderate complexity.

Course Learning Outcomes

S. #	CLO STATEMENT	DOMAIN	BT LEVEL	PLO
CLO-1	Describe basic machine learning concepts, theories and applications.	C	C1 Knowledge	2
CLO-2	Apply supervised learning techniques to solve classification problems of moderate complexity.	C	C3 Apply	2
CLO-3	Apply unsupervised learning techniques to solve clustering problems of moderate complexity	C	C3 Apply	2
*** BT= Bloom's Taxonomy, C=Cognitive Domain, P=Psychomotor Domain, A= Affective Domain**				

Textbook, Course Outline

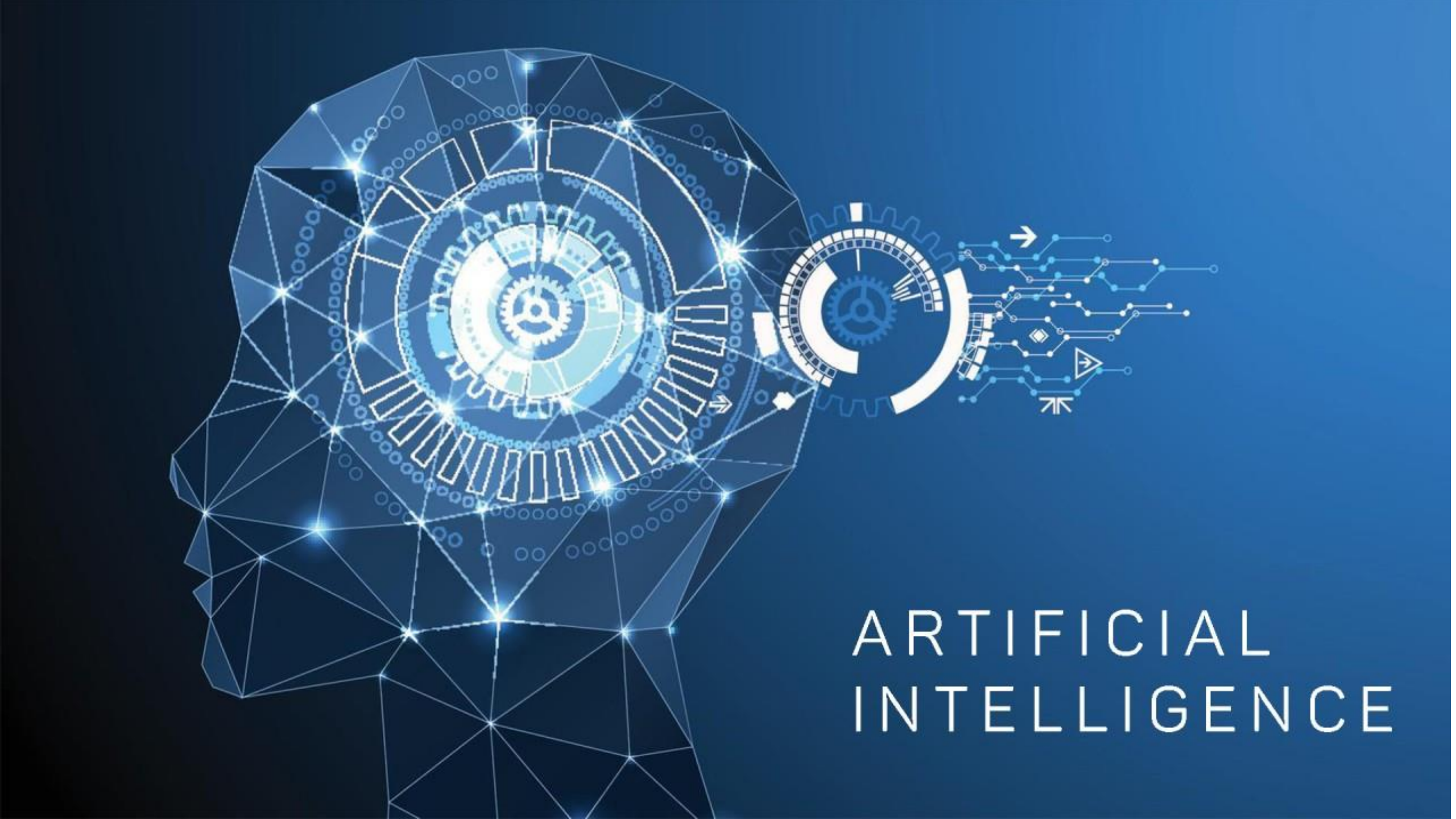
Visit LMS and find the file “Course Outline” – it includes course distribution, text book and other details.

Recommended Textbooks

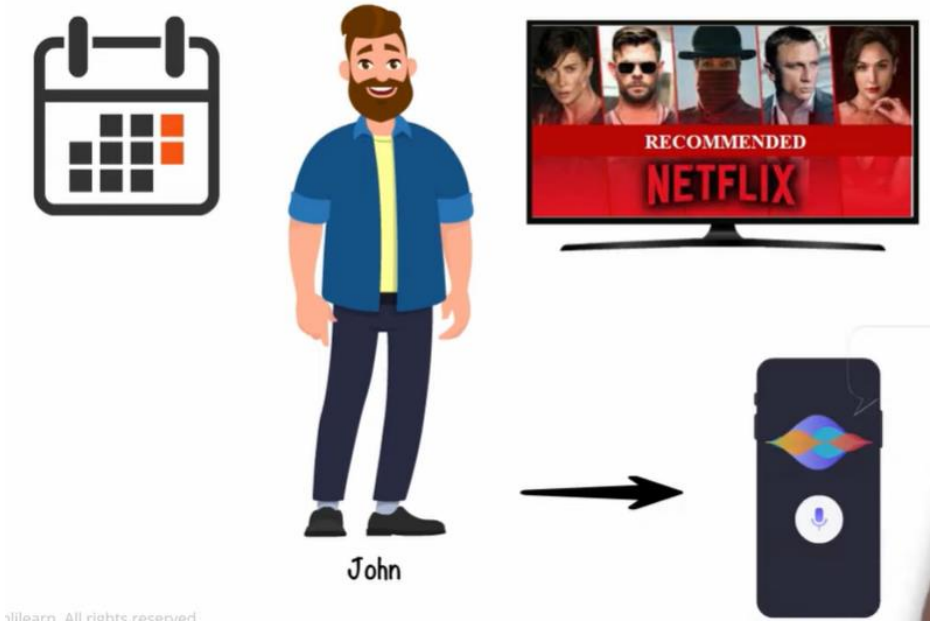
1. **Machine Learning, Tom, M., McGraw Hill, 1997.**
2. **Machine Learning: A Probabilistic Perspective, Kevin P. Murphy, MIT Press,2012**

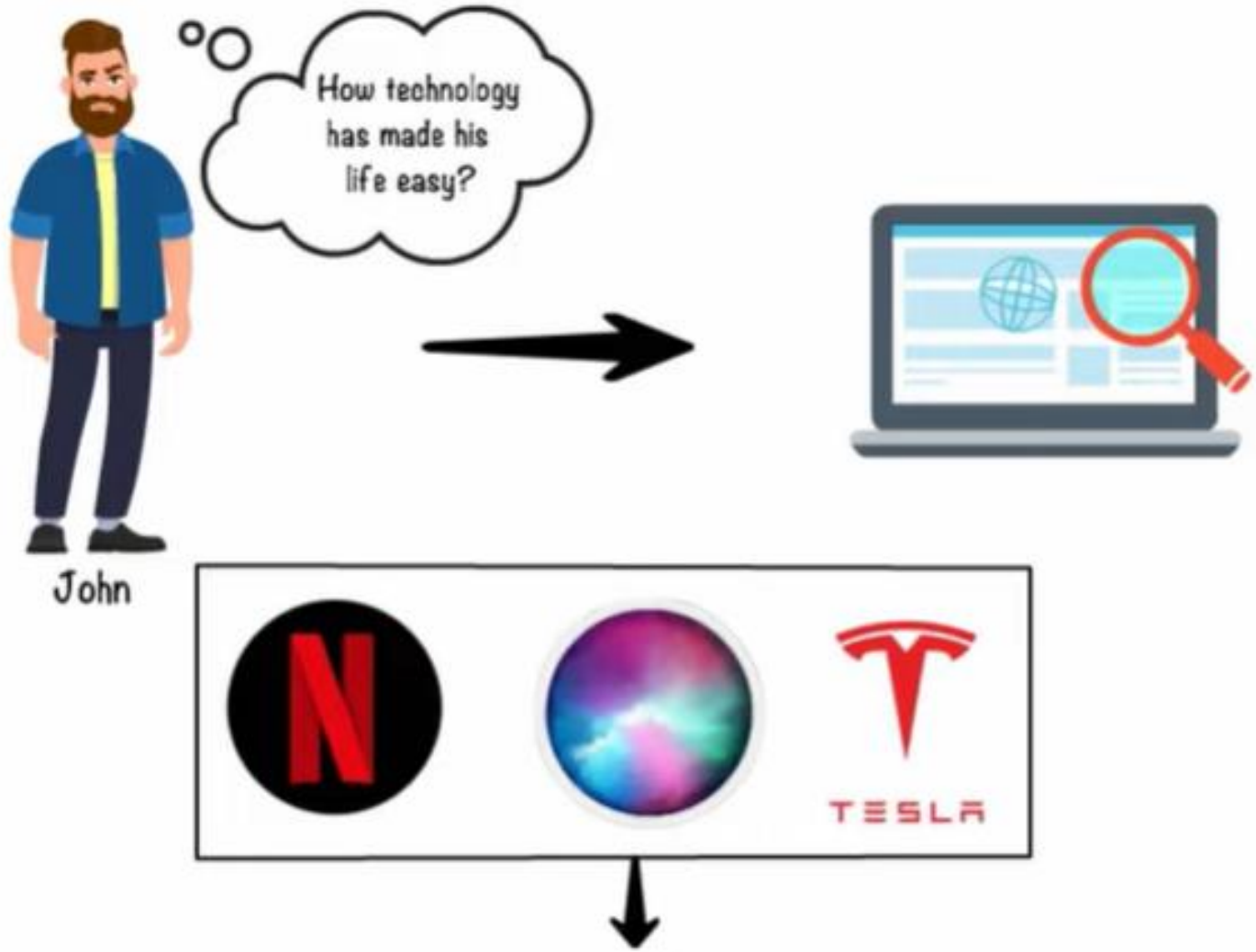
Week Wise Schedule

- Course outline to be uploaded on LMS.


ARTIFICIAL
INTELLIGENCE

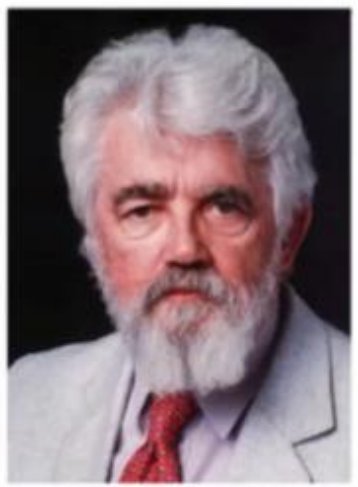
What is Artificial Intelligence?





What is AI?

Artificial Intelligence is not a new term



John McCarthy
(Computer scientist)

Artificial Intelligence
In 1956


What can I help
you with?
SIRI


amazon
alexa
amazon

Alexa and Siri

- Alexa and Siri are applications powered by artificial intelligence. They rely on natural language processing and machine learning, two subsets of AI, to improve performance over time.

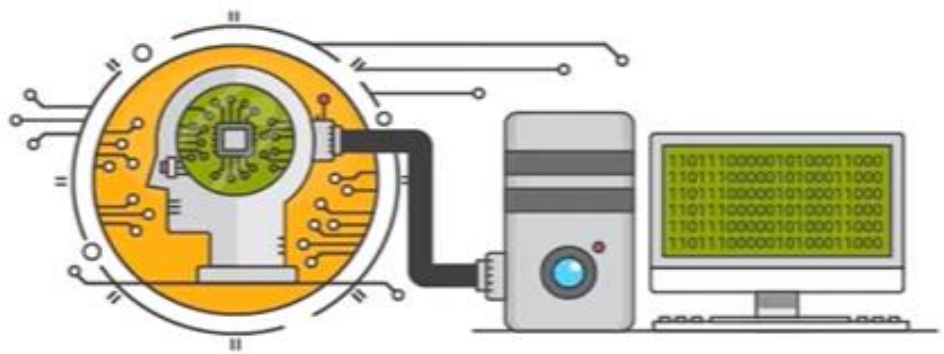
- Siri is there to automate tasks and provide information, and Siri becomes more familiar with your tendencies the more you use it.
  - It can inform you of the weather
  - Remind you of an appointment
  - Open an application
  - Even save your fingers from fatigue by replying to all of your text messages.


YouTube

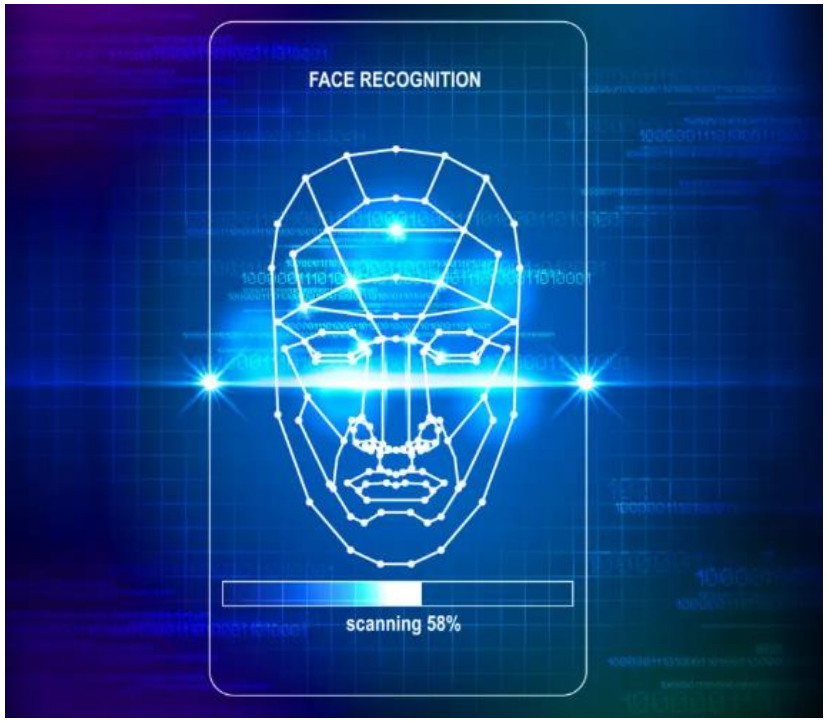

RECOMMENDED
NETFLIX

Definition of Artificial Intelligence

Artificial Intelligence refers to intelligence displayed by machines that simulates human and animal intelligence.

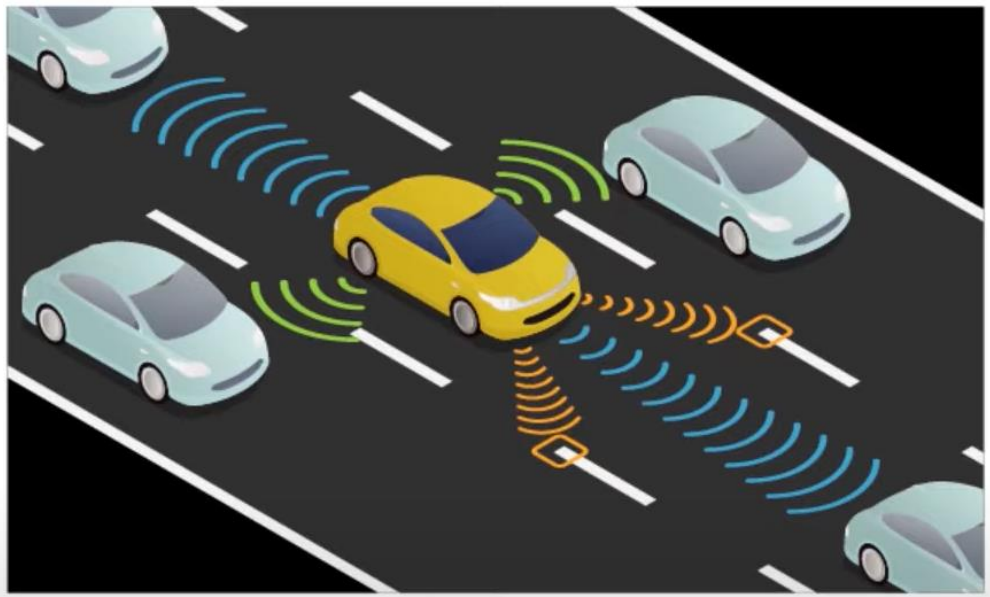


It enables computers to mimic human intelligence using logic.


FACE RECOGNITION
scanning 58%


DATA
NO: ONE PERSON
GENDER: MAN
AGE GROUP: YOUNG MAN
ETHNICITY: CAUCASIAN
HUMAN BODY PART: HUMAN FACE
TIME: 167 S
DETECTION: 63621 POINTS
POS (X/Y/Z): 1322 / 856 / 21

AI-based image recognition is a technology that uses AI to identify written characters, human faces, objects and other information in images. The accuracy of recognition is improved by having AI read and learn from numerous images



Self-driving cars

Self-driving cars are computer-controlled cars that drive themselves.

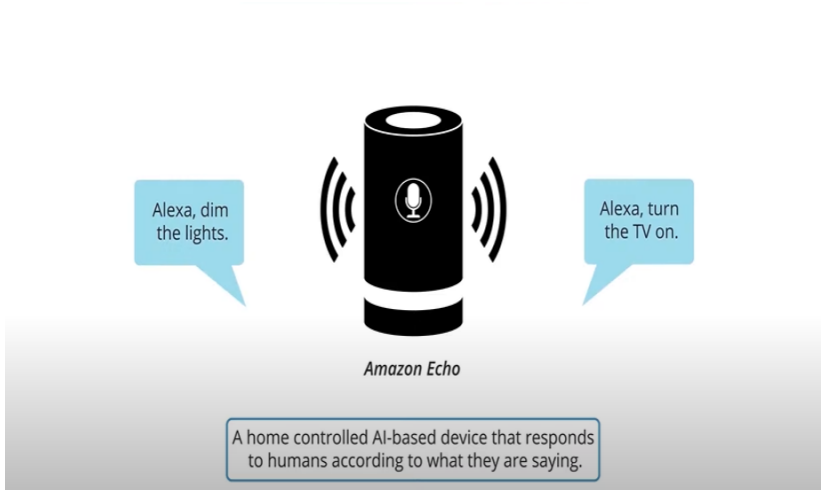
Human drivers are never required to take control.

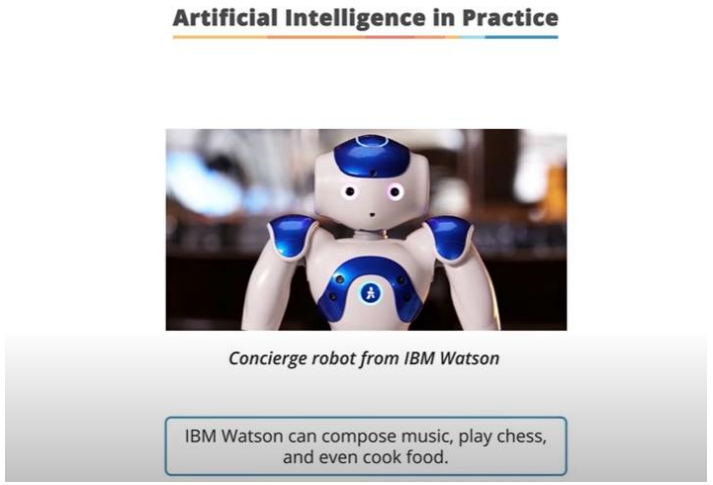
Sophia is one of the most sophisticated artificial intelligence (AI) humanoid robots able to interact with people and demonstrate humanlike expressions.

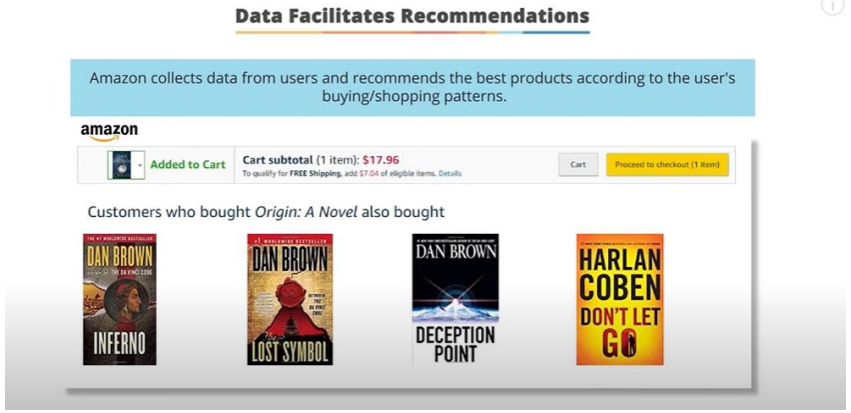
It was developed by the Hong Kong-based company Hanson Robotics. Sophia was activated on February 14, 2016, and made its first public appearance in mid-March 2016 at South by Southwest in Austin, Texas, United States.

Sophia is a realistic humanoid robot capable of displaying humanlike expressions and interacting with people. It's designed for research, education, and entertainment, and helps promote public discussion about AI ethics and the future of robotics.

AI in Practice

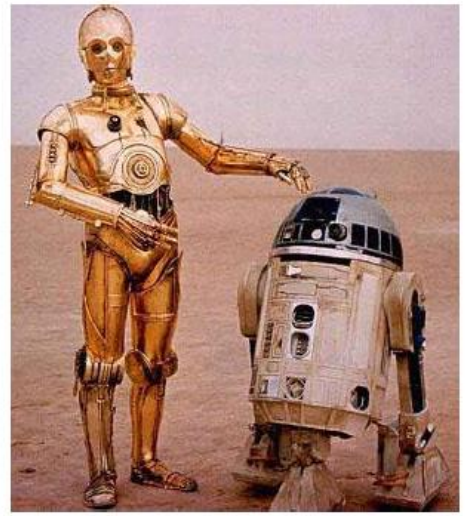


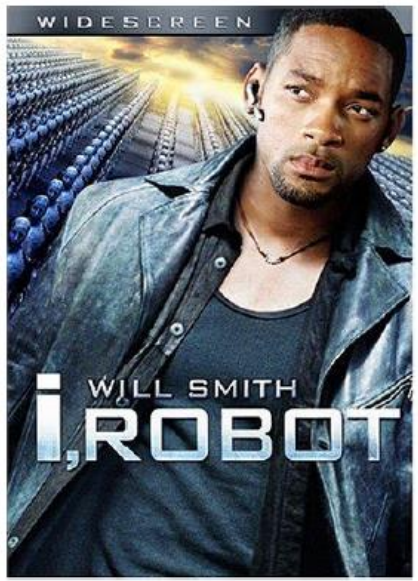


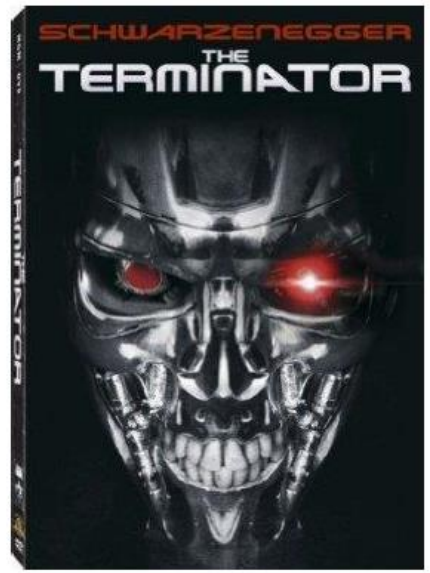



YESTERDAY DR. WILL CASTER WAS ONLY HUMAN
JOHNNY DEPP
REBECCA HALL
PAUL BETTANY
KATE MARA
CILLIAN MURPHY
AND MORGAN FREEMAN
TRANSCENDENCE
entertainmentfilms.co.uk

Artificial Intelligence in the Movies







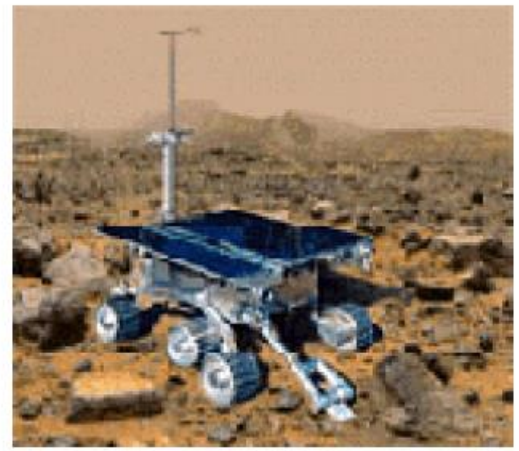
Journalists can use AI now in the process of making media. In what is becoming "automated journalism," they can gather content, understand data pools, write stories, and send them out with a button. Reports are being made on a large scale with the help of algorithms.

It wasn't until over a decade later that AI was incorporated into life sciences, and in the 1970s, it made its way into healthcare. In the 1980s and beyond, AI found its way into more clinical settings, using artificial neural networks, Bayesian networks, and hybrid intelligence systems.

AI enables better decision-making. AI-powered machines can also determine soil and crop health, provides fertilizer recommendations, monitor the weather, and can also determine the quality of crop. All such benefits of AI in agriculture enable the farmers to make better decisions and do efficient farming.

Why the interest in AI?

Labor



Science

Appliances

Google

YAHOO!

Search engines

Medicine/
Diagnosis

What else?

Definition of Artificial Intelligence

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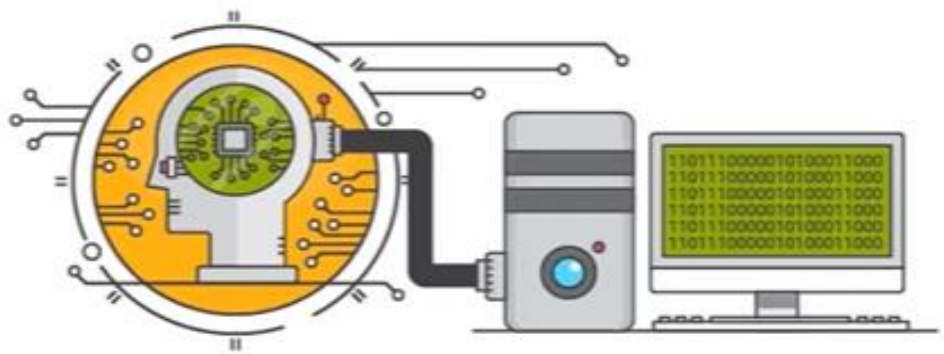


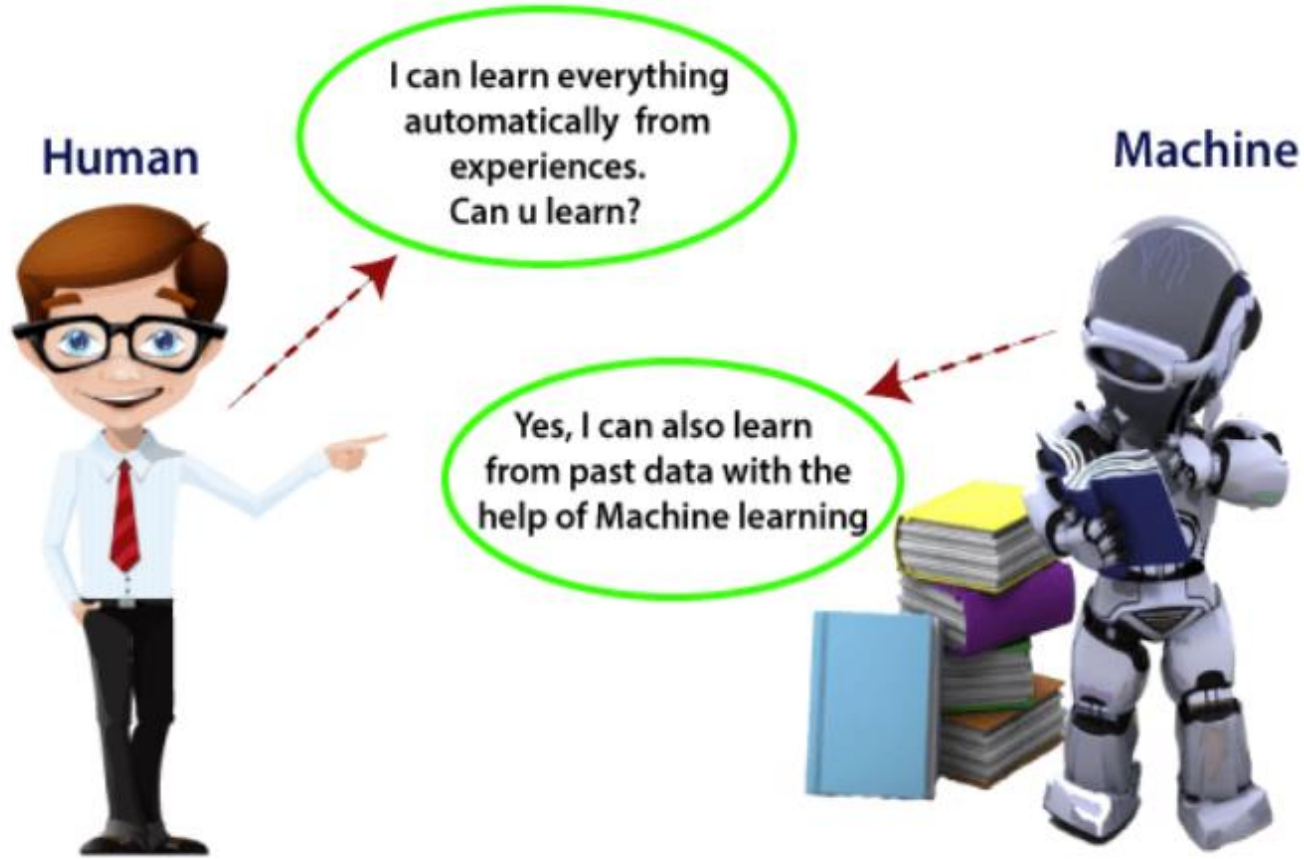
It enables computers to mimic human intelligence using logic.

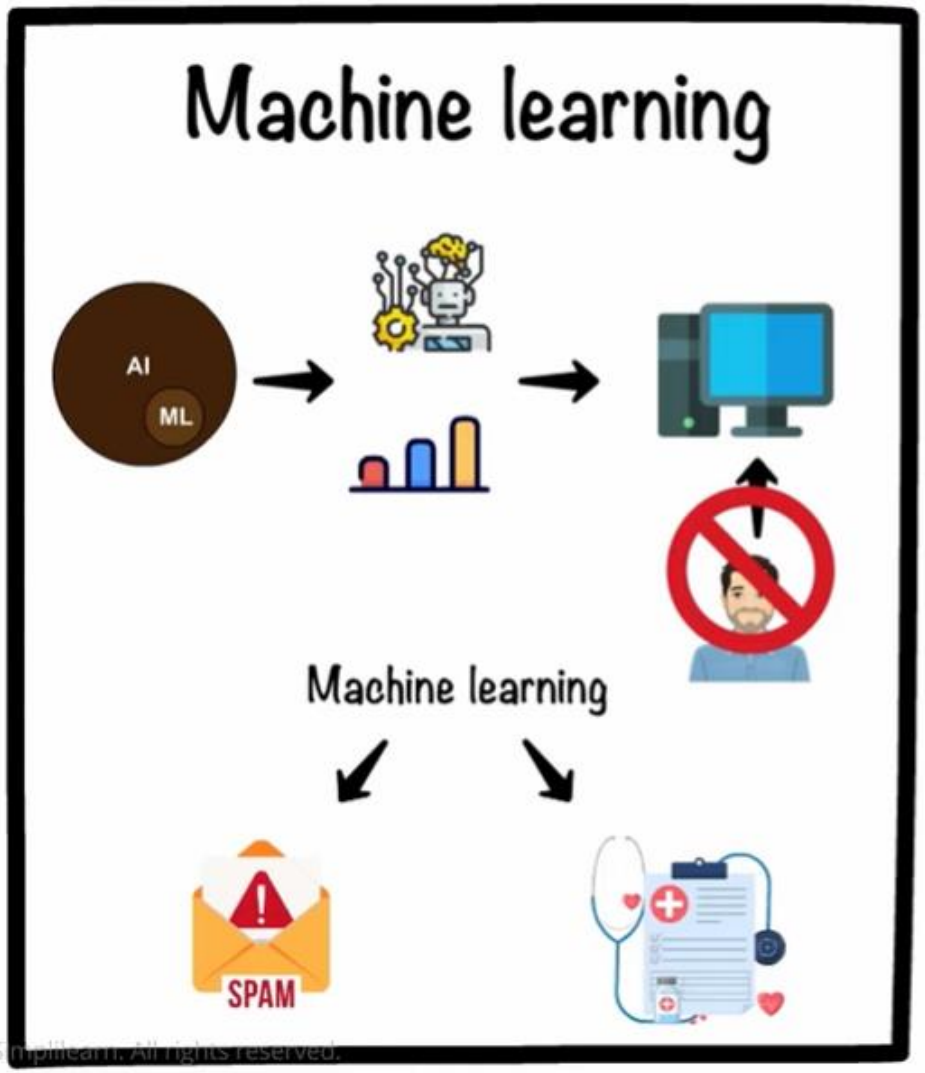
Artificial Intelligence Defined: Four Types Of Approaches

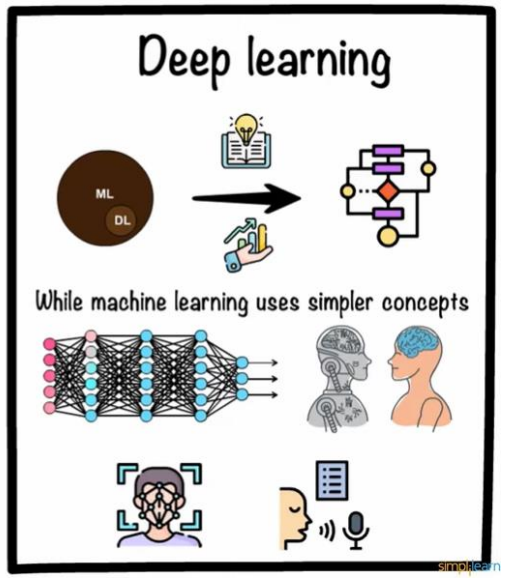
- Thinking humanly: mimicking thought based on the human mind.
- Thinking rationally: mimicking thought based on logical reasoning.
- Acting humanly: acting in a manner that mimics human behavior.
- Acting rationally: acting in a manner that is meant to achieve a particular goal.

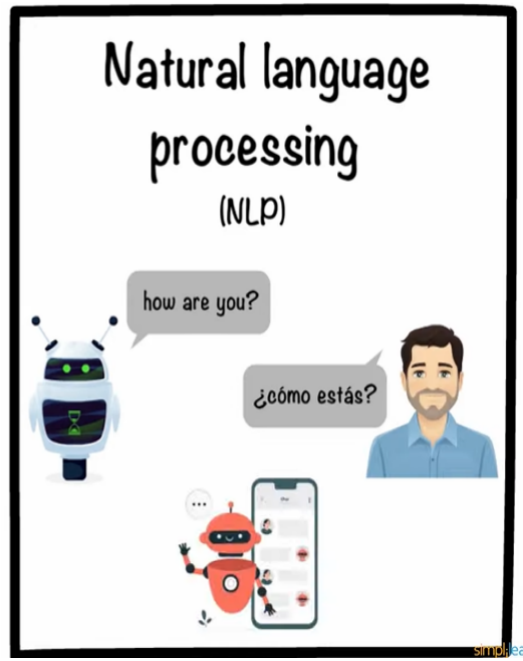

Artificial Intelligence
Machine Learning

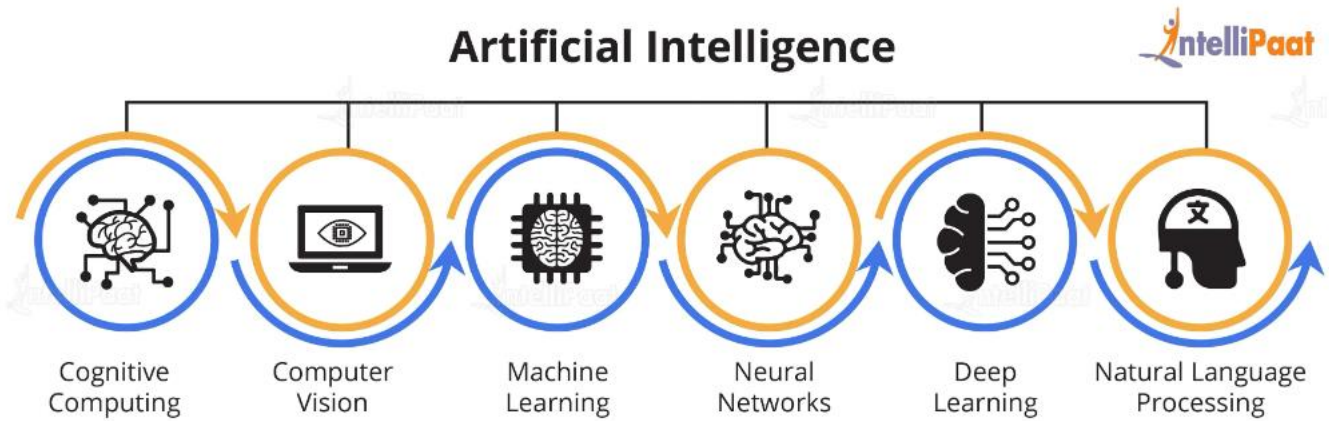
How is Machine Learning linked with Artificial Intelligence?

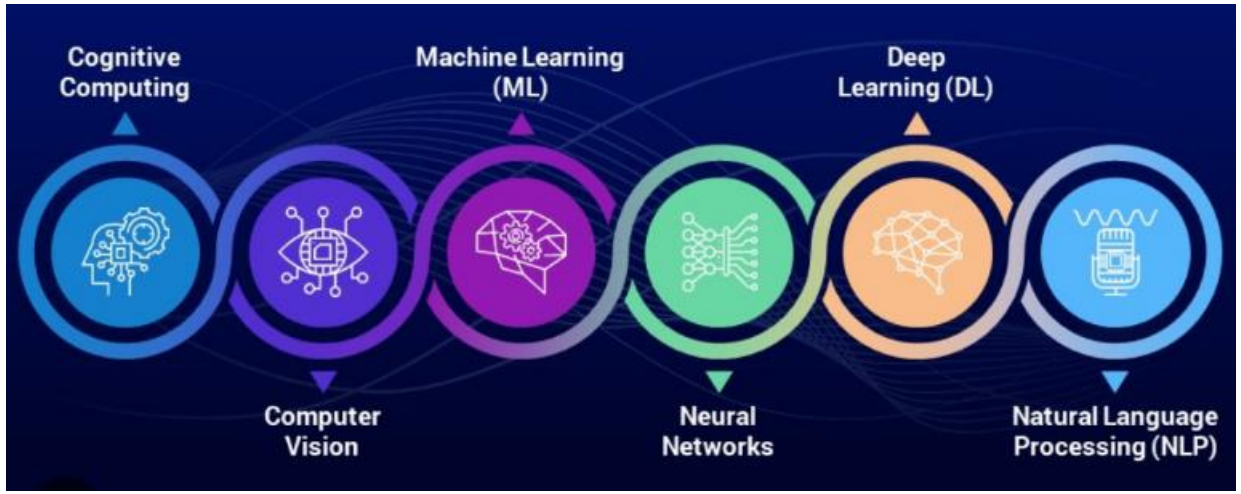

Human
I can learn everything automatically from experiences. Can u learn?
Machine
Yes, I can also learn from past data with the help of Machine learning



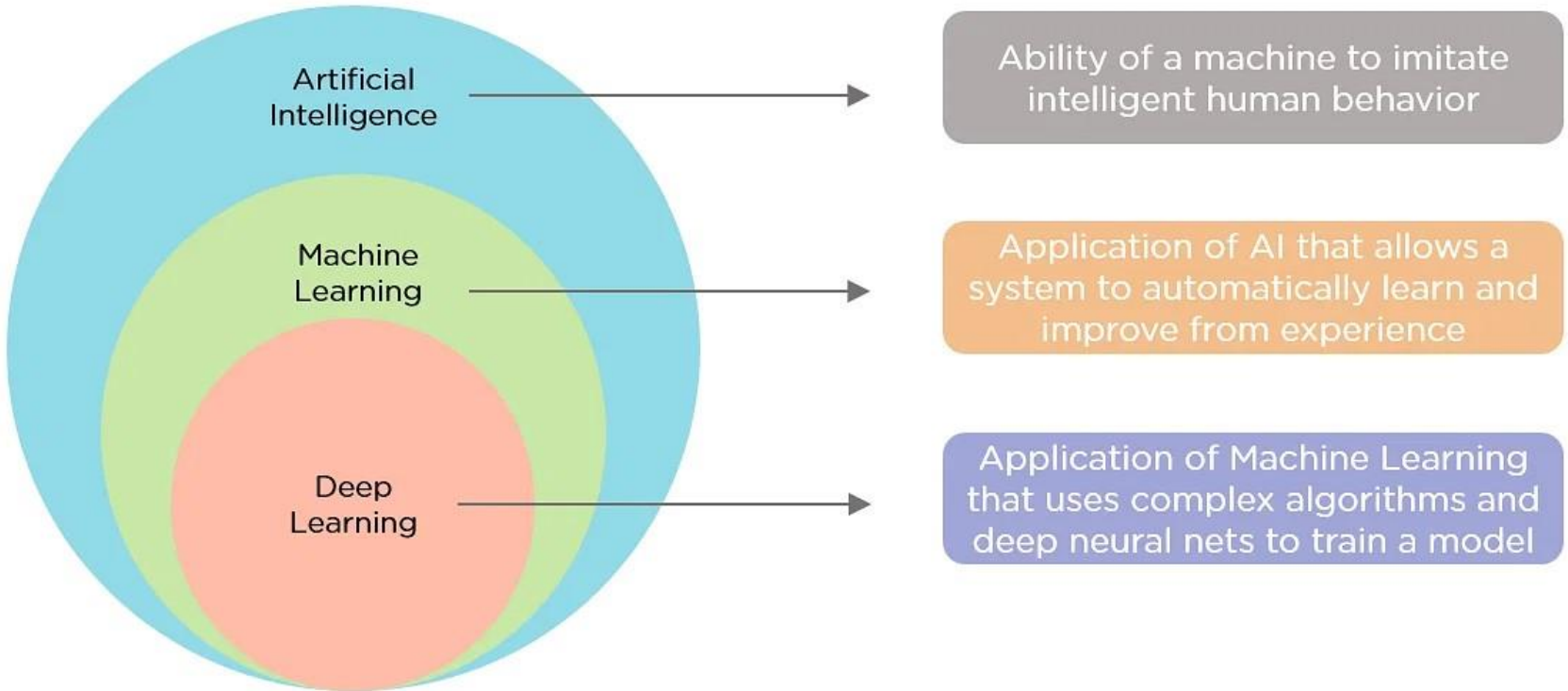





Artificial Intelligence
IntelliPaat
Cognitive Computing
Computer Vision
Machine Learning
Neural Networks
Deep Learning
Natural Language Processing


Cognitive Computing
Machine Learning (ML)
Deep Learning (DL)
Computer Vision
Neural Networks
Natural Language Processing (NLP)

“Machine learning enables a machine to automatically learn from data, improve performance from experiences, and predict things without being explicitly programmed.”


Artificial Intelligence
Machine Learning
Deep Learning
Ability of a machine to imitate intelligent human behavior
Application of AI that allows a system to automatically learn and improve from experience
Application of Machine Learning that uses complex algorithms and deep neural nets to train a model

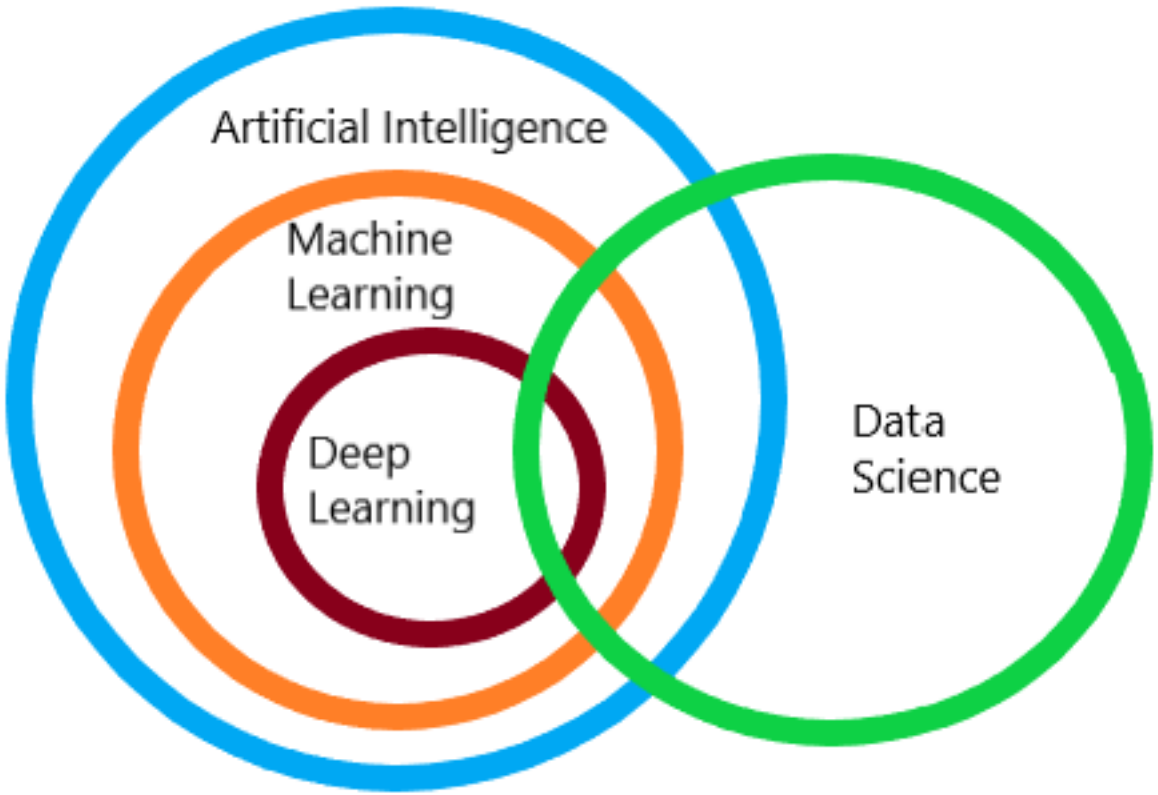
Machine Learning

- Machine learning (ML) is a branch of artificial intelligence (AI) that enables computers to “self-learn” from training data and improve over time, without being explicitly programmed.
- Machine learning is a growing technology which enables computers to learn automatically from past data.
- Machine Learning is said as a subset of artificial intelligence that is mainly concerned with the development of algorithms which allow a computer to learn from the data and past experiences on their own.

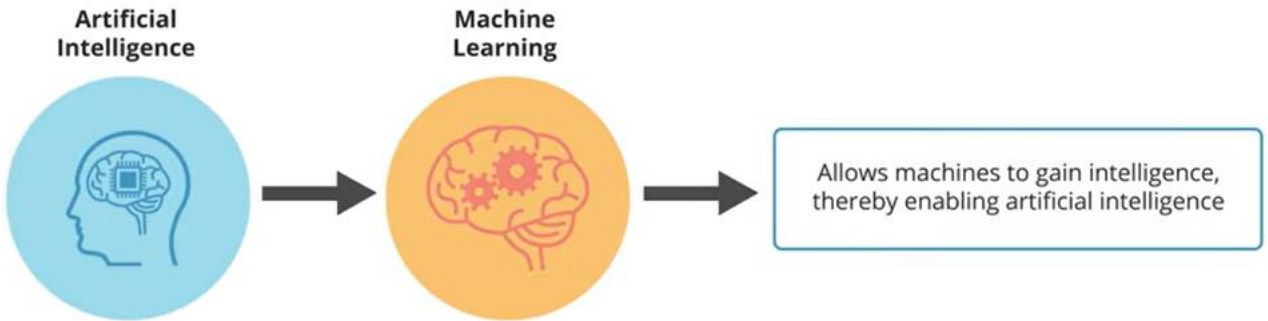
Machine Learning

- Machine learning is an umbrella term for a set of techniques and tools that help computers learn and adapt on their own. Machine learning algorithms help AI learn without being explicitly programmed to perform the desired action.
- By learning a pattern from sample inputs, the machine learning algorithm predicts and performs tasks solely based on the learned pattern and not a predefined program instruction.
- Machine learning is a life savior in several cases where applying strict algorithms is not possible. It will learn the new process from previous patterns and execute the knowledge.

Artificial Intelligence, Machine Learning, Deep Learning and Data Science

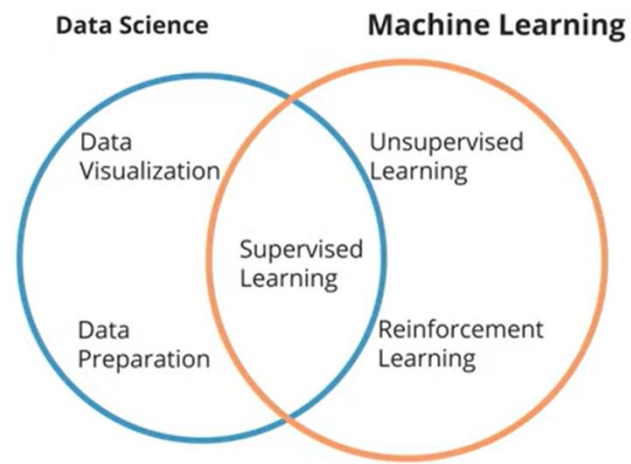


Relationship between Artificial Intelligence and Machine Learning



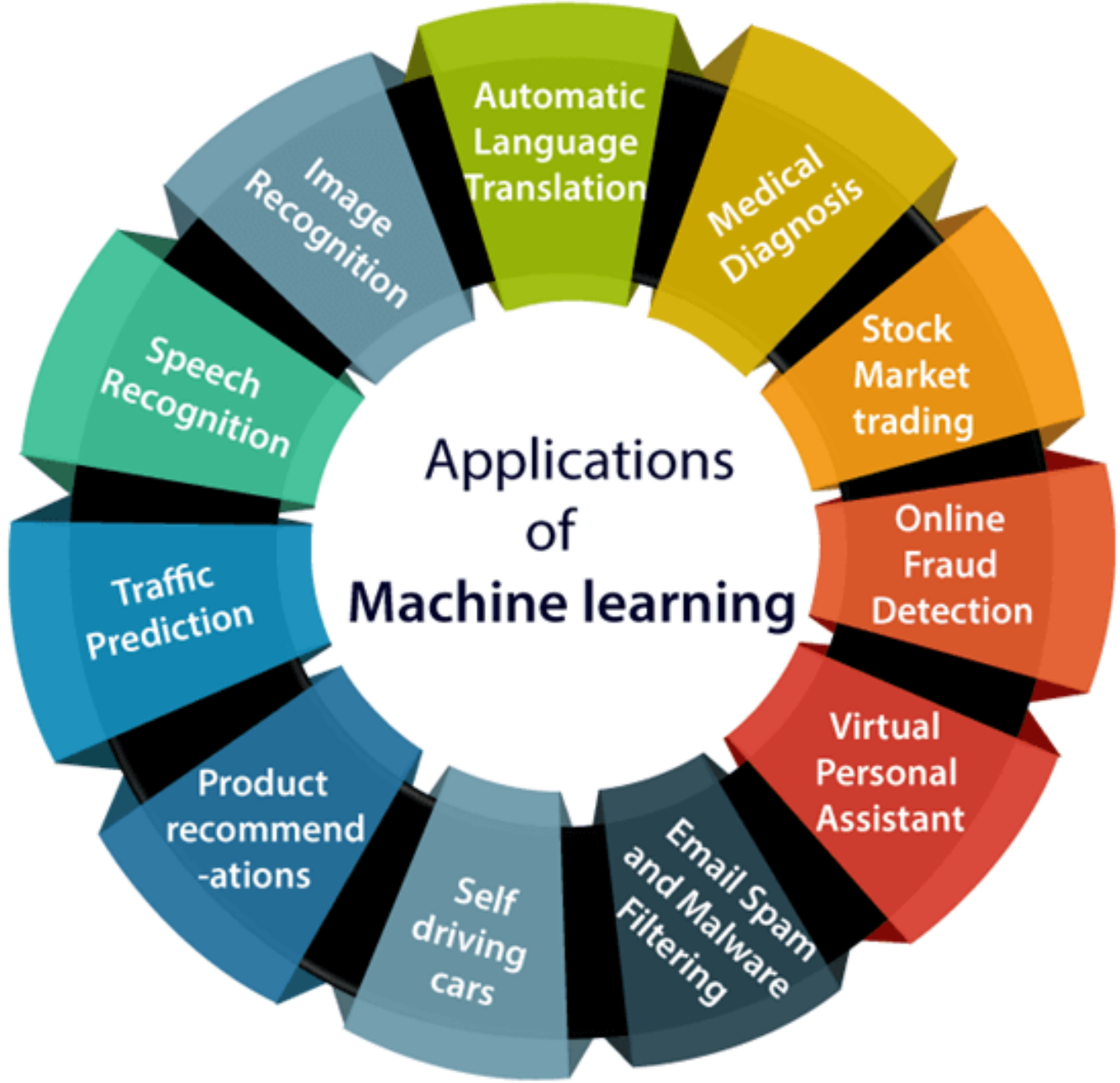
Relationship between Machine Learning and Data Science

Data science and machine learning go hand in hand. Data science helps evaluate data for machine learning algorithms.




Let’s go beyond the
human intelligence

Thank You!


Applications
of
Machine learning
Automatic Language Translation
Medical Diagnosis
Stock Market trading
Online Fraud Detection
Virtual Personal Assistant
Email Spam and Malware Filtering
Self driving cars
Product recommend-ations
Traffic Prediction
Speech Recognition
Image Recognition

Real time applications of Machine Learning


01
Virtual Personal Assistant
02
Predictions
03
Product Recommendation
04
Social Media
05
Online Fraud Detection
06
Spam and Malware Filtering
07
Video Surveillance
08
Search Engine Result Filtering
09
Stock Market Prediction


01
Image Recognition
02
Speech Recognition
03
Medical Diagnosis
04
Statistical Arbitrage
05
Learning Associations
06
Classification
07
Prediction
08
Extraction

Conclusion

- Popular machine learning applications and technology are evolving at a rapid pace, and we are excited about the possibilities that our Machine Learning course has to offer in the days to come.
- As the demand for AI and machine learning has increased, organizations require professionals with in-and-out knowledge of these growing technologies and hands-on experience.

Thank You!