General AI/ML

Unit 1: Intro to AI, ML and DL

1.1.1

General Introduction

What is ML/AI/DL, Potential Use-Cases and Applications

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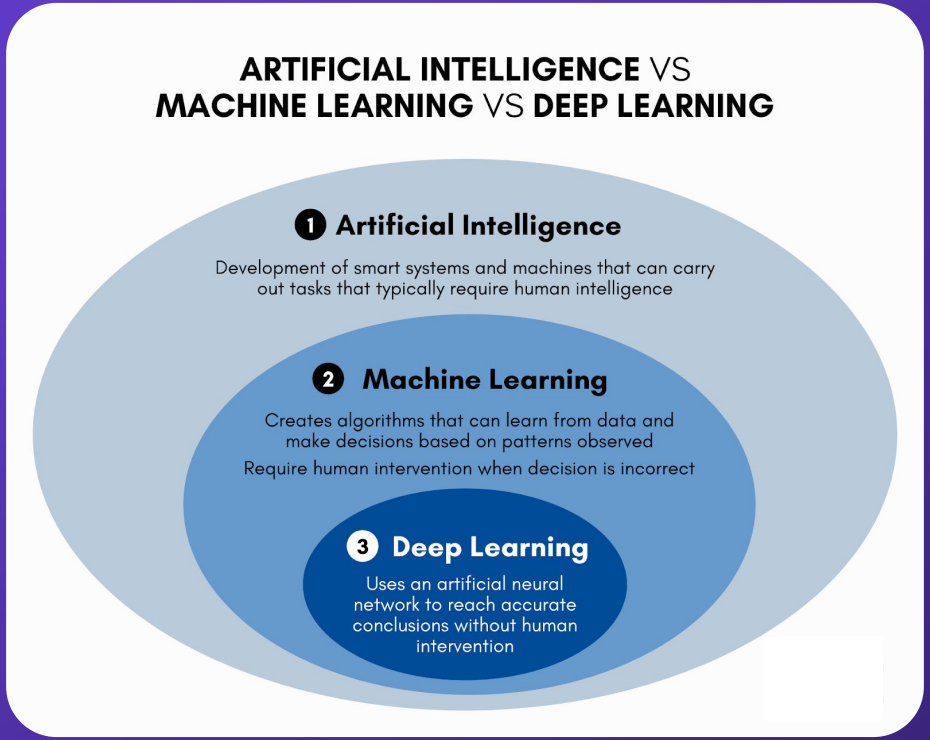

AI vs. Machine Learning vs. Deep Learning

What is Artificial Intelligence (AI)?

- AI enables machines to mimic human cognitive functions
- Encompasses problem-solving, reasoning, and learning
- Broad field with various subdomains

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What is Machine Learning (ML)?

- A subset of AI
- Algorithms learn from data without explicit programming
- Find patterns and make predictions or decisions
- Types of ML:
  - Supervised Learning
  - Unsupervised Learning
  - Reinforcement Learning

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Types of Machine Learning

	Supervised Learning	Unsupervised Learning	Reinforcement Learning
Definition	Learning from labeled data to predict outcomes for new data.	Learning from unlabeled data to identify patterns and structures.	Learning through trial and error, using feedback from actions to improve performance.
Data	Requires a dataset with input-output pairs.	Operates on data without predefined labels or categories.	Does not rely on data samples; instead, it learns from the environment by interactions.
Examples	Classification problems, regression problems.	Clustering, dimensionality reduction, association.	Game playing, robotics, navigation, personalization of content.
Feedback Loop	Explicit feedback in the form of labels.	No explicit feedback. Algorithms find structure in input data on their own.	In the form of rewards or penalties after actions are taken.
Goal	To make accurate predictions based on past data.	To discover the underlying structure or distribution in a data set.	To develop a strategy to maximize the cumulative reward over time.

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What is Deep Learning (DL)?

- A subset of ML
- Utilizes artificial neural networks with multiple layers
- Excels at processing complex and unstructured data (images, text, audio)

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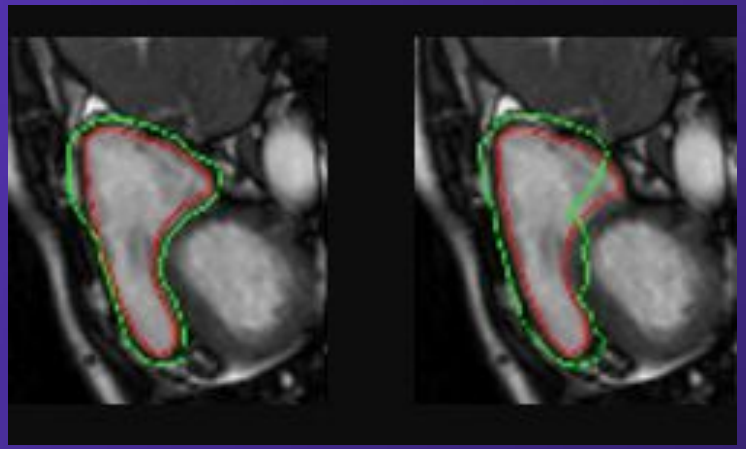
Applications of AI

- Healthcare:
  - Disease diagnosis
  - Personalized medicine
  - Medical image analysis



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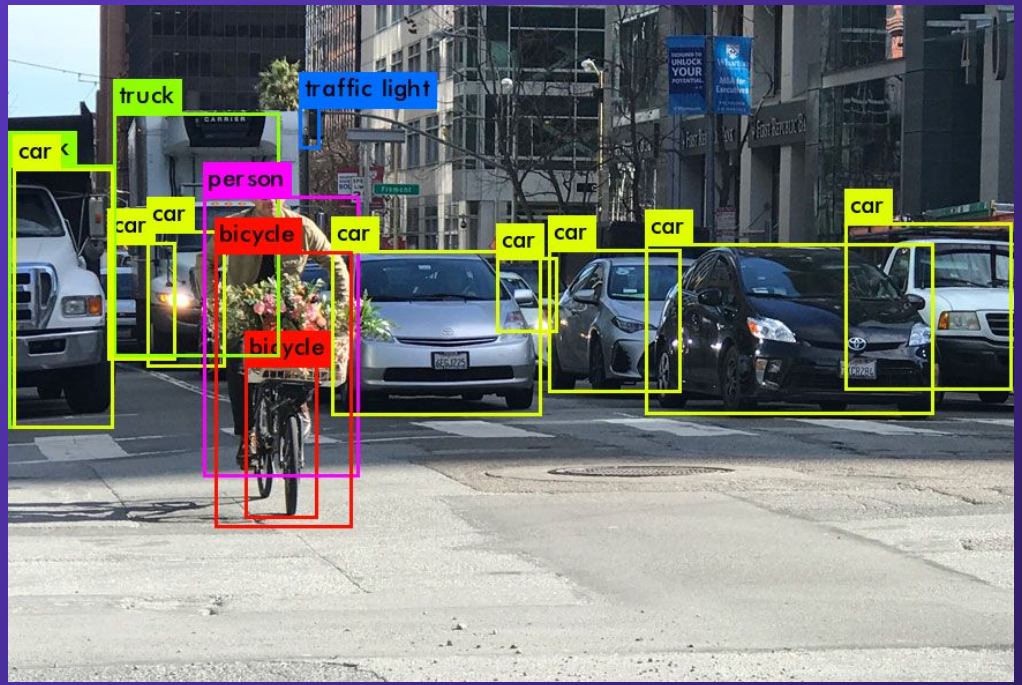
Applications of AI

- Self-driving cars
  - Object recognition
  - Path planning
  - Decision-making



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Applications of AI

- Customer Service
  - Chatbots
  - Virtual assistants

ChatGPT

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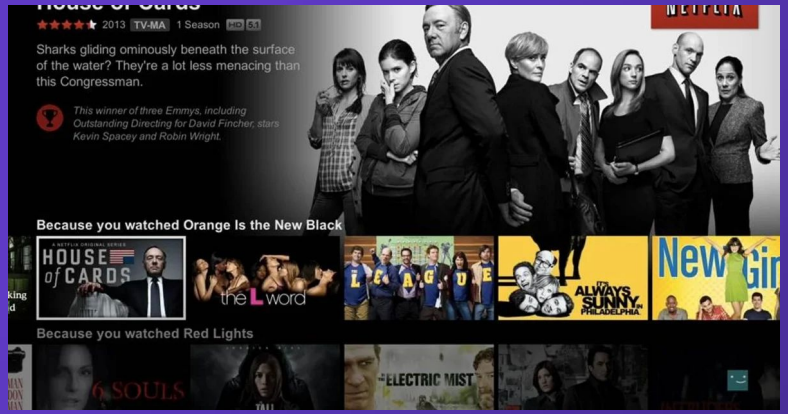
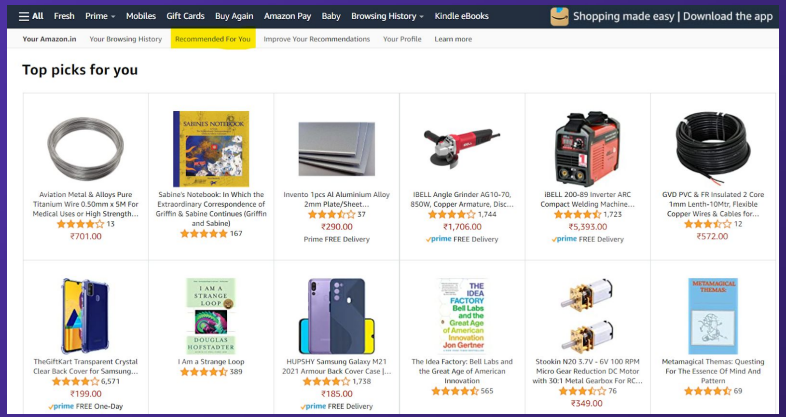
Applications of AI

- Personalized Recommendations





Applications of AI

- Finance:
  - Fraud detection
  - Risk assessment
  - Algorithmic trading

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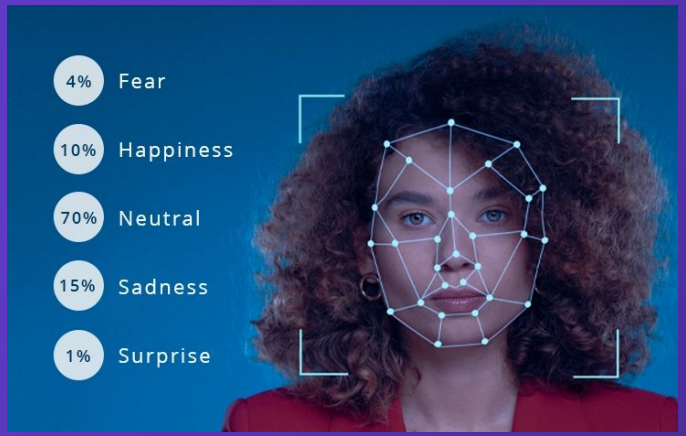
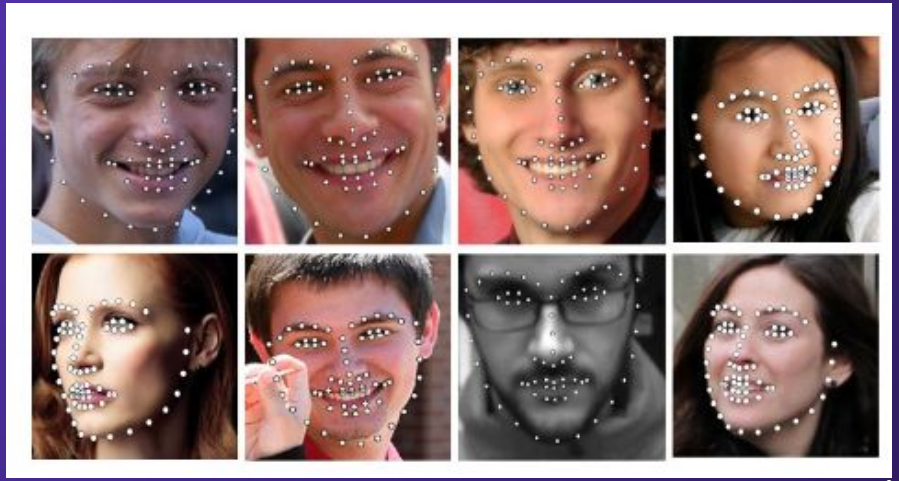
Applications of AI

- Image Recognition
  - Facial recognition
  - Biometric security





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The Future with ML/AI/DL

- AI, ML, and DL are still evolving fields with continuous breakthroughs
- Increasing accessibility and democratization of these technologies
- Potential for immense impact across all sectors of society
- Importance of responsible and ethical AI development