# Artificial Intelligence Overview

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## Definition

Artificial Intelligence (AI) is a field of computer science focused on building systems capable of performing tasks that typically require human intelligence such as reasoning, learning, and decision-making.

## Key Domains of AI

- Natural Language Processing (NLP): Enables machines to understand and generate human language.
- Computer Vision: Allows systems to interpret and analyze visual data from cameras or images.
- Robotics: Integrates AI for autonomous movement and manipulation in real-world environments.
- Expert Systems: Capture expert-level knowledge for decision-making in specific domains.

## Popular Machine Learning Algorithms

- Linear Regression
- Logistic Regression
- Support Vector Machines
- Decision Trees and Random Forests
- Neural Networks

## Deep Learning

Deep Learning is a subset of Machine Learning that uses multi-layered neural networks to model complex patterns found in data. It has driven major advancements in speech recognition, image classification, and language models.

## Real-World Applications of AI

- Medical imaging for disease diagnosis
- Fraud detection in banking
- Recommendation systems in e-commerce
- Speech assistants like Siri and Google Assistant
- Autonomous vehicles

## Challenges in AI

- Data quality and availability
- Ethical concerns and transparency
- High computational requirements
- Security vulnerabilities

## Conclusion

AI continues to evolve and impact industries worldwide, driving automation, personalization, and enhanced decision-making capabilities.