

Intro to AI and ML

1. Artificial Intelligence (AI)

- Overview:

Artificial Intelligence (AI) is a broad field in computer science that is aimed at creating systems or programs that can perform tasks requiring human-like intelligence. These tasks may include learning, reasoning, problem-solving, perception, language understanding, and decision-making.

Key Characteristics:

- Adaptive Behavior: AI systems can adapt to new situations, solving problems based on the environment and data they encounter.
- Automation of Intelligent Behavior: Tasks that typically require human intelligence, like interpreting spoken language or recognizing objects in images, can be automated using AI.
- Diverse Applications: AI has applications in various fields including healthcare, finance, autonomous vehicles, robotics, and customer service.

Types of AI:

- Rule-Based Systems: Systems that operate on predefined rules and logic.
- Learning Systems (Machine Learning): Systems that learn from data and improve over time.

2. Machine Learning (ML)

- Overview:

Machine Learning, a subset of AI, involves creating algorithms that enable computers to learn and make decisions based on data. It focuses on developing programs that can access, use, and learn from data autonomously.

Key Features:

- Learning from Data: ML systems improve their performance on a specific task over time by processing more data.
- Pattern Recognition: These systems can identify patterns and make decisions with minimal human intervention.
- Adaptability: They adapt their behavior based on new data, leading to improved functionality.

Applications:

- Predictive Analytics: Used in finance, marketing, and healthcare.
- Image and Speech Recognition: Common in smartphones and virtual assistants.
- Recommendation Systems: Used by e-commerce and streaming services.

3. Data Science

- Overview:

Data Science is an interdisciplinary field focusing on extracting knowledge and insights from structured and unstructured data. It combines aspects of statistics, computer science, and domain expertise.

Key Elements:

- Data Analysis and Processing: Involves collecting, cleaning, and analyzing data to extract meaningful information.
- Statistical Methods: Uses statistical techniques for making predictions or understanding patterns.
- Visualization: Data is often visualized to aid in understanding complex relationships.