



**SUPERVISED  
LEARNING**

**UNSUPERVISED  
LEARNING**

**SEMI-SUPERVISED  
LEARNING**

**REINFORCEMENT  
LEARNING**

# Types of Machine Learning

ALGORITHMS



**Supervised  
Machine Learning**



**Unsupervised  
Machine Learning**



**Semi-Supervised  
Learning**



**Reinforcement  
Learning**

# Supervised Learning

## HOW IT WORKS

- Algorithms learn from labeled data (inputs with corresponding output labels).
- The data is divided into a training set and a test set.
- During training, the algorithm learns the patterns and relationships between inputs and labels.
- The model's performance is evaluated on the test set to measure its accuracy and generalization.

## EXAMPLE:

DECISION TREES, SUPPORT VECTOR MACHINES, RANDOM FORESTS, NAIVE BAYES

## APPLICATION:

CLASSIFICATION, REGRESSION, TIME SERIES FORECASTING

# Unsupervised Learning

## HOW IT WORKS

- Algorithms analyze unlabeled data to discover patterns and relationships.
- Common techniques include clustering, where similar data points are grouped together, and dimensionality reduction to simplify complex datasets.
- Without predefined output labels, the model explores the data structure and identifies hidden insights.

## EXAMPLE:

K-MEANS, HIERARCHICAL CLUSTERING, PCA, T-SNE.

## APPLICATION:

CLUSTERING, DIMENSIONALITY REDUCTION

# Semi-supervised Learning

## HOW IT WORKS

- Combines labeled and unlabeled data for training.
- The labeled data provides some guidance, while the unlabeled data adds additional context and information.
- The model leverages both datasets to improve its understanding and performance.

## APPLICATION:

CLASSIFICATION, REGRESSION, ANOMALY DETECTION


# Reinforcement Learning

## HOW IT WORKS

- An agent interacts with an environment, taking actions and receiving feedback in the form of rewards or penalties.
- The agent learns to make optimal decisions that lead to maximizing cumulative rewards over time.
- Through trial and error, the agent adapts its strategy to achieve long-term goals.

## APPLICATION:

ROBOTICS, GAME PLAYING, AUTONOMOUS SYSTEMS.

The background features a dark purple gradient with several abstract, glowing shapes. A large, wavy, light purple shape is in the top left corner. A smaller, glowing sphere is in the bottom left. A larger, glowing, bean-shaped object is on the right side. A large, glowing, rounded shape is at the bottom center.

Explore the fascinating world of machine learning and its diverse applications, from predicting customer behavior to teaching robots how to navigate complex environments. Embrace the power of intelligent data-driven solutions!