AI/ML models

AI/ML models vary from **basic reactive systems to complex deep learning, categorized broadly by learning style (Supervised, Unsupervised, Reinforcement) or capability (Narrow, General)**, with specific algorithms like Linear Regression, Decision Trees, SVMs, Neural Networks, and Transformers handling tasks from classification and prediction to image/language generation.

By Learning Style

Supervised Learning: Learns from labeled data to make predictions (e.g., predicting house prices, classifying emails).

Examples: Linear Regression, Logistic Regression, Decision Trees, Random Forest, SVM, Naive Bayes.

Unsupervised Learning: Finds patterns in unlabeled data (e.g., customer segmentation).

Reinforcement Learning (RL): Learns through trial-and-error with rewards/penalties (e.g., game AI, robotics).

Semi-Supervised/Self-Supervised: Uses a mix of labeled/unlabeled data or learns from data structure itself.

By Capability/Type

Narrow AI (Weak AI): Performs specific tasks (e.g., Siri, Google Search).

General AI (Strong AI): Human-level intelligence (theoretical).

Deep Learning Models: Use neural networks with many layers for complex tasks like computer vision & NLP.

Examples: Convolutional Neural Networks (CNNs) for images, Recurrent Neural Networks (RNNs) for sequences, Transformers for language (like GPT).

Rule-Based/Expert Systems: Older AI using predefined rules.

Common Algorithms & Models

Regression: Predicts continuous values (Linear, Logistic).

Classification: Categorizes data (Naive Bayes, SVM, Decision Trees, KNN).

Clustering: Groups similar data points (e.g., K-Means, used in Unsupervised Learning).

Ensemble Methods: Combine multiple models (Random Forest, Gradient Boosting).

Transformers: Revolutionized NLP and vision (e.g., GPT, BERT).

Modern Applications

Language Models (LLMs): GPT, Claude, Gemini (Chat, Text Generation).

Image/Video Models: Veo, Sora (Image/Video Generation).

Computer Vision Models: Facial Recognition, Object Detection.

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