FAKULTAS TEKNOLOGI INDUSTRI
UNIVERSITAS JAYABAYA

Transformasi DIGITAL

Teknik Elektro

By:
Endang Sri Rahayu

ke-12

Machine Learning

1. Definisi ML
2. Deep Learning dan Neural Network
3. NLP
4. Computer vision dan Image Processing
5. Aplikasi AI dan ML

FUNDAMENTALS OF MACHINE LEARNING

Machine learning is a subset of AI that empowers computers to learn from data without explicit programming. It involves algorithms that analyze data, identify patterns, and make predictions. Key concepts include supervised and unsupervised learning, as well as deep learning.

01

Supervised Learning

Algorithms learn from labeled data, predicting outcomes based on known inputs.

02

Unsupervise d Learning

Algorithms discover hidden patterns and structures within unlabeled data, identifying relationships and anomalies.

03

Deep Learning

Algorithms employ artificial neural networks with multiple layers, enabling complex pattern recognition and decision-making.

DEEP LEARNING AND NEURAL NETWORKS

Deep learning is a branch of machine learning that uses artificial neural networks with multiple layers to learn complex patterns from data. These networks are inspired by the structure and function of the human brain, enabling powerful capabilities in areas like image recognition and natural language processing.

01 NEURAL NETWORK STRUCTURE

Consists of interconnected nodes organized in layers, with each node performing a simple calculation.

02 FORWARD PROPAGATION

Input data flows through the network, activating nodes and producing an output.

03 BACKPROPAGATION

Adjusting the network's weights to minimize the difference between predicted and actual outputs.

NATURAL LANGUAGE PROCESSING (NLP)

Natural language processing (NLP) enables computers to understand, interpret, and generate human language. It utilizes AI and ML techniques to analyze text and speech, facilitating tasks such as machine translation, sentiment analysis, and chatbot development.

APPLICATIONS MACHINE TRANSLATION	Examples Translating text between languages, such as Google Translate
SENTIMENT ANALYSIS	Determining the emotional tone of text, such as identifying positive or negative reviews
TEXT SUMMARIZATION	Concisely summarizing large amounts of text, such as news articles or research papers
CHATBOTS	Developing conversational agents that interact with humans, such as customer service chatbots

COMPUTER VISION AND IMAGE RECOGNITION

Computer vision allows computers to "see" and interpret images and videos. It involves using AI and ML algorithms to analyze visual information, enabling tasks such as object recognition, image classification, and video analysis.

Object Recognition

Identifying objects within images, such as cars, people, and animals.

Facial Recognition

Identifying individuals based on their facial features, used for security and authentication.

Image Classification

Categorizing images into different classes, such as identifying different types of animals or plants.

Video Analysis

Analyzing video footage to identify patterns, track objects, and detect anomalies.

REAL-WORLD APPLICATIONS OF AI AND ML

AI and ML are revolutionizing various industries, impacting our lives in countless ways. These technologies offer solutions to complex problems, enhancing efficiency, productivity, and decision-making across different sectors.

AUTONOMOUS VEHICLES

AI powers self-driving cars, enabling them to perceive their surroundings, make decisions, and navigate safely.

HEALTHCARE

AI assists in disease diagnosis, drug discovery, and personalized treatment plans, improving patient care and outcomes.

E-COMMERCE FINANCE

AI enhances financial analysis, risk management, and fraud detection, optimizing investment decisions and minimizing losses.

THE FUTURE OF AI AND MACHINE LEARNING

The future of AI and ML holds immense promise, with continued advancements expected in areas like natural language processing, computer vision, and robotics. As these technologies evolve, they will further transform our lives, leading to new innovations, increased efficiency, and a more interconnected world.

Thank You

For your Attention

Have a good day