CSST-102

Machine Learning Applications Across Various Domains

Presented by Geron Simon Javier

Overview

01 Healthcare: Early Disease Detection

02 Finance: Fraud Detection

03 Agriculture: Crop Yield Optimization

Healthcare: Early Disease Detection

Problem

Early detection of diseases, particularly cancer, to improve treatment outcomes.

Type of Machine Learning

Supervised Learning

Healthcare: Early Disease Detection (cont.)

Detailed Explanation

- Models trained on labeled medical images (X-rays, MRIs, CT scans)
- Example: CNNs for breast cancer detection in mammograms
- Identifies patterns and anomalies associated with diseases

Healthcare: Early Disease Detection (cont.)

Solution Impact

- Improved survival rates through earlier intervention
- Reduced healthcare costs
- Enhanced efficiency in medical diagnoses

Finance: Fraud Detection

Problem

Identifying fraudulent transactions in real-time to prevent financial losses.

Type of Machine Learning

Supervised Learning and Unsupervised Learning (hybrid approach)

Finance: Fraud Detection (cont.)

Detailed Explanation

- Supervised Learning: Models trained on labeled historical transaction data
- Unsupervised Learning: Anomaly detection for new types of fraud
- Example: Random Forest classifier for flagging suspicious activities

Finance: Fraud Detection (cont.)

Solution Impact

- Reduced financial losses for institutions and customers
- Improved security and trust in financial systems
- Real-time fraud prevention capabilities

Agriculture: Crop Yield Optimization

Problem

Maximizing crop yields while minimizing resource usage and environmental impact.

Type of Machine Learning

Reinforcement Learning

Agriculture: Crop Yield Optimization (cont.)

Detailed Explanation

- Adaptive system optimizing farming parameters over time
- Makes decisions on irrigation, fertilization, and pest control
- Learns from actions, observations, and rewards

Agriculture: Crop Yield Optimization (cont.)

Solution Impact

- Increased food production efficiency
- Reduced water and pesticide usage
- More sustainable farming practices

Conclusion

- Machine Learning has diverse applications across industries
- Significant impacts on healthcare, finance, and agriculture
- Continues to drive innovation and efficiency in various fields

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Thank You

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