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Trends In Computer Science
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Group No-2

Describe and compare two different machine-learning techniques

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Introduction

- Machine learning allows computers to learn without programming
- Two categories of techniques: supervised and unsupervised learning
- Technique depends on domain characteristics, data, and outcomes

Supervised Learning

- Uses labeled data to build predictive models
- Learns input-output relationships to classify new data
- Two problem types addressed:
- 1. Classification - Categorical target variable
- 2. Regression - Continuous target variable

Supervised Learning Algorithms

- Logistic Regression - Predicts categories
- Linear Regression - Predicts unknowns from known data
- Polynomial Regression - Determines dependent/independent relationships
- Support Vector Machines - Separates example groups
- Decision Trees - Breaks problems into simple decisions
- Neural Networks - Connects units to model patterns from examples

Unsupervised Learning

- Well suited when human experts don't know what to look
- It is applied to unlabeled datasets
- Prioritizes descriptive modeling and pattern discovery over prediction.
- Main difference in the training process as outputs are unknown in unlabeled data

Types Of Unsupervised Learning

1) Clustering

- Groups unlabeled examples based on similarities
- K-means partitions into clusters by distance to centroids

2) Association Analysis

- Discovers relationships between variables in large datasets
- Apriori

Conclusion

1) Strengths of unsupervised learning

- Explores complex unlabeled data
- Uncovers hidden patterns and associations

2) **Strengths of supervised learning**

- Can produce more accurate outputs with labeled data

3) Considerations when choosing a technique

References

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