Academy of Technology

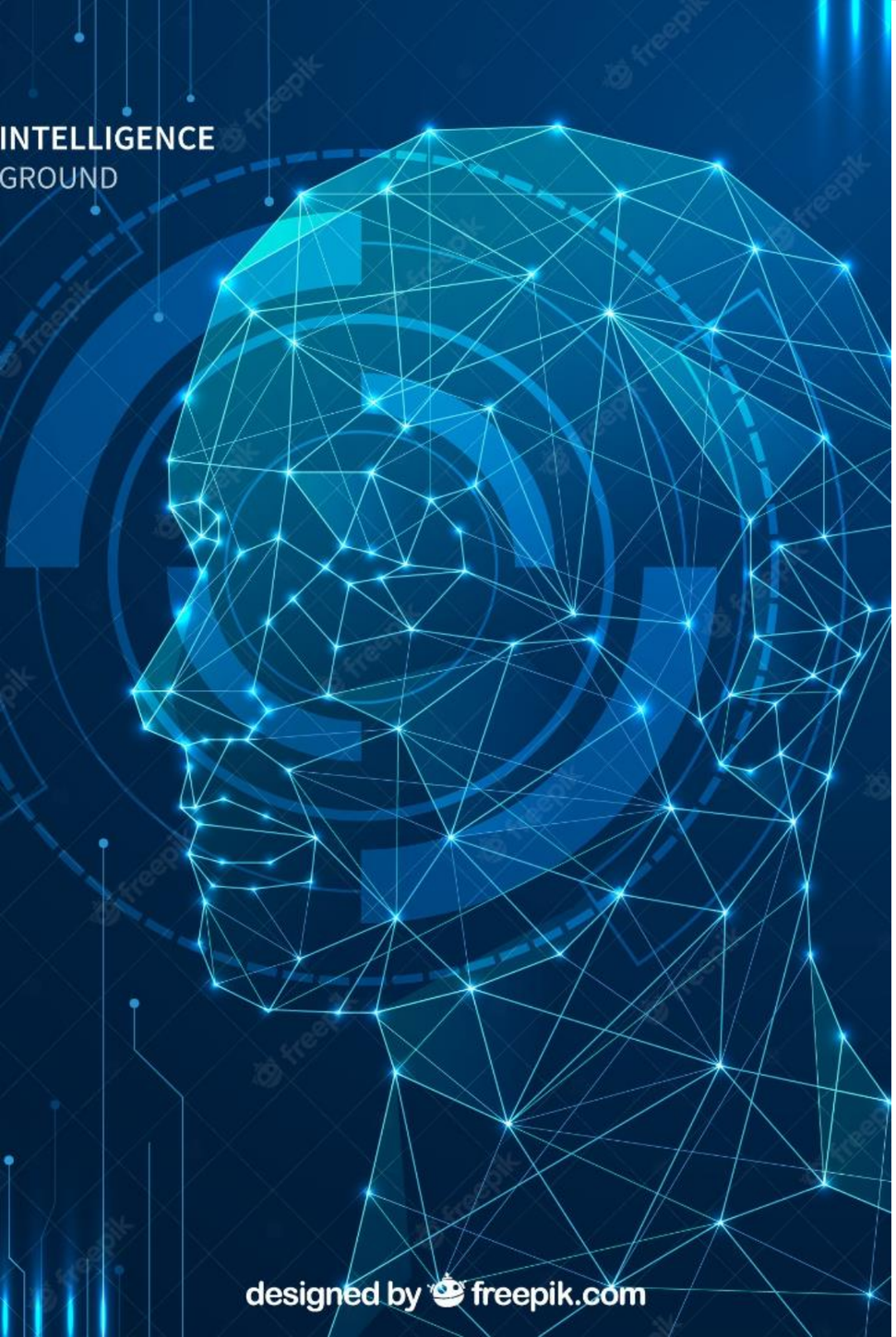
Department: CSE
Semester: 7th SEM
Paper Name: Machine Learning
Paper Code: PEC-CS701E

Power Point Presentation On Discuss the application of different types of Machine Learning

Presented by

Name of the Student: ARNAB MONDAL **University Roll No.**16900121190

To fulfil the requirement of Continuous Assessment 1 [CA1] of B. Tech / MCA Course.



Machine Learning

Machine learning is a subfield of artificial intelligence (AI) that focuses on developing algorithms and techniques that enable computers to learn from data and improve their performance on a specific task without being explicitly programmed for that task. The primary goal of machine learning is to allow computers to recognize patterns, make predictions, and make decisions based on the available data.

Supervised Learning: Enhancing Predictive Power with Advanced Algorithms

1

Classification

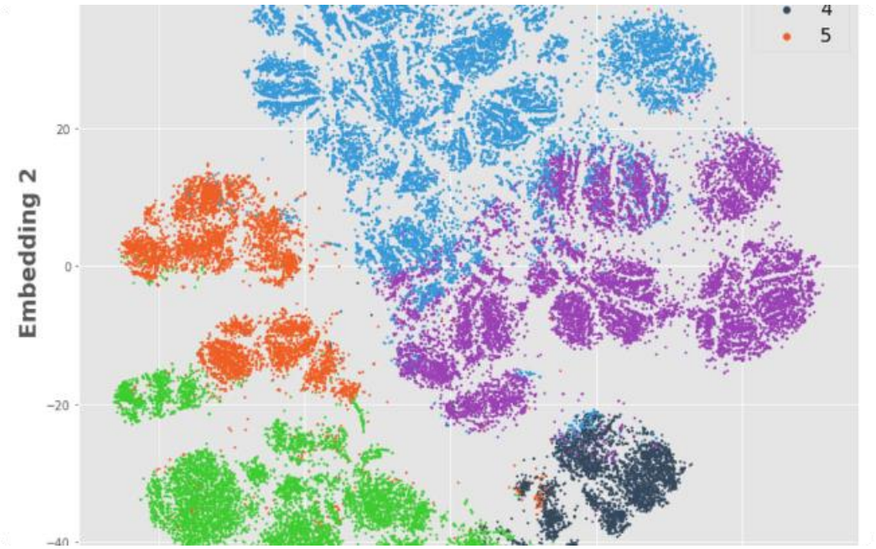
Classification algorithms predict the target class of new instances based on previous data. Examples include logistic regression and decision trees.

2

Regression

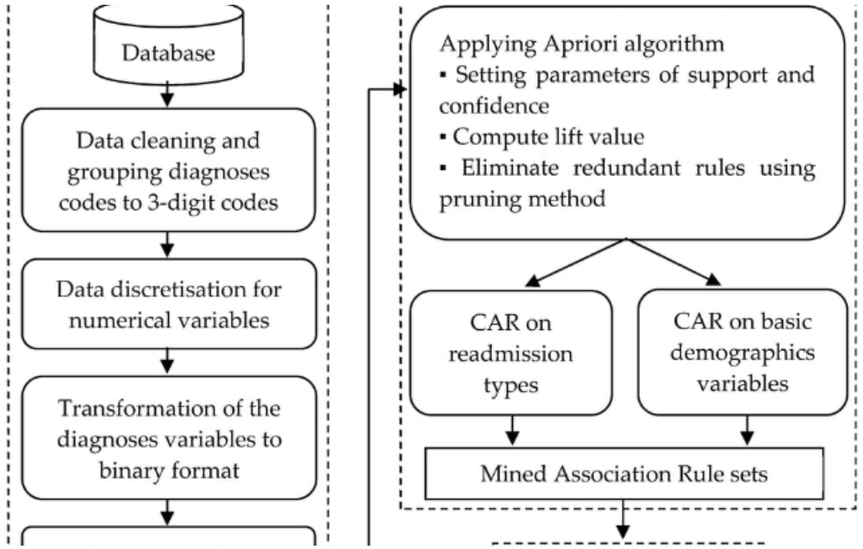
Regression algorithms predict a numerical value for continuous data based on prior instances. Examples include linear regression and polynomial regression.

Unsupervised Learning: Discovering Hidden Patterns in Data



Clustering

Clustering algorithms group similar data points together to discover underlying patterns. Examples include k-means clustering and hierarchical clustering.



Association

Association algorithms focus on finding co-occurrences and correlations within data sets. Examples include Apriori and FPGrowth.

Reinforcement Learning: Training Machines to Learn by Trial and Error

Agents

Inspired by behaviorist psychology, reinforcement learning agents take actions to maximize a reward signal. Examples include Q-learning and SARSA.

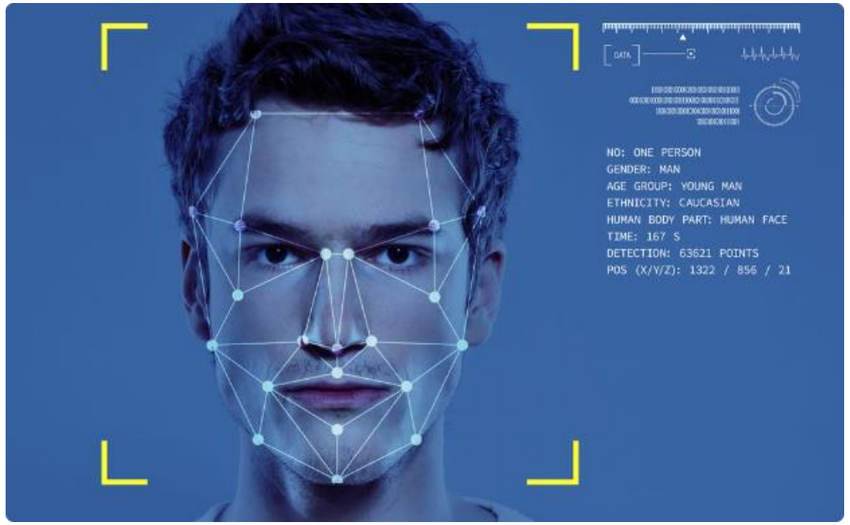
Environment

The environment is the system with which the agent interacts in order to receive feedback. The agent learns to optimize its outcomes in this context.

Optimization

Reinforcement learning algorithms optimize the agent policy to act in the environment to maximize future rewards. Deep reinforcement learning uses neural networks to optimize the policy.

Machine Learning in Action: Applications and Impact on Our World



Computer Vision

Machine learning is used to build advanced systems that can detect and interpret visual data. Examples include facial recognition software and self-driving cars.

Natural Language Processing

NLP is a field of AI that focuses on analyzing and synthesizing human language. Machine learning is an important component of NLP used for tasks such as sentiment analysis and machine translation.

The Challenges and Ethical Considerations of Machine Learning

1 Bias and Fairness

Machine learning algorithms can perpetuate biases and discrimination in data if not designed correctly, raising ethical concerns. Efforts must be made to ensure fairness and prevent harmful outcomes.

2 Privacy and Security

The collection and processing of vast amounts of personal data by machine learning algorithms requires strict privacy and security protocols to protect against misuse and unethical behavior.

3 Interpretability

The ability to interpret the decisions and outcomes presented by machine learning systems is important for accountability, transparency, and public trust. Efforts are underway to achieve greater interpretability in AI models.

Conclusion: The Future of Machine Learning

1

Integration

Machine learning is being integrated into almost every aspect of our society. New advances and applications are being developed continuously and the future of ML looks very promising.

2

Collaboration

The development of machine learning is not a one-man job. This field requires collaboration with various fields such as mathematics, computer sciences, and electrical engineering.

3

Exploratory Research

As more people delve into the mysteries of machine learning, this field will keep expanding—uncovering more ways to make our lives easier and efficient. Pushing the boundaries even further.

References

1. H. Jason, "Top 10 Machine Learning Algorithms Used By Data Scientists", Medium, 2018.

2. N. D. Lawrence, "A Few Useful Things to Know About Machine Learning", University of Sheffield, 2019.

3. E. Buchanan, "Prediction Machines: The Simple Economics of Artificial Intelligence", Harvard Business Review Press, 2018.