



COURSE OUTLINE

Isuru Lakmal

isurushanakalakmal@gmail.com

MPhil(Reading), PG.Dip.(IA), B.Sc.(Hons.)Eng., MIEEE, AMIE(SL), AEng(ECSL)

INTRODUCTION TO MACHINE LEARNING

- What is machine learning?
- Types of machine learning (supervised, unsupervised, reinforcement learning)
- Applications of machine learning in various fields



DATA PREPROCESSING

- Data cleaning and handling missing values
- Feature scaling and normalization
- Handling categorical data



REGRESSION

- Linear regression
- Polynomial regression
- Evaluating regression models (e.g., mean squared error, R-squared)

CLASSIFICATION

- Logistic regression
- Decision trees
- Random forests
- Evaluation metrics for classification (e.g., accuracy, precision, recall, F1 score)

MODEL EVALUATION AND SELECTION

- Cross-validation
- Overfitting and underfitting
- Hyperparameter tuning
- Model selection techniques



CLUSTERING

- K-means clustering
- Hierarchical clustering



DIMENSIONALITY REDUCTION

- Principal Component Analysis (PCA)
- Feature selection techniques



INTRODUCTION TO NEURAL NETWORKS AND DEEP LEARNING

- Basics of neural networks
- Feedforward neural networks
- Introduction to deep learning and its applications

INTRODUCTION TO NATURAL LANGUAGE PROCESSING (NLP)

- Text preprocessing
- Bag-of-Words model
- Word embeddings (e.g., Word2Vec)

INTRODUCTION TO COMPUTER VISION

- Image preprocessing
- Convolutional Neural Networks (CNNs)
- Object detection or image classification basics