Machine Learning Course Topics

Session – 1 'Getting Started'

1.1. Basics of Statistics

1.2. Installing Python

1.3. Python Basics – 1

1.4. Executing Python Scripts

Session – 2 'Understanding Data'

2.1. Basics of Data Analysis

2.2. Python Basics – 2

2.3. Understanding Datasets {Loading, Descriptive Analysis}

2.4. Understanding Datasets {Visualization}

Session – 3 'Data Preparation'

3.1. Data Transforms

3.2. Detecting outliers

3.3. Rescaling Data

3.4. Standardize, Normalize & Binarize

3.5. 1-Hot Encoding, Bias / Variance Tradeoff

Session – 4 'Feature Importance'

4.1. Feature, Univariate Selection

4.2. Recursive Feature Elimination

4.3. Principal Component Analysis

4.4. Dimensionality Reduction

4.5. Reinforcement Learning

4.6. Feature Importance

Session – 5 'Performance Evaluation'

5.1. Evaluate Algorithms

5.2. Test and Train set splits

5.3. Cross Validation {K-Fold, LOO}

5.4. Repeated Random Train / Test splits

5.5. Usage of CV types

Section – 6 'Model Construction'

6.1. Linear, Polynomial, Multivariate Regression

6.2. Multi-level models

6.3. Bayesian Methods

6.4. K-Means Clustering

6.5. DBSCAN

6.6. Measuring Entropy

6.7. Decision Trees

6.8. Support vector Machines

6.9. K-Nearest Neighbors

Session – 7 'Algorithm Performance Metrics'

7.1. Algorithm Evaluation Metrics

7.2. Classification Metrics

7.3. Regression Metrics

Session – 8 'Spot Check Algorithms'

8.1. Spot Check Regression Algorithms

8.2. Spot Check Classification Algorithms

Session – 9 'Compare Algorithm Performance'

9.1. Select Best Learning Model

9.2. Consistency comparison

Session – 10 'Automate workflows with Pipelines'

10.1. Automating workflows

10.2. Data preparation and modeling

10.3. Feature extraction and modeling

Session – 11 'Performance Improvement Techniques'

11.1. Combine models into Ensemble Predictions

11.2. Bagging Algorithms

11.3. Boosting Algorithms

11.4. Voting Ensemble

11.5. ML performance parameters

11.6. Grid Search parameter tuning

11.7. Random Search parameter tuning

11.8. Save and Load Models

Section – 12 'Case Studies'

12.1. Regression

12.2. Binary Classification

Final Session – 'Project'