Introduction to Machine Learning

Course Syllabus

Days	Topics
Day 0	Machine Learning, Classifications of ML problems (Supervised, Reinforcement and Unsupervised) with examples
Day 1	Tools for ML (Python, Conda, JupyterLab, Matlab), Python libraries for ML(SciPy, NumPy, Matplotlib, Pandas), Data visualization
Day 2	Linear Algebra for ML, Cost function, Model and hypotheses representation, Gradient Descent, Linear regression
Day 3	Classification and decision boundary, Logistic regression, Multiclass classification, Bias and Variance, Regularization
Day 4	Deep Learning and Neural Networks, Logic gates with NN, Multiclass classification with NN
Day 5	Neural Networks learning representation, Cost function, forward propagation, back-propagation, applications of NN
Day 6	Learning curves, Training/Test/Cross Validation sets, Error Metrics (Precision, Recall, F1 Score), Confusion matrix, K-fold improvement
Day 7	Large Margin classifiers, Kernels, Support Vector Machines, Decision Trees
Day 8	Linear Discriminant Analysis, K-Nearest Neighbors
Day 9	Unsupervised learning algorithms, K-means clustering, Dimensionality reductions and Principal Component Analysis
Day 10	Gaussian Distribution, Multi-variate Gaussian Distribution, Anomaly Detection, Recommender Systems
Day 11	Online learning, Batch Gradient Descent, Map-reduce and Data parallelism, Multi-core workload distribution