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, Convolutional NN, Recurrent NN, Multiclass classification with NN
Day 5	Learning curves, Training/Test/Cross Validation sets, Error Metrics (Precision, Recall, F1 Score), Confusion matrix, K-fold improvement
Day 6	Large Margin classifiers, Kernels, Support Vector Machines, Decision Trees
Day 7	Linear Discriminant Analysis, K-Nearest Neighbors
Day 8	Unsupervised learning algorithms, K-means clustering, Dimensionality reductions and Principal Component Analysis
Day 9	Gaussian Distribution, Multi-variate Gaussian Distribution, Anomaly Detection, Recommender Systems
Day 10	Online learning, Batch Gradient Descent, Map-reduce and Data parallelism, Multi-core workload distribution
Day 11	Applications of Machine Learning, Advice for applying Machine Learning, Project ideas and future plans