

- Estimators: MLE, MAP, Bayesian Estimation
- Model-Free Methods: Empirical Risk Minimization, Performance Measures
- Model Selection, Generalization, Overfitting, Regularization, Bias-Variance Tradeoff, Model Complexity
- Regression: Linear Regression, Regularized Linear Regression(Ridge, Lasso), Polynomial Regression Model
- Classification: Naive Bayes, Logistic Regression, Support Vector Machine, Boosting, Decision Tree, Conditional Independence in Naive Bayes Model, Generative vs Discriminative Classifiers, Linearly/Nonlinearly separable SVM, Role of Slack Variables in SVMs, Primal and Dual forms of constrained optimization problems, weak duality and strong duality
- Non-parametric Models: KNN, Kernal Regression, Kernel Trick
- Deep Learning and Neural Networks: Backpropagation, Overfitting, Regularization, Hyperparameter role and tuning for learning rate, momentum and regularizer, Stochastic and batch gradient descent
- Parametric vs Non-parametric Models
- K-means Clustering