

CS 189

700 pages

Elements of Statistical Learning

600 pgs

Introduction to Statistical Learning

- Statistical Learning: Regression, Classification
- Resampling methods
- Linear Model Selection and Regularization
- Moving beyond linearity
 - Tree-based methods, Support vector machines, Deep learning
- Survival analysis
- Unsupervised Learning
- Multiple testing

Stat 135

Mathematical Statistics and Data Analysis

- Probability
- Random Variables
- Joint Distributions
- Expected Values
- Limit Theorems
- Distributions Derived from Normal Distributions
- Survey Sampling
- Estimation of Parameters and Fitting of Probability Distributions
- Testing Hypotheses and Goodness of Fit
- Summarizing Data
- Comparing Two Samples
- The Analysis of Variance
- The Analysis of Categorical Data
- Linear Least Squares

- Overview of supervised learning
- Linear Methods for Regression
- Linear Methods for Classification
- Basis expansion and Regularization
- Kernel smoothing methods
- Model assessment and selection
- Model Inference and averaging
- Additive models, trees, related methods.
- Boosting and additive trees.
- Neural Networks
- Support Vector Machines and Flexible discriminants
- Prototype Methods and Nearest Neighbors
- Unsupervised Learning
- Random Forests
- Ensemble Learning
- Undirected Graphical Models
- High-dimensional problems: $p \gg N$

EECS 127



Convex Optimization

- ↳ Introduction
- ↳ Theory
 - ↳ Convex Sets
 - ↳ Convex Functions
 - ↳ Convex Optimization Problems
 - ↳ Duality
- ↳ Applications
 - ↳ Approximation and Fitting
 - ↳ Statistical estimation
 - ↳ Geometric Problems
- ↳ Algorithms
 - ↳ Unconstrained Minimization
 - ↳ Equality Constrained Minimization
 - ↳ Interior Point Methods

CS 182



Deep Learning With Python

- ↳ Fundamentals of Deep Learning
 - ↳ AI, ML, DL. History of ML why now?
 - ↳ Mathematical Building Blocks of Neural Nets
 - ↳ Data representations, tensor operations, gradient-operations
- ↳ Getting started