CS 559 Machine Learning:
Fundamentals and Applications

Summer 2021

In Suk Jang
Department of Computer Science
Stevens Institute of Technology

Instructor Information

- Instructor: In Suk Jang
    - Email: ijang@stevens.edu
    - Office Hours: Wednesday 8 PM – 9 PM
   - Zoom Link: https://stevens.zoom.us/j/97455778645

Course Information

- Prerequisite Course
  - MA 222 Probability Theory
- Lectures: Online
- Canvas: Announcements, Assignments, Quizzes, Exams
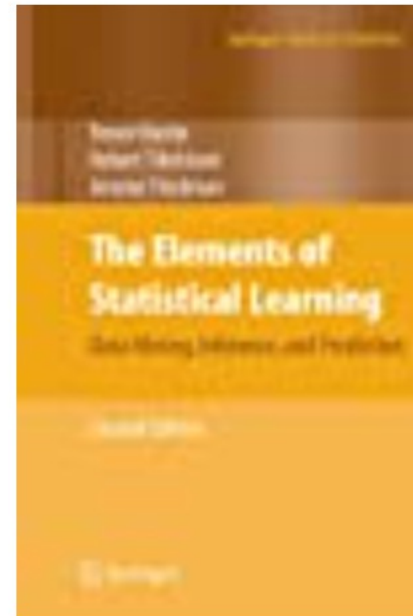- Required Environment: [Jupyter Notebook](#)

Reading Information

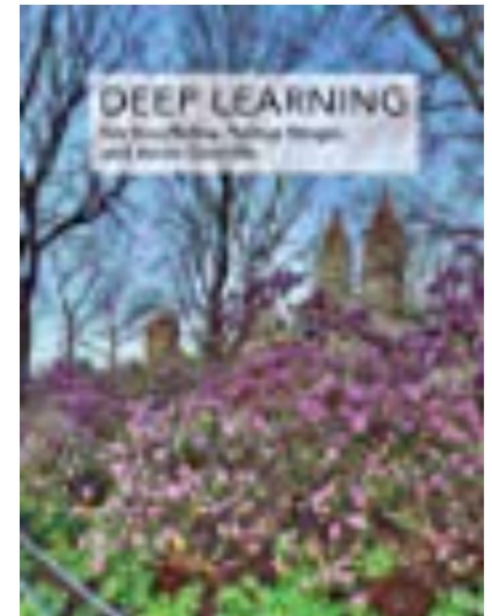- Bishop, Christopher M., 2006
  Pattern Recognition and Machine Learning
- Ian Goodfellow and Yoshua Bengio and Aaron Courville, 2016
  Deep Learning
- T. Hastie, R. Tibshirani, and J. Friedman, 2016
  The Elements of Statistical Learning
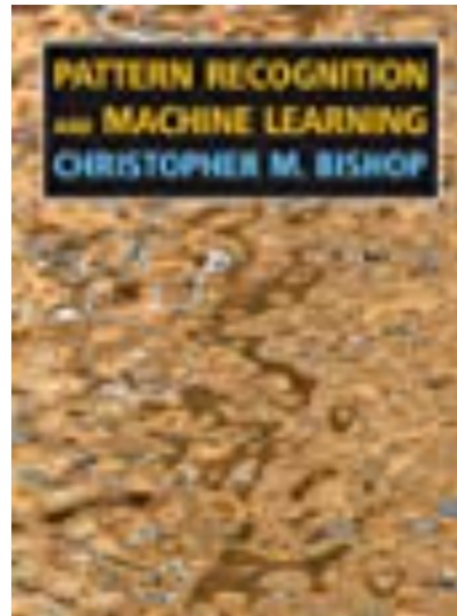
Course Prerequisites and Goals

Before this course, you should know…
- Programming - Python
- Linear Algebra – Vector, Matrix, Projection, Eigenvalues, ….
- Probability and Optimization – distributions, expectation/variance, etc…

At the end of this course, you should……
- Be more proficient at math and programming
- Be able to recognize when and how a new problem can be solved with an existing technique
- Be able to implement general ML techniques for a variety of problem types

Grade Information

Quiz	**10%**
Homework	15%
Project 1	25%
Project 2	25%
Midterm	10%
Final Exam	15%

Late Submission Information

No credit is granted to any written assignment submitted after the due date. Late assignments must receive prior permission from me, and a penalty will be assessed. All written assignments must be submitted to the course website; email submissions or re-submissions are not accepted.

The Honor Code Information

- Do not share writeup/code
- Quote any use of references
- Any violations - will report to the University

Course Information

Week	Date	Topics	Assignment Due
0	May 14	Orientation	
1	May 20	Probability and Linear Algebra Review	
2	May 27	Overview of ML Exploratory Data Analysis & Feature Engineering	HW 1 open
3	June 3	Unsupervised Learning	Quiz 1 & Project 1 Open
4	June 10	Linear Regression	HW 1 Due/HW 2 & Quiz 2 open
5	June 17	Linear Classifiers	Quiz 3 open
6	June 24	Gaussian Process & SVM	HW 2 Due/ Quiz 4 open
7	July 1	Midterm Exam	
8	July 8	Break	
9	July 15	Decision Trees	Project 1 Due Project 2, Quiz 5, & HW 3 open
10-11	July 22, 29	Ensemble Models I & II	Quiz 6 Open
12	August 5	Neural Network & CNN	HW 3 Due/ Quiz 7 Open
13	August 12	Times Series & Natural Language	Quiz 8 Open
14	August 19	Review	Project 2 Due
15	Aug 23-25	Final Exam	