Course

ENGN 2520 - Pattern Recognition and Machine Learning

Semester

Spring 2024

Instructor

- Prof. Pedro F. Felzenszwalb
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Course Description

This course will cover fundamental concepts in pattern recognition and machine learning. We will focus on mathematical formulations and computational methods that are broadly applicable. Topics include supervised learning, parametric and non-parametric models, decision theory, bayesian inference, dimensionality reduction, clustering, feature selection, generalization bounds, support vector machines and neural networks. We will consider motivating applications in computer vision, signal processing, medical diagnostics, and information retrieval.

Goals

The course is intended to provide an advanced introduction to machine learning and pattern recognition, including modern topics that are of interest for a variety of applications.

Prerequisites

Students are expected to have taken undergraduate courses in probability (such as APMA1650), linear algebra (such as MATH0520), multivariate calculus (such as MATH0200) and programming (such as CSCI0150).

Textbook

C. Bishop, Pattern Recognition and Machine Learning, Springer.

Evaluation

Grading will be based on bi-weekly homework assignments and a final exam. Homework will involve both mathematical exercises and programming assignments/projects. Students may discuss and work on homework problems in groups. However, each student must write their solutions independently.

Course Policies

Late and make up homework will be allowed only in special circumstances (such as a medical reason). Students are expected to attend lecture but there will be no direct evaluation of attendance or participation.

Course Work Expectation

Total time spent in and out of class for this course is about 180 hours total. Over 15 weeks, students will spend approximately 3 hours per week in lectures (45 hours total). Homework and other outofclass work is estimated at 8 hours per week (120 hours total). In addition, there is a 3 hour final exam for which approximately 20 hours of review is assumed.

Accommodations

Brown University is committed to full inclusion of all students. Please inform the instructor early in the term if you require accommodations or modification of any course procedures.