Course Introduction
Artificial Intelligence
(CSE4007-11676)

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Course Introduction

Introduction

- This course provides a variety of fundamental mathematical concepts and basic techniques used in the applications of artificial intelligence.
- It is aimed at giving an understanding of how to build a mathematical formulation for the concept of learning-from-data.

Lectures

- Lectures
  - Mon, 13:00 ~ 14:30
  - Thr, 10:30 ~ 12:00

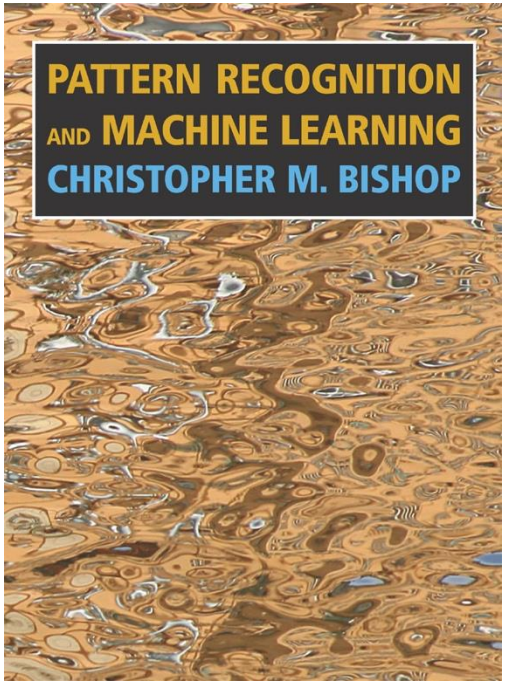
Course Instructor

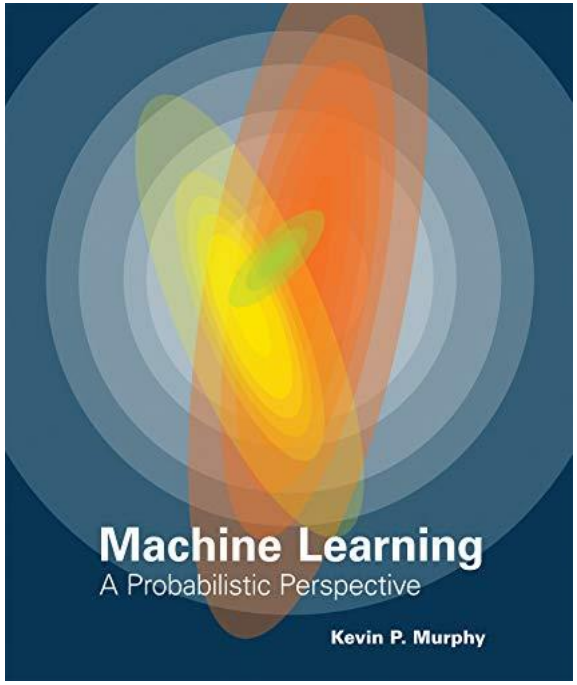
- Eun-Sol Kim
- IT.BT Bldg., 1208-1
- eunsolkim@hanyang.ac.kr

Books

- Basically, class notes are mainly used.

- Christopher M. Bishop, Pattern Recognition and Machine Learning
- Kevin. P. Murphy, Machine Learning: A Probabilistic Perspective





Prerequisites

- Linear algebra
- Probability
- Python Language (for project)
- Students should have a good understanding of the differentiation and integration and the basic operations using vectors and matrices.

Topics (1/2)

- Vector differentiation, matrix differentiation, obtaining analytic optimal solution
- Logistic regression, Fisher discriminant analysis
- Neural Network – Motivation, Architecture
- Neural Network – Backpropagation, Gradient descent, Numerical Optimization
- Nearest neighbor methods
- Large margin methods, Support vector Machines
- Kernel Methods
- Midterm

Topics (2/2)

- Probability model, Parameter estimation
- Graphical Model
- Gaussian Model, Multinomial Model
- Bayesian Inference
- Applications of Graphical Models
- Advanced Topics on Artificial Intelligence
- Final Exam

Grading

- Attendance : 0%
- Participation : 10%
- Homework, Project: 20%
- Two exams: 70% (35% each)

Homework, Project

- One assignment, One final project
- Assignment
  - Solving problems
- Project
  - Learning machine learning algorithms given a benchmark dataset
    - Python
  - Analysing the results
  - Writing a short paper

Late Assignment Penalty

- Before the due date: 100%
- < 24 hours: 80%
- < 48 hours: 60%
- >= 48 hours: no score

Plagiarism & etc.

- **Any type of plagiarism will directly result in the failure of this class (F) once detected!**
- Although active discussion between classmates is encouraged, you should write your original answers in your own words.
- Recording or video filming is prohibited.