Artificial Intelligence Project

SWE3032-41

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Course Overview

Machine learning and Deep learning

▸ Machine learning (ML)

- A type of artificial intelligence (AI) that allows software applications to become more accurate at predicting outcomes

- Machine learning algorithms use historical data as input to predict new output values.

▸ Deep learning

- A part of ML methods

- Multi-layered Perceptrons and their variants such CNNs, LSTMs, and GANs

- Deep learning leads the major advances in recent technology

    Self-driving cars, Machine translation, …

Goals

▸ AI including Machine learning and Deep Learning is one of the most important subjects. In this course, you will learn the foundations of Deep Learning, understand how to build neural networks, and learn how to lead successful machine learning projects.

▸ Upon completing the course, students should be able to:

  - Learn about different supervised and unsupervised neural learning methods in the field of deep learning.

  - Implement some of those algorithms.

  - Propose own ideas and implement them.

(Tentative) Topics

▸ Theory

- Deep feedforward networks

- Regularization for deep learning

- Optimization for training deep models

- Convolutional networks

- Sequence modeling: recurrent and recursive networks

- Autoencoders

- Representation learnings

▸ Projects

Textbook (Not mandatory to buy)

▸ Goodfellow, Bengio, and Courville, (2016), Deep Learning

  ▸ https://www.deeplearningbook.org/

▸ Some of the lecture slides are from the textbook(https://www.deeplearningbook.org/lecture_slides.html), UCB CS282A, and Stanford CS230

Workload

▸ Homeworks/programming projects

  - Paper summary, Written/math exercises, Programming assignments in python/R

▸ Late policy: 15% off per day late, maximum of 5 days

  Four extension days can be applied anytime to homeworks/projects (no explanation needed)

  - The use of extension days must be stated explicitly at the time of submission.

  - Cannot be rearranged after they are applied to a submission

  - Cannot be used after the final day of classes

▸ Exams: Mid-term exam only

Project

▸ Topic

 - Anything that pertains to the course material or any Deep learning topics

 - Please do not just run the existing codes (e.g., scikit-learn)

▸ Project proposal

 - One-page paragraph description of your project

▸ Final reports

 - You are encouraged to collaborate on the project.

 - We expect a 4 page write-up about the project, which should clearly and succinctly describe the project goal, methods, and your results.

   - A two person group will have 6 pages (4+2), a three person group will have 8 pages(4+2+2), and so on.

 - Each group should submit only one copy of the write-up and describe the contributions of each group member to the project.

(Online) Team Project: Workload

▸ Presentations: Last two or three classes before the final exam week

▸ Final report due date: the final exam week

Honor Code (1/2)

▸ We strongly encourage students to form study groups.

▸ Students may discuss and work on homework problems in groups.

▸ However, each student must write down the solution independently, and without referring to written notes from the joint session.

▸ Each student must understand the solution well enough in order to reconstruct it by him/herself. It is an honor code violation to copy, refer to, or look at written or code solutions from a previous year, including but not limited to: official solutions from a previous year, solutions posted online, and solutions you or someone else may have written up in a previous year.

▸ Furthermore, it is an honor code violation to post your assignment/exam solutions online, such as on a public git repo.

▸ We run plagiarism-detection software on your code against past solutions or online materials.

▸ If the plagiarism is detected, the final grade will be immediately F.

  - (성균관대학교학칙 시행세칙(학사과정) 제25조, 시행세칙(대학원과정) 제31조)

Honor Code (2/2)

▸ Example

- If you copy codes and sentences, which are available online or in solutions, you will have zero points and get F grade immediately.

✓ Exception: obvious api calls such as numpy or pytorch libraries

Communication

▸ We use the bulletin board (QnA board) and email communications.

  - Please specify the objective of your questions.

    ✓ Good title: How to choose hyper-parameters in CNNs

    ✓ Bad title: Questions about the lecture

Thank you!