ECON 4130 Introduction to Machine Learning Methods in Economics

Monday   2:30pm-4:15pm
Wednesday   1:30pm-2:15pm

Instructor: Vinci Chow (vincichow@cuhk.edu.hk)
Office hours: By appointment (https://www.econ.cuhk.edu.hk/booked/Web/schedule.php?sid=2)
Teaching Assistant: Joe Leung (1155142726@link.cuhk.edu.hk)

Purpose of this Course

This course introduces machine learning methods commonly used in analyzing data, with an emphasis on how these methods can be applied to economic analysis. Students are recommended to have knowledge of basic statistics and regression analysis before taking this course.

Learning Outcomes

After completing this course, the student should understand the common machine learning techniques used in analyzing data. They should also be able to use Python to collect data and conduct analysis.

Textbook

There is no mandatory textbook. Course materials will be designed and compiled by the instructor.

Recommended Reading: Hastie, Trevor, Robert Tibshirani and Jerome Friedman (2016) The Elements of Statistical Learning.

Python

We will frequently use the Python programming language to solve mathematical problems in class. We will use the Anaconda Scientific Python Distribution (https://www.anaconda.com/download/), which supports all major operating system platforms. You have the option of using the online installation managed by the Department (http://scrp.econ.cuhk.edu.hk) or using your own installation. If you choose the latter, please download and install Anaconda before the first class.

ELB 916 Computer Lab Access

To enter the computing lab, you need to use your student ID card.

To log in computers, you need to input your Computing ID and your PC LAN password. Please note that your PC LAN password is different from your CWEM password. Your PC LAN password is provided to you from ITSC with a Computing Accounts Information Slip.

Tentative Grading Scheme

Course participation   - 10%
Projects and presentations   - 90%

Class Schedule

Week 1-2   Overview and Basic Python Usage

Week 3   Data Scraping

Week 4   Regularization—Using Regression as an Example

Week 5   Cross Validation

Week 6-7   Classification and Clustering

Week 8   Collaborative Filtering

Week 9   Working with Text Data

Week 10   Introduction to Artificial Neural Network
              Convolutional Neural Networks and Recurrent Neural Networks

Week 11-12   Transformer-based models
              Large Language Models

Week 13   Reinforcement Learning (if time permits)

Exam Period   Student Presentations

Honesty in Academic Work

Please visit the following website for details of university policy on Honesty in Academic Work:
http://www.cuhk.edu.hk/policy/academichonesty/.