Course Name: EI320A(3) 深度學習使用Python (Deep Learning with Python)
Lecture language: English
Credits: 3
Prerequisites:

- It is recommended for students who have background in Fundamental Programming or Object Oriented Programming who familiar with control flow (if/else, for loops) and pythonic constructs (functions, classes, iterables). The main language programming used thorough this course is Python.
- Students are recommended to bring their own laptop for in-class hands-on demo.

Couse Description:

This course is designed to provide a complete introduction to Machine Learning and Deep Learning. It is aimed at beginners and intermediate programmers and data scientists who are familiar with Python or have some background on fundamental programming. We start with a review of Machine Learning tools and techniques and various Deep Learning applications. Topics to be covered include data collection, integration, management, modeling, analysis, visualization, prediction and informed decision making. This introductory course is integrative across the core disciplines of Data Science, including data indexing , data mining, data visualization and business intelligence. Professional skills, such as communication, presentation, and storytelling with data, will be fostered. Students will acquire a working knowledge of data science through hands-on projects and case studies in a variety of business, engineering, social sciences domains. In short, this course is a good balance between theory and practice. Mathematical details are not the main focus in this course, instead, we provide exercises and sample code to apply what you have just learned in class.

Learning Outcomes:

- Develop an appreciation for what is involved in learning models from data.
- Understand a wide variety of learning algorithms.
- Understand how to evaluate models generated from data.
- Apply the algorithms to a real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

Teaching Style:

Lecture and In-class Demos Simultaneously. Students are expected to code along with the instructor during the lecture.

Evaluation Criteria

Tasks	Percentage
In Class Hands-on	60
Project Proposal Presentation	10
Project Final Presentation	30
Bonus (In Class Participation)	5
Total	110/100

Lecture Time: 9am – 12pm. Friday

Location: R70802
Staff
Instructor: 泰提潘 Tipajin Thaipisutikul
Office hour: After class or By appointment.
TA: N/A

Tools:

- Anaconda Installation for Python and Jupyter notebooks used for class notes, in-class demos, and hands-on exercises.

Recommended Materials/Textbooks

- Mining of Massive Datasets by Jure Leskovec, Anand Rajaraman, and Jeffrey D. Ullman.
- Deep Learning by Ian Goodfellow and Yoshua Bengio and Aaron Courville https://www.deeplearningbook.org/

Course Outline (subject to change):

Week	Date	Content	Note	Total
1	2/26	Welcome to the course	Download & Install Anaconda Homework (1)	1
2	3/5	Crash Course of Python, Numpy, Pandas, and Matplotlib	In class hands-on (4)	5
3	3/12	Get to know about Data ML:Classification Models	In class hands-on (5)	10
4	3/19	ML:Regression Models	In class hands-on (5)	15
5	3/26	ML:Clustering /Apriori Models	In class hands-on (5)	20
6	4/2	Holiday		
7	4/9	Introduction to Deep Learning (ANN)	In class hands-on (5)	25
8	4/16	Convolutional Neural Network (CNN)	In class hands-on (5)	30
9	4/23	Convolutional Neural Network (CNN)	In class hands-on (5)	35
10	4/30	Recurrent Neural Network (RNN)	In class hands-on (5)	40
11	5/7	Recurrent Neural Network (RNN)	In class hands-on (5)	45
12	5/14	Project Proposal Presentation	Proposal Presentation (10)	55
13	5/21	Time series with DNN, CNN, RNN	In class hands-on (5)	60
14	5/28	Attention Neural Network	In class hands-on (5)	65
15	6/4	Generative Adversarial Network (GAN)	In class hands-on (5)	70
16	6/11	Reinforcement Learning (RL)	In class Participation (5)	75
17	6/18	Final Project Presentation	Final Presentation (30)	105

Bonus: 5 For class participation.