EE5184 Machine Learning Syllabus

2021 Fall

Instructors: Pei-Yuan Wu, Hung-Yi Lee, Tsungnan Lin

National Taiwan University

General Information

Class Time and place: 09:10-13:10, Friday, Fuli Building 113

Contact Hours: 4hours per week, with a total of 16 weeks, equivalent to 64 hours

Course Website(PPT Slides/ Course Videos): <https://ntueeml.github.io/ml-website>

Facebook group: Machine Learning (2021, Fall): <https://www.facebook.com/groups/1029900681122058>

Instructors

* Major Instructor: Pei-Yuan Wu
* Office: EE2-234
* Email: [peiyuanwu@ntu.edu.tw](mailto:peiyuanwu@ntu.edu.tw)
* Phone: (02)3366-4687
* Office Hours: 14:00 - 15:30 Friday
* Other instructors: Hung-Yi Lee
  + Tsungnan Lin

Taching Assistants

* Ji-Chang Lee [r08922a27@ntu.edu.tw](mailto:r08922a27@ntu.edu.tw)
* Zong-Lun Lee [b06901188@ntu.edu.tw](mailto:b06901188@ntu.edu.tw)
* Yan-Ru Lee [b07901075@ntu.edu.tw](mailto:b07901075@ntu.edu.tw)
* Hung-Yu Shu [r09943021@ntu.edu.tw](mailto:r09943021@ntu.edu.tw)

Grading(Tentative)

* Programming Assignments 7% x 5
* Written Assignments 3% x 5
* Final Project 20%
* Final Exam 30%

Intended Learning Outcome:

This course aims to introduce the basic machine learning theories, methods and tools that machine learning users should know. It is hoped that through this course, students will have a more systematic understanding of machine learning technologies and have the skills to implement these technologies. And students can acquire basic capabilities, with a view to applying these technologies to their respective fields of expertise in the future.

Course Outline:

1. Regression; Bias and Variance Errors

2. Probabilistic Generative Model; Logistic Regression

3. Dimensionality Reduction: Principle Component Analysis; Auto-Encoder; Neighbor Embedding

4. Semi-Supervised Learning

5. Neural Network Introduction: Gradient Decent; Back Propogation

6. Convolutional/Recurrent Neural Network

7. Ensemble

8. Support Vector Machine; Lagrange Duality

9. Expectation Maximization

10. Probability Approximately Correct Learning

Reference Books:

* Introduction to Machine Learning, Ethem Alpaydin, 2009, MIT Press
* Pattern Recognition and Machine Learning, Christopher M. Bishop, 2006, Springer
* Foundations of Machine Learning, M. Mohri, A. Rostamizadeh, and A. Talwalkar, MI

Table

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