

CS5260: Neural Networks and Deep Learning II

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TA: Yiyuan XIONG (yiyxio@gmail.com)

1. Tentative Schedule

Week 1 (January 15th):

Adversarial Machine Learning

Week 2 (January 22th):

Deep Reinforcement Learning

Week 3 (January 29th):

Generative Adversarial Networks

Tutorial 1: Adversarial Machine Learning

Week 4 (February 5th):

Neural Architecture Search

Tutoria 2: Deep Reinforcement Learning

Week 5 (February 12th):

Public holiday, no class

Week 6 (February 19th):

Mixture of Experts

Tutorial 3: Generative Adversarial Networks

Week 7 (March 5th):

Contrastive Learning/Self-Supervised Learning

Tutorial 4: Neural Architecture Search

Week 8 (March 12th):

Latest on Transformers: New Techniques after BERT

Tutorial 5: Mixture of Experts

Week 9 (March 19th):

Advanced deep learning optimizers and convergence

Tutorial 6: Contrastive Learning/Self-Supervised Learning

Week 10 (March 26th):

Background for distributed deep learning, TPU Pod, and Google's MLPerf results

Tutorial 7: Latest on Transformers: New Techniques after BERT

Week 11 (April 2nd):

Public holiday, no class

Week 12 (April 9th):

Distributed optimization: large-batch training (LARS & LAMB)

Tutorial 8: Advanced deep learning optimizers and convergence

Week 13 (April 16th):

Student presentation (5 minutes per team) or poster session

Tutorial 9: guidance on final project (we may cancel it if the presentations run out of time)

2. Evaluation and Grading

Weekly homework (40%)

Please form a team of 2-4 students for the final project

1. Each team gives a talk or presents a poster (20%)
2. Each team finishes a report (40%)

The workload can be reduced (depending on the feedback from the students)

- Homework requirement and deadline
 - Around **8** assignments (weeks 3, 4, 6, 7, 8, 9, 10, 12). Each assignment will take one or two hours to finish for most students.
 - Every week, TA will give a brief introduction of assignments in the tutorial.
 - The assignments are published by Jupyter notebook, which can be run on google colab. Each assignment will have several tasks, e.g., implementing some key functions/algorithms.
 - Finish the tasks according to the instructions. Only change the code in the required snippets and **DO NOT** change others or add new code/text snippets.
 - Submission: rename the assignment file as "StudentNumber_your-Name_assignment_1.ipynb". e.g., 'a0100000J_Wang-Wenjie_assignment_1.ipynb'. And submit it to **Luminus**. We will create a new folder for each assignment.
 - In addition to the ".ipynb" file, you may need to submit another ".py" file. More details can be found in the assignments.

- The submission deadline for each assignment is 23:59pm on Friday of the next week.
- Please follow the instructions strictly, otherwise you might be **penalized**.
- If you have any questions on assignments, please contact Wenjie Wang (wangwenjie@u.nus.edu) and Yiyuan Xiong (yiyxio@gmail.com).
- Final project report
 - Send it to yang.you.cs@gmail.com before 1st of May
 - Use NeurIPS format
 - <https://nips.cc/Conferences/2020/PaperInformation/StyleFiles>
 - The report should have at most 9 pages (contents & references)

3. Module Information

- Class Time: Friday 6:30-8:30pm
- Tutorial Time: Friday 8:30-9:30pm (From 3rd week)
- Location: zoom (due to COVID-19)