CS6208: Advanced Topics in Artificial Intelligence Graph Machine Learning

Administrative (Week 8)

Semester 2 2022/23

Xavier Bresson

https://twitter.com/xbresson

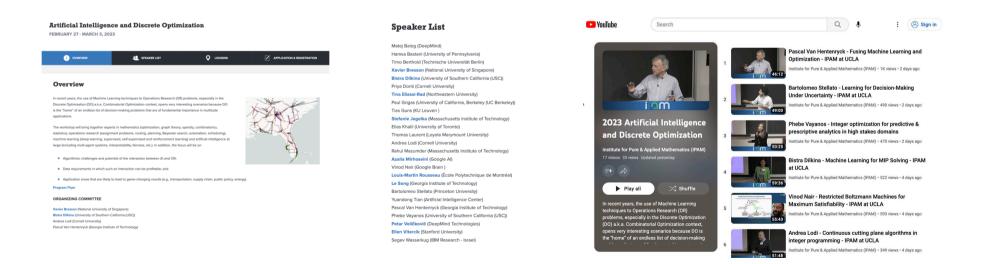
Department of Computer Science National University of Singapore (NUS)





Deep learning + discrete optimization

- UCLA/IPAM Workshop "Deep Learning and Discrete Optimization"
 - http://www.ipam.ucla.edu/programs/workshops/artificial-intelligence-and-discrete-optimization
- Check out the videos
 - $\bullet \quad https://www.youtube.com/playlist?list=PLHyI3Fbmv0SfG1vnBcJMn13NsJb7V92ha$



Group selection

- Group can be composed of 1 or 2 or 3 members, preferably 2-3 but not more than 3.
 - Use Canvas Discussions Project group if you need to find groupmate(s).
- Choose your group wisely
 - Each teammate must contribute *equally* to the project. Clearly, each member has different skills and it is fine to be weaker in maths, coding, etc. However, it is not fine to let the other teammates to do most of the work.
- Minimize conflict and make a short written "contract" at the beginning of the project regarding the commitment of each team member to the project.
 - Upload the "contract" to Canvas Assignments Group project contract with the file name "projectCS6208 contract name1 name2.pdf"
- → Deadline is Week 8, Tue March 7th 2023 11:59pm.
 - Penalty: You will lose 25% of the project grade every late day (except medical certificate).
 - It is fine that commitments change during the project development but the contributions must remain equally distributed.

Review paper and group project

- The topics of the review paper and the group project must be different.
 - For example, you cannot review a paper on molecular generation and develop a project on molecular generation. But you you can review a paper on graph recommendation and develop a project on molecular generation.
 - There must be significant differences between the review paper and the group project.

Office hour

- From Week 8, I will offer office hours to discuss lectures, etc
 - When/where?
 - Tue 4:30pm-5:30, my office COM2-04-26
 - How?
 - Appointment: Send me an email for priority, <u>xaviercs@nus.edu.sg</u>

 Please, use the excel file to make an appointment

https://docs.google.com/spreadsheets/d/1ynmNJtMazF7HbKXwot8_UY9s-Gm6a9g XuaoA9S1Pv0

- Walk-in meeting is fine but priority is by appointment
- If nobody at 5pm, office hour stops
- 15min max per student/group (more time if no student is waiting)

Tentative Lectures

- Introduction to Graph Deep Learning
- Part 1: GML without feature learning (before 2014)
 - Introduction to Graph Science
 - Graph Analysis Techniques without Feature Learning
 - Graph clustering
 - Classification
 - Recommendation
 - Dimensionality reduction
- Part 2 : GML with shallow feature learning (2014-2016)
- → Shallow graph feature learning

- Part 3: GML with deep feature learning, a.k.a. GNNs (after 2016)
- Graph Convolutional Networks (spectral and spatial)
 - Benchmarking GNNs
 - Graph Transformer
 - Graph ViT/MLP-Mixer
 - Generative GNNs and molecular science
 - Combinatorial optimization
 - GNNs for Recommendation
 - GNNs for knowledge graphs
 - Theory of GNNs

