KAIST

KSE801 – Recommender System and Machine Learning on Graph

Lecture 0: Course Logistics

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COURSE INFORMATION

- Instructor: Chanyoung Park (cy.park@kaist.ac.kr)
  - Office: Rm #4104, E2-2
  - Office hour: By appointments
- Classroom: Rm #1122, E2-2
- **This is an Edu 4.0 course**
- Non real-time online class 50% + real-time in-person class presentation 50%
  - Video recordings for the lectures will be provided
  - All course materials will be uploaded on KLMS
- **We will have student presentations on every Thursday at 10:30 AM**
  - Starting from week 3 (Refer to Slide 9 for detailed schedule)

PREREQUISITES

- Basics of machine learning
- Math (basic linear algebra, statistics)
- Experience in coding with Python

MATERIALS

- Textbook (Not required)
  - Aggarwal, Charu C. *Recommender systems*. Vol. 1. Cham: Springer International Publishing, 2016.
    - http://www.charuaggarwal.net/Recommender-Systems.htm
  - Hamilton, William L. "Graph representation learning." *Synthesis Lectures on Artificial Intelligence and Machine Learning* 14.3 (2020): 1-159.
    - https://www.cs.mcgill.ca/~wlh/grl_book/
- Online courses
  - Recommender System course at Coursera
    - https://www.coursera.org/specializations/recommender-systems
  - Stanford CS224W: Machine Learning with Graphs
    - Course website: http://web.stanford.edu/class/cs224w/
    - Video: https://www.youtube.com/playlist?list=PLoROMvodv4rPLKxIpqhjhPgdQy7imNkDn

GRADING

- **Class participation** (20%)
  - The amount of video watching time (10%)
  - **Participation in the presentation (Questions, discussions, etc) (10%) ← Important!**
- **Project** (45%)
  - Proposal (5%), Progress report (10%), Final presentation (15%), Final report (15%)
    - Evaluation for presentation: Instructor 7.5% + Peer evaluation 7.5%
- **Paper review** (15%)
  - Each student will write a comprehensive review on one top-conference paper.
- **Paper Presentation** (20%)
  - Evaluation: Instructor 10% + Peer evaluation 10%

PAPER PRESENTATION

- Starting from Week 3 (9/15)
  - Individual presentation
  - 30 minutes + 5 minutes Q&A and discussion
- 2 students will present per class
- Review of the paper + research idea
- The papers to be presented are pre-selected by instructor (Due date: 9/11)
  - Recent papers about RecSys and GNN (including best papers in RecSys and KDD)
  - Link: https://docs.google.com/spreadsheets/d/1jVVqvNxnJzmWbTNHBs05BXqJOvm0CgdryqvaMuh9nJI/edit?usp=sharing

PAPER REVIEW

- You will choose a recent paper by yourselves, and review it
  - The selected paper should not have been reviewed or summarized elsewhere on the internet
  - Korean students should write reviews in Korean
- Papers should be selected from top-tier DM/AI conferences (past 3 years)
  - ex) KDD/WWW/SIGIR/CIKM/ICDM/AAAI/ICLR/ICML/NeurIPS …
- To deliver reviews in high quality, your reviews will be peer reviewed by other students
- Process
  - Paper selection (9/25) → Write review (10/16) → Peer evaluation (10/30) → Revise review and re-submit (11/20) → Final peer evaluation (12/11)
- Link
  - https://docs.google.com/spreadsheets/d/1uOrYNWyHb8P0JkxJJJTydk9E1PKNf6-O1dgzsvGBl6k/edit?usp=sharing

PROJECT

- This is a group project (Team decision due: 9/18)
  - Maximum 3 students in a team. No individual team allowed
  - Any topic regarding recommender system or graph machine learning is fine
  - Link: https://docs.google.com/spreadsheets/d/1LhUyPH1sy5dWROwWJrPEOmvFI0Z5CODhUlSzZjanEPs/edit?usp=sharing
- **The final goal of this project is to write a research paper!**
  - **Project proposal report**: 10/9 (No template (1 page))
  - **Project progress report**: 11/6 (No template (no page limit))
    - 1. Task (What is the problem to be solved?)
    - 2. Why is it hard? (Why do current approaches fail?)
    - 3. Method description (What are the key components of the proposed approach?)
    - 4. Preliminary result
    - 5. Future direction
  - **Project final presentation:** 11/29, 12/6, 12/8
  - **Project final report / Source code**: 12/18
    - ex) ACM latex article template: https://www.acm.org/publications/proceedings-template
    - Max 8 pages (+ reference)

COURSE SCHEDULE

Week	Content	Assignments (Due date: end of each week)	Realtime Class
1	Course Logistics & Introduction to Recommender System		9/1
2	Neighborhood-Based Collaborative Filtering	Presentation paper selection due	-
3	Model-based Collaborative filtering	[Project] Team decision due	9/15
4	Side Information-based Recommender System (1)	[Paper review] Paper selection due	9/22
5	Side Information-based Recommender System (2)		9/29
6	Sequential Recommendation & Graph-based Recommendation	[Project] Proposal report due	10/6
7	Introduction to Graph-based ML	[Paper review] Review due (1st round)	10/13
8	Midterm Exam Week (No exam)		
9	Node-level Network Embedding (1)	[Paper review] Peer evaluation due	10/27
10	Node-level Network Embedding (2)(3)	[Project] Progress report due	11/3
11	Graph Neural Network		11/10
12	Advanced Topics in GNN	[Paper review] Review due (2nd round)	11/17
13	Applications of Graph Machine Learning		11/22, 11/24
14	Project Presentation I		11/29, ~~12/1~~
15	Project Presentation II	[Paper review] Final peer evaluation due	12/6, 12/8
16	Final Exam Week (No exam)	[Project] Final report due	-

Undergrad admission exam

IMPORTANT DATES

Assignment	Due date
Presentation paper selection	9/11
[Project] Team decision	9/18
[Paper review] Paper selection	9/25
[Project] Proposal report	10/9
[Paper review] Review (1st round)	10/16
[Paper review] Peer evaluation	10/30
[Project] Progress report	11/6
[Paper review] Review (2nd round)	11/20
[Paper review] Final peer evaluation	12/11
[Project] Final report	12/18