Course program and reading list

Semester 1 Year 2021

School: Efi Arazi School of Computer Science M.Sc.

Recommendation Systems

Lecturer:

Dr. Asnat Messica Asnat.Messica@post.idc.ac.il

Teaching Assistant:

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Course No.:	Course Type :	Weekly Hours :	Credit:
3639	Elective	3	3

Course Requirements :	Group Code :	Language:
Final Paper	211363901	English

Prerequisites

Prerequisite:

52 - Calculus I
53 - Calculus II
54 - Linear Algebra I
55 - Linear Algebra II
56 - Discrete Mathematics
59 - Data Structures
69 - Logic And Set Theory
417 - Introduction To Computer Science
3141 - Machine Learning from Data

Course Description

Introduction

Recommender systems are widely used by online companies worldwide to provide the most relevant content to each user. They changed the way users find relevant items in various areas such as e-commerce, content websites, social media, online advertisement and more.

The goal of this course is to provide the students with both theoretical and practical aspects of recommender systems. We will study machine learning algorithms for personalized recommendations, including recent algorithms, advanced evaluation, research topics, and implementation tools.

Meetings plan:

Meeting	Topic	Assignment
1	Introduction to Recommender Systems	
2 - 3	Collaborative filtering and Recommender Systems evaluation.	
4	Matrix Factorization	Exercise #1
5	Content based Recommender Systems and hybrid approach	

Meeting	Topic	Assignment
6	Factorization Machines. Context aware Recommender Systems.	
7	Loss types, multiple objectives optimization. Advanced Recommender Systems evaluation.	Exercise #2
8	Cold start, explore – exploit optimization	
9 - 10	Deep learning for Recommender Systems	Exercise #3
11	Explainability and application domains	
12	Practical aspects	
13	Summary and future trends	

Course Goals

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Grading

Course Grading:

Exam – 40%

Exercises – 60%

Exercise #1: Matrix Factorization implementation and evaluation;

Exercise #2: Kaggle competition submission.

Exercise #3: Deep Factorization Machines and custom loss: implementation, evaluation and comparison to traditional algorithms.

Learning Outcomes

Learning Outcomes:

Upon successful completion of this course students should be able to:

- Describe different approaches and algorithms for recommender systems
- Develop a recommender system to address specific use case needs and constraints
- Follow and take part in recent research in the area of recommender systems

Lecturer Office Hours

Friday 14-15

Reading List

Bibliography

- Ricci, F., Rokach, L., Shapira, B., Kantor, P.B., 2011. Recommender Systems Handbook.
- Aggarwal, C.C., 2016. Recommender systems (Vol. 1). Cham: Springer International Publishing.
- Koren, Y., Bell, R. and Volinsky, C., 2009. Matrix factorization techniques for recommender systems. Computer, (8), pp.30-37.
- Hu, Y., Koren, Y. and Volinsky, C., 2008, December. Collaborative filtering for implicit feedback datasets. In Data Mining, 2008. ICDM'08. Eighth IEEE International Conference on (pp. 263-272). IEEE

- Rendle, S., 2010, December. Factorization machines. In 2010 IEEE International Conference on Data Mining (pp. 995-1000). IEEE

Additional papers will be provided before every meeting