CS 672: Computational Economics for Data Analytics

Course Information

Instructor:	Yongfeng Zhang (https://www.cs.rutgers.edu/faculty/yongfeng-zhang)
Email:	yongfeng.zhang AT rutgers.edu
Office:	CoRE 309
Time:	Monday and Wednesday, 5:00-6:20 pm
Location:	Hill 116
Office Hours:	Fridays 2:00-3:00pm or by appointment
TA:	Yunqi Li
Email:	yunqi.li@rutgers.edu

Course Descriptions

The fundamental goal of the course would be to introduce how to integrate machine learning and economic principles in a variety of tasks, including but not limited to recommender systems, online advertising, sharing economy, social networks, etc, which covers many basic web-based services in Google, Facebook, Amazon, Microsoft, Uber, Airbnb, etc. The class will be a mixture of instructor lectures and student presentations.

Prerequisites

- CS 512 or CS 513 (Fundamental Algorithms)
- CS 536 (Machine Learning) is preferred but not required
- Linear Algebra, Basic Probability (Moments, Typical Distributions, MLE)
- Programming Languages: C++/Java/Python/R

Expected Work

- Paper Presentations: Complete as a team of at most 2 students (40%)
- Final Project: Complete as a team of at most 2 students, choose between an assigned project or a self-proposed project, provide a presentation and complete a project report (60%)

Self-proposed projects are encouraged but are subject to pre-approval by the instructor.

Tentative Schedule

Note that the schedule may be subject to change (e.g., due to snow or campus close). Please check the course website frequently for the latest schedule.

Week	Date	Topics and Assignments
1	9/5	Introduction to Economics and Computation
2	9/10 9/12	Basics of Micro-Economics Basics of Game Theory
3	9/17 9/19	Basic Machine Learning Economics of Recommender Systems
4	9/24 9/26	Sponsered Search Online Advertising
5	10/1 10/3	Sharing Economy The Matching Market
6	10/8 10/10	Profit Maximization in Online Services (EC/Search/P2P) Profit Maximization in Online Services (Matching approaches)
7	10/15 10/17	Computational Advertising (Search Systems) Computational Advertising (Social Networks)
8	10/22 10/24	Matching in Sharing Economy Dynamic Pricing in Sharing Economy
9	10/29 10/31	Crowd sourcing Online Freelancing
10	11/5 11/7	Online Auction and Mechanism Design I Online Auction and Mechanism Design II
11	11/12 11/14	Fairness and Risk in Online Services I Fairness and Risk in Online Services II
12	11/19 11/21	Digital Marketplace and Summary Presentation of Projects
13	11/26 11/28	Presentation of Projects Presentation of Projects
14	12/3 12/5	Presentation of Projects Presentation of Projects
15	12/10 12/12	Presentation of Projects Presentation of Projects and Summary of the Class

Rutgers is an equal access/equal opportunity institution. Individuals with disabilities are encouraged to direct suggestions, comments, or complaints concerning any accessibility issues with Rutgers web sites to: accessibility@rutgers.edu (mailto:accessibility@rutgers.edu) or complete the Report Accessibility Barrier / Provide Feedback (https://oit.rutgers.edu/accessibility/barrierform)