

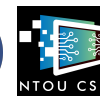
Economics and Computation

Introduction

Joseph Chuang-Chieh Lin

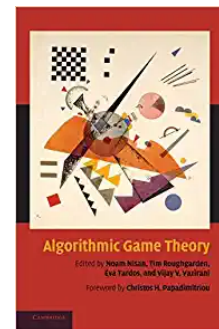
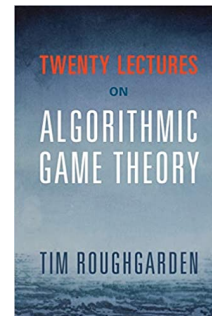
Dept. Computer Science and Engineering
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Textbooks and Materials

- Textbooks/Lectures:
 - *Twenty Lectures on Algorithmic Game Theory*. Tim Roughgarden. Cambridge University Press. 2016.
 - *Algorithmic Game Theory*. Noam Nisan, Tim Roughgarden, Eva Tardos, and Vijay V. Vazirani. Cambridge University Press. 2011.
- Other materials:
 - *Essentials of Game Theory: A Concise, Multidisciplinary Introduction* (Synthesis Lectures on Artificial Intelligence and Machine Learning). Leyton- Brown and Kevin, Shoham. Cambridge University Press. 2008.
- Course website:
 - https://josephcclin.github.io/courses/ec_and_agt.htm



Prerequisites

- Basic CS undergraduate courses in
 - Algorithms
 - Calculus
 - Probability theory
 - Programming
- Motivation.
- Curiosity.

Major Topics

- Game Theory
- Mechanism Design (Truthfulness, Social Welfare, Envy-freeness, ...)
- Equilibrium Concepts
- Auctions

Topics (adjusted accordingly)

- Introduction and Preliminaries
- Minimax Principles
- Social Choice
- Stable Matchings
- A Sketch of Nash's Theorem from Fixed Point Theorems
- Auctions & Mechanism Design Basics
- Algorithmic Mechanism Design (Knapsack Auctions)
- Revenue Maximizing Auctions
- Simple Near-Optimal Auctions
- Multi-Parameter Mechanism Design
- Other Selected Topics

Grading Policy

- Attendance (10%)
- Assignments (40%)
- Final Presentation (50%)
 - Research papers

Grading policy for the presentations

- Order:
 - Midterm: According to the book chapters.
 - Final: According to the seat number ordering.
- Complete the presentation: 60 point
 - Duration for each presentation: 30~50 minutes.
- Raising questions: +2 point for each one (maximum +20 point)
- Clearly answering the teacher's ≥ 4 questions: +5 point for each one.

Where to find the paper? (suggestions)

***Please look for papers in 2020—present.**

- **International conferences:**

- **EC:** Proceedings of the ACM conference on Electronic commerce.
- **NeurIPS:** Conference on Neural Information Processing Systems.
- **AAAI:** Association for the Advancement of Artificial Intelligence.
- **IJCAI:** International Joint Conferences on Artificial Intelligence.
- **AAMAS:** International Conference on Autonomous Agents and Multiagent Systems.
- **SAGT:** Symposium on Algorithmic Game Theory.
- **WINE:** International Conference on Web and Internet Economics.
- ...

- **Journals:**

- **Games and Economic Behavior**
- **International Journal of Game Theory**
- **Social Choice and Welfare**