

## Game Theory Course Miniproject (25 to 35 marks)

- There are 68 students in the class. Assigning miniprojects was clearly a challenge. So I have come up with this protocol. There are 68 papers listed here. The papers are selected mostly from EC 2020, WINE 2020, and EC 2019.
- I have done a truly random assignment of papers to students. Student \$i\$ gets Paper \$i\$. Some of you may prefer another paper but in the interest of simpler miniproject logistics, please stick to the paper that is assigned to you.
- Each student is expected to do the following.
- Read the paper diligently. Read all the important related papers (cited in the assigned paper) thoroughly. Look at all citations to this paper and read those papers as well. See this video by Prof. Andrew Ng on how to read papers:  
<https://www.youtube.com/watch?app=desktop&t=160&v=733m6qBH-ji&feature=youtu.be>
- April 15, 2021: Make a two page summary of this work and related papers in your own words (repeat – in your own words) **(5 Marks)**. I will advise you where to upload this two page writeup. Use the NeurIPS template:  
<https://neurips.cc/Conferences/2021/PaperInformation/StyleFiles>
- May 10, 2021: Make a 10 page writeup of this topic in the above NeurIPS format and submit it. Use the above template. See this nice presentation by Dimitris Bertsekas on math writing: [https://www.mit.edu/~dimitrib/Ten\\_Rules.pdf](https://www.mit.edu/~dimitrib/Ten_Rules.pdf). There are other excellent articles on how to write papers well. I will advise you where to upload this 10 page writeup.
- In the 10 page writeup, there should be an abstract, introduction, review of relevant work (with positioning of this paper), main contributions with simplified proofs, etc. Page number 9 should be devoted completely to your own ideas on how the paper can be non-trivially extended/enhanced and to any other creative new directions. Page number 10 should have at least 20 key references with complete details. **(10 marks)**.
- May 20, 2021: Submit a 15 minute video presentation with 15 slides and upload to OneDrive. I will indicate the details later. **(10 marks)**
- **Additional Bonus Marks:** Please note that you can get up to 10 additional bonus marks if you extend this work in a novel way and you are able to get some preliminary results. This could be written up in any number of pages in an appendix of the 10 page writeup.
- As soon as the 2 page writeups, 10 page writeups, slides, and video presentations are uploaded, they will all be made available to all of you, so you can get an idea of some of the best recent work in the area.

### List of Papers and List of Students

(Paper  $i$  is assigned to student  $i$  in the list of students that appears after the list of papers).

1. Paul Duetting, Zhe Feng, Harikrishna Narasimhan, David C. Parkes, Sai Srivatsa Ravindranath. Optimal Auctions through Deep Learning, ICML 2019
2. Lukas Graf and Tobias Harks. The Price of Anarchy for Instantaneous Dynamic Equilibria, WINE 2020
3. Will Ma. Revenue-Optimal Deterministic Auctions for Multiple Buyers with Ordinal Preferences over Fixed-price Items, WINE 2020
4. Niclas Boehmer and Klaus Heeger. A Fine-Grained View on Stable Many-To-One Matching Problems with Lower and Upper Quotas, WINE 2020.
5. Grant Schoenebeck and Fang-Yi Yu. Two Strongly Truthful Mechanisms for Three Heterogeneous Agents Answering One Question. WINE 2020.
6. Haris Aziz. Simultaneously Achieving Ex-ante and Ex-post Fairness. WINE 2020.
7. Caspar Oesterheld and Vincent Conitzer. Decision Scoring Rules. WINE 2020.
8. Sreenivas Gollapudi, Kostas Kollias and Benjamin Plaut. Almost Envy-free Repeated Matching in Two-sided Markets, WINE 2020.
9. Benjamin Plaut. Optimal Nash Equilibria for Bandwidth Allocation. WINE 2020.
10. Ben Berger, Alon Eden and Michal Feldman. On the Power and Limits of Dynamic Pricing in Combinatorial Markets. WINE 2020.
11. Yiannis Giannakopoulos, Diogo Poças and Alexandros Tsigonias-Dimitriadis. Robust Revenue Maximization Under Minimal Statistical Information. WINE 2020.
12. Devansh Jalota, Qi Qi, Marco Pavone and Yinyu Ye. Markets for Efficient Public Good Allocation with Social Distancing. WINE 2020.
13. Hanrui Zhang. A Generic Truthful Mechanism for Combinatorial Auctions, WINE 2020.

14. Siddharth Barman, Umang Bhaskar and Nisarg Shah. Optimal Bounds on the Price of Fairness for Indivisible Goods. WINE 2020.

15. Daniel Halpern, Ariel Procaccia, Alexandros Psomas and Nisarg Shah. Fair Division with Binary Valuations: One Rule to Rule Them All, WINE 2020.

16. Natalie Collina, Nicole Immorlica, Kevin Leyton-Brown, Brendan Lucier and Neil Newman. Dynamic Weighted Matching with Heterogeneous Arrival and Departure Rates, WINE 2020.

17. Niclas Boehmer and Klaus Heeger. A Fine-Grained View on Stable Many-To-One Matching Problems with Lower and Upper Quotas. WINE 2020.

18. Francisco Benita, Vittorio Bilò, Barnabé Monnot, Georgios Piliouras and Cosimo Vinci. Data-Driven Models of Selfish Routing: Why Price of Anarchy Does Depend on Network Topology. WINE 2020.

19. One Dollar Each Eliminates Envy

Authors: Johannes Brustle, Jack Dippel, Vishnu Narayan, Mashbat Suzuki and Adrian Vetta, EC 2020

20. Efficient Matchmaking in Assignment Games with Application to Online Platforms

Authors: Peng Shi. EC 2020.

21. Quick or Cheap? Breaking Points in Dynamic Markets

Authors: Panayotis Mertikopoulos, Heinrich Nax and Bary Pradelski, EC 2020

22. Optimal Mechanism Design for Single-Minded Agents

Authors: Nikhil Devanur, Kira Goldner, Raghuvansh Saxena, Ariel Schwartzman and Matthew Weinberg, EC 2020

23. Incentive-Compatible Selection Mechanisms for Forests

Authors: Oren Dean, Moshe Tennenholtz and Yakov Babichenko, EC 2020

24. Matching Algorithms for Blood Donation

Authors: Duncan Mcelfresh, Sergey Pupyrev, Christian Kroer, Karthik Sankararaman, John Dickerson, Eric Sodomka, Zack Chauvin and Neil Dexter, EC 2020

25. Proportionality and the Limits of Welfarism

Authors: Dominik Peters and Piotr Skowron, EC 2020

26. Fairness-Efficiency Tradeoffs in Dynamic Fair Division

Authors: David Zeng and Alexandros Psomas, EC 2020

27. Budget-Constrained Incentive Compatibility for Stationary Mechanisms  
Authors: Santiago Balseiro, Anthony Kim, Mohammad Mahdian and Vahab Mirrokni  
EC 2020
28. Data and Incentives  
Authors: Annie Liang and Erik Madsen, EC 2020
29. Driver Surge Pricing  
Authors: Nikhil Garg and Hamid Nazerzadeh, EC 2020
30. The Edgeworth Conjecture with Small Coalitions and Approximate Equilibria in Large Economies  
Authors: Siddharth Barman and Federico Echenique, EC 2020
31. Product Ranking on Online Platforms  
Authors: Mahsa Derakhshan, Negin Golrezaei, Vahideh Manshadi and Vahab Mirrokni, EC 2020
32. Incentivizing Exploration with Selective Data Disclosure  
Authors: Nicole Immorlica, Jieming Mao, Aleksandrs Slivkins and Zhiwei Steven Wu  
EC 2020
33. Adversarial Perturbations of Opinion Dynamics in Networks  
Authors: Jason Gaitonde, Jon Kleinberg and Eva Tardos, EC 2020
34. Stability and Learning in Strategic Queuing Systems  
Authors: Jason Gaitonde and Eva Tardos, EC 2020
35. Incentive Auction Design Alternatives: A Simulation Study  
Authors: Neil Newman, Kevin Leyton-Brown, Paul Milgrom and Ilya Segal, EC 2020
36. Differentially Private Call Auctions and Market Impact  
Authors: Emily Diana, Hadi Elzayn, Michael Kearns, Aaron Roth, Saeed Sharifi-Malvajerdi and Juba Ziani, EC 2020
37. Information Design for Congested Social Services: Optimal Need-Based Persuasion  
Authors: Jerry Anunrojwong, Krishnamurthy Iyer and Vahideh Manshadi, EC 2020
38. Experimental Design in Two-Sided Platforms: An Analysis of Bias  
Authors: Ramesh Johari, Hannah Li and Gabriel Weintraub, EC 2020
39. A Learning Framework for Distribution-Based Game-Theoretic Solution Concepts  
Authors: Tushant Jha and Yair Zick, EC 2020

40. Optimal Communication-Distortion Tradeoff in Voting  
Authors: Debmalya Mandal, Nisarg Shah and David Woodruff, EC 2020
41. EFX Exists for Three Agents  
Authors: Bhaskar Ray Chaudhury, Jugal Garg and Kurt Mehlhorn, EC 2020
42. Fair Cake Division Under Monotone Likelihood Ratios  
Authors: Siddharth Barman and Nidhi Rathi, EC 2020
43. Online Policies for Efficient Volunteer Crowdsourcing  
Authors: Vahideh Manshadi and Scott Rodilitz, EC 2020
44. Learning through the Grapevine: the Impact of Message Mutation, Transmission Failure, and Deliberate Bias  
Authors: Matthew Jackson, Suraj Malladi and David McAdams, EC 2020
45. A Formal Separation Between Strategic and Nonstrategic Behavior  
Authors: James Wright and Kevin Leyton-Brown, EC 2020
46. Online Matching with Stochastic Rewards: Optimal Competitive Ratio via Path Based Formulation  
Authors: Vineet Goyal and Rajan Udwani
47. Simple, Credible, and Approximately-Optimal Auctions  
Authors: Costis Daskalakis, Maxwell Fishelson, Brendan Lucier, Vasilis Syrgkanis and Santhoshini Velusamy, EC 2020
48. Best of Both Worlds: Ex-Ante and Ex-Post Fairness in Resource Allocation  
Authors: Rupert Freeman, Nisarg Shah and Rohit Vaish, EC 2020
49. Portfolio Compression in Financial Networks: Incentives and Systemic Risk  
Authors: Steffen Schuldenzucker and Sven Seuken, EC 2020
50. Pricing for the Stars: Dynamic Pricing in the Presence of Rating Systems  
Authors: Andre Stenzel, Christoph Wolf, and Peter Schmidt, EC 2020
51. Does Quality Improve with Customer Voice? Evidence from the Hotel Industry  
Authors: Uttara Ananthakrishnan, Davide Proserpio, and Siddhartha Sharma, EC 2020
52. Ganesh Ghalme, Amleshwar Kumar, Sujit Gujar, Shweta Jain, and Y. Narahari. Design of Coalition Resistant Credit Score Functions for Online Discussion Forums. AAMAS 2018.

53. Shweta Jain, Sujit Gujar, Satyanath Bhat, Onno Zoeter, and Y. Narahari. A quality assuring, cost-optimal multiarmed bandit mechanism for expert sourcing. Artificial Intelligence, 2018.
54. Swaprava Nath, Tuomas Sandholm: Efficiency and budget balance in general quasi-linear domains. Games and Economic Behavior. 2019.
55. Matchings under Preferences: Strength of Stability and Trade-offs  
Authors: Jiehua Chen, Piotr Skowron and Manuel Sorge, EC 2019
56. Spatio-Temporal Pricing for Ridesharing Platforms  
Authors: Hongyao Ma, Fei Fang and David C. Parkes, EC 2019
57. Truthful Aggregation of Budget Proposals  
Authors: Rupert Freeman, David Pennock, Dominik Peters and Jennifer Wortman Vaughan, EC 2019
58. Envy-freeness up to any item with high Nash welfare: The virtue of donating items  
Authors: Ioannis Caragiannis, Nick Gravin and Xin Huang, EC 2019
59. How Do Classifiers Induce Agents to Invest Effort Strategically?  
Authors: Jon Kleinberg and Manish Raghavan, EC 2019
60. How to Sell a Dataset? Pricing Policies for Data Monetization  
Authors: Sameer Mehta, Milind Dawande, Ganesh Janakiraman and Vijay Mookerjee, EC 2019
61. The Vickrey Auction with a Single Duplicate Bidder Approximates the Optimal Revenue. Authors: Hu Fu, Christopher Liaw and Sikander Randhawa, EC 2019
62. Centralized Admissions for Engineering Colleges in India  
Authors: Surender Baswana, Partha P Chakrabarti, Sharat Chandran, Yash Kanoria and Utkarsh Patange, EC 2019
63. Carpooling and the Economics of Self-Driving Cars  
Authors: Michael Ostrovsky and Michael Schwarz, EC 2019
64. Combinatorial Auctions with Interdependent Valuations: SOS to the Rescue. Alon Eden, Michal Feldman, Amos Fiat, Kira Goldner, and Anna Karlin, EC 2019
65. Credible Mechanisms. Mohammad Akbarpour and Shengwu Li, EC 2019
66. Incentivizing Exploration. Peter Frazier, David Kempe, Jon Kleinberg, and Robert Kleinberg. EC 2019

67. Almost envy-free allocations with connected bundles. Authors: Vittorio Bilò, Ioannis Caragiannis, Michele Flammini, Ayumi Igarashi, Gianpiero Monaco, Dominik Peters, Cosimo Vinci, William S. Zwicker ITCS 2019
68. Equitable Allocations of Indivisible Goods  
Authors: Rupert Freeman, Sujoy Sikdar, Rohit Vaish, Lirong Xia . IJCAI 2019

### **List of Students**

**Taken from the Attendance Report of the Class on March 29, 2021. Auditors are also welcome to do the miniproject.**

1. Umang Bhat
2. Chinmay S I
3. Yash Narayan
4. Shubham Kumar
5. GORANTLA  
SRUTHI
6. Bhushan  
Dhananjay Deo
7. SIMRAN  
JAYKUMAR
8. Ankita Koley
9. Saurabh  
Sushilkumar  
Chavan
10. Pallavi R Naik
11. Hari Govid  
Shrawgi
12. Somya Sangal
13. Hitesh Poply
14. Azal Fatima
15. Aditya Kumar
16. Abhilash  
Mukherjee
17. Shreyas Bhat
18. SRIRAM S
19. Prateek Somani
20. Hariom  
Choudhary
21. Hemanth Kongara
22. Ritik Patidar
23. Aanchal Satpuri

24. Prathamesh  
Gajanan Patil
25. Nancy Agrawal
26. Raj Jha
  
27. Vatan Goyal
28. Sajid Ahamed M A
29. Vishnu Teja Kunde
30. Hemanta  
Makwana
31. Vijayakumar  
Thanelanka
32. Manthan Sharma
33. Debabrata Kumar  
Karan
34. S GAURANG
35. Harishwar Reddy  
Kasireddy
36. Meghnath Singh
37. ADIT VISHNU P M
38. Abhigyan Dutta
39. Saankhya Subrata  
Mondal
40. Rohit Patel
41. Yash Bagdi
42. Rokkam Sandeep  
Reddy
  
43. Banuprasad  
Bathala
44. Omprakash  
Vishwakarma
45. Shaikh Danish  
Mahemood
46. Deepanshu
47. Girish Kumar  
Madugula
48. Rohit Chowdhury
49. Nikita Yadav
50. Darshika Tiwari
51. Hemang Jain
52. DHARANISH R
53. Meghal Sachdev
54. Ankit Sharma (EE)
55. Sowjanya  
Pidathala
  
56. Aman Sachan



- 57. Vijay Kumar Boda
- 58. Nandini Gour
- 59. Pranshul  
Kushwaha
- 60. Shankararama  
Sharma R
- 61. Amit Kumar  
Prajapat
- 62. Ashish Shashikant  
Bokil
  
- 63. Anshul Kumrawat
- 64. Akash A
- 65. Abhinav Jaiswal
  
- 66. Ramarajan R
- 67. PIYUSH BHUWAN  
SATI
- 68. Eklavya Sharma