

Debmalya MANDAL

TITLE: Assistant Professor
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RESEARCH INTERESTS

Computational Social Choice, Algorithmic Fairness, Multi-Agent Systems, Reinforcement Learning.

APPOINTMENTS

- Oct 2023 - Present Assistant Professor at
Dept. of Computer Science
University of Warwick, UK
- Oct 2021 - Sep 2023 Postdoctoral Researcher at
Max Planck Institute for Software Systems
Group: Network Sciences
Mentor: Dr. Goran Radanovic
- Aug 2019 - July 2021 Postdoctoral Fellow at
Data Science Institute
Columbia University in the city of New York, NY, USA
Mentors: Profs. Daniel Hsu and Shipra Agarwal
- Jun 2017 - Aug 2017 Research Intern at
Microsoft Research, Redmond, WA, USA
Mentors: Dr. Jacob LaRiviere and Dr. Matt Taddy
Worked on measuring the causal impact of chatbots on text and call rates of support.microsoft.com

EDUCATION

- Aug 2014 - Jun 2019 PhD in COMPUTER SCIENCE
John A. Paulson School of Engineering and Applied Sciences
Harvard University, Cambridge, MA, USA
Thesis: "Decision Making with Heterogeneous Agents:
Elicitation, Aggregation, and Causal Effects"
Advisor: Prof. David C. Parkes
GPA: 3.9/4.0
- Aug 2011 - Jul 2013 Master of Engineering
Dept. of Computer Science and Automation
Indian Institute of Science, Bangalore, India
Thesis: "Allocation Rules for Multi-Slot Sponsored Search Auctions"
Advisor: Prof. Y. Narahari
GPA: 7.6/8.0 (First Class with Distinction)
- Jul 2007 - Jun 2011 Bachelor of Engineering
Dept. of Computer Science and Technology
Bengal Engineering and Science University, Shibpur, India
GPA: 89% (First Class with Honors)

TEACHING

- Spring 2023 AGENT BASED SYSTEMS (CS 404/924)
University of Warwick
Jointly with Dr. Markus Brill
- Spring 2018 Teaching Fellow for HUMAN AND MACHINE PREDICTIONS, IN SOCIETAL CONTEXT (CS 236)
Harvard University
Received a *Certificate of Distinction in Teaching*
- Spring 2016 Teaching Fellow for ECONOMICS AND COMPUTATION (CS 136)
Harvard University
- Spring 2013 Teaching Assistant for GAME THEORY AND MECHANISM DESIGN (E1 254)
Indian Institute of Science
- Fall 2012 Teaching Assistant for ALGORITHMS AND PROGRAMMING (ESc-101)
Indian Institute of Science

HONORS

- **Certificate of Distinction in Teaching**, Spring 2018, Harvard University.
- **NeurIPS'19 Oral Presentation**, "Efficient and Thrifty Voting by Any Means Necessary", (less than 0.5% of papers).
- Paper invited to the **special issue on selected papers from ACM EC'17**, "Peer Prediction with Heterogeneous Users" (only six accepted papers).
- **Columbia Data Science Institute (DSI) Post-Doctoral Fellowship**, 2019-2021.
- **Top-Reviewer Award for a PC member** (NeurIPS-2019, 2021, 2022, and ICML-2020).

GRANTS

- **Democratic Metaverse: Recovering Truth from Ranking Data**, Amount: \$33,000.
 - Funded by Penn State IST Seed Award.
 - Jointly with Hadi Hosseini.

PUBLICATIONS

Papers in alphabetical order are denoted by ☆.

26. Ben Rank, Stelios Triantafyllou, Debmalya Mandal, and Goran Radanovic. **Performative Reinforcement Learning in Gradually Shifting Environments**. In the 40th International Conference on Uncertainty in Artificial Intelligence (UAI), 2024.
25. Andi Nika, Debmalya Mandal, Adish Singla, and Goran Radanovic. **Corruption-Robust Offline Two-Player Zero-Sum Markov Games**. In the 27th International Conference on Artificial Intelligence and Statistics (AISTATS), 2024.
24. Jiarui Gan, Rupak Majumdar, Debmalya Mandal, and Goran Radanovic. **Sequential Principal-Agent Problems with Communication: Efficient Computation and Learning (Extended Abstract)**. Proc. of the 23rd International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2024.
23. Debmalya Mandal, Stelios Triantafyllou, and Goran Radanovic. **Performative Reinforcement Learning**. In the 40th International Conference on Machine Learning (ICML), 2023.
22. Mohammad Mohammadi, Jonathan Nöther, Debmalya Mandal, Adish Singla, and Goran Radanovic. **Implicit Poisoning Attacks in Two-Agent Reinforcement Learning: Adversarial Policies for Training-Time Attacks**. Proc. of the 22nd International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2023.
21. Debjyoti Kar, Mert Kosan, Debmalya Mandal, Sourav Medya, Arlei Silva, Palash Dey, and Swagato Sanyal. **Representation-Based Individual Fairness in k-Clustering (Extended Abstract)**. Proc. of the 22nd International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2023.

20. Debmalya Mandal, Goran Radanovic, Jiarui Gan, Adish Singla, and Rupak Majumdar. **Online Reinforcement Learning with Uncertain Episode Lengths**. In the 37th AAAI Conference on Artificial Intelligence (AAAI), 2023.
19. Jiarui Gan, Annika Hennes, Rupak Majumdar, Debmalya Mandal, and Goran Radanovic. **Markov Decision Processes with Time-Varying Geometric Discounting**. In the 37th AAAI Conference on Artificial Intelligence (AAAI), 2023. [★]
18. Samuel Deng, Yilin Guo, Daniel Hsu, and Debmalya Mandal. **Learning Tensor Representations for Meta-Learning**. In the 25th International Conference on Artificial Intelligence and Statistics (AISTATS), 2022. [★]
17. Nick Bishop, Hau Chan, Debmalya Mandal, and Long Tran-Thanh. **Sequential Blocked Matching**. In the 36th AAAI Conference on Artificial Intelligence (AAAI), 2022. [★]
16. Debmalya Mandal, Sourav Medya, Brian Uzzi, and Charu Aggarwal. **Meta-Learning with Graph Neural Networks: Methods and Applications**. In the ACM SIGKDD Explorations Newsletter (SIGKDD), 2021.
15. Hadi Hosseini, Debmalya Mandal, Nisarg Shah, and Kevin Shi. **Surprisingly Popular Voting Recovers Rankings, Surprisingly!**. The 30th International Joint Conference on Artificial Intelligence (IJCAI), 2021. [★]
14. Debmalya Mandal, Samuel Deng, Suman Jana, Jeannette M. Wing, and Daniel Hsu. **Ensuring Fairness Beyond the Training Data**. Thirty-Fourth Conference on Neural Information Processing Systems (NeurIPS), 2020.
13. Debmalya Mandal, Nisarg Shah, and David Woodruff. **Optimal Communication-Distortion Tradeoff in Voting**. Twenty-First ACM Conference on Economics and Computation (EC), pp. 795-813, 2020. [★]
12. Debmalya Mandal, Goran Radanovic, and David C. Parkes. **The Effectiveness of Peer Prediction in Long-Term Forecasting**. Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI), pp. 2160-2167, 2020. Selected for **Poster Spotlight**.
11. Debmalya Mandal, Nisarg Shah, and David Woodruff. **Optimal Communication-Distortion Tradeoff in Voting**. Twenty-First ACM Conference on Economics and Computation (EC), pp. 795-813, 2020. [★]
10. Arpit Agarwal, Debmalya Mandal, David C. Parkes, and Nisarg Shah. **Peer Prediction with Heterogeneous Users**. ACM Transactions on Economics and Computation, vol. 8, no. 1, pp. 1-34, 2020. [★]
9. Debmalya Mandal, Ariel Procaccia, Nisarg Shah, and David Woodruff. **Efficient and Thrifty Voting by Any Means Necessary**. Thirty-third Conference on Neural Information Processing Systems (NeurIPS), pp. 7178-7189, 2019, Selected for **Oral Presentation (One of 36 Out of 1428 Accepted Papers)**. [★]
8. Yang Liu, Goran Radanovic, Christos Dimitrakakis, Debmalya Mandal, and David Parkes. **Calibrated Fairness in Bandits**. Fourth Workshop on Fairness, Accountability and Transparency in Machine Learning (FAT/ML), 2017. (Also at the Conference on Digital Experimentation (CODE), 2017)
7. Arpit Agarwal, Debmalya Mandal, David Parkes, and Nisarg Shah. **Peer Prediction with Heterogeneous Users**. Proc. of 18th ACM Conference on Economics and Computation (EC), pp. 81-98, 2017. Invited for **Special Issue on Selected Papers from EC-2017**. [★]
6. Debmalya Mandal, and David Parkes. **Correlated Voting**. Proc. of 25th International Joint Conference on Artificial Intelligence (IJCAI), pp. 366-372, 2016.
5. Arpita Biswas, Shweta Jain, Debmalya Mandal, and Yadati Narahari. **A Truthful Budget Feasible Multi-Armed Bandit Mechanism for Crowdsourcing Time Critical Tasks**. Proc. of the 14th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), pp. 1101-1109, 2015.

4. Arupratan Ray, Debmalya Mandal, and Yadati Narahari. **Profit Maximizing Prior-free Multi-unit Procurement Auctions with Capacitated Sellers (Extended Abstract)**. Proc. of the 14th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), pp. 1753-1754, 2015.
3. Rohith D. Vallam, Priyanka Bhatt, Debmalya Mandal, and Y. Narahari. **A Stackelberg Game Approach for Incentivizing Participation in Online Educational Forums with Heterogeneous Student Population**. Proc. of the 29th AAAI Conference on Artificial Intelligence (AAAI), pp. 1043-1049, 2015.
2. Praphul Chandra, Yadati Narahari, Debmalya Mandal, and Prasenjit Dey. **Novel Mechanisms for Online Crowdsourcing with Unreliable, Strategic Agents**. Proc. of the 29th AAAI Conference on Artificial Intelligence (AAAI), pp. 1256-1262, 2015.
1. Debmalya Mandal, and Yadati Narahari. **A Novel Ex-Post Truthful Mechanism for Multi-Slot Sponsored Search Auctions (Extended Abstract)**. Proc. of the 13th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), pp. 1555-1556, 2014.

WORKING PAPERS (UNDER SUBMISSION)

6. Debmalya Mandal, Andi Nika, Parameswaran Kamalaruban, Adish Singla, Goran Radanovi , **Corruption Robust Offline Reinforcement Learning with Human Feedback**, arXiv preprint arXiv:2402.06734, 2024.
5. Andi Nika, Debmalya Mandal, Parameswaran Kamalaruban, Georgios Tzannetos, Goran Radanovi , Adish Singla. **Reward Model Learning vs. Direct Policy Optimization: A Comparative Analysis of Learning from Human Preferences**, arXiv preprint arXiv:2403.01857, 2024.
4. Nam Tran, The-Anh Ta, Shuqing Shi, Debmalya Mandal, Yali Du, Long Tran-Thanh, **Learning the Expected Core of Strictly Convex Stochastic Cooperative Games**, arXiv preprint arXiv:2402.07067, 2024.
3. Debmalya Mandal, and Jiarui Gan. **Socially Fair Reinforcement Learning**. ArXiv preprint arXiv:2208.12584, 2023.
2. Stelios Triantafylliou, Aleksa Sukovic, Debmalya Mandal, and Goran Radanovic. **Agent Specific Effects: A Causal Effect Propagation Analysis in Multi-Agent MDPs**, ArXiv preprint arXiv:2310.11334, 2023.
1. Ben Rank, Stelios Triantafylliou, Debmalya Mandal, and Goran Radanovic. **Performative Reinforcement Learning in Gradually Shifting Environments**, 2023.

PAPERS AT PEER-REVIEWD WORKSHOPS

2. Debmalya Mandal, and David Parkes. **Weighted Tensor Completion for Time-Series Causal Inference**. (under submission), preliminary version appeared in NeurIPS Workshop on Causal Learning, 2018.
1. Debmalya Mandal, Matthew Leifer, David Parkes, Galen Pickard, and Victor Shnayder. **Peer Prediction with Heterogeneous Tasks**. NIPS Workshop on Crowdsourcing and Machine Learning (CrowdML-NIPS), 2016.

TALKS

12. **AI for Societal Decision-Making**, Department Colloquium, Penn State College of Information Science and Technology, 2024.
11. **AI for Societal Decision-Making**, Department Seminar, University of Warwick, Department of Computer Science, 2023.
10. **Online Reinforcement Learning with Uncertain Episode Lengths**, 37th AAAI Conference on Artificial Intelligence, 2023.
9. **Surprisingly Popular Voting Recovers Rankings, Surprisingly!**, 30th International Joint Conference on Artificial Intelligence, Virtual, Jul-2021.

8. **Ensuring Fairness Beyond the Training Data**, Columbia University Data Science Day, Apr-2021.
7. **Efficient and Thrifty Voting**, Google Research, Mar-2021.
6. **Optimal Communication-Distortion Trade-off in Voting**, 21st ACM Conference on Economics and Computation (EC), Virtual, Jul-2020.
5. **The Effectiveness of Peer Prediction in Long-Term Forecasting**, 34th AAAI Conference on Artificial Intelligence (AAAI), New York, USA, Feb-2020.
4. **Efficient and Thrifty Voting by Any Means Necessary**, 33rd Conference on Neural Information Processing Systems (NeurIPS), Vancouver, Canada, Dec-2019.
3. **Correlated Voting**, 25th International Joint Conference on Artificial Intelligence (IJCAI), New York, July-2016.
2. **Peer Prediction with Heterogeneous Users**, 18th ACM Conference on Economics and Computation (EC), Cambridge, MA, Jun-2017.
1. **Peer Prediction with Heterogeneous Users**, Bayesian Crowd Workshop, Rotterdam, Netherlands, Jul-2017.

SERVICE

- **Area Chair / Senior Program Committee**, NeurIPS 2024.
- **Program Committee / Reviewing**, ICML 2019-2024, NeurIPS 2019-2023 AAAI 2020-2023 IJCAI 2020, 2023, EC 2020, ICLR 2021-2023, AAMAS 2021, 2023 AISTATS 2021, COLT 2021-2024.
- **Journal Reviewing**, Journal of Artificial Intelligence Research (JAIR), Journal of Machine Learning Research (JMLR), Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS), Royal Society Open Science (RSOS).
- **Seminar Coordinator**, EconCS group, Harvard University, Fall 2016 and Spring 2017.

MENTORING EXPERIENCE

- Ben Rank, Research Intern, Max Planck Institute for Software Systems. **Stateful Performative Reinforcement Learning**, Summer 2022.
- Samuel Deng, Masters Student, Columbia University. **Fairness Checking**, Fall 2019.
- Kevin Chen, Undergraduate Student, Harvard University. **Causal Inference for Matching Markets**, Fall 2018.
- Kojin Oshiba, Undergraduate Student, Harvard University. **Robust Counterfactual Fairness**, Spring 2018.
- Matthew Leifer, Undergraduate Student, Harvard University. **Peer Prediction with Heterogeneous Tasks**, Summer 2016.