

AURGHYA MAITI

Ph.D. in Computer Science

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RESEARCH INTERESTS

Causality, Bandits, Reinforcement Learning, Game Theory, Finance: My research focuses on causal reasoning for improved decision-making in multi-agent systems, with potential applications in finance.

ACADEMIC DETAILS

Columbia University

PhD in Computer Science (CGPA: 4.05/4.00)

Sep'22 - May'27

Advisor: Prof. Elias Bareinboim

Indian Institute of Technology Kharagpur

B.Tech. (Hons.) in Computer Science and Engineering

Jul'16 - Jul'20

CGPA: 9.79/10 (Department Rank 2 and Institute Rank 3)

EXPERIENCE

Research Associate, Adobe Research India

Aug'20 - Aug'22

Mentor: Dr. Gaurav Sinha and Dr. Atanu Sinha

- Conducted research in *Causality, Bandits and Reinforcement Learning* along with their potential applications in Business Analytics, Decision Making and Marketing
- Designed algorithms to extract *insights* from large datasets and generate *actionable recommendations*

Undergraduate Research Assistant, CNERG Lab, IIT Kharagpur

Aug'19 - Jul'20

Guide: Prof. Niloy Ganguly and Prof. Sourangshu Bhattacharya

- Explored problems in *Multi-Agent Reinforcement Learning*
- Developed algorithms for *identification of role* and *designing incentives* for the teams in a mixed game

Research Intern, Adobe Research India

May'19 - Jul'19

Mentor: Dr. Gaurav Sinha

- Explored and implemented algorithms for *learning Bayesian Networks* from big data
- Designed and implemented efficient algorithms for the *identification and localization of interventions* in a Causal Bayesian Network

RELEVANT SKILLS

- **Languages and Frameworks:** C, C++, Python, SQL, Git, PyTorch, Scikit-learn, OpenCV
- **Expertise:** Machine Learning, Quantitative Finance, Natural Language Processing, Database Systems

RESEARCH PAPERS

- Maiti, A., Jain, P., Bareinboim, E. **Counterfactual Rationality: A Causal Approach to Game Theory.** *Under Review.* [PDF]
- Maiti, A., Jain, P. **Estimating Causal Effects in Gaussian Linear SCMs with Finite Data.** *ICML 2025 Workshop on Scaling Up Intervention Models.* [PDF]
- Maiti, A., Plecko, D., Bareinboim, E. **Counterfactual Identification Under Monotonicity Constraints.** *The 39th Annual AAAI Conference on Artificial Intelligence (AAAI 2025).* (Oral Presentation) [PDF] [Blog]
- Madhavan, R., Maiti, A., Sinha, G., Barman, S. **Causal Contextual Bandits with Adaptive Context.** *Reinforcement Learning Conference (RLC 2024).* [PDF]

- Sinha, A. R., Chopra, H., **Maiti, A.**, Ganesh, A., Kapoor, S., Myana, S., Mahapatra, S. **The Role of Unattributed Behavior Logs in Predictive User Segmentation.** *32nd ACM International Conference on Information and Knowledge Management (CIKM 2023)*. [PDF]
- Chopra, H., Sinha, A. R., Choudhary, S., Rossi, R. A., Indela, P. K., Parwatala, V. P., Paul, S., **Maiti, A.** **Delivery optimized discovery in behavioral user segmentation under budget constraint.** *32nd ACM International Conference on Information and Knowledge Management (CIKM 2023)*. [PDF]
- **Maiti, A.**, Nair, V., Sinha, G. **A causal bandit approach to learning good atomic interventions in presence of unobserved confounders.** *UAI 2022*. [PDF]
- Koley, P., **Maiti, A.**, Bhattacharya, S., Ganguly, N. **Offsetting Unequal Competition through RL-assisted Incentive Schemes.** *IEEE Transactions on Computational Social Systems*, 2022. [PDF]
- Sinha, G., Chauhan, A., **Maiti, A.**, Poddar, N., Goel, P. (2020). **Dis-entangling Mixture of Interventions on a Causal Bayesian Network Using Aggregate Observations.** *Ninth International Workshop on Statistical Relational AI at the 34th AAAI Conference on Artificial Intelligence (AAAI) 2020*. [PDF]

PATENTS

- Sinha, A. R., Rossi, R. A., Choudhary, S., Chopra, H., Indela, P. K., Parwatala, V. P., Paul, S., Mahapatra, S., **Maiti, A.** **Delivery aware audience segmentation.** *US 2025/0061488 A1*. [PDF]
- Sinha, A. R., **Maiti, A.**, Ganesh, A., Myana, S., Chopra, H., Kapoor, S., Mahapatra, S. **Systems and methods for content customization.** *US 12,206,925 B2*. [PDF]
- Porwal, V., Chauhan, A., **Maiti, A.**, Sinha, G., Pandya, R. S. **Systems for estimating terminal event likelihood.** *US 12,154,042 B2*. [PDF]
- **Maiti, A.**, Burhanuddin, I. A., Sinha, A. R., Mahapatra, S., Du, F. **Systems and methods for indicator identification.** *US 2024/0232702 A1*. [PDF]
- Goel, P., Poddar, N., Sinha, G., Chauhan, A., **Maiti, A.** **Determining feature contributions to data metrics utilizing a causal dependency model.** *US 2024/0061830 A1*. [PDF]
- **Maiti, A.**, Sinha, A. R., Chopra, H., Kapoor, S., Ganesh, A., Myana, S., Mahapatra, S. **Generating segments of users based on unobserved behaviors.** *US 2023/0342799 A1*. [PDF]
- Sinha, A. R., Kilaru, M., Burhanuddin, I. A., Shetty, A., Chakraborty, T., Bansal, R., Chandra, T. S., Du, F., **Maiti, A.**, Mahapatra, S. **Leading indicators and monitor business KPIs and metrics for preemptive action.** *US 11,769,100 B2*. [PDF]
- Sinha, G., **Maiti, A.** **Treatment effect estimation using observational and interventional samples.** *US 2023/0144357 A1*. [PDF]

SCHOLASTIC ACHIEVEMENTS

- Recipient of **Columbia-Dream Sports AI Ph.D. Fellowship**
- Invited speaker at **Adobe Tech Summit 2022**
- Awarded the **Batch of '85 Scholarship** from IIT Kharagpur for academic excellence
- **ACM-ICPC Asia Amritapuri Onsite Regionals (2018)**
- **Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship**, a competitive fellowship awarded by the Department of Science and Technology, Government of India
- **Indian National Physics Olympiad, 2016**; ranked top 1% in National Standard Examination in Physics
- Ranked 6th nationally and **1st in district** in Class X Board Examination (West Bengal Board of Secondary Education) out of nearly 1 million students

VOLUNTARY SERVICES

- **Reviewer:** UAI 2025, AISTATS 2022, CoDS-COMAD 2022
- **Positions of Responsibility:** President, Graduate Organization of Computer Science (GrOCS)
- **Defy Ventures:** Volunteered as a judge for a business pitch competition for incarcerated individuals
- **National Service Scheme (NSS):** Taught underprivileged children in rural India