

# Aditya Karan

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## Education

<b>PhD</b>	<b>University of Illinois at Urbana Champaign</b> , Computer Science Research on human and AI/algorithmic interactions via the lenses of incentives, collective action, data poisoning, and HCI. <ul style="list-style-type: none"><li>• Thesis: Collective "Rage Against the Machine": How Collectives can Improve Outcomes from Algorithmic Systems</li><li>• Advisor: Hari Sundaram</li></ul>	Urbana, IL, USA Aug 2020 – present
<b>MS</b>	<b>Harvard University</b> , Computational Science and Engineering Research on Interpretable Machine Learning <ul style="list-style-type: none"><li>• Thesis: Fair, Interpretable, and Diverse Clustering</li><li>• Advisor: Himabindu (Hima) Lakkaraju</li></ul>	Cambridge, MA, USA Sept 2018 – June 2020
<b>BS</b>	<b>California Institute of Technology (Caltech)</b> , Computer Science and Applied & Computational Mathematics	Pasadena, CA, USA Sept 2012 – June 2016

## Experience

<b>Vijil</b> , Applied Scientist <ul style="list-style-type: none"><li>• Building agentic pipeline to create custom red teaming scenarios for other agents</li><li>• Developed a persona based red teaming leading towards Global Dialogue Challenge 🏆 Honorable Mention</li><li>• Implemented an approximate solution for several large LLM benchmark (DecodingTrust, OpenLLM) to give an accurate estimate of trust of an LLM more efficiently</li></ul>	Remote, USA May 2024 – present
<b>Instacart</b> , Machine Learning PhD Intern <ul style="list-style-type: none"><li>• Initiated and developed a more personalized payment authorization amount per user with \$10MM estimated impact with work resulting in a Pending Patent Application (18/965,877) <i>Using Machine-Learning Model of an Online System for Dynamic Modification of an order authorization buffer.</i></li><li>• Built a generic contextual bandit process to perform automatic feature selection and mining through existing experiments for heterogeneous treatment effects</li></ul>	Remote, USA May 2023 – Aug 2023
<b>Snap Inc.</b> , Applied Research Intern <ul style="list-style-type: none"><li>• Developed a POC on joint user segmentation and retention modeling for subgroup analysis which provided insights on user content preferences that tend to correlate higher retention</li></ul>	Santa Monica, CA USA May 2022 – Aug 2022
<b>Terrafuse (joint with Lawrence Berkeley National Lab)</b> , Intern <ul style="list-style-type: none"><li>• Designed potential markets for commercialization of high resolution wildfire forecasting</li></ul>	Berkeley, CA USA May 2019 – Aug 2019
<b>Papaya</b> , Software Engineering Intern <ul style="list-style-type: none"><li>• Implemented a generic payment tool to automatically make web payments without human intervention</li></ul>	Remote USA June 2020 – Dec 2020
<b>Goldman Sachs</b> , Strategist in Global Liquidity Products <ul style="list-style-type: none"><li>• Modeled forward looking funding requirements as required by Federal Reserve's Comprehensive Capital Analysis and Review process (CCAR) and the consequences to Funds Transfer Pricing (FTP) management.</li><li>• Implemented various aspects of FTP framework to incentive prudent spot and contingent liquidity risk management</li><li>• Systematized calculations of internal liquidity metrics to better align with business incentives</li><li>• Refined repo pricing under various liquidity and funding constraints</li></ul>	New York, NY July 2016 – July 2018

## Select First Author Publications

<b>Sync or Sink: Bounds on Algorithmic Collective Action with Noise and Multiple Groups</b> <b>Aditya Karan</b> , Prabhat Kalle, Nicholas Vincent, Hari Sundaram	Dec 2025
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[arxiv.org/abs/2510.18933](https://arxiv.org/abs/2510.18933) (Workshop on Algorithmic Collective Action at 2025 Conference on Neural Information Processing Systems (NeurIPS '25))

<b>Algorithmic Collective Action with Two Collectives</b> <i>Aditya Karan</i> , Nicholas Vincent, Karrie Karahalios, Hari Sundaram 10.1145/3715275.3732098 (2025 ACM Conference on Fairness, Accountability, and Transparency (FAcCT '25))	June 2025
<b>Oh the Prices You'll See: Designing a Fair Exchange System to Mitigate Personalized Pricing</b> <i>Aditya Karan</i> , Naina Balepur, Hari Sundaram 10.1145/3715275.3732076 (2025 ACM Conference on Fairness, Accountability, and Transparency (FAcCT '25))	June 2025
<b>Your Browsing History May Cost You: A Framework for Discovering Differential Pricing in Non-Transparent Markets</b> <i>Aditya Karan</i> , Naina Balepur, Hari Sundaram 10.1145/3593013.3594038 (2023 ACM Conference on Fairness, Accountability, and Transparency (FAcCT '23))	June 2023

## Select Talks and Posters

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<b>Algorithmic Collective Action with Noise and Multiple Groups</b> Incentives for Collaborative Learning and Data Sharing Workshop at Toyota Technological Institute, Chicago	Aug 2025
<b>Algorithmic Collective Action with Two Collectives</b> ACM Conference on Fairness Accountability and Transparency (FAcCT) 2025	June 2025
<b>Oh the Prices You'll See: Designing a Fair Exchange System to Mitigate Personalized Pricing</b> ACM Conference on Fairness Accountability and Transparency (FAcCT) 2025	June 2025
<b>Your Browsing History May Cost You: A Framework for Discovering Differential Pricing in Non-Transparent Markets</b> ACM Conference on Fairness Accountability and Transparency (FAcCT) 2023	June 2023

## Awards and Recognition

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<b>Collective Intelligence Project Global Dialogue Challenge</b> (Honorable Mention)	2025
<b>Outstanding Teaching Assistant</b>	2025
<b>Computer Science Excellence Fellowship</b>	2020 – 2021

## Skills

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<b>Programming:</b> Python, C, C++, Java, Ocaml, Matlab, Scala, SQL, MongoDB, Slang
<b>Research Skills:</b> Algorithmic Collective Action, AI Alignment, Fair and Safe Machine Learning, AI Safety, LLM Finetuning, LLM Red Teaming, Algorithmic Game Theory, Data Poisoning, Interpretable Machine Learning, Algorithmic Audits, Recommender Systems, Deep Learning, Statistical Reinforcement Learning, Bayesian Inference, Experimental Design, Mobile Robotics, Data Science, Computational Biology
<b>Technical Stacks and Frameworks:</b> PyTorch, PyMC3, GCP (Vertex Agent Builder), AWS, ROS
<b>Other Skills:</b> Financial Modeling, Repo Pricing, Funds Transfer Pricing
<b>Languages:</b> English (Native), Hindi (Intermediate/Heritage), Mandarin Chinese (Beginner)

## Select Teaching Experiences

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- Probability and Statistics for Computer Science (Fall 2020-Present)
- Abstraction in Computing (Functional Programming) (Spring 2019/ Spring 2020)
- Economics and Computation (Fall 2019)
- Computer Graphics (Spring 2020)
- Systems Development for Computational Science (Fall 2019)
- Networks and Economics (Spring 2016)
- Computer Science Shop (Fall 2013-Spring 2014)

**Teaching Awards** \_\_\_\_\_

- Teacher Scholar Certificate - UIUC
- Graduate Teaching Certificate - UIUC
- Teacher Ranked as Excellent - UIUC. Every semester from Spring 2021- Spring 2025.

**Academic Service** \_\_\_\_\_

<b>FAcCT Program Committee Member</b>	2025
<b>AIES Program Committee Member</b>	2024 – 2025

**External Involvement** \_\_\_\_\_

<b>Chicago Metropolitan Agency for Planning - Citizen Advisory Board Member</b>	2022 – present
<b>IMSA Alumni Association Board Member</b>	2017 – 2018