Siddharth Prasad

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EMPLOYMENT

Toyota Technological Institute at Chicago (TTIC) — Chicago, IL
Research Assistant Professor — 2025-present

Google Research — Mountain View, CA
Student Researcher — 2022

EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Ph.D. in Computer Science — 2019–2025

- Thesis: *Mechanism Design and Integer Programming in the Data Age*
- Advisors: Maria-Florina Balcan, Tuomas Sandholm; Committee: Gérard Cornuéjols, Craig Boutilier, Peter Cramton

California Institute of Technology — Pasadena, CA
B.S. in Mathematics and Computer Science — 2015–2019

- Awarded Bhansali Family Prize in Computer Science for outstanding undergraduate research

AWARDS, HONORS, AND RESEARCH IMPACT

- Best poster award (honorable mention) at Mixed Integer Programming (MIP) Workshop — 2024
- Invited speaker at Chicago Junior Theorists Workshop — 2024
- Machine Learning Department TA Award (CMU) — 2024
- Inaugural recipient of the Gibbons-Newell Graduate Fellowship in Artificial Intelligence (CMU) — 2023
- CMU nominee (one of four) for the Google PhD fellowship — 2023
- Voted best poster at CMU YinzOR student conference — 2022
- National Science Foundation Graduate Research Fellowship Honorable Mention — 2020
- Bhansali Family Prize in Computer Science (Caltech) — 2019
- Morgan Ward Prize for Outstanding Original Research in Mathematics (Caltech) — 2016

Software impact:

- The new family of lifted cutting planes I invented is currently being tested within state-of-the-art commercial integer programming solvers FICO Xpress and Cardinal Optimizer by the R&D teams at those companies.

Paper awards:

- Oral presentation at NeurIPS 2022 (top 2% of submissions)
- Spotlight paper at NeurIPS 2021 (top 3% of submissions)

Publications

[1] M.-F. Balcan, **S. Prasad**, and T. Sandholm, "Increasing revenue in efficient combinatorial auctions by learning to generate artificial competition", in *AAAI Conference on Artificial Intelligence (AAAI)*, 2025, Acceptance rate 23.4%.

[2] **S. Prasad**, M.-F. Balcan, and T. Sandholm, "Revenue-optimal efficient mechanism design with general type spaces", 2025.

[3] **S. Prasad**, M.-F. Balcan, and T. Sandholm, "Weakest bidder types and new core-selecting combinatorial auctions", 2025.

[4] **S. Prasad**, E. Vitercik, M.-F. Balcan, and T. Sandholm, "New sequence-independent lifting techniques for cutting planes and when they induce facets", in *International Joint Conference on Artificial Intelligence (IJCAI)*, 2025, **Best poster honorable mention** at Mixed Integer Programming Workshop (MIP) 2024.

[5] M.-F. Balcan, **S. Prasad**, and T. Sandholm, "Bicriteria multidimensional mechanism design with side information", in *Conference on Neural Information Processing Systems (NeurIPS)*, 2023, Acceptance rate 26.1%.

[6] **S. Prasad**, M. Mladenov, and C. Boutilier, "Content prompting: Modeling content provider dynamics to improve user welfare in recommender ecosystems", in *RecSys Workshop on Causality, Counterfactuals & Sequential Decision-Making (CONSEQUENCES)*, 2023.

[7] M.-F. Balcan, **S. Prasad**, and T. Sandholm, "Maximizing revenue under market shrinkage and market uncertainty", in *Conference on Neural Information Processing Systems (NeurIPS)*, 2022, Acceptance rate 25.6%.

[8] M.-F. Balcan, **S. Prasad**, T. Sandholm, and E. Vitercik, "Improved sample complexity bounds for branch-and-cut", in *International Conference on Principles and Practice of Constraint Programming (CP)*, 2022, Acceptance rate 51.3%.

[9] M.-F. Balcan, **S. Prasad**, T. Sandholm, and E. Vitercik, "Structural analysis of branch-and-cut and the learnability of Gomory mixed integer cuts", in *Conference on Neural Information Processing Systems (NeurIPS)*, 2022, **Oral presentation**, Acceptance rate 2%.

[10] M.-F. Balcan, **S. Prasad**, and T. Sandholm, "Learning within an instance for designing high-revenue combinatorial auctions", in *International Joint Conference on Artificial Intelligence (IJCAI)*, 2021, Acceptance rate 13.7%.

[11] M.-F. Balcan, **S. Prasad**, T. Sandholm, and E. Vitercik, "Sample complexity of tree search configuration: Cutting planes and beyond", in *Conference on Neural Information Processing Systems (NeurIPS)*, 2021, **Spotlight presentation**, Acceptance rate 3%.

[12] M.-F. Balcan, **S. Prasad**, and T. Sandholm, "Efficient algorithms for learning revenue-maximizing two-part tariffs", in *International Joint Conference on Artificial Intelligence (IJCAI)*, 2020, Acceptance rate 12.6%.

[13] F. Echenique and **S. Prasad**, "Incentive compatible active learning", in *Innovations in Theoretical Computer Science Conference (ITCS)*, 2020, Acceptance rate 42.2%.

[14] Z. Chase and **S. Prasad**, "Learning time dependent choice", in *Innovations in Theoretical Computer Science Conference (ITCS)*, 2019, Acceptance rate 32.7%.

List of publications may be outdated; see my website `sid-prasad.github.io` for an up-to-date list.

TEACHING AND ACADEMIC SERVICE

Guest Lectures

- Mechanism design lectures for the CMU course "Foundations of Learning, Game Theory, and Their Connections"   2023-2025

Teaching Assistant

At CMU:

- Foundations of Learning, Game Theory, and Their Connections (10-422); received departmental TA award   2024
- Graduate Artificial Intelligence (15-780)   2023

At Caltech:

- Algorithmic Economics (CS/Ec 149)   2019
- Graduate Complexity Theory (CS 151)   2019
- Introduction to Algorithms (CS 38)   2017
- Decidability and Tractability (CS 21)   2017
- Transition to Mathematical Proofs (Ma 0)   2017, 2018

Service

- Instructor for OurCS 2022, a research workshop at CMU for undergraduate women in computer science. Led a one-day session on voting theory and mechanism design.
- Mentor for CMU Graduate Application Support Program, a program to help PhD applicants with fewer resources available or from underrepresented backgrounds with their applications. Gave detailed feedback on students' statements of purpose and helped the program organizers improve and refine the review criteria given to mentors.
- Mentor for CMU Undergraduate AI Mentorship program, a program to help undergraduates get acquainted with AI research and graduate school (2022, 2023).
- Organizer of CS PhD mentorship group meetings for first-year PhD students in the computer science department (2022, 2023).
- Member of CMU Computer Science Department PhD admissions committee (2021-2022).
- Organizer of "Seminal theoretical research in economics, AI, and machine learning" reading group (2023).
- Conference and journal reviewing: EC (2019), ICML (2022 - top 10% of reviewers, 2023, 2024), NeurIPS (2022-2025), AAAI (2024-2026), ICLR (2024), Journal of Machine Learning Research, Theory of Computing Systems.
- Program committee: AAAI (2024-2026), CONSEQUENCES Workshop at RecSys (2025).

SELECTED TALKS

- "New Sequence-Independent Lifting Techniques for Cutting Planes and When They Induce Facets"; Google Algorithms Seminar, 2024, CMU CS Theory Lunch, 2024.
- "Structural Analysis of Branch-and-Cut and the Learnability of Gomory Mixed Integer Cuts"; Chicago Junior Theorists Workshop (Invited talk), 2024.
- "Multidimensional Mechanism Design with Side Information"; INFORMS Annual Meeting, 2024.
- "Content Prompting: Modeling Content Provider Dynamics to Improve User Welfare in Recommender Ecosystems"; RecSys Workshop on Causality, Counterfactuals, & Sequential Decision Making (CONSEQUENCES), 2023. (Oral presentation; given to top 7 out of 15 accepted papers.)
- "Bicriteria Multidimensional Mechanism Design with Side Information"; Marketplace Innovation Workshop (MIW), 2023, CMU Artificial Intelligence Seminar Series, 2023.
- "Tree Search Configuration: Cutting Planes and Beyond"; INFORMS Annual Meeting, 2022.

- "Within-Instance Mechanism Design"; INFORMS Annual Meeting, 2022.

- "Learning to Cut in Integer Programming"; CMU CS Theory Lunch, 2022.

- "Learning Across and Within Instances for Mechanism Design"; CMU CS Theory Lunch, 2021.