

Sherry Sarkar

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🌐 <https://sherrysarkar.github.io/>

Mathematics Department
Carnegie Mellon University

Research Interests

Combinatorial optimization and approximation algorithms, particularly in an online or stochastic setting.

Education

- 2020 – pres 📖 **Ph.D., Carnegie Mellon University** Mathematics
completing the Algorithms, Combinatorics, and Optimization (ACO) program
- 2016 – 2020 📖 **B.S., Georgia Tech** Computer Science
with threads Theory and Intelligence, minor in Mathematics

Research Publications

Journal and Conference Publications

- 1 Buchbinder, N., Gupta, A., Hathcock, D., Karlin, A., & **Sarkar, S.** (2024). Maintaining matroid intersections online. *ACM-SIAM Symposium on Discrete Algorithms (SODA)*. Retrieved from [🔗 https://arxiv.org/abs/2309.10214](https://arxiv.org/abs/2309.10214)
- 2 Gupta, A., Lee, E., Li, J., Mucha, M., Newman, H., & **Sarkar, S.** (2022). Matroid-based tsp rounding for half-integral solutions. *Integer Programming and Combinatorial Optimization (IPCO)*. Retrieved from [🔗 https://arxiv.org/abs/2111.09290](https://arxiv.org/abs/2111.09290)
- 3 **Sarkar, S.**, & Soberón, P. (2022). Tolerance for colorful tverberg partitions. *European Journal of Combinatorics*, 103, 103527. [🔗 doi:https://doi.org/10.1016/j.ejc.2022.103527](https://doi.org/10.1016/j.ejc.2022.103527)
- 4 **Sarkar, S.**, Xue, A., & Soberón, P. (2021). Quantitative combinatorial geometry for concave functions. *Journal of Combinatorial Theory, Series A*, 182, 105465. [🔗 doi:10.1016/j.jcta.2021.105465](https://doi.org/10.1016/j.jcta.2021.105465)
- 5 Rubinstein-Salzedo, S., & **Sarkar, S.** (2020). Stability for take-away games. *Journal of Integer Sequences*, 23. Retrieved from [🔗 https://cs.uwaterloo.ca/journals/JIS/VOL23/Rubinstein/rub3.html](https://cs.uwaterloo.ca/journals/JIS/VOL23/Rubinstein/rub3.html)

In Submission




- 1 Braun, A., & **Sarkar, S.** (2023). *The secretary problem with predicted additive gap*. In Submission.
- 2 Hathcock, D., Jin, B., Patton, K., **Sarkar, S.**, & Zlatin, M. (2023). *Online matroid intersection: Submodular water-filling and matroidal welfare maximization*. In Submission. Retrieved from [🔗 https://sherrysarkar.github.io/files/OMI-draft-Nov15.pdf](https://sherrysarkar.github.io/files/OMI-draft-Nov15.pdf)

Surveys



- 1 Kothari, P., & **Sarkar, S.** (2022). Sum-of-squares to approximate knapsack: An exposition of the Karlin-Mathieu-Nguyen analysis of sum-of-squares relaxation of Knapsack. Retrieved from [🔗 https://sherrysarkar.github.io/files/KnapsackSoS.pdf](https://sherrysarkar.github.io/files/KnapsackSoS.pdf)

Employment History








Internships

- Summer 2020  **Data Scientist.** Systems Technology Research
Designed spectral based graph cutting algorithms for unsupervised clustering on a geo-spatial dataset. This work culminated in a package for use in an STR project.
- Summer 2019  **Researcher.** CUNY Discrete Geometry REU
Studied the intersection properties of convex sets, including volumetric extensions of Helly's and probabilistic techniques to prove Tverberg type results.
- Summer 2018  **Researcher.** DIMACS REU
Studied random walks for SAT solvers.

Mentoring

- Summer 2023  **Lead Mentor.** Polymath Jr Research Program
Led a group undergraduate students in an expository research project focused on creating surveys in theory CS.
- Summer 2022  **Graduate Mentor.** Polymath Jr Research Program
Helped mentor undergraduate students in a research project focused on improving upper and lower bounds for small Ramsey numbers. Our work culminated in a computational approach for proving bounds.

Teaching




- Spring 2023  **Teaching Assistant.** CMU: Operations Research
- Fall 2022  **Teaching Assistant.** Euler Circle: Complexity Theory, Abstract Algebra
- Summer 2022  **Teaching Assistant.** New Horizons in Theoretical Computer Science Summer School
- Spring 2021  **Teaching Assistant.** CMU: Concepts of Mathematics
- Summer 2020  **Teaching Assistant.** Euler Circle: Abstract Algebra
- Spring 2020  **Teaching Assistant.** Georgia Tech: Honors Discrete Mathematics
- Fall 2019  **Teaching Assistant.** Georgia Tech: Design and Analysis of Algorithms

Miscellaneous Experience




Skills

Coding  Python, JAVA

Fellowship Awards

- 2020  **CMU Mathematics Departmental Scholarship**
- 2019  **Goldwater Scholar**, CISE.
 **NSF Graduate Research Fellowship Program**, Honorable Mention


Competition Awards


- 2022  **CMU ACM Hackathon: Algorithms with a Purpose**, Second Place
- 2020  **Joint Mathematics Meeting, Outstanding Poster**
- 2018  **Hack GT: Goldman Sachs Data Mining Challenge**, First Place

Miscellaneous Experience (continued)

2017  **Hack GT: FINRA Data Mining Challenge**, First Place

Leadership and Service

2022  **Graduate Program Committee**. A member of a committee dedicated towards creating an engaging and supportive environment for the math department's PhD students.

2023  **Graduate Student and Postdoc Seminar**. Organizer for weekly math department seminar among PhD students and post-docs.

2018 – 2020  **Theory Club**. President of Georgia Tech's undergraduate theoretical CS club.