Daniel **Hathcock**

PhD Candidate in ACO · Carnegie Mellon University

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Education

Carnegie Mellon University — *Pittsburgh, PA*

Ph.D. candidate in Algorithms, Combinatorics, and Optimization (ACO) — *Aug. 2020 - pres.*

- Advised by Professor R. Ravi.
- Research in approximation algorithms and network design.
- NSF Graduate Research Fellowship recipient.

Georgia Institute of Technology — *Atlanta, GA*

B.S. in Computer Science, Minor in Mathematics — *Aug. 2016 - May. 2020*

- Concentrations in Theory and Intelligence.
- Undergraduate Thesis: Enumerating Acyclic Orientations, advised by Professor Prasad Tetali

Research Publications

Improved Approximation Algorithms for Steiner Connectivity Augmentation Problems

with Mik Zlatin — *2023*

Arxiv Preprint: arxiv.org/pdf/2308.08690.pdf

Maintaining Matroid Intersections Online — *SODA'24*

with Niv Buchbinder, Anupam Gupta, Anna R. Karlin, Sherry Sarkar — *2024*

ACM-SIAM Symposium on Discrete Algorithms (SODA24). arxiv.org/pdf/2309.10214.pdf

One Tree to Rule Them All: Poly-Logarithmic Universal Steiner Tree — *FOCS'23*

with Costas Busch, Da Qi Chen, Arnold Filtser, D Ellis Hershkowitz, Rajmohan Rajaraman — *2023*

IEEE Symposium on Foundations of Computer Science (FOCS) 2023. arxiv.org/pdf/2308.01199

Toppleable Permutations, Excedances and Acyclic Orientations — *CT-2(1)*

with Arvind Ayyer, Prasad Tetali — *2022*

Combinatorial Theory, 2(1). doi.org/10.5070/C62156882

On the Hypergraph Connectivity of Skeleta of Polytopes — *DCG'22*

with Josephine Yu — *2022*

Discrete & Computational Geometry (2022), pages 1–4. doi.org/10.1007/s00454-021-00362-9

Professional Experience

Teaching and Mentoring

Fall 2023	**Network Optimization I (47-835)**, Grader	*CMU*
Summer 2023	**Polymath Jr. Research Program**, Graduate Mentor for Covering Grids with Hyperplanes Project	*Polymath Jr.*
Summer 2022	**Polymath Jr. Research Program**, Graduate Mentor for Ramsey Theory Project	*Polymath Jr.*
Summer 2021	**Concepts of Mathematics (21-127)**, Graduate Teaching Assistant	*CMU*
Spring 2021	**Discrete Mathematics (21-228)**, Graduate Teaching Assistant	*CMU*
Fall 2020	**Calculus in 3 Dimension (21-259)**, Graduate Teaching Assistant	*CMU*
Fa. '19 - Sp. '20	**Design & Analysis of Algorithms (CS 3510)**, Teaching Assistant	*Georgia Tech*
Fall 2018	**Intro to Linear Algebra (Math 1553)**, Teaching Assistant	*Georgia Tech*

Internships

Summer 2020	**Tagup, Inc.**, Data Science Intern Developed and implemented machine learning models using JAX and Tensorflow for survival analysis, predicting time-to-event (TTE). Enabled >10x speedup of distributed model training using Dask.	*Somerville, MA*
Summer 2017	**Left Hand Robotics**, Prototyping / Software Engineering Intern Worked on the design and control of a self-driving snow removal robot. Prototyped algorithms for high precision GPS path collection, following, and correction. Used Python and Java being run on a Raspberry Pi.	*Longmont, CO*

Professional Service

2023	**CMU Theory Lunch Seminar**, Co-organizer	*CMU*
2022	**ICALP**, Reviewer	*Paris, FR*
Fa. '19 - Sp. '20	**Georgia Tech Theory CS Club**, Talk Coordinator	*Georgia Tech*

Honors & Awards

Academic

2021	**NSF Graduate Research Fellowship Program**, Awarded (3 years PhD funding)	*NSF*
2020	**Highest Honor**, Georgia Tech institutional honors	*Atlanta, GA*
2016-2020	**Faculty Honors Letter**, 4.0 GPA all semesters at Georgia Tech	*Atlanta, GA*

Professional

2022	**CMU ACM Hackathon: Algorithms with a Purpose**, Second Place	*Pittsburgh, PA*
2021	**CMU ACM Hackathon: Algorithms with a Purpose**, Second Place	*Pittsburgh, PA*
2018	**HackGT: Goldman Sachs Data Mining Challenge**, First Place	*Atlanta, GA*
2017	**HackGT: FINRA Data Mining Challenge**, First Place	*Atlanta, GA*

Misc

Languages	Python/SageMath, Mathematica, Java, C/C++, LaTeX
Skills	TensorFlow, PyTorch, Anaconda (SciPy, NumPy, scikit, Jupyter, etc.), Dask, OpenCV, Git
Service	Math Tutoring at Minadeo Elementary, a Title I school in Pittsburgh, PA (2022)