Kalen Patton

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Research Interests

Optimization under uncertainty, online algorithms, resource allocation, submodular functions, prophet inequalities

Experience

Postdoctoral Researcher, EPFL – Lausanne, Switzerland — Sept 2026 – Present

- Hosted by Ola Svensson in the School of Computer and Communication Sciences.

Education

PhD, Georgia Institute of Technology, Mathematics — Aug 2021 – Aug 2026

- Part of the Algorithms, Combinatorics, and Optimization (ACO) program — GPA: 4.0/4.0
- Advised by Sahil Singla. Graduating in **Aug 2026**.

BS, Georgia Institute of Technology, Mathematics, Computer Science — Aug 2017 – May 2021

- Dual degree, concentrations in machine learning, networks, and discrete math — GPA: 4.0/4.0

Publications

Online Algorithms via Minimax and Posterior Matching — FOCS 2026
Thomas Kesselheim, Marco Molinaro, Kalen Patton, Sahil Singla.
IEEE Symposium on Foundations of Computer Science (FOCS). 2026.

Online Combinatorial Optimization with Graphical Dependencies — STOC 2026
Zhimeng Gao, Evangelia Gergatsouli, Kalen Patton, Sahil Singla.
ACM Symposium on Theory of Computing (STOC). 2026.

Online Resource Allocation with Concave, Diminishing-Returns Objectives — SODA 2026
Kalen Patton.
Best Student Paper.
ACM-SIAM Symposium on Discrete Algorithms (SODA). 2026.

Intergral Online Algorithms for Set Cover and Load Balancing with Convex Objectives — FOCS 2025
Thomas Kesselheim, Marco Molinaro, Kalen Patton, Sahil Singla.
IEEE Symposium on Foundations of Computer Science (FOCS). 2025.

The Online Submodular Assigment Problem — FOCS 2024
Daniel Hathcock, Billy Jin, Kalen Patton, Sherry Sarkar, Michael Zlatin.
IEEE Symposium on Foundations of Computer Science (FOCS). 2024.

Improved Mechanisms and Prophet Inequalities for Graphical Dependencies — EC 2024
Vasilis Livanos, Kalen Patton, Sahil Singla.
The Twenty-Fifth ACM Conference on Economics and Computation (EC). 2024.

Submodular Norms with Applications To Online Facility Location and Stochastic Probing — APPROX 2023
Kalen Patton, Matteo Russo, Sahil Singla.
Approximation Algorithms for Combinatorial Optimization Problems (APPROX/RANDOM). 2023.

Prague Dimension of Random Graphs — 2023
He Guo, Kalen Patton, Lutz Warnke.
Combinatorica 43, 853-884. 2023.

Markov Chain-Based Sampling for Exploring RNA Secondary Structure under the Nearest Neighbor Thermodynamic Model and Extended Applications — 2020
Anna Kirkpatrick, Kalen Patton, Prasad Tetali, Cassie Mitchell.
Mathematical and Computational Applications. 25(4), 67. 2020.

Awards

SODA 2026 Best Student Paper Award. Society for Industrial and Applied Mathematics. 2026
ACO-ARC Research Fellowship. Georgia Tech, Algorithms and Randomness Center. 2024
David L. Brown Fellowship. Georgia Tech, School of Mathematics. 2023
Robert A. Pierotti Memorial Scholarship. Georgia Tech, College of Science. 2021
Provost's Academic Excellence Award. Georgia Tech, College of Science. 2021
Provost's Academic Excellence Award. Georgia Tech, College of Computing. 2021

Work Experience

Student Researcher, Google – Mountain View, CA May 2026 – Aug 2026
- Worked on the Market Algorithms team to prove theoretical results for Waymo pricing schemes.

Software Engineer Intern, Expanse (acquired by Palo Alto Networks) – Atlanta, GA May 2020 – July 2020
- Designed efficient algorithms and software for transferring large datasets between web APIs.
- Worked in Python with use of Docker and cron scheduling.

Technical Skills

Languages: Python, C, C++, Javascript, Java **Software:** Git, Docker, Cron, Jenkins

Teaching Experience

Graduate Courses
- CS 6550 Advanced Algorithms and Uncertainty, Teaching Assistant Spring 2024
- Math 7018 Probabilistic Combinatorics, Grader Spring 2022
- Math 7018 Probabilistic Combinatorics, Grader Spring 2021

Undergraduate Courses
- Math 1554 Linear Algebra, Teaching Assistant Spring 2026
- Math 4108 Abstract Algebra, Grader Spring 2023
- Math 1554 Linear Algebra, Teaching Assistant Fall 2022
- Math 4022 Intro to Graph Theory, Grader Fall 2022
- Math 1554 Linear Algebra, Teaching Assistant Spring 2022
- Math 1553 Linear Algebra, Teaching Assistant Spring 2020
- Math 1553 Linear Algebra, Teaching Assistant Fall 2019
- Math 4221 Stochastic Processes, Grader Fall 2019
- Math 2551 Multivariable Calculus, Teaching Assistant Summer 2019
- Math 1552 Integral Calculus, Teaching Assistant Fall 2018

Academic Service

Volunteering
- Georgia Tech High School Math Day, Volunteer Mar 2026
- Georgia Tech High School Math Day, Volunteer Mar 2025
- Georgia Tech High School Math Day, Organizer Mar 2024
- FOCS 2024, Volunteer and session chair Oct 2024

Conference/Journal Reviewing
- SODA 2024, 2025, 2026
- ICALP 2026
- ITCS 2025
- Mathematical Programming
- STOC 2024