

# SAMI DAVIES

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<i>position</i>	Post-doc at Northwestern CS

## Research Objective

To design algorithms for combinatorial optimization problems that go beyond worst-case analysis in order to (1) develop a more complete theoretical understanding of a problem's difficulty and (2) provide performance guarantees that are representative of what happens in practice.

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## Education

University of Washington	2016–2021	Ph.D. in Mathematics
University of Illinois at Chicago	2015–2016	M.S. in Mathematics
Carnegie Mellon University	2011–2015	B.S. in Mathematics Minor in Economics, College and University Honors

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## Publications

In submission	[1] Oct. 2022	Predictive Flows for Faster Ford-Fulkerson Sami Davies, Benjamin Moseley, Sergei Vassilvitskii, Yuyan Wang
In submission	[2] July 2022	Robust Factorizations and Colorings of Tensor Graphs Joshua Brakensiek, Sami Davies
SPAA 2022	[3] Feb. 2022	Balancing Flow Time and Energy Consumption Sami Davies, Samir Khuller, Shirley Zhang
ALT 2022	[4] Sept. 2021	New Lower Bounds on the Total Variation Distance Between Mixtures of Two Gaussians Sami Davies, Arya Mazumdar, Soumyabrata Pal, Cyrus Rashtchian
SODA 2022	[5] July 2021	On the Hardness of Scheduling with Non-Uniform Communication Delays Sami Davies, Janardhan Kulkarni, Thomas Rothvoss, Sai Sandeep, Jakub Tarnawski, Yihao Zhang
ISIT 2021	[6] July 2021	Approximate Trace Reconstruction: Algorithms Sami Davies, Miklós Z. Rácz, Benjamin Schiffer, Cyrus Rashtchian
SODA 2021	[7] July 2020	Scheduling with Communication Delays via LP Hierarchies and Clustering II: Weighted Completion Times on Related Machines Sami Davies, Janardhan Kulkarni, Thomas Rothvoss, Jakub Tarnawski, Yihao Zhang

- [8] April 2020 Scheduling with Communication Delays via LP Hierarchies and Clustering  
FOCS 2020 Sami Davies, Janardhan Kulkarni, Thomas Rothvoss, Jakub Tarnawski, Yihao Zhang
- [9] July 2018 A Tale of Santa Claus, Hypergraphs and Matroids  
SODA 2020 Sami Davies, Thomas Rothvoss, Yihao Zhang
- [10] Jan. 2019 Reconstructing Trees from Traces  
COLT 2019 Sami Davies, Miklós Z. Rácz, Cyrus Rashtchian. Full version in the Annals of Applied Probability 31(6): 2772–2810, 2021
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## Recent Invited Participation and Internships

- Feb. 2023 Dagstuhl Seminar in Scheduling (Upcoming)
- Oct. 2022 EECS Rising Stars Workshop, held at UT Austin in 2022
- June 2022 TCS Women Rising Stars at STOC 2022 Virtual talk on robust tensor factorization
- May 2022 IDEAL Workshop on Algorithms for Massive Data Sets Virtual talk on learning-augmented algorithms
- May 2021 CanaDAM(Canadian Discrete and Algorithmic Mathematics) Virtual talk on scheduling with communication delays
- Summer 2020 Microsoft Research, Redmond Intern Hosted by Janardhan Kulkarni and Jakub Tarnawski in the Algorithms group
- Feb. 2020 Dagstuhl Seminar in Scheduling Talk on the Santa Claus problem
- Feb. 2019 Nebraska Conference for Women in Mathematics Panelist, invited guest at conference at the University of Nebraska–Lincoln
- June 2018 Women in Theory Workshop, held at Harvard in 2018
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## Awards and Fellowships

- 2021-2023 NSF Computing Innovation Fellow  
Awarded funding for a two-year post-doctoral fellowship
- 2020 Tanzi-Egerton Fellow  
Awarded to an outstanding senior graduate student in mathematics at UW
- 2020 Microsoft Research Dissertation Grant  
Awarded to ten graduate students in computer science across the US
- 2017-2019 McKibben and Merner Endowed Fellowship in Mathematics  
Awarded to two mathematics Ph.D. students at UW who were exceptional in their preliminary exams and first-year courses

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## Teaching

I taught the following courses:

<b>Math 107</b>	Math in Society	FEPPS Summer 2018
<b>CSE 311</b>	Foundations of Computing I	UW Spring 2020

I served as a teaching assistant for the following courses:

<b>Math 111</b>	Algebra with Applications	UW Fall 2017
<b>Math 124</b>	Calculus I	UW Winter & Spring 2017
<b>Math 126</b>	Multivariable Calculus	UW Fall 2016
<b>Math 121</b>	Pre-Calculus	UIC Fall 2015 & Spring 2016
<b>21-241</b>	Matrices & Linear Transformations	CMU Spring 2015

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## Service and Outreach

### External Reviewer

SODA 2020, ICALP 2020, *IEEE Transactions on Information Theory*, MFCS 2020, ISAAC 2020, *Operations Research*, PODS 2021, WADS 2021, ICALP 2021, STOC 2022, ICALP 2022, ESA 2022, *Discrete Mathematics*, ISAAC 2022, SODA 2023

*Dec. 2021*

### Co-organizer 2021 Northwestern Junior Theorists Workshop

Co-organized a workshop highlighting rising theoretical computer scientists. <https://theory.cs.northwestern.edu/events/2021-junior-theorists-workshop/>

*2018-2021*

### Washington Directed Reading Program

Mentored for the WDRP, a program that pairs undergraduate students with graduate students for independent reading projects. Helped conceive and write grants for the WDRP in summer 2018.

*2021*

### Mastery Learning Hour

Tutored math for K-12 students. Provided support to students during COVID-19 pandemic.

*2017-2019*

### Freedom Education Project Puget Sound (FEPPS)

Tutored incarcerated women during the fall and winter of 2017. Served as the course co-instructor for Math 107 during the summer of 2018 at the Washington Corrections Center for Women.

*2018*

### Math Circle

Served as an instructor during the spring of 2018.

*2016-2021*

### Association for Women in Math

Served as secretary of the UW student chapter during the 2018-2019 academic year.

November 2, 2022