

Sami Davies

EDUCATION

University of Washington

2016 - 2021

M.S. in Mathematics, 2019

Ph.D. in Mathematics, 2021

University of Illinois at Chicago

2015-2016

M.S. in Mathematics

Carnegie Mellon University

2011-2015

B.S. in Mathematical Sciences, Minor in Economics

College and University Honors

MY RESEARCH IN THREE SENTENCES

I design algorithms for combinatorial optimization problems. My Ph.D. focused on approximation algorithms for classic theory questions (particularly, in scheduling). In my post-doctoral work, I work broadly in beyond-worst-case analysis.

PUBLICATIONS

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

10. Sami Davies, Miklós Z. Rácz, Cyrus Rashtchian. “Reconstructing Trees from Traces,” COLT 2019. Full version to appear in the Annals of Applied Probability
11. Sami Davies, Chenxiao Xue, Carl R. Yerger, “Algorithms for finding knight’s tours on Aztec diamonds,” *Involve, a Journal of Mathematics*, Vol. 10 (2017), No. 5, 721-734.

RECENT INVITED PARTICIPATION AND INTERNSHIPS

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

AWARDS AND FELLOWSHIPS

CI Fellow Northwestern University Awarded funding for a two-year postdoctoral fellowship	2021-2023
Tanzi-Egerton Fellow University of Washington Awarded to an outstanding senior graduate student in mathematics	2020

Microsoft Research Dissertation Grant 2020
Microsoft Research
Awarded to 10 graduate students in computer science across the US

McKibben and Merner Endowed Fellowship in Mathematics 2017-2019
University of Washington
Awarded to two students who were exceptional in their preliminary exams and first year courses

TEACHING

I taught the following courses:

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

I served as a teaching assistant for the following courses:

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

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

Northwestern Junior Theorists Workshop December 2021
Co-organized a workshop that highlighted rising theoretical computer scientists
<https://theory.cs.northwestern.edu/events/2021-junior-theorists-workshop/>

Washington Directed Reading Program 2018-2021
Mentor for the WDRP, which pairs undergraduate students with graduate student mentors for independent reading project. Helped conceive and write grants for the WDRP in summer 2018.

Mastery Learning Hour 2021
Math tutor for K-12 students. Provide support to students remotely during COVID-19 pandemic.

Freedom Education Project Puget Sound (FEPPS) 2017-2019
Tutor during fall and winter of 2017. Course instructor during the summer of 2018 at the Washington Corrections Center for Women.

Math Circle 2018
Instructor spring of 2018.

Association for Women in Math 2016-2021
Member since 2016. Secretary of the UW student chapter 2018-2019 academic year.