CURRICULUM VITAE

Vaidehi Srinivas

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EDUCATION

Ph.D. in Computer Science
Sep. 2021 – current
Advisor: Aravindan Vijayaraghavan
Area: Algorithms, Theoretical Machine Learning
Northwestern University
Evanston, Illinois

Fulbright Visiting Student
Sep. 2020 – May 2021
Host: Christian Schulz
Theory and Application of Algorithms group
University of Vienna
Vienna, Austria

B.S. in Computer Science, minor in German Studies
Aug. 2016 – May 2020
University and college honors
Carnegie Mellon University
Pittsburgh, Pennsylvania

PUBLICATIONS

The Burer-Monteiro SDP method can fail even above the Barvinok-Pataki bound [arXiv]
with Liam O'Carroll and Aravindan Vijayaraghavan,
36th conference of Neural Information Processing Systems (NeurIPS) 2022.
The Burer-Monteiro method is a practical and popular heuristic for solving semidefinite programs (SDPs). We provide a family of instances that have spurious local minima for high rank (so Burer-Monteiro could indeed fail), which justifies the use of beyond-worst-case paradigms like smoothed analysis to obtain guarantees.

Memory Bounds for the Experts Problem [arXiv] [talk]
with David P. Woodruff, Ziyu Xu, and Samson Zhou,
54th Annual ACM Symposium on Theory of Computing (STOC) 2022.
We initiate the study of the online learning with expert advice problem in the streaming (low memory) setting. Our upper and lower bounds give a smooth tradeoff between memory and regret.

Simpler Approximations for the Network Steiner-tree Problem [pdf]
advised by Anupam Gupta,
Undergraduate Honors Thesis 2020.
The 11/6 and 1.55-approximation algorithms given by Zelikovsky ('93) and Robins and Zelikovsky ('05) are classic results in approximation algorithms. They are also notorious for their very technical analyses. We provide a simple modular analysis by reducing to submodular function optimization under knapsack constraints (idea due to Deeparnab Chakrabarty).

TEACHING

TA for CS 212: Mathematical Foundations of Computer Science
Fall 2022
Northwestern University
Peter and Adrienne Barris Outstanding Teaching Assistant Award for Fall 2022

Fulbright English Teaching Assistant
Oct. 2020 – May 2021
Vienna, Austria
I worked in two public secondary schools, in various English classrooms, with middle and high school students. I did some individual speaking practice, some small group activities, and some lectures for the whole class on various topics, from history to art.

TA for 15-451: Algorithms
Spring 2020
Carnegie Mellon University

TA for 15-354: Computational Discrete Math
Fall 2019
Carnegie Mellon University

(Head) TA for 15-251: Great Ideas in Theoretical Computer Science
Spring 2018, Fall 2018, (Head TA) Spring 2019
Carnegie Mellon University
My responsibilities as an undergraduate teaching assistant are described in more detail in the "outreach and leadership" section.

OUTREACH

Books and Breakfast
Jan. 2022 – current
Evanston, Illinois
Books and Breakfast is a before-school academic enrichment program for elementary school students. The students we work with are recommended for the program based on need, and we work with them to do homework, practice reading and math skills, and provide a warm environment to help them feel ready for a day of school. I volunteer as a mentor three days a week.

Math Circles of Chicago
Sep. 2022 – current
Chicago, Illinois
Once every two weeks, I co-teach a class of middle school students from across Chicago. We show them areas of math that they may not see in school. We hope to expose them to problem solving and mathematical thinking, and get them excited about learning more math in the future.

Calico Youth Services
May 2020 – August 2020
Palo Alto, California
Calico Youth Services runs mentoring programs targeted at students from the underserved areas of East Palo Alto and Redwood City, California. I spent the summer of 2020 working to design curriculum, organize events, and write grant applications. I created and ran a one-week summer "onboarding" program for middle school students and adult mentors joining the program. Over the course of the week, we got to know each student, learned about their interests and hobbies, to pair them with suitable mentors for the rest of the year.

FORGE
Aug. 2019 – May 2020
Pittsburgh, Pennsylvania
FORGE is a student organization that works with the Pittsburgh-area refugee community. I volunteered at the "after school club," where we helped elementary-school students with homework. Many of these students did not have anyone at home who could help them with academic work, and some were English language learners.

LEADERSHIP

Northwestern CS PhD Advisory Council
2022-current
Northwestern University
We organize and run events to build academic community among CS PhD students at Northwestern. We assist with planning the visit day for incoming students, student panels, and other events designed to help junior students meet and be mentored by senior students.

IDEAL Student Event Planning
2022-current
Northwestern University
IDEAL (the Institute for Data, Econometrics, Algorithms, and Learning) brings together researchers studying data science from five major Chicago-area research universities. I have been organizing their first student-centered event. In the long term, I hope to create an inter-connected community of data science students from across Chicago.

Undergraduate Teaching Assistant
Jan. 2018 – May 2020
Carnegie Mellon University
In addition to grading, teaching discussion sections, and hosting office hours, I ran a variety of events and programs to make our course more accessible and inclusive. This includes running review sessions, and "conceptual" office hours, which were a venue for students to work together and with TAs (as opposed to homework, which they were expected to do alone). I met individually, weekly, with students who had failed the course before, to make sure they had the strategies and knowledge to pass this time. I also updated the TA hiring process, to broadcast more information, to encourage a larger subset of students to apply, and make the process more inclusive. In the Spring 2019 semester, I was head TA and I helped organize and run a staff of 18 TAs, as well as design homework assignments, exams, update discussion section material, and write rubrics.

Women@SCS and SCS-4-ALL
Jan. 2018 – May 2020
Carnegie Mellon University
We ran outreach programs and organized community events for the computer science department. We ran events targeted at bringing together new students, experienced students, and faculty, including faculty "ask-me-anything" panels, pre-registration advice events, and various seasonal social events. I was a co-president of Women@SCS in 2019-2020 academic year.

INTERNSHIPS

News Engineering Intern at Apple
May 2018 – Aug. 2018
Cupertino, California
I worked on the Apple stocks app, which displays articles from the Apple news system, that are relevant to stocks that the user follows. I did a comparative analysis of their old and new article feed systems. This involved building a program to match articles between systems for comparison and providing feedback to engineering and publisher relations teams that was incorporated into news ranking.

Software Engineering Intern at BlueJeans Network
Jun. 2017 – Aug. 2017
Mountain View, California
I helped build a testing framework for components of the BlueJeans videoconference system. This involved writing unit tests for REST APIs that used Cassandra and MySQL

AWARDS AND FELLOWSHIPS

Fall 2022 Peter and Adrienne Barris Outstanding Teaching Assistant Award
Awarded to one graduate student teaching assistant in the Northwestern Computer Science department each quarter

2021 Todd M. and Ruth Warren Fellowship
Competitive fellowship for Computer Science students at Northwestern University

2020 Fulbright Combined Award for Austria
Award funding one year of combined research and teaching in Vienna, Austria. For research, I was a visiting student at the University of Vienna, Theory and Application of Algorithms group, hosted by Christian Schulz. For teaching, I worked in two public secondary schools in Vienna. The teaching component is described in more detail in the "teaching" section.

2020 Phi Beta Kappa
One of 11 students in my undergraduate class selected for early induction into the Phi Beta Kappa academic honor society.

2020 Andrew Carnegie Society Scholar
One of 40 undergraduate seniors chosen for this award at Carnegie Mellon University. Students are nominated by their department heads based on academics, volunteerism, and involvement in student organizations, athletics, or the arts.