

## CURRICULUM VITAE

**Vaidehi Srinivas**

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## EDUCATION

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### **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

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**The Burer-Monteiro SDP method can fail even above the Barvinok-Pataki bound** [\[arXiv\]](#)

*with Liam O’Carroll and Aravindan Vijayaraghavan,*

[36<sup>th</sup> 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,*

[54<sup>th</sup> 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).

## **AWARDS AND FELLOWSHIPS**

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### **2023 Northwestern University Presidential Fellowship**

The Presidential Fellowship is funded by the President of the University and awarded by The Graduate School. This highly competitive award is the most prestigious fellowship awarded by Northwestern. All recipients become members of the Northwestern Society of Fellows.

### **2022-2023 Northwestern University Computer Science Department PhD Student Research Award**

Awarded to one PhD student in the Northwestern Computer Science department each academic year

### **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.

## **INTERNSHIPS**

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### **IDEAL Summer Exchange Program**

*June 2023 – Sep. 2023*

*Toyota Technological Institute (TTIC), Chicago, Illinois*

Research intern hosted by Avrim Blum at TTIC, and funded by the Institute for Data, Econometrics, Algorithms, and Learning

### **News Engineering Intern at Apple**

*May 2018 – Aug. 2018*

*Cupertino, California*

### **Software Engineering Intern at BlueJeans Network**

*Jun. 2017 – Aug. 2017*

*Mountain View, California*

## **TEACHING**

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### **TA for CS 396/496: Foundations of Quantum Computing and Quantum Information**

*Winter 2024*

*Northwestern University*

**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*

**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**

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**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**

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**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.

**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.