

Vaidehi Srinivas

PERSONAL INFORMATION

Email: vaidehi@u.northwestern.edu

Web: vaidehi8913.github.io

U.S. Citizen

RESEARCH INTERESTS

I am a theoretical computer scientist, and I am interested in the *foundations of machine learning*.

- *Beyond-worst-case learning guarantees*: learning guarantees for worst-case intractable machine learning problems on non-worst-case instances, and analyzing practical methods, like gradient descent, on non-worst-case instances
- *Using ML as a black box*: designing algorithms that use unreliable predictions from a black box ML model to produce provably useful and reliable output

EDUCATION

Northwestern University, Evanston IL, USA

Ph.D, Computer Science, 2021-present

Advisor: Aravindan Vijayaraghavan

University of Vienna, Vienna, Austria

Fulbright Visiting Student, Sep. 2020 - Jun. 2021

Host: Christian Schulz, Theory and Application of Algorithms Group

Carnegie Mellon University, Pittsburgh PA, USA

B. S. in Computer Science, minor in German Studies, May 2020

University and college honors

PUBLICATIONS

Authors are listed **alphabetically** according to the convention in theoretical CS.

- **Online Conformal Prediction with Efficiency Guarantees**,
Vaidehi Srinivas.
ACM-SIAM Symposium on Discrete Algorithms (**SODA**) 2026.
- **Guarantees for Alternating Least Squares for Overparametrized Tensor Decomposition**,
Dionysios Arvanitakis, *Vaidehi Srinivas*, and Aravindan Vijayaraghavan.
39th Conference on Neural Information Processing Systems (**NeurIPS**) 2025.
(Selected as spotlight)
- **Computing High-dimensional Confidence Sets for Arbitrary Distributions**,
Chao Gao, Liren Shan, *Vaidehi Srinivas*, and Aravindan Vijayaraghavan.
38th Conference on Learning Theory (**COLT**) 2025.
- **Volume Optimality in Conformal Prediction with Structured Prediction Sets**,
Chao Gao, Liren Shan, *Vaidehi Srinivas*, and Aravindan Vijayaraghavan.
42nd International Conference on Machine Learning (**ICML**) 2025.
- **Competitive Strategies to use “warm start” algorithms with predictions**,
Avrim Blum and *Vaidehi Srinivas*.
ACM-SIAM Symposium on Discrete Algorithms (**SODA**) 2025.

- **The Predicted-Updates Dynamic Model: Offline, Incremental, and Decremental to Fully Dynamic Transformations**,
Quanquan C. Liu and *Vaidehi Srinivas*.
37th Annual Conference on Learning Theory (**COLT**) 2024.
- **New Tools for Smoothed Analysis: Least Singular Value Bounds for Random Matrices with Dependent Entries**,
Aditya Bhaskara, Eric Evert, *Vaidehi Srinivas*, and Aravindan Vijayaraghavan.
56th Annual ACM Symposium on Theory of Computing (**STOC**) 2024.
- **The Burer-Monteiro SDP method can fail even above the Barvinok-Pataki bound**,
Liam O’Carroll, *Vaidehi Srinivas*, and Aravindan Vijayaraghavan.
36th conference on Neural Information Processing Systems (**NeurIPS**) 2022.
- **Memory Bounds for the Experts Problem**, *Vaidehi Srinivas*,
David P. Woodruff, Ziyu Xu, and Samson Zhou.
54th Annual ACM Symposium on Theory of Computing (**STOC**) 2022.
- **Simpler Approximations for the Network Steiner-tree Problem**,
Vaidehi Srinivas, advised by Anupam Gupta.
Undergraduate Honors Thesis 2020.

HOSTED WORKSHOPS AND TUTORIALS

- **Co-presenter of Minitutorial on Learning-Augmented Algorithms**,
Symposium on Applied and Computational Discrete Algorithms (**ACDA**) 2025,
Montreal, Canada
- **Co-organizer of Workshop on Predictions and Uncertainty**,
Conference on Learning Theory (**COLT**) 2025, Lyon, France

INVITED TALKS

- *The Burer-Monteiro SDP method can fail even above the Barvinok-Pataki bound*,
IDEAL Workshop on Metric Embeddings, High-dimensional Geometry, and Vector Databases, Evanston IL, USA, Nov. 2025
- *Computing High-dimensional Confidence Sets: A Robust Estimation Perspective*,
IDEAL Workshop on Inference in High-Dimensions: Algorithms and Statistics, Evanston IL, USA, Oct. 2025
- *Guarantees for Alternating Least Squares for Overparameterized Tensor Decompositions*,
Optimization Unplugged Workshop, Bernoulli Center of EPFL, Lausanne, Switzerland, Aug. 2025
- *Online Conformal Prediction with Efficiency Guarantees*, IDEAL Annual Meeting, Chicago IL, Jun. 2025
- *Computing High-dimensional Confidence Sets for Arbitrary Distributions*, TRIPODS Annual Meeting, Chicago IL, Dec. 2024
- (poster) *The Predicted-Updates Dynamic Model: Offline, Incremental, and Decremental to Fully Dynamic Transformations*, IDEAL Get Ready for Research Workshop, Chicago IL, Oct. 2024
- *Competitive Strategies to use “warm start” algorithms with predictions*, IDEAL NSF Site Visit, Evanston IL, Sep. 2024
- *Competitive Strategies to use “warm start” algorithms with predictions*, TTIC Workshop on Learning-Augmented Algorithms, Chicago IL, Aug. 2024
- *The Burer-Monteiro SDP method can fail even above the Barvinok-Pataki bound*,
25th Annual Symposium on Mathematical Programming (ISMP), Montréal, Canada, Jul. 2024

- *The Predicted-Updates Dynamic Model: Offline, Incremental, and Decremental to Fully Dynamic Transformations*, Stanford University Theory Lunch, Stanford CA, Mar. 2024
- (poster) *The Predicted-Updates Dynamic Model: Offline, Incremental, and Decremental to Fully Dynamic Transformations*, TRIPODS Annual Meeting, San Diego CA, Feb. 2024
- *Algorithms with Predictions: a Promising Way Forward for Reliable Machine Learning*, McCormick School of Engineering Advisory Council, Evanston IL, Nov. 2023
- *The Predicted-Updates Dynamic Model: Offline, Incremental, and Decremental to Fully Dynamic Transformations*, Google Research, Mountain View CA, Nov. 2023
- *The Burer-Monteiro SDP method can fail even above the Barvinok-Pataki bound*, INFORMS Annual Meeting, Phoenix AZ, Oct. 2023
- *The Burer-Monteiro SDP method can fail even above the Barvinok-Pataki bound*, IDEAL NSF Site Visit, Chicago IL, Aug. 2023
- *The Burer-Monteiro SDP method can fail even above the Barvinok-Pataki bound*, University of Chicago Theory Lunch, Chicago IL, Apr. 2023
- *The Burer-Monteiro SDP method can fail even above the Barvinok-Pataki bound*, Capital Area Theory Seminar at University of Maryland, College Park, Maryland, Apr. 2023

CONFERENCE AND JOURNAL REVIEWS

Served as a (sub)reviewer for conferences: STOC 2023, ICML 2023, FOCS 2023, SODA 2024, ITCS 2024, ICML 2024, STOC 2024, STOC 2025, ICALP 2025, COLT 2025 (junior PC), NeurIPS 2025, SODA 2026, Reliable ML from Unreliable Data Workshop at NeurIPS 2025 (PC), ITCS 2026. Served as a reviewer for journal: SICOMP (2023).

AWARDS AND FELLOWSHIPS

- **MIT EECS Rising Star**, 2025, Boston MA
- **Northwestern University Presidential Fellowship**, Fall 2023-Summer 2025, Evanston IL
- **Northwestern University Computer Science Department PhD Student Research Award**, 2022-2023 Academic Year, Evanston IL
- **Peter and Adrienne Barris Outstanding Teaching Assistant Award**, Fall 2022, Northwestern University CS Department, Evanston IL
- **Todd M. and Ruth Warren Fellowship**, Fall 2021 – Spring 2022, Northwestern University CS Department, Evanston IL
- **Fulbright Combined Award for Austria**, Sep. 2020 – Jun. 2021, Vienna, Austria
- **Andrew Carnegie Society Scholar**, 2020 Graduation Year, Carnegie Mellon University, Pittsburgh PA
- **Phi Beta Kappa**, 2020 Graduation Year, Carnegie Mellon University, Pittsburgh PA

INTERNSHIPS

- **IDEAL Summer Exchange Program**, June 2023 – Sep. 2023, Toyota Technological Institute (TTIC), Chicago, Illinois, Hosted by Avrim Blum at TTIC
- **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

Guest Lectures

- (*Fall 2025*) 31290: Machine Learning for Algorithm Design, Toyota Technological Institute at Chicago
- (*Winter 2024*) CS 396/496: Foundations of Quantum Computing and Quantum Information, Northwestern University
- (*Spring 2024*) CS 262: Mathematical Foundations of CS Part 2: Continuous Mathematics for Computer Science, Northwestern University

Teaching Assistantship

- **CS 396/496: Foundations of Quantum Computing and Quantum Information**, Winter 2024, Northwestern University, Evanston IL
- **CS 212: Mathematical Foundations of Computer Science**, Fall 2022, Northwestern University, Evanston IL
(Peter and Adrienne Barris Outstanding Teaching Assistant Award for Fall 2022)
- **Fulbright English Teaching Assistant**, Oct. 2020 – May 2021, Vienna, Austria
- **15-451: Algorithms**, Spring 2020, Carnegie Mellon University, Pittsburgh, Pennsylvania
- **15-354: Computational Discrete Math**, Fall 2019, Carnegie Mellon University, Pittsburgh, Pennsylvania
- **15-251: Great Ideas in Theoretical Computer Science**, Spring 2018, Fall 2018, (Head TA) Spring 2019, Carnegie Mellon University, Pittsburgh, Pennsylvania

OUTREACH

- **Books and Breakfast**, Jan. 2022 – present, Evanston IL
- **Math Circles of Chicago**, Sep. 2022 – May 2024, Chicago IL
- **Calico Youth Services**, May 2020 – August 2020, Palo Alto CA
- **FORGE (Facilitating Opportunities for Refugee Growth and Empowerment)**, Aug. 2019 – May 2020, Pittsburgh PA

LEADERSHIP

- **Northwestern CS PhD Advisory Council**, 2022 - 2024, Northwestern University, Evanston IL
- **Northwestern CS Theory Seminar Organizer**, Fall 2023, Northwestern University, Evanston IL
- **IDEAL Student Event Planning**, Spring 2022, Northwestern University, Evanston IL
- **Women@SCS and SCS-4-ALL**, Jan. 2018 – May 2020, Carnegie Mellon University, Pittsburgh PA