

Shambhavi Suryanarayanan

ss3472@princeton.edu • 98 Charlton St, Princeton, NJ • 609-302-1672 • <https://orcid.org/0009-0002-1424-7322>

EDUCATION

Princeton University

Ph.D. in Operations Research and Financial Engineering, GPA: 3.91/4

Princeton, New Jersey

Expected May 2026

Indian Institute of Science Education and Research

M.S. and B.S. in Mathematics, GPA: 9.8/10

Best Master's Thesis Award

INSPIRE Scholarship (Awarded by the Government of India)

Pune, India

2016 - 2021

SKILLS

Computer Languages: Proficient in Python and R; experience with Matlab and C++.

WORK EXPERIENCE

Data Science Intern, *Massive Dynamics, LLC*

June 2025 - September 2025

- Developed theoretical models to quantify the market cannibalization of consumer product goods.
- Implemented and incorporated these models to the existing workflow cutting down the runtime by a factor of 20.

RESEARCH EXPERIENCE

Ph.D. Candidate, *Princeton University*

2021 - Present

Dissertation Topic: Robust Algorithms for Low-Rank Tensor Recovery

- Designing and analyzing iterative methods for recovery of low-rank tensors from incomplete database-friendly measurements.
- Presented primary results at MAA Mathfest, SIAM MDS Conference and NSF CompMath Meeting.

WiSDM Collaboration

August, 2023 - Present

- Working with a team of mathematicians to build robust and efficient iterative algorithms for handling large and noisy multi-modal data.
- Our research has been supported by many funding sources including IPAM, SLMATH, AIM and ICERM.

Graduate Researcher, *Indian Institute of Education and Research, Pune*

2020 - 2021

Master's Thesis: Applications of Topology to Data Analysis

- Developed topological techniques to extract features robust to isometric transformations from images.

TEACHING AND LEADERSHIP EXPERIENCE

Assistant in Instruction, *Operations Research and Financial Engineering Department*

2022 - 2024

- Prepared course material and held weekly recitation and discussion hours for 20+ students.
- Courses taught - Networks, Fundamentals of Queueing Theory, Probability and Stochastic Systems and Graduate Probability Theory.

Graduate Student Representative, *Princeton University*

2023 - 2024

- Communicated concerns and requests of the student body with the Dean of the graduate program.

PUBLICATIONS

- **On Trimming Tensor-structured Measurements and Efficient Low-rank**
(by Suryanarayanan S and Rebrova E.) arXiv:2502.02843, 2025.
- **Randomized Kaczmarz methods for t-product tensor linear systems with factorized operators**
(by Castillo A, Haddock J, Hartsock I, Hoyos P, Kassab L, Kryshchenko A, Larripa K, Needell D, Suryanarayanan S, Yacoubou Djima K.) BIT Numerical Mathematics, 2025.
- **Quantile-Based Randomized Kaczmarz for Corrupted Tensor Linear Systems**
(by Castillo A, Haddock J, Hartsock I, Hoyos P, Kassab L, Kryshchenko A, Larripa K, Needell D, Suryanarayanan S, Yacoubou Djima K.) arXiv:2503.18190, 2025.
- **Block Gauss-Seidel methods for t-product tensor regression**
(by Castillo A, Haddock J, Hartsock I, Hoyos P, Kassab L, Kryshchenko A, Larripa K, Needell D, Suryanarayanan S, Yacoubou Djima K.) Numerical Algorithms, 2025.

INVITED TALKS AND POSTER PRESENTATION

- **Poster: Efficient Hard Thresholding Algorithms for Low-Rank Tensor Recovery.**
SIAM Mathematics of Data Science, Seattle *October 2024*
- **Invited Poster: Convergence of Block Gauss-Seidel Methods for Tensor t -linear Systems.**
SIAM Mathematics of Data Science, Seattle *October 2024*
- **Invited Talk: Efficient Adaptive Hard Thresholding for Low-Rank Tensor Recovery.**
MAA Mathfest, Indianapolis *August 2024*
- **Poster: Efficient Adaptive Hard Thresholding for Low-Rank Tensor Recovery.**
NSF CompMath PI Meeting, Seattle *July 2024*
- **Johnson-Lindenstrauss Lemma and its Applications.**
Data Science Seminar, Chennai Mathematical Institute, Chennai, India *August 2023*

CONFERENCES AND SUMMER SCHOOLS ATTENDED

- SLMath - Summer Research in Mathematics, Berkeley *June 2024*
- AIM SQuaREs, Pasadena *February 2024*
- Connecting Higher-Order Statistics and Symmetric Tensor, Providence *January 2024*
- WiSDM : Research Collaboration workshop (IPAM), UCLA, Los Angeles *August 2023*
- Mathematics of Big Data, SLMath - IBM Research Summer school, Almaden *July 2023*
- CAMDA conference, Texas A & M, College Station *May, 2023*
- Visiting Students' Summer Research Programme, Tata Institute of Fundamental Research *2019*
- Madhava Mathematics Nurture Camp, St. Xavier's College, Kolkata *June 2018*
- Vijyoshi Science and Mathematics Camp, Indian Institute of Science, Bangalore *December 2016*

SELECT GRADUATE COURSEWORK

Probability Theory, High Dimensional Probability, Stochastic Calculus, Linear Optimization, Statistical Foundations of Data Science, Convex and Conic Optimization and Advanced Algorithmic Design.