


Joe Suk

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 U.S. Citizen

Employment

Columbia University Statistics Dept

Jan. 2025 – June 2025

Postdoctoral Research Scientist under Prof. Samory Kpotufe working on efficient online outlier detection

Education

Columbia University

2018–2024

PhD in Statistics

Stony Brook University

2014–2018

B.S. in Mathematics

Research Interests

My PhD research studies the statistical theory of machine learning, with an emphasis on sequential-decision making problems (e.g., multi-armed bandits, reinforcement learning) under changing environments. Prior to this, during undergrad, I did research in combinatorics and geometric topology.

Preprints and Publications

1. [Tracking Significant Shifts in Infinite-Armed Bandits](#).
Joe Suk, Jung-hun Kim. *International Conference on Machine Learning (ICML) 2025*.
2. [Adaptive Smooth Nonstationary Bandits](#).
Joe Suk. *SIAM Journal on Mathematics of Data Science (SIMODS)*.
3. [Nonstationary Dueling Bandits with a Weighted Borda Criterion](#)
Joe Suk, Arpit Agarwal. *Transactions on Machine Learning Research (TMLR)* ("Featured Certification").
4. [When Can We Track Significant Preference Shifts in Dueling Bandits?](#)
Joe Suk, Arpit Agarwal. *Advances in Neural Information Processing Systems (NeurIPS) 2023*.
5. [Tracking Most Significant Switches in Nonparametric Contextual Bandits](#)
Joe Suk, Samory Kpotufe. *Advances in Neural Information Processing Systems (NeurIPS) 2023*.
6. [Tracking Most Significant Arm Switches in Bandits](#)
Joe Suk, Samory Kpotufe. *Conference on Learning Theory (COLT) 2022*.
7. [Self-Tuning Bandits over Unknown Covariate Shifts](#)
Joe Suk, Samory Kpotufe. *International Conference on Algorithmic Learning Theory (ALT) 2021*.
8. [Dihedral Sieving Phenomena](#)
Sujit Rao*, Joe Suk*. *Discrete Mathematics*.
9. [Factorizations of \$k\$ -Nonnegative Matrices](#).
Sunita Chepuri*, Neeraja Kulkarni*, Joe Suk*, Ewin Tang*. *Journal of Combinatorics*.

Earlier Research Experience

Data Science Intern at Institute for Pure and Applied Mathematics (IPAM)

Summer 2018

- Developed data science pipeline in MATLAB and Python to model microstructure evolution in 3D printing for HRL Laboratories.

Undergraduate Mathematics Honors Thesis

2017–2018

- Developed algorithm to approximate planar trees using harmonic measure and dessins d'enfant.

University of Minnesota Twin Cities Combinatorics NSF REU

Summer 2017

- Worked on two published research projects in combinatorics and representation theory.

Stony Brook University Geometry/Topology NSF REU

Summer 2016

- Developed algorithm to count the mapping class group orbits of geodesics on the hyperbolic punctured torus.

Talks and Presentations

- (invited speaker) 2025 IMS International Conference on Statistics and Data Science (ICSDS) – Seville, Spain (December 2025).
- International Conference on Machine Learning (ICML) 2025 – Vancouver, CA (July 2025).
- Seoul National University School of Data Science Group – Seoul, Korea (December 2024).
- SUNY Korea Applied Math & Statistics Seminar – virtual (February 2024).
- Columbia Statistics Dept Student Seminar – New York, NY (November 2023).
- Columbia Statistical Machine Learning Symposium – New York, NY (April 2023).
- Conference on Learning Theory – London, UK (July 2022).
- Columbia University Data Science Day Poster Session – New York, NY (April 2022).
- Minghui Yu Memorial Conference at Columbia Statistics Dept – virtual (April 2021).
- International Conference on Algorithmic Learning Theory – virtual (March 2021).
- Joint Mathematics Meetings – San Diego, CA (2018).
- Young Mathematicians Conference – The Ohio State University (2017).
- MathFest – Chicago, IL (2017).
- SUMS (Symposium for Undergraduates in the Mathematical Sciences) – Brown University (2017).
- Joint Mathematics Meetings – Atlanta, Georgia (2017).
- Young Mathematicians Conference – The Ohio State University (2016).
- Summer Geometry/Topology Workshop – Stony Brook University (2016).

Academic Service and Outreach

- Reviewing/Refereeing:
 - Journals: Enumerative Combinatorics and Applications, JRSS-B, TMLR, IEEE Trans. Inf. Theory.
 - Conferences: NeurIPS (2022, 2023 – “Top Reviewers”, 2024), AISTATS 2024, ICML (2023, 2024, 2025), IJCAI 2024, ICLR 2024, COLT (2024, 2025).
- Designed and taught core competency exam [review sessions](#) for Columbia PhD Statistics students in 2021 and 2022.
- Graduate student mentor for [Columbia Summer REU in Mathematical Modeling](#) in 2021 and 2022.
- Teaching Assistant for 20 undergrad/grad courses in statistics and mathematics across Columbia and Stony Brook.

Awards

- DeepMind student travel grant for COLT 2022.
- William Lowell Putnam Math Competition Top 500.
- Kuga-Sah Memorial Award in Mathematics (outstanding junior, senior math undergraduate at Stony Brook University).
- Srivastav, Tucker & Weitzman Scholarship in Applied Mathematics.

Skills

- Programming: Python, Julia, Bash, R.
- Other Technical: SLURM, git, Linux sysadmin (Artix/Arch Linux and Ubuntu), \LaTeX