Joe Suk

joesuk.github.io joesuk Google Scholar j.suk@nyu.edu U.S. Citizen

EMPLOYMENT

New York University Stern School of Business **July 2025 – Present**
Postdoctoral Researcher under Yaqi Duan working on post-training for LLM's.

Columbia University Statistics Department **Jan. 2025 – June 2025**
Postdoctoral Research Scientist under Samory Kpotufe working on efficient online outlier detection.

EDUCATION

Columbia University **2018–2024**
PhD in Statistics (advised by Samory Kpotufe)

Stony Brook University **2014–2018**
B.S. in Mathematics, magna cum laude

• PhD-Level Coursework: Algebraic Geometry, Smooth Manifolds, Riemann Surfaces, Algebraic Topology, Complex Analysis, Real Analysis I-II, Algebra I-II, Algorithms, Numerical Analysis, Machine Learning, Mathematical Statistics.

PREPRINTS AND PUBLICATIONS

1. Optimization Dynamics of RLVR: Gradient Gap and Step Size Scaling
   Joe Suk, Yaqi Duan. *NeurIPS 2025 Workshop on Foundations of Reasoning in Language Models*.
2. An Efficient Variant of One-Class SVM with Lifelong Online Learning Guarantees
   Joe Suk, Samory Kpotufe. *In submission at Journal of Machine Learning Research (JMLR)*.
3. Tracking Significant Shifts in Infinite-Armed Bandits
   Joe Suk, Jung-hun Kim. *International Conference on Machine Learning (ICML) 2025*.
4. Adaptive Smooth Nonstationary Bandits
   Joe Suk. *SIAM Journal on Mathematics of Data Science (SIMODS)*.
5. Nonstationary Dueling Bandits with a Weighted Borda Criterion
   Joe Suk, Arpit Agarwal. *Transactions on Machine Learning Research (TMLR)* ("Featured Certification").
6. When Can We Track Significant Preference Shifts in Dueling Bandits?
   Joe Suk, Arpit Agarwal. *Advances in Neural Information Processing Systems (NeurIPS) 2023*.
7. Tracking Most Significant Switches in Nonparametric Contextual Bandits
   Joe Suk, Samory Kpotufe . *Advances in Neural Information Processing Systems (NeurIPS) 2023*.
8. Tracking Most Significant Arm Switches in Bandits
   Joe Suk, Samory Kpotufe. *Conference on Learning Theory (COLT) 2022*.
9. Self-Tuning Bandits over Unknown Covariate-Shifts
   Joe Suk, Samory Kpotufe. *International Conference on Algorithmic Learning Theory (ALT) 2021*.
10. Dihedral Sieving Phenomena
    $(\alpha - \beta)$ Sujit Rao, Joe Suk. *Discrete Mathematics*.
11. Factorizations of k-Nonnegative Matrices.
    $(\alpha - \beta)$ Sunita Chepuri, Neeraja Kulkarni, Joe Suk, Ewin Tang. *Journal of Combinatorics*.

AWARDS/HONORS

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

ACADEMIC SERVICE AND OUTREACH

- Reviewing/Refereeing (74 papers in total):
  - Journals: JRSS-B, JMLR, TMLR, IEEE Trans. Inf. Theory, Enumerative Combinatorics & Applications.
  - Conferences: NeurIPS ("Top Reviewers" in 2023, 2025), AISTATS, ICML, IJCAI, ICLR, COLT.
- 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.

EARLIER RESEARCH EXPERIENCE

Data Science Intern at Institute for Pure and Applied Mathematics (IPAM) *Summer 2018*

- Developed data science pipeline in MATLAB & Python to model microstructure evolution in 3D printing.

Undergraduate Mathematics Honors Thesis advised by Prof. Chris Bishop *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.

SKILLS

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