Joe Suk

joesuk.github.io joesuk joe.suk@columbia.edu U.S. Citizen

Education

Columbia University **2018–2024**
PhD in Statistics

Stony Brook University **2014–2018**
B.S. in Mathematics

Research Interests

I focus on sequential decision-making (online learning, multi-armed bandits, reinforcement learning), statistical learning theory, and non-parametric statistics. I'm especially interested in questions of adaptivity and robustness in the context of non-stationary environments and transfer learning problems, and how to deal with changing environments in practical problems of interest.

Preprints and Publications

- Adaptive Smooth Nonstationary Bandits. *In preparation, forthcoming preprint*.
- Nonstationary Dueling Bandits with a Generalized Borda Criterion, with Arpit Agarwal. *Preprint*.
- Tracking Most Significant Switches in Nonparametric Contextual Bandits, with Samory Kpotufe . *NeurIPS 2023*.
- When Can We Track Significant Preference Shifts in Dueling Bandits?, with Arpit Agarwal. *NeurIPS 2023*.
- Tracking Most Significant Arm Switches in Bandits, with Samory Kpotufe. *COLT 2022*.
- Self-Tuning Bandits over Unknown Covariate-Shifts, with Samory Kpotufe. *ALT 2021*.
- Dihedral Sieving Phenomena, with Sujit Rao. *Discrete Mathematics*.
- Factorizations of k-Nonnegative Matrices, with Sunita Chepuri, Neeraja Kulkarni, Ewin Tang. *Journal of Combinatorics*.

Earlier Research Experience

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.

Independent Researcher at Stony Brook University *Summer 2015*
- Worked on number theory project proving generalizations of the Gauss congruence for integer matrices.

Academic Service and Outreach

- Academic Reviewing/Refereeing:
  - Journals: Enumerative Combinatorics and Applications, JRSS-B, TMLR, IEEE Trans. Inf. Theory.
  - Conferences: NeurIPS ("Top Reviewers"), AISTATS, ICML, IJCAI, ICLR, COLT.
- Graduate student mentor for Columbia Summer REU in Mathematical Modeling in 2021 and 2022.
- Created and taught review sessions for Columbia PhD Statistics Core Competency Exam in 2021 and 2022.
- Teaching Assistant for over 20 different undergrad/grad courses in statistics and mathematics at Columbia and Stony Brook.

Awards

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

Skills

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