Krish Singal

ksingal@seas.upenn.edu | krishsingal.github.io

EDUCATION

University of Pennsylvania **Philadelphia, PA**

*Ph.D. in Computer Science (*Advised by Sanjeev Khanna and Erik Waingarten) *2024 - 2029*

Research: Sublinear Algorithms for problems in machine learning and high-dimensional geometry

Graduate Coursework Randomized Algorithms, Machine Learning Theory, Convex Optimization, Zero Knowledge Proofs, Algorithms for Massive Data

Columbia University **New York, NY**

B.S. in Computer Science *2024*

GPA: 4.02/4.0 *(Magna Cum Laude)*

Selected CS Coursework Randomized Algorithms, Advanced Algorithms, Machine Learning Theory, Computational Complexity, Algorithms for Massive Data, Quantum Computing, Operating Systems, Distributed Systems

Selected Math Coursework Real Analysis, Abstract Algebra, Probability Theory, Topology

Skills Python, Java, C++, C, Go, Latex

SELECTED WORK EXPERIENCE

Software Engineering Intern *2022*

Apple (CoreMotion) *Cupertino, CA*

- Developed memory efficient machine learning models for human gesture detection

Software Engineering Intern *2021*

Amazon Web Services (Config) *Seattle, WA*

- Built multi-tenant library to track and process real-time resource management metrics

Teaching Assistant *2022-Present*

Columbia University *New York, NY*

- Advanced Algorithms (Spring 2024), Computational Complexity (Fall 2023), Analysis of Algorithms (Fall 2022 + Spring 2023)

University of Pennsylvania *Philadelphia, PA*

- Algorithms for Massive Data (Fall 2025)

SELECTED PUBLICATIONS (Authors are ordered alphabetically by last name unless otherwise noted (*))

1. A Polynomial Space Lower Bound for Diameter Estimation in Dynamic Streams. Sanjeev Khanna, Ashwin Padaki, **Krish Singal**, Erik Waingarten. *Foundations of Computer Science (FOCS) 2025*
2. Separating Single Linkage Clustering from Minimum Spanning Tree in High-Dimensional ℓ_1 and ℓ_2. Alexandr Andoni, **Krish Singal**. In submission to *Symposium on Simplicity in Algorithms (SOSA) 2026*
3. *MC*^{2}: Rigorous and Efficient Directed Greybox Fuzzing*. Abhishek Shah, Dondgdong She, Samanway Sadhu, **Krish Singal**, Peter Coffman, Suman Jana. *ACM Conference on Computer and Communications Security (CCS) 2022.* **Honorable Mention Best Paper Award.**

SELECTED PROJECTS

Chip Firing Interface *2023*

SMALL REU *Williamstown, MA*

- Devised and implemented fast algorithms to simulate chip firing games and compute gonality on finite graphs

TALKS

- (Upcoming) A Polynomial Space Lower Bound for Diameter Estimation in Dynamic Streams (FOCS 2025, UPenn Theory Seminar)
- On the Size and Complexity of Scrambles (Joint Mathematics Meetings 2024, Young Mathematician's Conference 2023)

SERVICE

Mentor *2023*

Columbia Undergraduate Learning Seminar in Theoretical Computer Science *New York, NY*

- Organized and taught seminar on boolean function analysis for undergraduate students

SELECTED HONORS

Jonathan M. Smith Fellowship Awardee *2025*

NSF Graduate Research Fellowship Program Honorable Mention *2024*

Tau Beta Pi Inductee *2024*