

Walter McKelvie

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EDUCATION

Harvard University

Ph.D. in Computer Science

Advised by Salil Vadhan and Sitan Chen.

Cambridge, MA

2024 –

Columbia University

B.S. in Computer Science; GPA: 4.089/4.0

Robotics Club, Chess Club, Ski Team, Theoretical Computer Science Group, Jazz Ensemble

New York, NY

2020 – 2024

WORK EXPERIENCE

Purdue University

Visiting Student Intern

West Lafayette, IN

May 2023 – Aug 2023, Full-time

Research in distribution testing, advised by Paul Valiant. Worked on a few projects, including notably:

- Optimal mean estimation in low moments: attempting to extend previous sample-efficient algorithms for mean estimation for distributions of finite variance, to those with finite $(1 + \epsilon)$ -norm for any $\epsilon > 0$. Research is ongoing.
- Optimal distribution testing: found a general distribution tester which is optimal in its sample complexity up to a $1 + o(1)$ factor of optimal, greatly extending previous results.

Columbia University

Teaching Assistant III

- TA for Computer Science Theory, Complexity Theory, and Intro to Cryptography.

New York, NY

Sep 2022 – Present, Part-time

Columbia Crypto Lab

Research Assistant

Cryptography research advised by Tal Malkin.

- Attended various reading groups, went to TCC 2022, and presented on a paper.
- Completed a blockchain paper aimed at introducing accountability to certain proof-of-stake election protocols, now submitted to Financial Crypto 2024.

New York, NY

Sep 2022 – Present, Part-time

Apple, Inc.

Software Engineer Intern

Summer intern in CoreMotion team in Sensing and Connectivity

- Invented and benchmarked a novel digital signal processing algorithm.
- Data collection framework and real-time implementation using C++.
- Data analysis and algorithm prototyping with NumPy/SciPy and MATLAB.

Cupertino, CA

May 2022 – Aug 2022, Full-time

SELECTED PAPERS

- Miranda Christ, Walter McKelvie, Kevin Choi, Joseph Bonneau, Tal Malkin. *Accountable Secret Leader Election*. Manuscript, 2023. Preprint available on my website.
- Trung Dang, Walter McKelvie, Paul Valiant, and Hongao Wang. *Improving Pearson's chi-squared test: hypothesis testing of distributions - optimally*. Manuscript, 2023. Preprint available on ArXiv.

AWARDS & ACHIEVEMENTS

NSF Graduate Research Fellowship 2024

Theodore R. Bashkow Award 2024. *Presented by Columbia University to a senior in computer science who has excelled in independent projects.*

CRA Outstanding Undergraduate Researcher Award Honorable mention, 2024