Phillip Harris

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Interests

I study analytic number theory at the University of Wisconsin. My advisor is Simon Marshall. I also have experience in finance, software engineering and formal methods.

Education

University of Wisconsin — Madison, WI
Ph.D. in Mathematics — *2019 – Present*

University of Illinois at Urbana-Champaign — Urbana, IL
Bachelor of Science in Mathematics & Computer Science — *2014 – 2018*

Experience

University of Wisconsin — Madison, WI
Research Assistant — *Spring 2021, Spring 2022*
Teaching Assistant — *2019 – 2024*
Taught MATH 240 (Discrete Mathematics) and MATH 221 (Calculus I). Graded MATH 421 (Spivak's Calculus, proof-based). Mentored entering graduate students and undergraduate students considering grad school.

Susquehanna International Group — Bala Cynwyd, PA
Quantitative Research Intern — *Summer 2023*

- Used LightGBM and pandas to develop a modeling pipeline for stock prices on several terabytes of data.
- Took classes on options pricing, machine learning and general finance topics.

Onai — Palo Alto, CA
Contractor — *Summer 2020*

- Developed a formally verified state transition model for distributed computation in Idris. `https://www.onai.com/`

Runtime Verification — Urbana, IL
Haskell Engineer — *2018 – 2019*

- Implemented SMT solver integration, syntax tree transformations, logging and unit tests in Haskell for the $\mathbb{K}$ language compiler: `https://github.com/kframework/kore`.

Clemson University — Clemson, SC
Student Researcher — *Summer 2017*

Under Prof Kevin James, studied the distribution of the trace of Frobenius a_p of CM and non-CM elliptic curves. Work resulted in two papers.

Publications

- *Uniform Bounds for Maximal Flat Periods in Higher Rank*. Harris, Phillip. (In preparation)
- *Random Nilpotent Groups of Maximal Step*. Harris, Phillip. (Accepted, New York Journal of Mathematics) `https://nyjm.albany.edu/j/2022/28-57v.pdf`
- *Average Frobenius Distributions in Short Intervals*. A. Agwu, P. Harris, S. Kannan, K. James, H. Li. (Accepted, Ramanujan Journal)
- *Frobenius Distributions in Short Intervals for CM Elliptic Curves*. A. Agwu, P. Harris, S. Kannan, K. James, H. Li. Journal of Number Theory, Volume 188, 263-280, 2018

Coding

Languages Haskell, C/C++, Java, Rust, Python, Idris, Agda, R, LaTeX, Javascript, CSS.
Tools vim, git, pandas, lightGBM, Mathematica, Nix package manager