Phillip Harris

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Interests

I study analytic number theory at the University of Wisconsin. My advisor is Simon Marshall. I also work in formal methods and programming language theory.

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*
Coursework includes A+ in CS 374 (Algorithms), A/A+ in 10 graduate math courses, including theory of PDE's, functional analysis, 3 courses in combinatorics and number theory topics

William Lowell Putnam Competition: Top 10% nationwide — *2015*

Publications

- *Random Nilpotent Groups of Maximal Step*. Harris, Phillip. (Accepted, New York Journal of Mathematics)
- *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

Talks

- "Integrals of Eigenfunctions over Geodesics" @ UW Grad Analysis Seminar

Experience

University of Wisconsin — Madison, WI
Research Assistant — *Spring 2022*
Teaching Assistant — *2019 – 2021*
– MATH 221 Calculus and Analytic Geometry (Fall 2019, Spring 2020, Spring 2021, Fall 2021)
– MATH 240 Introduction to Discrete Mathematics (Fall 2020)

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, automated theorem proving, and symbolic execution functionality for the new 𝕂 language backend: `https://github.com/kframework/kore`. 𝕂 is a framework for formal verification of programs using rewriting logic semantics. `https://runtimeverification.com/`

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.

Coding

Google Code Jam — *2014*

- Top 1,000 out of 20,000+ contestants
- Used Haskell, C++

Languages Haskell, C/C++, Java, Rust, Python, Idris, Agda, R, LaTeX, Javascript, Nix
Tools Vim, Git, macOS, Linux, Mathematica