Samuel S. Schiavone

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SUMMARY

Ph.D. mathematician with six years of research experience at MIT in computational number theory and a track record of turning theory into working software: algorithms devised and implemented in over ten open-source packages, databases used by tens of thousands of researchers, and AI evaluation and tooling work for a Fortune 500 technology company. Fluent in Python and computer algebra systems; recent data science training.

SKILLS & CERTIFICATIONS

- Programming Languages: Python, PostgreSQL, Magma, SageMath, Julia (OSCAR), PARI/GP, R
- Development & Infrastructure: Git, Docker, GNU Parallel, Flask, Jinja, LLM agent tooling (agent skills, LangChain)
- Data Science & ML: Pandas, NumPy, SciPy, scikit-learn, statsmodels, Matplotlib, Seaborn
- Certifications: The Erdős Institute Data Science Boot Camp (2025) [Link]
- Languages: English (native), French (fluent), Spanish (intermediate)

EDUCATION

Ph.D. in Mathematics, **Dartmouth College** (Hanover, New Hampshire) [Dissertation] **Sep 2019**
M.S. in Mathematics, **The University of Vermont** (Burlington, Vermont) **Dec 2013**
B.A. in Mathematics, magna cum laude, Phi Beta Kappa, **Amherst College** (Amherst, Massachusetts) **May 2010**

EXPERIENCE

Fortune 500 Tech Company, *Mathematical Consultant* (Remote) **Feb 2026 – Aug 2026**

- Advised on the design of AI evaluation benchmarks drawn from thousands of research-level problems in computational number theory; built verification interfaces between computer algebra systems and AI APIs, and ran timing experiments comparing competing computer algebra systems on verification workloads to guide backend selection.
- Developed, using AI-assisted engineering, a software package that turns theoretical results from the number theory literature into practical routines for solving concrete problem instances, producing tens of thousands of verified solutions.
- Adapted the package into a library of tools for AI models, enabling them to perform specialized mathematical computations.

Massachusetts Institute of Technology, *Research Scientist* (Cambridge, Massachusetts) **Sep 2019 – Aug 2025**

- Conducted research in computational arithmetic geometry: devised and implemented algorithms to compute mathematical objects, wrote mathematical proofs, published results in academic articles, and presented them at conferences.
- Aided in the development and maintenance of the L-functions and modular forms database. [lmfdb.org]
- Instructed ~75 undergraduate students in four courses on linear algebra, algebraic geometry, mathematical communication, and Belyi maps.

PROJECTS

LingPredict: Developmental Norms and Second Language Acquisition **Fall 2025**
Erdős Institute Data Science Boot Camp Project (Remote) [Video, Slides, Article, GitHub]

- As part of a team of five, investigated whether the age at which children acquire a word in their native language predicts the difficulty adults have learning it in a second language, by combining Stanford's Wordbank developmental norms with the Duolingo SLAM dataset of 2 million learner responses.
- Led the Wordbank data work: retrieved and consolidated vocabulary and cross-linguistic concept mappings for English and Spanish via the `wordbankr` R package (dplyr, tidyr), and fit logistic acquisition curves for ~1,700 words using SciPy to extract median age of acquisition and growth rate as model features.
- Contributed these features to token-level error classifiers (regularized logistic regression and gradient-boosted trees, scikit-learn); the added features improved AUC and average precision for both models on held-out test data and roughly doubled recall at fixed precision for the gradient boosting model.

Development for the L-functions and modular forms database (LMFDB) **May 2018 – Present**
Full Stack Web Development (Remote) [lmfdb.org, GitHub]

- Contributed to an open-source project to create an accessible repository of data in algebra, geometry, and number theory, used by over 30,000 researchers and educators in math.
- Co-created two sections of the LMFDB: a database of 544,831 finite groups and over 275 million subgroups, and a database of ~1,100 Belyi maps; added data to the backend using Python and PostgreSQL; designed webpages to display the data using Flask, Jinja, and HTML.
- Supervised four undergraduate students in the creation of a Magma and SageMath package to compute additional data.
- Connected these sections to the rest of the LMFDB by linking related objects with Python and SageMath scripts.

PUBLICATIONS

1. Creating a dynamic database of finite groups. *LuCaNT Proceedings, Contemp. Math. 840*. 2026
2. Mumford-type Shimura curves contained in the Torelli locus. *Preprint*. 2025
3. The constructive inverse Galois problem via Hilbert modular forms: realizing the transitive group 17T7. *Preprint*. 2024
4. Equations of genus 4 curves from their theta constants. *Preprint*. 2024
5. A database of basic numerical invariants of Hilbert modular surfaces. *LuCaNT Proceedings, Contemp. Math. 796*. 2024
6. Gluing curves of genus 1 and 2 along their 2-torsion. *Mathematics of Computation*. 2021
7. A database of Belyi maps. *ANTS XIII Proceedings, Open Book Series 2*. 2019
8. On Algebras of Low Rank and on Belyi Maps. *Ph.D. dissertation, Dartmouth College*. 2019
9. Numerical calculation of three-point branched covers of the projective line. *LMS J. Comput. Math.* 2014