Kevin Lui Ph.D.

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: https://kevinlui.org/pages/code
: Seattle, WA

Education

- **University of Washington, Seattle** — Seattle, WA
  Ph.D. in Mathematics specializing in Computational Number Theory under William Stein - 3.75 GPA — *June 2019*
- **University of California, Santa Barbara** — Santa Barbara, CA
  Bachelors in Mathematics - 3.8 GPA — *June 2014*

Programming Skills

- **Fluent in:** Python, Git, Sagemath, Latex, Linux as a desktop/development environment
- **Prior projects in:** SQL, Bash, Zsh, C++, MATLAB, Cython

Experience

- **University of Washington** — Seattle, WA
  Researcher in Computational Number Theory — *Sep. 2014 — Jun. 2019*
  - **Overview**: Thesis research centered around creating and implementing algorithms for computing invariants of modular abelian varieties. I was able to create algorithms for computing certain invariants where existing methods where computationally infeasible or non-existent.
  - **Technical skills used**: Code was written using the Sagemath Python library. Experiments were done using Jupyter notebooks. Tables of related invariants were computed and stored in PostgreSQL databases.
  - **Link to thesis**: https://kevinlui.org/pages/thesis
- **Sagemath Open Source Project** — Online
  Volunteer Developer — *Jun. 2016 — Present*
  - **Overview**: Active contributor and user of Sagemath which is a Python mathematics package, similar to scipy, suitable for research-level number theory computations. See https://www.sagemath.org/
  - **Contribution stats**: Authored 25 tickets, 19 of which has been accepted. Reviewed 10 tickets. Thousands of Python lines added.
  - **Link to code contributions and code reviews**: https://kevinlui.org/pages/code#sagemath
  - **Sage days 87 - workshop/coding spring**: Finished old tickets to improve functionality of elliptic curves.
- **Google Summer of Code - Sagemath** — Online
  Student Developer — *Summer 2016*
  - **Overview**: Implemented algorithms in Python supporting recent research in number theory.
  - **Outcome**: This code has been merged into the master branch https://trac.sagemath.org/ticket/21496 and is the foundation for my Ph.D. thesis work.
- **University of Washington Sage Seminar** — Seattle, WA
  Organizer — *Summer 2019*
  - **Overview**: Mentored a group of math graduate students towards contributing to the Sagemath open source project. We had 8 meetings lasting 1-2 hours.
  - **Role**: Introduced members to the Sagemath codebase. Taught members the Sagemath development process which includes developing in a Linux environment.
  - **Outcome**: Six attendees have made their first open source code contribution!
- **UC Santa Barbara** — Santa Barbara, CA
  Undergraduate Summer Researcher — *Summer 2012*
  - **Overview**: Derived a parametric model for determining a consensus given a group of experts' rankings on a set of alternatives.
  - **Role**: Wrote MATLAB code to solve the LP problem derived in the paper. Worked closely with faculty mentor to develop the model.
  - **Outcome**: Published: https://www.sciencedirect.com/science/article/pii/S0165011413003308

Select Coursework

- **Instructor/TA/Grader**: Linear Algebra, Operation Research, Topology, Calculus, Real Analysis
- **Graduate**: Logic in CS, Game Theory, Real and Complex Analysis, Manifolds, Algebra
- **Undergraduate**: Data Structures and Algorithms, Cryptography, Computer Theorem Proving

Select Projects

- **Links**: https://kevinlui.org/pages/code/
- **caleb**: Python package that helps with Latex citation by automatically retrieving bibliographic information from publicly available online sources. Used travis for CI, pytest for testing, and poetry for dependency management. See https://github.com/kevinywlui/caleb
- **Sagemath – isomorphism testing**: Implemented isomorphism testing of modular abelian varieties into the Sagemath Python library. Currently in the process of being merged. See https://trac.sagemath.org/ticket/28275