Andreas Iseus Hatziiliou

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EDUCATION

- **University of British Columbia** — Vancouver, BC
  Master of Science in Mathematics - Computational Number Theory | GPA 4.0/4.0 — *Sept 2021 - Nov 2023*
- **McGill University** — Montreal, QC
  B.Sc. Honours Mathematics and Computer Science | GPA 3.64/4.0 — *Sept 2018 - May 2021*

EXPERIENCE

- **Full Stack Software Engineer - Savoir-faire Linux** — Aug 2024 - Present
  - Core developer of the Jami GNU project, a fully decentralized communication platform. Worked to improve the robustness of our SIP implementation in C++, making the group audio and video calls more stable and reliable.
  - Integrated front end support for multiple simultaneous calls in group conversation using QML.
  - **Technologies:** SIP, ICE/STUN/TURN, UPnP, GnuTLS, DHT (Distributed Hash Table).
- **Embedded Software Engineer - Savoir-faire Linux** — Jan 2025 - Present
  - Develop board support packages for our clients custom hardware designs. Implement secure boot, and partition encryption using NXP's Cryptographic Acceleration and Assurance Module.
  - Performed threat modeling and security analysis, ensuring the delivered product was compliant with all clients requirements
  - **Technologies:** Yocto Project, High Assurance Boot, AES.
- **Graduate Research Assistant - University of British Columbia** — Sept 2021 - May 2023
  - Finding elliptic curves of high rank and predicting quantities such as $rk(E/\mathbb{Q})$ and Ш using various ML models.
  - Generalized results from my previous paper to coefficients of form $\pm q^{\alpha}$ for $3 < q < 100$ prime using methods of Bennett et al.

SELECTED PUBLICATIONS

- **A quest for 5 dimensional Calabi-Yau Manifolds using Genetic Algorithms**
  Preprint available shortly. — *Feb 2024*
  - Wrote a Genetic Algorithm in C to find reflexive polytopes in 5 dimensions. Used the PALP and EASEA libraries for computation and parallelization across a 3 Petaflop cluster. Made improvements to the Genetic Algorithm proposed by Berglund et al. in order to generate polytopes in a much larger search space.
  - Wrote C code to process a 4TB dataset of weight spaces in order to classify non-isomorphic polytopes in 5d. Implemented parallelization and sorting algorithms which reduces the computation time from years to 10 days.
- **Elliptic curves of prime conductor - an exploration of conjecture, data and bias**
  Masters Thesis — *October 2023*
  - Utilized Andrew Sutherland's C libraries $smalljac$ and $ffpoly$ in order to write and optimize code which sieves through the data of the 400 billion elliptic curves over $\mathbb{Q}$ of prime conductor $p \leq 2 \cdot 10^{13}$ and classifies their ranks.
  - Analyzed whether the data fits the best current heuristics regarding models for invariants such as the rank, the Tate-Shavarevich group, the Selmer groups as well as other invariants such as those from the BSD conjecture.
  - Gave evidence towards previously undetected biases in certain invariants and conjecture as to why they occur.
  - Trained various Machine Learning models on our data set in order to build high accuracy probabilistic classifiers for quantities such as the rank $rk(E/\mathbb{Q})$ and the analytic order of the Sha group Ш .
- **On admissible fourier coefficients of modular forms of weight 2 and 2k+1**
  Published in the Annales mathématiques du Québec — *June 2021*
  - For weight 2 normalized newforms $f(z)$ defined over $\mathbb{Q}$ and trivial residual mod 2 Galois representation we rule out or locate all odd prime values $|\ell| < 100$ of their Fourier coefficients $a(n)$ when n satisfies certain congruences.

TECHNICAL SKILLS & MISCELLANY

- **Programming Languages**: C, C++, Python, QML, LaTeX, JavaScript
- **Tools**: Linux, Sage, MAGMA, Pandas, Tensorflow, PyTorch, Vim, Jenkins, Docker, Yocto
- **Spoken Languages**: English, French, Greek
- **Citizenship**: Canadian, Greek