

Samuel Ruggerio






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EDUCATION

- **University of Illinois Urbana Champaign** August 2023 - Anticipated Graduation 05/28
Ph.D Candidate in Computer Science USA
 - **GPA:** 4.00/4.00 **Advisor:** Sariel Har-Peled
 - **Research Focus:** Theoretical Computer Science; Computational Geometry, Algorithms, Optimization
- **University of Illinois Urbana Champaign** August 2020 - May 2023
B.S. in Computer Science, with Highest Honors USA
 - **GPA:** 3.96/4.00
 - **Senior Thesis:** *A Parallelized Approach to Physically Accurate Lightning Generation*

EXPERIENCE

- **Battelle**  **BATTELLE** May 2024 - August 2024
Vulnerability & Reverse Engineering Research Intern Columbus, Ohio
 - Reverse Engineered Mobile Devices and their respective Bluetooth stack
 - Reverse engineered Bluetooth chipset firmware using Ghidra & Binary Ninja, performed graph & program analysis to determine chipset features.
 - Expanded upon open source tooling ([internalblue](#)) to provide features for fuzzing and automation
- **Amazon Web Services**   May 2022 - August 2022
Software Development Engineering Intern Seattle, Washington
 - Designed & developed a frontend platform to streamline in updating legal entity deployment, using React & Typescript.
 - Reduced deployment time of legal entities, to achieve goal of 91% speedup.
 - Implemented an interactive map to visualize legal entity coverage worldwide, querying the respective entity to serviced countries
- **Ergoseal**   **ERGOSEAL** January 2021 - July 2021
Engineering Intern Carol Stream, Illinois
 - Conducted feasibility reviews for new projects within the Engineering Department.
 - Automated revision control for part files between imports of SOLIDWORKS PDM and GSS
 - Designed scripts that aggregate company success metrics, reducing backlog work by 2 weeks per year

TECHNICAL PROJECTS

- **A CGRA Accelerator with Timesharing for RISC-V Instructions** November 2025
Tools: System Verilog, Synopsys Suite (Design Compiler, VCS, Verdi, Spyglass), Cadence Suite (Innovus, Virtuoso), Calibre 
 - Designed a Course Grained Reconfigurable Array which supports data flow acceleration, while able to insert translated RISC-V operations into the Compute Mesh for reuse and efficiency.
 - The CGRA is based on an Hybrid ADRES Architecture, with support for dynamic routing tables located within each processing element, for configurable parallelism.
 - The chip was successfully taped out on TSMC's 65nm process, supporting up to 500MHz clock speeds and a 32-bit data bus.
- **RISC-V Out-of-Order Processor** Fall 2024
Tools: System Verilog, Verilator, Synopsys Suite 
 - Designed a Harvard Architecture, out-of-order RV32IM processor using explicit register renaming
 - Included several power and area saving optimizations, along with early branch recovery mechanisms

RESEARCH AND PUBLICATIONS

Conference Publications

- **[Optimizing a Model-Agnostic Measure of Graph Counterdeceptiveness via Reattachment](#)**

Appeared in **IEEE CARS 2025** in the AI and Cyber track.

Anakin Dey, **Sam Ruggerio**, Manav Vora, Melkior Ornik

- **[FSM Builder: A Tool for Writing Autograded Finite Automata Questions](#)**

Appeared in **ITiCSE 2024** in the experience reports and tools track

Eliot Wong Robson, **Sam Ruggerio**, Jeff Erickson

- **[Auto-Graded Scaffolding Exercises For Theoretical Computer Science](#)**

Appeared in **ASEE 2023** Annual Conference and Exposition on the Computer Science Education track

Jeff Erickson, Jason Xia, Eliot Wong Robson, Tue Do, Aidan Tzur Glickman, Zhuofan Jia, Eric Jin, Jiwon Lee, Patrick Lin, Steven Pan, **Samuel Ruggerio**, Tomoko Sakurayama, Andrew Yin, Yael Gertner, Brad Solomon

Manuscripts

- **[In Search of Good Neck Cuts](#)**

Fast & real-time algorithms detecting neck-like features on surface meshes and returning corresponding surface loops.

Sam Ruggerio, Sariel Har-Peled

TECHNICAL SKILLS

- **Programming Languages:** C, C++, Python, Java, Verilog/SystemVerilog, Tcl, Objective-C, Javascript, Typescript, Perl
- **Technologies:** LaTeX, PyTorch, CUDA, CAD Tools and EDA Tools: Synopsys Toolchain, Cadence Toolchain

HONORS AND AWARDS

- **Outstanding Teaching Assistant**

University of Illinois Urbana Champaign

Fall 2024



- Awarded to select graduate students in the Computer Science department for outstanding work in teaching and supporting student learning

- Criteria include professor nominations and being ranked Excellent by students on student evaluations

- **Computer Science Gene Golub Fellowship**

University of Illinois Urbana Champaign

Fall 2023



- Fellowship endowed by Gene Golub, awarded to select students in Theory, Optimization, and Numerical Methods

- **Dean's List**

University of Illinois Urbana Champaign

Fall 2020 - Spring 2023



SERVICE & OUTREACH

- **SIGPwny**

Member, Leader

September 2020 - Present



- Student Organization focused on teaching students various principles of cybersecurity
- Designed and conducted 12 interactive lessons discussing binary exploitation and helped organize Capture the Flag events
- Collaborated with WECE and WiCyS on various events to encourage diverse participation in cybersecurity

- **SIGma - Special Interest Group for Math & Algorithms**

Co-Founder

January 2022 - May 2025



- Founded a student organization and lowered the barrier of entry to math & TCS research to undergraduates
- Helped run weekly meetings on various theory topics, invited professors to give talks
- Facilitated connections & internship opportunities between quantitative firms and our members

TEACHING

I have taught, or developed learning material for the following classes:

- **CS 421 Programming Languages & Compilers**
 - Summer 2025, TA⁺
- **CS 374 Introduction to Algorithms & Models of Computation**
 - Spring 2025, TA, ranked *Excellent* by students
 - Fall 2024, TA, ranked *Excellent* by students
 - Spring 2022 - Spring 2023, *Course Developer*
- **CS 473 Algorithms**
 - Spring 2023, *Undergraduate TA*

⁺ *No evaluation was assessed in this semester*