
Education

Ph.D. in Computer Science

Expected Graduation in May 2030 | Purdue University, West Lafayette, IN

- Research Focus: LLMs, Formal Methods, & Programming Languages

B.S. Computer Science and Mathematics | 4.0 GPA

May 2025 | Cleveland State University, Cleveland, OH

- WPT Leadership Award
- Outstanding Mathematics Student Award
- Student Achievement Award (Engineering)

Publications

- [1] G. Averkov, K. von Dichter, S. Richard, and I. Soprunov, "Mixed Volumes of Zonoids and the Absolute Value of the Grassmannian (Extended Abstract)." Accessed: Oct. 16, 2024. [Online]. Available: <http://arxiv.org/abs/2404.02842>
- [2] J. S. Richard, "Hybrid Quantum or Purely Classical? Assessing the Utility of Quantum Feature Embeddings," Aug. 2024, doi: [10.12688/f1000research.154428.1](https://doi.org/10.12688/f1000research.154428.1).
- [3] J. S. Richard, "Making the Transition to Post-Quantum Cryptography," *The Downtown Review*, vol. 9, no. 2, May 2023, [Online]. Available: <https://engagedscholarship.csuohio.edu/tdr/vol9/iss2/4>

Research Experience

Graduate Researcher Program (GRP) Intern — Cyber Security

May 2026 – August 2026 | The Boeing Company, Arlington, VA

- Explored cyber-security and systems-engineering-related research topics in an aerospace setting, focusing on problems that program verification can inform.
- Gained exposure to CHERI, a memory-safety-focused hardware architecture.
- Wrote internal funding proposals for university-led research.

Senior Math / Computer Science Project: "Large Language Model Reasoning and AutoFormalization"

August 2024 – May 2025 | Cleveland State University, Cleveland, OH

Advised by **Dr. Aditi Singh**, **Dr. L. Felipe Martins**, and **Dr. Shawn D. Ryan**

- Created a novel framework for proposition autoformalization
- Built a system integrating Large Language Models (LLMs) with the LEAN 4 Proof Assistant (via tool use), enabling the verification of definitions and proofs generated by the LLMs
- Managed a team of three other Computer Science and Data Science seniors, directing research and engineering efforts.
- Explored the foundations of formal theorem proving and the LEAN 4 proof language.

Mathematics Research Assistant

August 2023 – May 2025 | Cleveland State University, Cleveland, OH

Advised by **Dr. Ivan Soprunov**

- Wrote exploratory and proof-oriented code using SageMath (an extension of Python).
- Reasoned in the context of geometry (2D and 15D), combinatorics, linear algebra, and group theory.
- Refactored research code, improving readability, usability, and performance.

Honors Thesis: "Hybrid Quantum or Purely Classical? Assessing the Utility of Quantum Feature Embeddings."

August 2023 – May 2024 | Cleveland State University, Cleveland, OH

Advised by **Dr. Satish Kumar**

- Critically evaluated a hybrid quantum-classical machine learning technique using cross-validation and extensive hyperparameter tuning.
- Reproduced the model architecture from scratch using PyTorch and PennyLane.
- Published findings concluding that the classical-only models perform just as well as models using the hybrid quantum-classical methodology.

R&D Intern

May 2023 – August 2023 | MIM Software, Beachwood, OH

Advised by **Dr. Soroush Pahlavian**

- Reviewed and presented on current literature.
- Reproduced several methodologies for adapting an open source 2D image segmentation model in order to segment 3D medical scans using publicly available code and data.
- Fine-tuned those models using a proprietary CT scan dataset.
- Summarized findings in a technical report and presented the results to MIM's R&D Team and Chief Science Officer.

Leadership & Teaching Experience

Graduate Teaching Assistant

August 2025 – Present | Purdue University, West Lafayette, IN

- Host lab sessions, guiding students through hardware and software labs
- Grade labs, homework assignments, exams

Computer Peer Teacher (CPT) Coordinator

August 2023 – May 2025 | Cleveland State University, Cleveland, OH

- Managed a team of 8 CPTs, including hiring, training, class assignments, & time sheets
- Improved IT infrastructure and cybersecurity.
- Organized 8 computer science events, coordinated with faculty and peer programs.
- Received the Washkewicz Peer Teacher (WPT) Leadership Award

Computer Peer Teacher (CPT)

October 2022 – August 2023 | Cleveland State University, Cleveland, OH

- Provided 1-on-1 assistance to students learning Python, Java, and C

- Helped organize computer science events.

Peer Math Tutoring

December 2019 – April 2021 | Lakeland Community College, Kirtland, OH

- Tutored other students in the area of mathematics up to and including Calculus 3, both online and in-person.

Additional Technical Experience

Data & DevOps (IT) Intern

May 2025 – August 2025 | The Sherwin-Williams Company, Cleveland, OH

- Worked directly with stakeholders to build and launch a NextJS + Snowflake analytics proof-of-concept serving \$100M customer portfolio
- Set up CI for Snowflake schema codebase
- Proved concept for AI-generated KPI reports
- Deployed/debugged web app & Tekton on Kubernetes
- Set up frontend tracing with Grafana Faro
- Delivered rapid, consistent value

Software Engineering Intern

May 2022 – August 2022 | MIM Software Inc., Beachwood, OH

- Contributed to a 1M+ line code base by implementing UI features and bug fixes.
- Added support for a legacy file format that will allow the company to drop support for older versions of their flagship product.
- Participated in biweekly stand-up meetings as a part of the Agile development process.
- A publicly released co-op report is available upon request.

Software Engineering Intern

July 2020 – December 2021 | Integrated Mill Systems Inc., Willoughby, OH

- Developed a PLC data-logging service for the Raspberry Pi using Python / Bash Scripting, Docker, Rust, and sockets.
- Wrote a data-visualization web app using React and d3.js.

Technical Skills

Programming Languages

- Python (12 years; proficient)
- JavaScript/TypeScript (8 years; proficient)
- Rust (6 years; familiar)
- LEAN 4 (2 years; familiar)
- Java (3 years; familiar)
- C (2 years; familiar)

ML Libraries

- PyTorch (3 years; familiar)
- Scikit-Learn (3 years; familiar)
- NumPy (3 years; familiar)
- Pandas (3 years; familiar)

Tools

- Git (11 years; proficient)
- Linux (6 years; proficient)
- Docker (6 years; proficient)
- Kubernetes (3 months; basic)
- SageMath (1 year; familiar)
- PostgreSQL (2 years; familiar)
- MongoDB (1 year; basic)
- Snowflake Warehouse (3 months; familiar)

Other Honors

- Attendee of the 12th Heidelberg Laureate Forum (September 2025), an international conference for young researchers in Computer Science and Mathematics and laureates in the same fields, including recipients of the ACM A.M. Turing Award and the Fields Medal (among other awards).