

Matt Schwennesen

✉ schwennesen@cs.wisc.edu

✉ mjschwenne@gmail.com

in Matt Schwennesen

🌐 <https://www.schwennesen.org/>

🐙 mjschwenne

Education

- Aug 2023 – **University of Wisconsin – Madison**, Pursuing Ph.D. in Computer Sciences.
- Aug 2023 – Dec 2025 **University of Wisconsin – Madison**, M.S in Computer Sciences
- Aug 2019 – Dec 2022 **Michigan Technological University**, B.Sc. Computer Science
Minor in Mathematical Sciences, GPA: 4.00

Teaching Experience

- Jun 2026 – Aug 2026 **Graduate Student Instructor**, University of Wisconsin – Madison.
CS 400 Programming III
- Jan 2026 – May 2026 **Teaching Assistant**, University of Wisconsin – Madison.
CS 400 Programming III
- Jan 2024 – Dec 2024 **Head Teaching Assistant**, University of Wisconsin — Madison.
CS 400 Programming III
- Aug 2023 – Dec 2023 **Teaching Assistant**, University of Wisconsin — Madison.
CS 400 Programming III
- Aug 2022 – May 2023 **Teaching Assistant**, Michigan Technological University.
CS 3411 Systems Programming
- Jan 2023 – May 2023 **Lab Instructor**, Michigan Technological University.
CS 1121 Introduction to Programming I
- Jan 2021 – Dec 2022 **Learning Center Coach**, Michigan Technological University.




Conferences

- Nov 22 2024 **Midwest Programming Languages Summit**, University of Chicago
- Jun 17–21 2024 **NetSci 2024**, Québec City, Canada.
Presented during *Software Tools for Network Science* tutorial on cross package network analysis.
- Jun 3–13 2024 **Oregon Programming Languages Summer School**, Boston University, Massachusetts.
Types, Semantics and Applications

Research



- Feb 2025 – **Pollux: Verified Updates to Data Descriptor Formats**
 - Currently researching verifiably compatible updates to Protocol Buffer descriptors and JSON messages.
 - Exploring formal definitions for update compatibility and constructing a verified compatibility checker.

Research (continued)




- Aug 2024 – Jan 2025  **Grackle: Proof-Instrumented Marshaling & Unmarshaling.**
Independent Study with Tej Chajed.
- Investigated techniques for automating repetitive Rocq proofs using Goose and Perennial.
 - Implemented a go program generating marshaling and unmarshaling code for protobuf messages and a Rocq proof of correctness.
- May 2022 – Aug 2022  **Locality Sensitive Hashing of Polygons.**
Research Experiences for Undergraduates – Marquette University.
- Researched uses of locality sensitive hashing to approximate nearest neighbor searches over polygons.
 - Implemented a multi-threaded C++ system to perform geometric approximate nearest neighbor searches.
- May 2021 – Aug 2021  **Asymmetric Traveling Salesperson Approximation.**
Google Summer of Code – NetworkX.
- Worked with NetworkX to implement approximate asymmetric traveling salesperson algorithm from original publication.

Research Publications

Conference Proceedings

-  B. A. M. K., S. Puri, A. Soman, **M. Schwennesen**, and S. K. Prasad, “ShapeToVec: Encoding Polygonal Shapes with Extreme Area Variability for Effective Approximate Jaccard Similarity Queries”, in *2025 IEEE International Conference on Big Data (BigData)*, Dec. 2025, pp. 530–539.  DOI: 10.1109/BigData66926.2025.11401899






Skills

- Mathematics  Proof tactics, mechanized proofs, separation logic, programming languages, graph theory, combinatorics, linear optimization, algorithm design, complexity theory
- Programming  Rocq, Go, Python, C, C++, Java, Nix, Haskell, F*, SQL, Lisp, R
- Misc.  Academic research, teaching, \LaTeX typesetting.

Awards and Achievements

-  **Dean’s List**, Michigan Technological University, 7 semesters.

Certificates of Merit in:

-  **Combinatorics & Graph Theory.** Awarded by Michigan Technological University.
-  **Optimization & Graph Algorithms.** Awarded by Michigan Technological University.
-  **Statistical Programming.** Awarded by Michigan Technological University.
-  **Regression Analysis.** Awarded by Michigan Technological University.
-  **Predictive Modeling.** Awarded by Michigan Technological University.