

Matt Schwennesen

 schwennesen@cs.wisc.edu

 <https://www.schwennesen.org/>

 mjschwenne@gmail.com

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Education

Teaching Experience

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|---------------------|---|
| 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

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

Research

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| Feb 2025 – … |  Pollux: Verified Updates to Data Descriptor Formats <ul style="list-style-type: none">• Currently researching verifiably compatible updates to Protocol Buffer descriptors and JSON messages.• Exploring formal definitions for update compatibility and constructing a verified compatibility checker. |
| Aug 2024 – Jan 2025 |  Grackle: Proof-Instrumented Marshaling & Unmarshaling.
Independent Study with Tej Chajed. <ul style="list-style-type: none">• 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. |

Research (continued)

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.
- Learned how to manage GitHub within a large open source project.
- Perform critical analysis of relevant graph theory and computer science research papers.

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, L^AT_EX 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.