Jack Stanek

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Education

Sep 2023 — Current **University of Wisconsin – Madison**
PhD in Computer Sciences (in progress)

Sep 2023 — Dec 2025 **University of Wisconsin – Madison**
MS in Computer Sciences

Sep 2015 — May 2019 **University of Minnesota – Twin Cities**
BS in Computer Science; awarded with distinction
Minors: Mathematics, German

Research Experience

Jan 2025 – Current **Stochastic Summaries and Neurosymbolic Reasoning**
(Under the supervision of Adithya Murali)

- Developing techniques to integrate LLMs with SMT solvers for sound reasoning over open-texture natural-language theories and real-world knowledge
- Designed a probabilistic programming language with guarded recursion and exact inference, and built a program synthesis framework in Rust to learn generative models of tree-like data [1]
- Developed a prototype algorithm to construct diverse models of logical formulas, helping proof engineers uncover cognitive blind spots and construct non-obvious counter-examples in verification workflows

Jan 2024 – May 2024 **Gradual Information Flow Types with Secure Downgrading**
(Under the supervision of Ethan Cecchetti)

- Formalized a core calculus, operational semantics, and type system for a language with gradual information flow labels
- Developed a type system-based mechanism to enforce robust declassification and transparent endorsement to unify flexible non-interference with gradual type systems

Publications

[1] **J. Stanek** and A. Murali, "Stochastic Summaries: Characterizing Structured Datasets Using Probabilistic Programs," Preprint, Oct. 2026. doi: 10.48550/arXiv.2611.01189.

Industry Experience

Feb 2019 – Jul 2023 **Cray, Inc. / Hewlett Packard Enterprise** — *Software Engineer*

- Implemented an end-to-end automated HPC hardware maintenance package in Python which reduced system downtime from days to hours and eliminated human error from repair procedures and diagnostics
- Designed HPC hardware observability features in system administrator-oriented tooling, enabling a system-wide view of hardware state to speed up routine management and diagnostic tasks

Technical Skills

Languages	Python, Rust, C++, Haskell, Java, OCaml
PL Theory	Formal verification, program synthesis, SMT solving, type systems, proof assistants
Machine Learning	PyTorch, NumPy, agentic systems, neurosymbolic reasoning and learning, probabilistic programming, Bayesian reasoning, Monte Carlo methods

Teaching Assistantships

Spring 2025	CS 536: Intro to Compilers
Fall 2024	CS 559: Intro to Computer Graphics
Spring 2024	CS 577: Intro to Algorithms
Fall 2023	CS 559: Intro to Computer Graphics

Conferences and Workshops

Nov 2026	Midwest Programming Languages Summit
Jun 2024	Oregon Programming Languages Summer School

Awards and Honors

May 2017 – May 2019	College of Science and Engineering Dean's List University of Minnesota
May 2015	Robert E. Rice Computer Engineering Scholarship University of Minnesota

Languages

English	Native fluency
German	Moderate proficiency