

Patrick Brophy

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EDUCATION

University of Wisconsin-Madison | Madison, WI

May 2025

Bachelor of Science: Computer Science

- GPA: 3.4
- Relevant Coursework: Intro to Artificial Neural Networks, Introduction to Algorithms, Intro to Machine Organization, Intro to Statistics

University of Cincinnati | Cincinnati, Ohio

August 2021 – June 2022

Bachelor of Science: Computer Science

INDUSTRY EXPERIENCE

Center for High Throughput Computing | Madison, WI

June 2024 – Present

Distributed Systems Software Engineering Fellow

- Enhanced Pelican origin monitoring by implementing new probes within Pelican and XRootD using Go and C++
- Utilized Grafana to design intuitive visualizations used to provide administrators with comprehensive overviews of origin activities, improving operational oversight.
- Developed alert systems to identify and report health issues in the origin, enhancing system reliability and preventive maintenance.

RESEARCH EXPERIENCE

University of Wisconsin-Madison | Madison, WI

October 2023 – February 2024

Research Assistant

- Developed an ETL pipeline to automate GitHub code sample extraction, enhancing data analysis.
- Contributed to the development of 'PromptSet', a dataset with 61,000+ unique developer prompts, advancing research in language models.
- Conducted comprehensive data analysis on 'PromptSet', identifying key patterns and insights that inform the improvement of prompt engineering practices.

University of Cincinnati | Cincinnati, OH

January 2022 – April 2022

Research Assistant

- Optimized electromagnetic side-channel attack scalability for enhanced handling of complex datasets.
- Increased side-channel attack accuracy using advanced deep learning techniques.
- Conducted in-depth security analysis and research using the Chip Whisperer tool suite.

PUBLICATIONS

PromptSet: A Programmer's Prompting Dataset | [Paper](#) | [Code](#)

- Authored By: Kaiser Pister, Dhruva Jyoti Paul, **Patrick Brophy**, Ishan Joshi
- LLM4Code 2024 at ICSE 2024

PROJECTS

Personal Search Engine | Python, PyTorch, Hugging Face, Rust with Tauri

- Created application to store articles, notes, and documents in a personal knowledge database
- Utilized LLMs to create text embeddings to store documents based on textual semantics
- Implemented RAG solution to enable an interactive assistant

CAPTCHA Solver | Node.JS with Express, Puppeteer, Python with PyTorch | Demo

- Created application using web scraping, deep learning, and caching that allows users to easily solve captchas
- Utilized pre-trained models for fine-tuning on custom data that allowed for generalizability across captchas
- Deployed models on AWS SageMaker for scalable, real-time captcha recognition.