Ian McCormack

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Education

Ph.D. in Software Engineering, Carnegie Mellon University *September 2021 - Present*
- Coadvised by Jonathan Aldrich and Joshua Sunshine

University of Wisconsin-Eau Claire *summa cum laude, May 2021*
- **B.S.**, Computer Science
- **B.A.**, English, Rhetorics of Science, Technology, and Culture
- **Minor**, Mathematics

Publications

A Study of Undefined Behavior Across Foreign Function Boundaries in Rust Libraries.
Ian McCormack, Joshua Sunshine, Jonathan Aldrich
PDF - *Preprint*, 2024.

"Against the Void": An Interview and Survey Study on How Rust Developers Use Unsafe Code.
Ian McCormack, Tomas Dougan, Sam Estep, Hanan Hibshi, Jonathan Aldrich, Joshua Sunshine.
PDF - *Preprint*, 2024.

Gradual C0: Symbolic Execution for Efficient Gradual Verification.
Jenna DiVincenzo, **Ian McCormack**, Hemant Gouni, Jacob Gorenburg, Mona Zhang, Conrad Zimmerman, Joshua Sunshine, Éric Tanter, Jonathan Aldrich.
PDF - *Under minor revision for* **TOPLAS**, 2024.

Plan B: Design Methodology for Cyber-Physical Systems Robust to Timing Failures.
Mohammad Khayatian, Mohammadreza Mehrabian, Edward Andert, Reese Grimsley, Kyle Liang, Yi Hu, **Ian McCormack**, Carlee Joe-Wong, Jonathan Aldrich, Bob Iannucci, Aviral Shrivastava
PDF - **TCPS**, 2022.

Computational Making via Bidirectional Parametric Modeling.
Chris Johnson and **Ian McCormack**.
PDF - **Bridges**, 2021.

One Program to Rule the Intersection - 🏆 *(2^{nd})*
Reese Grimsely, Edward Andert, **Ian C. McCormack**, Eve Hu, Bob Iannucci.
Video - **CPS-IoT** *Week 2021, Student Design Competition: Networked Computing on the Edge*.

A Software Library Model for the Internet of Things
Ian McCormack
PDF - **SPLASH SRC**, 2020.

Experience

Research Assistant, Carnegie Mellon University's REUSE Program *June 2020 - May 2021*
Mentors: Bob Iannucci, Jonathan Aldrich
- Explored and prototyped a novel software repository system to allow mixing and matching disjointly-versioned software modules.
- Implemented a networking layer for the TTPython distributed programming framework to support an autonomous vehicle intersection that won 2^{nd} place in the 2021 CPS-IoT Week's Student Design Competition.

Undergraduate Researcher, University of Wisconsin-Eau Claire *September 2019 - March 2021*
Mentor: Chris Johnson

- Designed Scute, a programming system for creating SVG files and animations. Users write code to create vector graphics—which they can directly manipulate—and Scute repairs their programs to match the result.
- Implemented a compiler and interpreter for Scute in C, designed a visual editor using React, and deployed both as a web app using WebAssembly for interoperation.

Technology Intern, Travelers Insurance, St. Paul, Minnesota *June - August, 2019*
Mentor: Mikko Niemioja

- Solved ongoing issues with configuring production environments by creating a .NET application to allow partial backup and restoration of Windows Registry configurations.
- Identified employees' shared frustrations with onboarding and provisioning and used Angular to create a wireframe application that would improve the experience for new hires.

Awards

2024 CyLab Presidential Fellowship - Article 2024-2025
National Science Foundation Graduate Research Fellow (NSF GRFP) 2021-2026

Talks

Introduction to Rust.

- Guest Lecture at CMU for *Secure Coding* (14-735). August 2023 & 2024.
- Guest Lecture at CMU for *Programming Language Pragmatics* (17-363). November 2022.

Slides

Examining Rust Developers' Motivations for Using `unsafe` Code.

- Guest Lecture, *Secure Coding (14-735)*. CMU, November 9th, 2023.
- Talk, *2023 CyLab Partners Conference*. CMU, October 3rd, 2023.

Slides

Direct Manipulation for Computational Making.
Lightning Talk with Chris Johnson, *SPLASH-E*, November 20th, 2020.
Slides, Abstract

Teaching

Co-Instructor, *Software Engineering Reflection (17-415)* *CMU, Fall 2024*
Teaching Assistant, *Software Engineering Reflection (17-415)* *CMU, Fall 2023*

Mentoring

Tomas Dougan, (Brown) *CMU REUSE Program, Summer 2023*
Timothy Zhou (UCSD) *CMU REUSE Program, Summer 2022*

Service

Student Co-Director, Carnegie Mellon University's REUSE Program *August 2024 - Present*

- Assisted with data collection and analysis to support an application for a continuing grant from the National Science Foundation to remain an active REU site.

Student Organizer, **PLATEAU Workshop** *2023-Present*