Tommy McMichen

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800 Hinman Ave
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Research Interests

Compilers
Heterogeneous Computing Systems
Data Movement
Hardware-Software Codesign

Education

Northwestern University, Evanston, IL — August 2020 - Present
Candidate for Ph.D in Computer Science

Rose-Hulman Institute of Technology, Terre Haute, IN — August 2016 - May 2020
B.S in Computer Engineering and Computer Science
GPA: 3.80

Publications

Angelo Matni, Enrico Armenio Deiana, Yian Su, Lukas Gross, Souradip Ghosh, Sotiris Apostolakis, Ziyang Xu, Zujun Tan, Ishita Chaturvedi, Brian Homerding, **Tommy McMichen**, David I. August, and Simone Campanoni. *NOELLE Offers Empowering LLVM Extensions.* 2022

Leela Pakanati, **John T. McMichen**, and Zachary Estrada. *Work-in Progress: Fine-Grained Acceleration using Runtime Integrated Custom Execution (RICE).* 2019.

Research Experience

ARCANA Lab — August 2020 – Present
Graduate Researcher, Advisor: Simone Campanoni

- Compiler research for abstractions and representation to meet the needs of emerging programming models and computing hardware
- Focus on improving how we handle data movement in traditional and emerging domains
- Contributing to NOELLE, a framework that provides the building blocks to more easily build research prototypes and enhance educational opportunities in the compiler space

Runtime Integrated Custom Execution using RISC-V — May 2017 – July 2019
Undergraduate Researcher, Advisors: Daniel Chang, Mario Simoni

- Designed model for reconfigurable, extensible instruction set using an implementation of RISC-V
- Developed simulation model in gem5 for performance benchmarks
- Added new instructions to GCC for compilation of custom instruction set

Engineering Experience

Texas Instruments — May – August 2019, May – August 2020
Digital Design Engineering Intern, Embedded Processors, Analytics

- Performed silicon debug for cache coherence in a heterogeneous multicore system
- Developed test coverage metrics for cache coherence testing
- Converted SQL databases to XML source files for ISA information
- Updated RTL and TLM auto-generation scripts to use XML source files

National Instruments — May - August 2018
R&D Software Engineering Intern, Digitizers

- Designed and Implemented FPGA logic for new function generator feature with LabVIEW FPGA
- Added kernel, driver and API support for new function generator feature
- Implemented full driver stack support for new oscilloscope triggers
- Communicated with multiple teams to add new entry points to .NET API

Teaching Experience

Teaching Assistant, Northwestern University — January 2022 - March 2022
Course: Compiler Construction, Instructor: Simone Campanoni

- Developed an interpreter to allow students to more easily understand the compiler intermediate representations used for class
- Provided one-on-one and group tutoring to students in classroom and office settings

August 2019 - May 2020

Resident Tutor, Rose-Hulman Institute of Technology
Courses: Digital Systems, Computer Architecture, Data Structures and Algorithm Analysis

- Created review materials and ran review sessions for monitored courses
- Provided one-on-one and group tutoring to students in classroom and office settings

Funding and Awards

IP/ROP Student Travel Award, $2500, 2019
ESweek Student Travel Grant, $500, 2019
IP/ROP Student Project Grant, $850, 2018

Professional Societies

IEEE, Chairperson of Rose-Hulman student branch (August 2019 - May 2020), Student Member
Eta Kappa Nu, Corresponding Secretary of Epsilon Eta chapter (August 2019 - May 2020)