

## Min-Yih “Min” Hsu

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### EDUCATION

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University of California, Irvine (UCI). Irvine, CA, United States

- Ph.D. in Computer Science. September 2018 ~ August 2023
  - Advised by Prof. Michael Franz
  - Dissertation title: *Efficient Program Analyses that Scale to Large Codebases*

National Tsing-Hua University (NTHU). Hsinchu, Taiwan

- B.S. in Computer Science. GPA: 3.73 / 4.3 June 2018

### PUBLICATIONS

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- Min-Yih Hsu, Felicitas Hetzelt, David Gens, Michael Maitland, and Michael Franz. “A Highly Scalable, Hybrid, Cross-Platform Timing Analysis Framework Providing Accurate Differential Throughput Estimation via Instruction-Level Tracing”. *Proceedings of ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE)* (2023)
- Min-Yih Hsu, David Gens, Michael Franz. “MCA Daemon: Hybrid Throughput Analysis Beyond Basic Blocks”. *EuroLLVM Developers’ Meeting* (2022).
- Min-Yih Hsu. “LLVM Techniques, Tips, and Best Practices Clang and Middle-End LIBRARIES: Design Powerful and Reliable Compilers Using the Latest Libraries and Tools from LLVM”. *Packt Publishing* (2021).
- Min-Yih Hsu, Stan Kvasov, and Vince Del Vecchio. “Souper-Charging Peepholes with Target Machine Info”. *LLVM Developers Meeting* (2019).

### RESEARCH / WORKING EXPERIENCES

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SiFive

Remote, CA, United States. Sep 2023 ~ Present

*Staff Compiler Engineer, RISC-V Compiler Team*

- Working on LLVM compiler for **RISC-V processors**. My primary responsibility is the **code generation** pipeline.

University of California, Irvine

Irvine, CA, United States. Sep 2018 ~ August 2023

*Student Researcher, Secure Systems and Software Lab*

- Working on **MCA Daemon** (<https://github.com/secure-systems-lab/LLVM-MCA-Daemon>), a *hybrid* throughput analysis tool that scales up with real-world execution traces spanning thousands of basic blocks and **millions of instructions**.

- Working on **MultiCompiler** ([github.com/seuresystemslab/multicompiler](https://github.com/seuresystemslab/multicompiler)), a LLVM-based compiler that protects programs from code-reuse attacks by using **software diversity**.
- Primary maintainer of **LLVM target / backend** for the **Motorola 68000** series CPU.
  - <https://github.com/llvm/llvm-project/tree/main/llvm/lib/Target/M68k>

## Apple Inc.

Cupertino, CA, United States. June ~ Sep, 2021

*Compiler Engineer Intern, Debugger Compiler Integration Team*

- Improve **debug info** quality in **optimized** Swift code
  - Improve the number of source variables visible in LLDB by at most **19%**.
- Contributed **10** pull requests, consisting of **15** commits, to the Swift compiler GitHub repository: <https://github.com/apple/swift/commits?author=mshockwave>

## Sony Interactive Entertainment

San Mateo, CA, United States. June ~ Sep, 2020

*Compiler Engineer Intern, PlayStation CPU compiler team*

- **Contributed** to the LLVM project
  - [D83967](#) [profile] Move \_\_llvm\_profile\_raw\_version into a separate file
- Improved LLVM's **compilation speed** by leveraging profile guided optimization (**PGO**) info.
  - [D87337](#) and [D87338](#) [PGO] De-Optimizing cold functions based on PGO info

## MediaTek USA. Inc.

Woburn, MA, United States. June ~ Sep, 2017, 2018 and 2019

*Compiler Engineer Intern, DSP compiler team*

- **Contributed** to the LLVM project. Here are two of my bug fixes.
  - [D37902](#) [CodeExtractor] Fix multiple bugs under certain shape of extracted region
  - [D66060](#) [MemCpyOpt] Fixing Incorrect Code Motion while Handling Aggregate Types
- Improved resource utilization and core synchronization in **multi-core heterogeneous system** by modifying LLVM-based internal compiler and proposing a new programming model.
- Integrated **Souper**, a **LLVM-based superoptimizer**, into the internal toolchain. And improved Souper's peephole generation quality on different targets.

## REFERENCES

Prof. Michael Franz

<https://www.michaelfranz.com>

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