Min-Yih Hsu

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EDUCATION

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

- Ph.D. Student in Computer Science. (**GPA: 3.89 / 4.0**) September 2018 ~ Present
  - Advised by Prof. Michael Franz

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

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

PUBLICATIONS

- 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).
- Li Wang, Shao-Chung Wang, Min-Yih Hsu, and Jenq-Kuen Lee et al. "Analyzing OpenCL 2.0 Workloads Using a Heterogeneous CPU-GPU Simulator." *IEEE International Symposium on Performance Analysis of Systems and Software* (2017).

RESEARCH / WORKING EXPERIENCES

University of California, Irvine Irvine, CA, United States. Sep 2018 ~ Present

Student Researcher, Secure Systems and Software Lab

- Working on **MCA Daemon** (https://github.com/securesystemslab/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/securesystemslab/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.

National Tsing-Hua University Hsinchu, Taiwan. Feb 2015 ~ June 2018

Research Assistant, Programming Language Lab.

- Proposed **fixed-point** numeric type for next generation **OpenCL** standard. I also implemented a prototype compiler and library to demonstrate it.

REFERENCES

Prof. Michael Franz
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University of California, Irvine. CA, USA
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https://www.michaelfranz.com/