Micah Weston

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Education

Northeastern University   Boston, MA | May 2023

Candidate for Bachelor of Science in Computer Engineering and Computer Science   GPA: 4.00

Honors: University Honors Program, Dean's List (all semesters)

Activities: NU Computer Architecture Research Lab, Competitive Programming Club, IEEE Eta Kappa Nu

Courses: High Performance Computing, Algorithms, Computer Architecture, Programming Languages, Object-Oriented Design, Computer Systems, Digital Design and Computer Organization, Embedded Design, Networks, Logic and Computation, Discrete Structures, GPU Programming Basics with CUDA

Professional Experience

AMD | *GPU Compiler Engineer*   Boxborough, MA | June – Dec 2022
- Developing C++ code for GPU shader compiler used within multiple production graphics drivers
- Working directly with multiple ASIC ISAs and different compiler IRs
- Determining causes of IR compilation failures at instruction, CFG, call graph, and compiler driver level
- Creating unique algorithms to transform and canonicalize IR for optimizations and lowering
- Tracing validation failures between code compilation and hardware emulation

Khoury College of Computer Science | *Teaching Assistant*   Boston, MA | May – June 2021 & Jan – June 2022
- CS 3500 Object Oriented Design Summer 2022, Summer 2021 — CS 5600 Computer Systems Spring 2022
- Guided students during office hours and graded assignments for computer science courses

MORSE Corp | *C++ Software Engineer for Aerospace*   Cambridge, MA | July – Dec 2021
- Developed C++ software on ARM Cortex-M series processors for aerospace and integrated systems applications
- Acted as sole firmware engineer for project comprised of a diverse set of 16 engineers from different backgrounds
- Refactored satellite communication firmware to double message rate and increase reliability
- Integrated improved system drivers to reduce halts by 80 percent in time sensitive real-time devices
- Wrote Python code for data analysis scripts and utility software to support embedded systems
- Aided multiple flight test events as main software support for the field crew
- Validated hardware and software for integrated systems devices through simulated and physical tests

Freelance | *Embedded Software Engineer*   Las Vegas, NV | Apr – Aug 2020 & Dec – Jan 2021
- Developed C++ software for a digital color organ running from an ESP32 NodeMCU microcontroller
- Designed and implemented automatic calibration system that balanced light amplitudes based on audio input
- Generated dynamic color patterns from audio input processed by an FFT library to display through an LED display

Skills

Programming: C++, C, Rust, Haskell, Go, CUDA, Java, Bash, Python, Verilog, LLVM IR

Tools: Git, GDB, CMake, Bash Shell, Jenkins, JetBrains IDEs, Vim, Visual Studio, VS Code

Software: Jira, Confluence, GitHub, GitLab, Bitbucket

Technical: Linux, Windows, ESP32, ARM Cortex-M, SPI, I2C, Arduino, PlatformIO, Atmel ICE

Project Experience

LLVM Compiler Infrastructure | *Open-Source Contributor*   Remote | Dec 2021 – Present
- Implemented bug fix for Clang diagnostic which flags the unsafe usage enum conversions
- Contributed patches to optimize machine instructions with 24-bit immediate operands in the AArch64 back end

NU Computer Architecture Research Lab | *GPU Research Assistant*   Boston, MA | Oct 2019 – July 2022
- Developed code and supported benchmarks for a multi-GPU simulator built with the Go programming language
- Integrated support for V3 and V4 AMD GPU code object format to load kernel code into the simulator
- Wrote emulation code for instructions in GCN3, RDNA, and CDNA architectures
- Researched Translation Lookaside Buffer (TLB) design to increase hit rate through memory address coalescing
- Implemented the page migration process as an interface supported with unit tests

GPU Programming Basics with CUDA | *Final Project Competition, NUCAR Lab*   Boston, MA | Oct – Nov 2020
- Developed CUDA code for a Histogram Equalization image processing program ran with a Nvidia Kepler GPU
- Increased kernel speed by 10% through use of Hillis-Steele Scan, shared memory, and fewer memory accesses
- Improved program speed by 25% through reducing the memory footprint and coalescing the remaining allocations
- Placed second as the only undergrad student in the class competition judged for program accuracy and speed