George Hilliard

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TECHNICAL SKILLS

Software development: Extensive development experience with Linux and embedded systems, both bare-metal and RTOS. Fluent in C, modern C++, Python, and Rust.

Computer architecture: Industry experience developing system-on-chip microarchitecture, including topics in machine learning, data movement, high-performance compute, and concurrency. Comfortable designing hardware logic, especially making it performant and easy to use from software.

EXPERIENCE

Amazon Web Services (Annapurna Labs)

Senior Software Engineer *October 2023 – present*
Software Engineer *April 2020 – October 2023*

- Functioned as technical lead and manager for team maintaining Trainium machine learning accelerator (MLA) firmware, responsible for on-chip execution of compiled bytecode. Led maintenance of the C++ codebase with nanosecond-scale performance requirements.
- Drove design of new chip functionality both pre- and post-silicon, including prototyping and releasing a new data movement paradigm. This significantly reduced on-device program size, in some cases by 25% of device memory. Backported to older chip generations to help drive adoption by the compiler.
- Designed & implemented hardware (CPU instructions, acceleration logic) for diverse workloads.
- Interfaced directly with customers, troubleshooting complex performance bugs and driving customer-requested features across multiple teams, such as root-causing and fixing a customer report of pathological HBM behavior causing 40% bandwidth reduction.

Kopis Mobile, Lead Firmware Engineer *July 2016 – April 2020*

- Bootstrapped multiple custom embedded Linux and RTOS systems. Debugged prototype hardware, ported Linux, and wrote business logic to run on the devices.

PERSONAL PROJECTS

Metastring — A physically modeled string synthesizer audio plugin

Building on the past 20 years of academic research on physical modeling and digital waveguides, Metastring implements a realtime-capable model of vibrating strings. Its custom waveguide data structure delivers 100ns/sample latencies. Pluggable models of bridges, picks, and instrument bodies make it able to emulate multiple instruments.

Linux-powered business card — A $3 minimal Linux computer in a business card form factor

This card is a minimal ARM-based computer running a customized Buildroot-based Linux firmware, using a low-cost system-in-package Allwinner processor. Ported Linux and U-Boot to the new platform. The card is powered via USB, boots in 6 seconds, and allows the user to log in over a serial console.

See GitHub profile (listed above) for other personal projects and open-source contributions.

EDUCATION

Mississippi State University **Starkville, MS**
Bachelor of Science, Computer Engineering *Fall 2012 – Spring 2016*

Cumulative GPA: 3.83/4.0 (*summa cum laude*). MSU Presidential Scholar.