ELLIOT SABA

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Signal processing expert with 10 years experience building widely-deployed, real-world systems.

Areas of expertise: Digital Signal Processing, Machine Learning, High-Performance Computing, Compilers, Operating Systems, Wireless Communications, Networking.

EDUCATION

ELECTRICAL ENGINEERING, UNIVERSITY OF WASHINGTON, Seattle, WA 2011 - 2018

Ph.D. (2018), M.S. (2014), B.S. (2011)

- Ph.D. Dissertation: a deep learning system to detect cough sounds and classify tuberculosis using off-the-shelf, low-power embedded computing systems, implemented in real time on a Raspberry Pi.

EXPERIENCE

JULIAHUB, Seattle, WA 2013 - Present

Creators of the Julia language for high-performance technical computing, hundreds of thousands of active users

Director of EDA Engineering (2023)

- Led a team of 7 engineers to develop analog circuit simulation and verification tools, reporting directly to CTO. Improved signal analysis runtime by 3 orders of magnitude, wrote custom compiler passes to achieve best-in-class simulation performance, and served as primary engineering contact for client stakeholders.

Senior Research Engineer (2018)

- Created a cross-compiling toolkit for C/C++/Fortran/Go/Rust software to package and distribute all binary dependencies for the entire Julia ecosystem seamlessly and reliably. Designed and implemented best-in-class deployment strategy enabling users to easily install complex software packages like GTK and CUDA.
- Wrote, deployed, and maintained a global package distribution network for the Julia package manager, serving hundreds of thousands of users 100TB+/month while both achieving low latency and cutting costs by 75%.
- Increased linear algebra performance by more than 200% by enabling runtime-configurable BLAS calls to a variety of backing vendor libraries with almost zero overhead, greatly improving small-matrix workloads.
- Built Machine Learning models for large phased array systems using software-defined radios and GPUs. Developed a full-duplex realtime communication stack from gateware to Linux kernel drivers to C++ software to a GPU processing framework for a 16x16 MIMO system.

Core Julia Language Developer — Open Source Volunteer (2013)

- Independently led ecosystem-wide efforts, developed and debugged a huge portion of the core Julia language. Open source leadership of ecosystem-wide efforts led to professional employment at JuliaHub.

MICROSOFT RESEARCH, Redmond, WA Summer 2015, Summer 2017

Research Intern — Mobility and Networking Research Group (2017)

- Accelerated computer vision models 3-5x by developing a framework to apply approximating optimizations to convolutional networks, implementing new operators in TensorFlow.

Research Intern — Medical Devices Group (2015)

- Prototyped hardware for a wearable health device to detect arteriosclerosis using pressure sensors on the wrist and a microphone on the chest.

OCULUS RESEARCH, Redmond, WA Summer 2016

Research Intern

- Prototyped a pulsed sonar system for real-time hand tracking in the presence of occlusions. Developed custom FPGA gateware and host software to determine feasibility.

SKILLS

- Mastery of **Julia**, **C**, **Python**
- Proficiency in Assembly, C++, Java, Rust, CUDA, Verilog, Objective-C, C#