

Aaron C. Lindsay

Raleigh, NC

Summary

Software engineer with strong experience distilling challenging problems down to their core, developing system-level solutions, and methodically debugging elusive problems across language and project boundaries

Expertise

Languages: Assembly (ARM), (Ba)sh, C, C++, CSS, Go, HTML, JavaScript, Lua, make, Python

Skills: Design/develop/debug applications, libraries, and operating system kernels (Linux), optimize for performance (from assembly to web applications), debug complex multi-system problems, Linux/Unix administration, automation, continuous integration, web development, distributed VCS (i.e. git)

Experience

Qualcomm Senior Engineer

August 2012 to present

- Developed lightweight containers, Python workloads API, and `ptrace`-based tools to accelerate data-gathering and analysis for software and hardware optimization by enabling automated profiling across arbitrary workloads
- Maintained in-house Linux distribution, authoring kernel patches and custom packaging to support modeling
- Debugged Linux kernel and application functionality and performance at all levels – from high-level software using `gdb` to custom model instruction traces and processor pipeline interactions
- Supported mapping performance data from software processor models to benchmark source code symbols by adding semihosting support for perf events in the Linux kernel
- Influenced next-generation processor design via micro-benchmarks and innovative workload sampling methods, reducing the required performance model runtime over 1000×
- Pioneered basic block vector validation for model workloads, ensuring trusted results for critical microarchitectural decisions – achieved correlation error of only 1% between software models and silicon
- Adapted open-source software to speed up workload creation and contributed changes upstream, including emulated ARM PMUv3 (performance monitor) for QEMU
- Optimized Android/Linux application and library performance for Qualcomm’s mobile and server processors
- Setup, championed, and maintained continuous integration (Jenkins) for team projects

Real-time Systems Research at Virginia Tech

August 2010 to May 2012

- Formulated and empirically evaluated cache-aware real-time scheduling algorithms and partitioning schemes
- Developed and maintained ChronOS Linux, a set of Linux kernel scheduling patches and library/test applications

Qualcomm Software Development Engineer

Summer 2011

- Designed and implemented snapshot/restore mechanism for next-generation mobile processor simulator
- Co-developed ‘fast-forwarding’ for the same processor performance model

Virtual Environments Research in Computer Science

Spring 2010

- Conducted user studies testing the effects of interaction fidelity on procedure memorization
- Developed test environment using Blender, Python, and interfaced with VR hardware using C++

IBM Emerging Technologies (jStart Team)

January 2009 to February 2010

- Created new distributed mashup technology with XMPP, Java, MySQL, and JavaScript
- Granted patent US20110161833 for “Distributed Multi-User Mashups”

Technical Hobbies

- Develop open-source software – recently a personal finance/accounting library and web app in Go and ReactJS
- Administer web services for family/friends using Ansible, including email, wiki, personal cloud, and git

Education

Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA

M.S. Computer Science and Applications (3.95/4.0 GPA)

June 2012

Thesis: *LWFG: A Cache-Aware Multi-core Real-Time Scheduling Algorithm*

B.S. Computer Science / Math Minor (Summa Cum Laude - 3.90/4.0 GPA)

December 2010