

dan.luu@gmail.com

EXPERIENCE

- Microsoft, Engineer; Seattle, WA** **2015 – Present**
- ◇ BitFunnel search engine; near order of magnitude throughput/cost improvement *C++*
 - Found an algorithmic simplification, reducing largest and most complicated part of the system to 30LOC
 - Replaced poorly-understood ML config system with optimal mathematical formula; 2x perf improvement
 - ◇ SmartNIC; multiple order of magnitude tail latency improvement *SystemVerilog*
 - Half the latency of Amazon “enhanced networking”
- Google, Engineer; Madison, WI** **2013 – 2014**
- ◇ TPU (deep learning hardware accelerator); order of magnitude perf improvement over GPUs *SystemVerilog*
 - Took project from requirements gathering stage (2 people) to full implementation stage (~20 people)
- Recurse, Sabbatical; New York, NY** **Spring 2013**
- ◇ Projects include channels and coroutines in C and a BitTorrent client in Scala.
- Centaur Technology (acquired by VIA), Member of Technical Staff; Austin, TX** **2005 – 2013**
- ◇ Here’s one sample six-month project (adding an ARM front-end to our x86):
 - Helped reverse engineer the ARMv7 ISA (this was pre-AArch64)
 - Created architectural simulator and got Android running on it *C*
 - Implemented 1/2 of the translator, and wrote associated microcode *Verilog / Templating language*
 - Created test generator that found 90% of the first 1000 bugs on the project *F#*
 - ◇ Other projects included formal verification, adding fault tolerance to a distributed system, post-silicon debug, test tooling, etc.
- Ultrafast Optics and Fiber Communications Lab, Research Assistant; Lafayette, IN** **2003 – 2005**
- ◇ Lab work, included speeding up parallel (256 wavelength) polarimeter by 40x *MATLAB and C*
- IBM, Intern; Austin, TX** **Summer 2003**
- ◇ Semi-formal / constrained random POWER6 completion unit functional verification *VHDL*
- Micron Technology, Intern; Boise, ID** **Summer 2002**
- ◇ Flash product engineering / characterization. Automated previously manual tasks. *Perl*
- Spatial Systems Research Laboratory, Research Assistant; Madison, WI** **2001**
- ◇ Studied tilings and related combinatorial models, e.g., alternating sign matrices and square ice

EDUCATION

BS Math & CMPE (Wisconsin, '00-'03), MS EE (Purdue, '03-'05)

NON-WORK PROJECTS

- ◇ Sega system on FPGA <https://github.com/danluu/sega-system-for-fpga>
- ◇ Randomized algorithms can beat LRU/pseudo-LRU caches: <http://danluu.com/2choices-eviction/>
- ◇ A fuzzer written in an hour that found ~20 bugs in Julia <https://github.com/danluu/Fuzz.jl>
- ◇ Web performance benchmarks for slow/flaky connections <http://danluu.com/web-bloat/>
- ◇ Formal verification of a secure hypervisor model <https://github.com/danluu/secvisor-formal-verification>
- ◇ See <https://github.com/danluu/> and <http://danluu.com> for more!

MISCELLANEOUS

- ◇ Work Authorization: U.S. Citizen