Geng-You CHEN (陳庚佑)

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I'm a software engineer with good fundamentals in CS (algorithms, data structures, computer architectures, OS, and network).
My professional experience *includes 3 completely different CS areas*: (1) Linux Kernel and device drivers, (2) Tools/Algorithms design in EDA (Electronic Design Automation), (3) Optimizing SSDs in data centers for SLO (Service-Level Objectives) and lifetimes.

Jobs

MediaTek, Inc. — **Taipei City, Taiwan**
Principal Software Engineer, Set-top Box — *Jan 2019 ~ Mar 2019*
Principal Software Engineer, TV SoC (former MStar Semiconductor, Inc.) — *Nov 2014 ~ Dec 2018*

I'm a Kernel developer focusing on Linux Kernel's USB core, EHCI (USB 2.0) driver, and the mass storage driver.

- I achieved an innovate "Lazy Resuming" mechanism in Linux Kernel's DPM (device power management) for tackling slow USB HDDs
  - ✓System wake-up time is improved by up to 10x (measured when a slow USB hard disk is plugged into the system)
- I invented methodologies and software tools for Linux Kernel's USB to discovering 3rd-party device compatibility issues
  - ✓Annual # of USB compatibility issues is reduced by up to 84% (measured in my Korea customer's project)
- I re-wrote entire USB layer from the ground in U-Boot to help customers get way from GPL license
  - ✓More than 6 models of SoCs can be completely GPL-free, and used by China customers for security applications
- I worked oversea with customers (5 weeks in a year), and helped our IC designers improve/validate their next generation TV SoCs
  - ✓I became the USB software owners for more than 15 models of major TV SoCs (more than 50% global market share)

TinnoTek, Inc. (Closed. It's an EDA company founded by Prof. Shi-Yu Huang) — **Hsinchu City, Taiwan**
Software Engineer (Internship), Electronic Design Automation — *Jul 2011 ~ Dec 2011*

I'm a software engineer focusing on how to speed-up our existing SoC power simulation software (written in C/C++) using FPGA.

- I developed a tool which scans customer's Verilog source codes, and generates & routes our power monitoring modules into them.
  - ✓ With the help of FPGA, our SoC power simulation software is speeded up by more than 10x (depends on customer's SoC size).

Research Projects

Exploiting Write Heterogeneity of Morphable MLC/SLC SSDs in Datacenters with Service-Level Objectives — **USA**
Published in IEEE Transactions on Computers (TC), one of the top journals in computer architecture — *Mar 2017*

- I proposed an online algorithm which smartly guides MLC SSDs to temporarily operate at SLC mode in order to meet the data center's SLO requirement (e.g. 99% of I/O requests should be completed within 100ms) without over-provisioning more storage nodes
  - ✓For real workloads requiring 2.4x over-provisioning to meet their SLO, I can meet the same SLO without any over-provisioning, by just sacrificing less than 2.8% of SSD's lifetime (due to using SLC mode)

DuraCache: A Durable SSD Cache Using MLC NAND Flash — **USA**
Published in ACM/EDAC/IEEE Design Automation Conference (DAC), one of the top conferences in computer architecture — *May 2013*

- I create a test platform for wearing out MLC NAND Flash chips and measuring how their BER (bit error rate) grow
  - ✓ My experiment result inspired us that if we design our data center to treat the data corruptions in SSD as regular cache misses, we can improve the SSD lifetime by more than 1.7x, by just sacrificing less than 1% of cache hit count

Educations

Dept. of CSIE, National Taiwan University — **Taipei City, Taiwan**
M.S., Computer Science (Advisor: Prof. Chia-Lin Yang) — *Sep 2012 ~ Jun 2014*

- Overall GPA: 4.28/4.30 (ranking: 3/144)
  - ✓I was elected as a Honorary Member of the Phi Tau Phi Scholastic Honor Society of the Republic of China

Undergraduate Program of EECS, National Tsing Hua University — **Hsinchu City, Taiwan**
B.S., Electrical Engineering — *Sep 2008 ~ Jun 2012*

Skills

- Programming: C/C++ (proficient), C#, Java, Bash, HTML, JavaScript, PHP, MySQL
  - My best ranking in LeetCode weekly coding contest: 169, and in Google CodeJam Kickstart competition: 489
- Linux Kernel device driver development
  - It requires good OS fundamentals and multi-thread programming skills
- Optimizing SSDs in data centers for SLO (Service-Level Objectives) and lifetime
  - It requires good computer architecture fundamentals and cross system layer design skills