Hung-Chun (Alan) Tseng

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SUMMARY

Embedded and firmware engineer working across the stack, from bootloader and Linux kernel to BMC firmware and Android platform integration. U-Boot maintainer for the virtio RTC driver and reviewer for the SpacemiT K1 board, with patches accepted into mainline Linux and the Android common kernel. Automates bring-up and porting with AI agents run under an isolation design that won an internal engineering award.

SKILLS

Boot & Kernel	U-Boot, Linux kernel, device tree, kexec / LinuxBoot (u-root), QEMU, RISC-V (RVV) / arm64
Firmware & BMC	OpenBMC, Yocto / Buildroot, I2C / PMBus / GPIO / ADC, IPMI / Redfish, systemd / D-Bus, AOSP
Debug & Perf	GDB / gdbserver, core dumps, perf / ftrace / uftrace, libFuzzer
Languages	C, C++, Python, Shell, JavaScript / TypeScript
Infrastructure	Kubernetes (kubeadm, Helm), Docker, PXE / DHCP / TFTP provisioning, CI/CD pipelines
AI Tooling	LLM agents, tool-use / function calling, RAG, agent skill and workflow design

EXPERIENCE

Project System Integration Engineer – Android Platform Sep. 2025 – Present
MediaTek, Hsinchu, Taiwan

- Own a driver module on a commercial tablet program and port it to new chips (config, DT nodes, register base, build wiring).
- Take part in bring-up of a multi-version Android vendor upgrade, booting to the home screen; root-cause build failures, runtime logs, and benchmark regressions across the vendor and AOSP system layers, and drive fixes across software and QA teams.
- Write AI agent skills for the system upgrade in an Android migration project, covering porting, Gerrit system upgrade, and build-flash-boot.
- Task lead for the development and research of a remote device farm: build the client app and booking system, and extend the one-PC-per-DUT setup so that N users share N DUTs.
- Maintain the branch, repo, CI, and image pipelines for the program.
- Lead competitor benchmarking: write WebGPU / WebAssembly / Web API programs to measure CPU and GPU on a locked competitor tablet; design the performance and low-power methodology and coordinate QA/SA execution.
- Design the defense-in-depth architecture of an internal AI agent toolset (reasoning/action split, least privilege, complete mediation) and build its namespace-isolation PoC, which won an internal engineering award.

Embedded Systems Engineer – BMC Firmware Dec. 2024 – Sep. 2025
Wiwynn, New Taipei City, Taiwan

- Developed device-specific handling in the PMBus driver path – I2C/SMBus register access and bit-field decoding per vendor datasheet – to expose correct hwmon/sysfs sensor values for datacenter customer platforms.
- Built a cross-debugging workflow with gdbserver, core dump analysis, and live-attach to triage BMC firmware crashes and service failures on production servers; presented it at COSCUP 2025.
- Brought up and debugged device tree, I2C, GPIO, ADC, systemd, and D-Bus interfaces, and resolved IPMI and Redfish endpoint issues against customer platform requirements.
- Developed OpenBMC firmware on Yocto and Buildroot hyperscale platforms; wrote Python and pytest tools that automated sanity checks before customer hand-off.

Server Software Engineer – Provisioning Automation Sep. 2024 – Dec. 2024
Pegatron, Taipei City, Taiwan

- Designed and built Kubernetes-based PXE provisioning for rack-scale ARM and x86 server validation (kubeadm, Helm, Docker, DHCP, TFTP), with stage-by-stage logging to diagnose boot failures without a physical console.
- Cut image and repository footprint from 663 MB to 2.4 MB (about 99%) by serving the bundled `.deb` packages and artifacts from a file server on the Kubernetes node instead of baking them into the image.

Software Engineer Intern Jul. 2022 – Nov. 2022
LINE Corporation, Taipei City, Taiwan

- Built a PoC that generates a mock server from the team's OpenAPI spec, unblocking parallel frontend development.

UPSTREAM CONTRIBUTIONS

- **U-Boot** (as Hung-Chun Tseng) – Merged 10 commits into mainline: `tpm2_get_random`, QEMU RISC-V standard boot, qfw, and initrd fixes; SpacemiT K1 board fixes (DRAM map, EEPROM, SPI NOR, USB hub). Reviewer (R:) for the K1 board.
- **U-Boot virtio RTC** – Wrote the virtio RTC driver with sandbox tests and documentation (6 commits), applied to `u-boot/next`; listed as its maintainer (M:) in MAINTAINERS.
- **u-root / LinuxBoot** – Added riscv64 and arm kexec support to `pkg/boot`; made FDT memory parsing honour `#address-cells` / `#size-cells`; fixed several kexec and boot issues.
- **Linux kernel** – Fixed the SpacemiT reset driver (in mainline) and the dma-buf documentation (in linux-next). Merged 7 kernel-doc changes into the Android common kernel across android-mainline, 6.1, and 6.18 (dma-heap, dma-buf, binder, UFS).
- **AOSP** – Merged 3 fixes into GBL (Generic Bootloader). Submitted a robustness hardening series for the HID report-descriptor parser in `hardware/libhardware`, with a libFuzzer harness. gerrit
- **llama.cpp** – Wrote the Q8_0 IME1 int8×int8 GEMM kernel for SpacemiT X60 (RVV 1.0), merged by ggml-org; Qwen2.5-0.5B prefill 10.7 to 93.9 tok/s (Q8_0), quant-exact golden test. PR #28479 | build PR #27961
- **Other** – Merged 3 changes into OpenPRoT pldm-lib (wire-length bounds checks), 2 into DMTF libspdm, and 3 into triton-cpu.

EDUCATION

M.Sc., Graduate Institute of Networking and Multimedia, College of Electrical Engineering & Computer Science, National Taiwan University — Sep. 2021 – Jan. 2024 | GPA: 4.12/4.3

B.S., Computer and Communication Engineering, Ming Chuan University — Sep. 2017 – Jun. 2021 | GPA: 3.99/4.0

SELECTED PROJECTS

- **Low-Bit LLM Inference Profiling (T-MAC / BitNet)** – Profiled CPU-side inference with `perf` and `uftrace` (IPC, cache and TLB misses, page faults) to locate optimization targets.
- ***Operating System in 1000 Lines*** – Translated all 17 chapters into Traditional Chinese, now the project's zh-TW locale; wrote Linux kernel course materials on eBPF, perf / flamegraph profiling, and memory management. translation | wiki
- **Technical Writing** – TIL and blog on embedded systems, Linux debugging, and platform engineering. TIL | Blog

TALKS AND HONORS

- **Talk** – *Agentic AI for Firmware Development*, COSCUP 2026: where LLM agents fit in firmware work – reading code, assisting debugging, and using tools safely in engineering pipelines.
- **Talk** – *Debugging OpenBMC Firmware*, COSCUP 2025: cross-debugging production BMCs with gdbserver, core dump analysis, and live-attach.
- **Honors** – Research Excellence Award (Ming Chuan University); Intel Andy Grove Scholarship; College Student Research Scholarship from Taiwan's Ministry of Science and Technology.
- **Leadership** – Lead, Google Developer Student Club; volunteer staff at SITCON and COSCUP community events.