
SUMMARY

Experienced system software engineer in embedded systems development on Linux and FreeRTOS platforms. Skilled in driver implementation, debug mechanism development, and performance improvement.

PROFESSIONAL EXPERIENCE

- **Airoha** Hsinchu, Taiwan
System Software Engineer @ Ethernet SoC team Feb 2022 – Present
 - **FreeRTOS SDK Implementation:** Refine the GPIO and I2C driver, eliminating the legacy database and functions to reduce memory usage approximate 10%.
 - **Linux SDK Implementation:** Revamp I2C and GPIO drivers to replace legacy counterparts, transitioning to standard in-kernel platform subsystem. Additionally, develop a kernel module with ioctl interface to streamline communication between user space and kernel space, resulting in a 40% improvement in boot-up speed.
 - **SDK Integration:** Overhauled the SDK architecture by consolidating multiple SDKs into a single repository, and restructured the Makefile compilation process, resulting in a sevenfold increase in compilation speed compared to previous iterations.
 - **IC Verification:** Verify CPU bus, GPIO, I2C, SCU (System Control Unit), pin-mux, cache, and debug module.
 - **Debug Mechanism Development:** Develop a debug mechanism to monitor access to specific memory regions and provide the corresponding program counter at the time of access.
 - **Increased image download speed:** Enhanced flash erase sections from 4k bytes to 64k bytes, resulting in a 2x improvement in image download speed.
 - **System Level Testing Software Development:** Develop production test software to verify the basic functionality of each chip, particularly focusing on the loopback function, need to check the packet count and the correctness of packet content.
 - **Auto Test Software Development:** Develop automated testing programs to verify code correctness immediately after code submission, ensuring code accuracy.
- **biRISC-V Analyzation** Tainan, Taiwan
Computer Architecture January 2022
 - **Exploration of biRISC-V Processor:** Analyze the datapath, control, and pipeline implementation within the biRISC-V processor code. Utilized Verilator with GTKWave for validation purposes.
 - **Analyze dual issue pipeline:** Explore and identify conditions for dual-issue execution. Use GTKWave to verify the assumption.
- **Performance Evaluation of Algorithms used in Linux Kernel** Hsinchu, Taiwan
Linux Kernel Internal January 2023
 - **Analyze sort algorithm between heap sort in Linux Kernel and customer quick sort:** Under certain circumstances, the custom sorting algorithm, which combines qsort and insertion sort, demonstrates an average performance improvement of 4 times over heap sort in Linux.
 - **Analyze string length between Linux Kernel and GCC:** The strlen function provided by GCC exhibits significantly better performance compared to Linux kernel, with a speedup of 6x.
- **A RISC-V System Emulator** Hsinchu, Taiwan
Contribution on Github January 2023
 - **Improved emulator image loading time:** Implemented mmap for direct mapping of linux images, reducing copying overhead, conserving memory space and enhance the bootup speed.

EDUCATION

- **National Cheng Kung University** Tainan, Taiwan
Master of Mechanical Engineering Sep. 2020 – Aug. 2022
- **National Central University** Taoyuan, Taiwan
Bachelor of Mechanical Engineering Sep. 2016 – Jun. 2020