# Hsin Yu Chen
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## Summary


A system software engineer with over an year of experience at Airoha Inc., specializing in embedded systems development on Linux and FreeRTOS platforms. Focus on driver implementation, debug mechanism development, platform improvement, memory utilization enhancement and performance optimization.


## 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 database to reduce memory usage approximate 10%.
  - **Linux SDK Implementation**: Re-Implement the I2C and GPIO driver to replace legacy driver and port to standard in-kernel platform subsystem. Additionally, Implement a kernel module ioctl interface to reduce the time cost by user space to kernel space transitions, improving the boot-up speed 40%.
  - **SDK Integration**: Redesign the SDK architecture to merge all SDKs into one repository, and redesign the Makefile compilation process, improving compilation speed seven times faster than before.
  - **IC Verification**: Verify CPU bus, GPIO, I2C, SCU (System Control Unit), pin-mux, cache, and debug module.
  - **Debug Mechanism Development**: Develop an illegal access module to detect illegal memory usage, such as heap overflow and stack overflow, which is normally disabled but can be enabled by modifying the binary file's pattern.
  - **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
  - **Analyze the data path, control and pipeline in biRISC-V**: TODO
  - **Analyze instruction cycle**: TODO
  - **Analyze the dual issue implementation and verify in waveform**: TODO
- **Performance Evaluation of Algorithms used in Linux Kernel** — Tainan, 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.

## 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