Ting-Shan Huang (黃定山)

SECOND YEAR GRADUATE STUDENT

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Research Overview

Space Lab (National Cheng Kung University)

Tainan City, Taiwan

M.S. in Department of Electrical Engineering

Jul. 2022 - Present

- I study in Satellite Research Laboratory - SPACELAB website
- Developed IoT payload(Internet of Thing) for the subsystem of **Lilium-1.**

Lilium-1 CubeSat's mission objective is to demonstrate Internet of Things CubeSat communication technology and in-orbit intelligent remote sensing data processing technology. I am currently researching **IoT information security**, which is related to computing trust algorithms between IoT devices. My master's thesis delves into the realm of information security, exploring the amalgamation of low-earth orbit satellite characteristics with the conventional framework of edge computing architecture.

Education

National Cheng Kung University (NCKU)

Tainan City, Taiwan

B.S. in Department of Mechanical Engineering

Sep. 2017 - Jun. 2022

- I was ranked in the 19th percentile within my mechanical engineering department.
- Recipient of '62 Chen Mao-Qiang Scholarship, awarded a grant of $50,000 NTD.
- Participate in 2019 Formula SAE Japan - Monozukuri Design Competition and successfully advanced to the second round.

Skills

General	Modern C++(17), Modern C(99), Python 3, LaTeX
Linux	GUN Radio
Other	Git, Docker
Languages	Mandarin (native), English (intermediate)

Projects

The implementation of audio EdgeAI in the embedded system

Side Project

Main Developer/Leader

Jun. 2023 - Present

- Developing a robot with edge AI capabilities using STM32.
- To enable precise audio recognition within the device, we integrate a digital signal processing algorithm with a lightweight model in MCU.
- It also entails the use of an Android application for robot command and mission control.
- `https://github.com/Sun970053/IoT_Spider_End_Node`

RISC-V 3-stage pipeline processor (Computer Architecture)

NCKU

Fork in GitHub

Sep. 2023 - Jan. 2024

- Implement A (atomic) extension for srv32[MIT] and verify with FreeRTOS.

Work Experience

Posiflex Technology inc.

Taipei City, Taiwan

Intern Engineer

Jun. 2020 - Aug. 2020

- I endeavored to enhance the original point-of-service device by redesigning and rigorously verifying its mechanical structure for real-world reliability.

StarLight Aerospace LTD. *Tainan City, Taiwan*

Software Engineer *Nov. 2023 - Present*

- I am currently in the process of developing a Telemetry, Tracking & Command (TT&C) board for a Low-Earth Orbit Satellite.
- I have developed API for the transceiver on our TT&C board to communication with the MCU. The board assumes a pivotal role as a subsystem within the entire satellite system, actively interacting with the onboard computer (OBC).
- This project represents a collaborative relationship involving student researcher and the company, and we look forward to creating a new commerical product related to the TT&C control module in the future.

Honors & Awards

Domestic Awards

Jul. 2020 **Bronze Prize in Industrial Internet of Things (IIoT) Category,** *Taipei, Taiwan*
Ministry of Education Second Annual Smart Internet of Things (IoT) Competition

Dec. 2023 **2nd Place,** *Taoyuan, Taiwan*
National Intelligent Innovation and Cross-Field Integrated Competition in 2023

Dec. 2023 **Special Award for Cross-Field Integration,** *Taoyuan, Taiwan*
National Intelligent Innovation and Cross-Field Integrated Competition in 2023

Speaker

The sixth ground station/ground sensor terminal workshop *Thimphu, Bhutan*

Presenter for satellite ground station *Mar. 2023*

- As a speaker at this workshop, I presented the ongoing development progress and current technical features of the National Cheng Kung University's (NCKU) satellite ground station. Additionally, I aim to foster an exchange of technical knowledge with participants from diverse countries.
- Develop a mobile ground sensor terminal with a LoRa module to communicate with the CubeSat in Low-Earth Orbit.

Relevant Courses

Object Oriented Programming And Its Applications (A) *NCKU*

Department of Mechanical Engineering *Sep. 2021 - Jan. 2022*

- Develop an accounting application in C++ using object-oriented programming (OOP).

Analysis And Implementation of Embedded Operating Systems (A+) *NCKU*

Department of Computer Science and Information Engineering *Feb. 2023 - Jun. 2023*

- Using FreeRTOS to develop IoT environment sensing devices.
- Define packet format and facilitate communication between IoT devices using the LoRa technique.

Computer Architecture *NCKU*

Department of Computer Science and Information Engineering *Sep. 2023 - Jan. 2024*

- RISC-V instruction, datapath, pipeline, cache, multithreading and synchronization.
- Validate and analyze the performance of the assembly code I wrote using rv32emu to enhance the original program and make comparisons.