

WORK EXPERIENCE

Thales (Digital Identity & Security), Singapore
Embedded Software Engineer

Sep 2021 – Now

- Developed embedded software modules in C and Java for GXOS (proprietary operating system for mobile connectivity products running on Javacard such as eSIM/SIM and eSE).
- Developed and executed test suites in Visual Basic to ensure compliance of mobile connectivity products with industry standards such as EMVCo, GlobalPlatform, Mifare and CommonCriteria.
- Reviewed security attack paths by in-house security lab on software modules such as GlobalPlatform Amendment B (HTTP and TLS implementation on smart card) and implemented respective countermeasures in C or Java layer of the OS.
- Conducted chip-porting and cryptography suites (RSA, ECC, etc) performance benchmarks on various ARM-based chipset by STMicroelectronics (ST54J, ST33K) and Samsung (SN4V, SN6V).

Nanyang Technological University, Singapore
Part-time Research Assistant

May 2021 – Jul 2021

- Built embedded Linux images for Xilinx ZCU102 FPGA using Yocto Project and Petalinux tools to evaluate visual SLAM algorithms.
- Ported C++ based visual SLAM algorithms from x86-64 to aarch64 architecture by using Cmake scripts and cross-compilation toolchains for the target system.
- Evaluated throughput and data bandwidth of SLAM pipelines running on FPGA and NVIDIA Jetson Xavier NX platforms to recommend optimizations for ROS pipeline.

Thermo Fisher Scientific Pte Ltd
Firmware Engineer Intern

Jan 2020 – Aug 2020

- Designed a Python-based command-line interface debugger for the firmware team's application protocol that consists of 7 messages and builds on top of CAN protocol.
- Prototyped a RTOS thread for controlling 4 electro-magnets in clockwise/anti-clockwise direction to provide a uniform electromagnetic field for a research scientist's usage in his research on cell biology.
- Set up Amazon FreeRTOS on NXP iMXRT1020EVK MCUs and tested its integration to AWS IoT services.
- Designed a low-level library for playing tunes on piezo buzzers to provide notification sounds to users in company's upcoming products.

EDUCATION

Georgia Institute of Technology, United States
Master of Science (Computer Science)

Aug 2023 – Dec 2025

- GPA 4.00/4.00
- Specialized in Computing Systems

Nanyang Technological University, Singapore
Bachelor of Engineering (Computer Engineering)

Jul 2017 – Jul 2021

- Dean's List for Academic Year 2018-2019 & 2020-2021
- CGPA 4.76/5.00
- Honours (Highest Distinction)

UNDERGRADUATE FINAL YEAR PROJECT

Real-time Visual Localization System on an Embedded Platform

Final Year Project

- Developed 2 modular, distributed semantic visual SLAM pipelines with 3.2 fps pose estimation throughput as backbone for 3D semantic mapping system.
- Evaluated Pytorch semantic segmentation models and 2 optimization strategies to minimizing their inference time on NVIDIA Jetson Xavier NX platform.
- Integrated Python 2D segmentation models with C++ functions of ORB-SLAM2 visual SLAM system into a novel, light-weight SLAM system that is less prone to error from dynamic environments.
- Designed a ROS node in Python to create 3D semantic pointclouds to build 3D occupancy grid maps in a probabilistic manner.
- Report: <https://dr.ntu.edu.sg/handle/10356/148230>

SKILLS

Programming and Scripting Languages: Python, C, Rust, Groovy, Bash

Source Code Version Control: Git.

Development Platforms: Linux/Unix.

CI/CD Tools: Jenkins

REFERENCES

Mr Naveed Ahmed (Line Manager)

Project Leader

Thales (DIS) Singapore

Email: naveed.ahmed@thalesgroup.com

Assoc. Prof. Lam Siew Kei (FYP/Part-time Job's Supervisor)

School of Computer Science and Engineering

Nanyang Technological University, Singapore

Email: assklam@ntu.edu.sg

Mr. Shi Benyong (Internship Supervisor)

Ex-Staff Software Engineer

Thermo Fisher Scientific, Singapore

Email: shibenyong@gmail.com