Reuben Low Yu Xiang

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Education

Singapore Institute of Technology Sep 2022 - Current
Bachelor of Engineering with Honors in Robotics Systems

Singapore Polytechnic Apr 2017 - March 2020
Diploma in Mechatronics & Robotics, and Diploma Plus in Business

Coursework

Robot Operating System (**ROS 1 & ROS 2**), **System Engineering**, **Project Management**, **Machine Learning**, Prototyping, Data Structures & Algorithms, Embedded Systems, Object-Oriented Programming, Robotics, Mechanical Design

Skills

Languages: C, C++, Python, Latex, Spin Language
Tools: ROS1, ROS2, Gazebo, RViz, Solidworks, Visual Components, STM32, Raspberry Pi, Arduino, Git/GitHub, Linux
Certification: Lufthansa-CAS Technical Training (TPE2018-1557)

Work Experience

SIT-FireFense | *Intern* June 2024 - Current

- Utlizing an **OpenAI** Language Model (LM), **Omron TM5-700**, **Robotiq 2F-85**, **Intel RealSense D435I** to assist in object detection by processing image data and generating coordinates(**JSON** format) for target objects.
- Developed driver for controlling the robot end-effector, utilizing Python scripts to interface with the **MODBUS** protocol. Implementing a **MoveIt2** package for the TM5-700.

Advanced Remanufacturing and Technology Centre (ARTC) | *Intern* Mar 2019 - Aug 2019

- Contributed to a project to optimize mirror finish on stainless steel. Experimented with **spindle speeds**, **tool paths**, and **abrasive sheet grits** using the **ABB IRB 140 robot arm**; analyzed and documented surface roughness and visual quality.
- Assisted in the integration of **ABB's Simplified Robot Programming (SRP)** system with the **ABB IRB 6660 robot arm**. Designed 3D printed adapters for spray nozzles, refined tool data and work object data, showcasing the SRP's motion tracking at the 2019 **ROS-I APAC conference**
- Developed components for a new **cable management system** on the ABB IRB 6660 robot arm, significantly reducing cable strain and preventing entanglement.

Singapore Armed Forces | *Supply Assistant* Jul 2020 - Jul 2022

- Managed logistical operations, maintaining operational readiness and support.
- Awarded the Best Soldier of the Month (BSOM), Sergeant Major Coin and SBW CO Letter of Commendation.

Projects

Bollore Logistics | *ROS1, ROS2, UR10, AgileX-LIMO, Visual Components, STM32, C, Python, Solidworks*

- Collaborated with **3PL** Company Bollore Logistics, to produce a business case for a modular automated solution that allows for easy integration with emerging technologies. for Value Added Service Assembly lines.
- Leveraged **Visual Components** to simulate the proposed solution, and utilized ROS 2, Gazebo and RViz to simulate and script the solution within a realistic virtual environment, and implemented and integrated a prototype of the proposed assembly line as a **Proof-of-Concept (Robotic Platform and Robotic Arm)**.
- Proposed Solution led to a **25%** increase in throughput, and a corresponding **25%** reduction in costs and labour. Established a projected **ROI period of three years**.

Robotic Platforms | *C, Python, Spin Language, STM32 Nucleo MCU, Pixy Camera, Parallax MCU, AgileX-LIMO*

- Developed a robotic platform capable of remote control via a GUI, further evolving it into an **autonomous system** using a Pixy camera to **follow coloured objects**.
- Implemented Breadth-First Search Algorithm in **ROS2** Gazebo and RViz to explore an unknown maze.
- Developed a ROS1 script for autonomous goal-to-goal navigation on a robotic platform, incorporating MoveBaseAction and MoveBaseGoal packages, implemented a GUI with **PyQt**, functionalities to save and load robot positions. Optimized navigation behavior via ROS parameter YAML files.