GABRIEL TWIGG- HO
Blackburn, Victoria | (61+) 434 795 941**|** gabrieljyth@gmail.com |
https://www.linkedin.com/in/gabriel-twigg-ho-96579b1b8
Portfolio Website: https://gabriel-twiggho.github.io/

Robotics & Mechatronics Engineering Honours student (GPA 4.0/4.0) specialising in autonomous systems and industrial automation. Recognised by Inductive Automation for engineering a predictive CO_2 system at CUB achieving 95% forecast accuracy and ~$150k/year in energy savings. Hands-on experience bridging hardware and software across industrial SCADA, ROS2-based robotics, and embedded systems. Seeking engineering roles in robotics and autonomous systems.

EDUCATION

Robotics and Mechatronics Major, Bachelor of Engineering (Honours) 2021 - Current
Swinburne University Of Technology, Hawthorn VIC, Full-Time
Relevant Coursework: Control Systems, Embedded Systems, Robot Kinematics/Dynamics
GPA: 4.0/4.0

Exchange Semester – Computer Science Electives AUG 2024 – DEC 2024
Loyola Marymount University, Los Angeles CA, Full-Time
Relevant Coursework: Algorithms, Networks and Internets, Interaction Design
GPA: 4.0/4.0

WORK EXPERIENCE

Trainee Engineer / Control Systems Contractor | Nov 2022 – Jan 2025
Carlton & United Breweries (Asahi Beverages), Abbotsford VIC

- Full-time placement (2023), part-time contractor (2024–25).
- Engineered a predictive CO_2 control and monitoring system using Ignition SCADA, Python and SQL improving forecast accuracy from ~70% to ~95% (2024 Ignition Discover Gallery Finalist)
- Designed and deployed intuitive HMI screens (Ignition Perspective) for real-time data from PLCs and SQL databases
- Applied control systems knowledge and PLC programming (Ladder Logic) to optimize brine chiller sequencing, saving ~$150k/year in energy costs
- Took over Utilities Area management during key staff absences, coordinated contractors, scheduled operators, responded to emergencies (e.g., ammonia and trade waste system failures) and ensured operational continuity
- Bridged mechanical, electrical and automation systems to drive diagnostics, KPI tracking, and continuous improvements across teams

Space Robotics Lab Intern | 2026 – Present
Swinburne University, Hawthorn VIC, Volunteering

- Developing automation of an existing vacuum chamber system, including solenoid valve integration and ESP32-based control architecture for cryogenic LN_2 management; assisting in heat shroud implementation under postdoctoral supervision
- Coordinating materials procurement and installation using KF and BSPT/NPT fittings to cryogenic and vacuum standards; interfacing with high-voltage heat shroud systems
- Designed and iterated rapid prototypes via 3D printing and modelling to validate mechanical components prior to fabrication for vacuum-environment use

Research Assistant | Distributed Computing & Scheduling | 2024 – Present
Loyola Marymount University (Remote)

- Conduct research with Professor Jared Coleman on task scheduling heuristics for distributed systems using the open-source SAGA framework.
- Implemented and evaluated Online HEFT scheduling logic, comparing performance against static and baseline scheduling models through simulation.
- Developing support for conditional task graphs and studying their effects on heuristic schedulers such as HEFT and CPOP.
- Participating in weekly research meetings to analyse findings and generalize scheduling logic for dynamic use cases.

ENGINEERING & RESEARCH PUBLICATIONS

Final Year Project | Autonomous Drone Swarm Algorithms | 2025
Swinburne University of Technology

- Demonstrated at Swinburne Engineering Expo | Thesis + Internal Research Paper
- Achieved a 94% LOS swarm-based algorithm for tracking faster moving targets, Link to publication.

Research Publication | 2025 — Online Task Scheduling for Distributed Systems

- Published paper: Adapting Classic Scheduling Heuristics for Online Execution under Uncertainty (2025)
- Exploring how classical scheduling algorithms (HEFT, CPOP) can be adapted for online, uncertain, dynamically arriving task graphs, Link to publication.

PERSONAL PROJECTS

AI-Powered Mobile Robot (ROS 2 Iron / Raspberry Pi) | *Current*

- Architected a voice-controlled autonomous rover using ROS 2, bridging a Raspberry Pi (hardware control/sensors) and a Windows PC (CUDA-accelerated YOLOv11 perception) via Wi-Fi.
- Engineered software stack from scratch, PID motor control, state machines and a deadband-compensated kinematic controller for "follow-me" functionality.
- Tech Stack: ROS 2, Python, Bash/PowerShell, OpenCV, YOLOv8, PyTorch, Linux (Debian), Git. Link to project.

SKILLS AND INTERESTS

Technical Skills

- Robotics & Automation: ROS2, PLC (Rockwell), SCADA/HMI (Ignition), PID/Control Tuning, Sensor Integration
- Programming & Software: Python (primary), C++ (reading/embedded), SQL, Linux, Git/Version Control, VBA, MS Excel (Advanced), SAP
- Embedded Systems & Hardware: ESP32, Electrical Circuits, Soldering & Wiring, Actuators, VFDs, 3D Printing & Fabrication
- Design & Modelling: CAD (OnShape, SolidWorks), 3D Modelling (Blender), Predictive Modelling, Data Visualisation
- Operations: Contractor Management, Emergency Response, Scheduling, KPI Tracking

Interests

- Autonomous Systems, Simulation & Digital Twins (Nvidia Omniverse), Game Development (UE5)

ADDITIONAL EXPERIENCE

Farm Hand | Pinelee Dairy
Co-President, Swinburne Christian Union | 2025
Swinburne University of Technology

AWARDS & RECOGNITION

Ignition Discover Gallery Finalist, Inductive Automation – Sacramento, CA 2024

- Recognized for developing an advanced CO_2 automation system at CUB; featured in 2024 Discover Gallery View project