GABRIEL TWIGG- HO

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Portfolio Website: https://gabriel-twiggho.github.io/

Robotics & Mechatronics Engineering Honours student (GPA 4.0/4.0) specializing in distributed systems and industrial automation. Recognized by Inductive Automation for engineering a predictive CO_2 system at CUB that achieved 95% forecast accuracy and another project that had a $150k/year savings. Experienced in bridging the gap between hardware (PLC, Sensors) and software (Python, SQL, ROS) to solve complex operational challenges. Seeking R&D 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, Abbotsford, VIC

Carlton & United Breweries (Asahi Beverages)   Nov 2022 – Jan 2025
- 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

Research Assistant, Los Angeles, CA (Remote)   2024 – Present
Loyola Marymount University
- Working under Professor Jared Coleman to optimize task scheduling algorithms (HEFT, CPOP) for distributed computing.
- Implementing Online HEFT scheduling logic and running simulations to evaluate performance vs. static and naive models.
- Participating in weekly research meetings to analyse findings and generalize scheduling logic for dynamic use cases.

Farm Hand | Pinelee Dairy
- Operational Reliability: Assisted in time-critical farm operations and livestock coordination in a high-pressure, unpredictable environment.
- Resolved immediate infrastructure and livestock issues (e.g., rapid fence repair, containment breaches) to maintain 100% operational continuity.

Co-President, Swinburne Christian Union

Swinburne University of Technology   2025
- Co-led a 50+ member student organisation, coordinating weekly programs and campus-wide initiatives.
- Managed committee operations, delegation and communication while organising club events and outreach

ENGINEERING & RESEARCH

Final Year Project — How Slow Drones Track Fast Target

Swinburne University of Technology — 2025
- Demonstrated at Swinburne Engineering Expo | Thesis + Internal Research Paper
- Achieved a 94% LOS swarm based algorithm for tracking faster moving targets

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.

SKILLS AND INTERESTS

Technical Skills
- Robotics & Automation: PLC (Rockwell), SCADA/HMI (Ignition), Control Tuning, Sensor Integration.
- Programming & Software: Python, SQL, VBA, CAD, MS Excel (Advanced), SAP, Linux
- Mechatronics: Electrical & Mechanical Interfacing, Predictive Modelling, Data Visualization
- Operations: Contractor Management, Emergency Response, Scheduling, Communication

Hardware & Tools
- PLCs, Actuators, Sensors, VFDs, Electrical Circuits, KPI Tracking

Interests
- Autonomous Systems, Real-Time Simulation, Game Development (UE5), 3-D Modelling (Blender)

PERSONAL PROJECTS

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

- Developing a voice-controlled autonomous platform integrating **ROS 2**, **YOLOv8**, and **LLMs** for natural language command processing. Tech Stack: Raspi OS, Python, OpenCV.

- **Current Status:** Successfully implemented the perception pipeline (YOLOv8) and voice-to-intent logic (Python/LLM API); currently debugging the hardware abstraction layer and motor control nodes on Raspberry Pi.

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](#)