Oscar Jones

Undergraduate Mechatronics Engineer - Robotics & Control Systems

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Summary

Penultimate-year undergraduate mechatronics engineer at QUT specialising in **robotics and control systems**. Hands-on experience prototyping robotic arms, designing **classical and modern control systems** (LQR, PID, root-locus, state-space), **embedded and systems-level C/Python programming**, and **industrial PLC programming** (Rockwell, Siemens). Track record delivering end-to-end engineering work in industry and leading multidisciplinary student engineering teams. Australian citizen, NV1-eligible.

Skills

Control Systems: LQR, PID, classical control, root-locus design, lead compensation, state-space modelling, linearisation, system identification, transfer function analysis, controllability analysis, MATLAB/Simulink

Programming: C, C++, Python, ROS2, embedded systems, POSIX threads & shared memory, TCP/IP socket programming, Linux, Robotic Process Automation (RPA)

Hardware & Industrial: PLC programming (Rockwell Studio 5000, Siemens), field instrumentation, loop checking, commissioning, circuit design, electrical design

Design: CAD (SolidWorks), mechanical design, robotics, systems integration, project management, team leadership

Experience

Post Landing Systems Lead *Apr 2026 – Present*

QUT ROAR Team (Remote Off-world Autonomous Rover) · Part-time

- Leading a small team to redesign and improve the rover-mounted robotic arm for remote-operation tasks in the Australian Rover Challenge (simulated Mars mission): keyboard/dial interaction, fuel-hose connection, lander damage assessment, navigation to supply caches

Undergraduate Mechatronics Engineer *Jul 2023 – Present*

Engdell · Part-time

- Support control systems and electrical engineers through design, installation, and commissioning of industrial automation systems (Saint Elmo Project, Julia Creek, QLD); conduct loop checks and commission field instrumentation end-to-end
- Designed and delivered a floating pontoon system for a fire water skid, full lifecycle from design through procurement, fabrication, and site deployment; Rockwell Studio 5000 trained; working knowledge of Siemens PLC environments

Electrical and Control Systems Engineer *Nov 2024 – Jan 2026*

QUT Heartbeats

- Led circuit design, component selection, control system modelling and implementation for a student-built total artificial heart competing internationally; contributed to the team winning the **Best Newcomers Award** at the Heart Hackathon 2025 Grand Finals (ISMCS, Austria); represented the team at SXSW Sydney

Industry Lead (prev. Executive) *Mar 2024 – Sep 2025*

QUT Robotics Club · Part-time

- Led industry outreach, secured sponsorships and strategic partnerships; promoted to Industry Lead within six months

Projects

Autonomous Pick-and-Place Robot - Item Collection Subsystem *2025*

- Designed, built, and integrated a 2DOF robotic arm and modular gripper (end-effector-mounted camera) for an autonomous warehouse robot, achieving **>90% item-retrieval reliability**
- Chose 2DOF elbow-servo over rack and pinion raise to improve item drop off; derived joint angles via trigonometry and sized servo actuators from torque calculations; iterated through CAD and physical prototype cycles to resolve structural and torque issues

Multi-Process Elevator Control System - C / Linux Systems Programming *2025*

- Built five communicating processes (car, controller, call pad, internal controls, safety system) in C for Linux using POSIX shared memory, `pthread` mutexes/condition variables, and a custom length-prefixed TCP/IP protocol
- Safety monitoring component written to MISRA-C-influenced standards with documented deviation justifications; used `write()` over buffered I/O to guarantee message delivery on abnormal termination

Magnetic Levitation Train - LQR Control System Design *2025*

- Modelled nonlinear coupled-carriage dynamics, linearised about the operating point, identified a controllability deficiency, derived a reduced-order state representation, and designed an **LQR controller** with integral action, output clamping, and anti-windup

Servo Motor Position Control - Classical Control Design *2024*

- Root-locus design of gain and lead compensator for a system-identified servo motor meeting a 5% overshoot specification; validated analytical transfer-function results against MATLAB step-response simulations

Education

Bachelor of Engineering (Honours), Mechatronics and Medical Engineering *2023 – 2027 (expected)*

Queensland University of Technology (QUT) | GPA: 6.1 / 7.0 | Australian citizen, NV1-eligible