Alex Cacciola

Graduate Mechatronics Engineer

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Professional Summary

Graduate-level Mechatronics Engineer with hands-on experience designing, building, and deploying automated manufacturing systems for HVAC production. Skilled in end-to-end development of semi-automated welding equipment, custom tooling, production jigs, and CNC-driven motion systems. Proficient in SolidWorks mechanical design, electrical integration, embedded logic, PCB development, and PLC-based automation. Demonstrated capability in delivering reliable, cost-effective manufacturing solutions from concept through prototyping, commissioning, and factory rollout.

Engineering Experience

Mechatronics Technician – Price Holyoake MAR 25-PRESENT

Maintain, improve, and troubleshoot automation systems across mechanical, electrical, and control domains within HVAC manufacturing. Design and model custom tooling, fixtures, and semi-automated processes to support sheet-metal assembly and production workflows. Provide electrical integration support including PLC wiring, diagnostics, and panel layout. Develop SolidWorks models for jigs, assemblies, and production tooling. Assist with commissioning documentation, testing plans, and process validation for new sovereign-manufacturing product lines.

Key Achievements:

- Enhanced assembly accuracy by developing improved fixturing for critical-environment components
- Reduced troubleshooting time through redesigned wiring and diagnostic pathways
- Improved production uptime by upgrading ageing tooling and identifying systemic mechanical faults

Mechatronics Engineering Intern – Price Holyoake JAN 25 - MAR 25

Designed and delivered two semi-automated laser-welding systems for critical-environment HVAC units within a combined $7.5k budget. Integrated mechanical fixturing, electrical control systems, CNC motion control, and embedded programming into production-ready equipment. Developed a Raspberry Pi–based CNC controller for programmed weld-path execution. Supported system validation, tuning, documentation, and operator training.

Key Achievements:

- Standardised weld quality across high-volume production
- Eliminated reliance on specialised welding labour
- Increased throughput through automated sequencing and repeatable cycle times

Engineering Projects

Semi-Automated Laser Welding System – Plenum-Knifedge Line

Developed a semi-automated welding solution for stainless and aluminium plenum to knifedges. Designed SolidWorks fixtures for stable weld geometry, built a custom Raspberry Pi–driven CNC motion controller, and integrated electrical and mechanical subsystems for precise weld delivery.
Impact: Improved weld consistency, reduced cycle time, and removed specialised labour dependency.

Semi-Automated Laser Welding System – Inlet to Plenum

Engineered a dedicated jig and automated weld sequence for inlet-to-plenum assemblies. Developed mechanical fixturing, electrical wiring, and controlled motion paths to standardise weld quality across high-volume production.
Impact: Improved weld consistency, reduced cycle time, and removed specialised labour dependency.

Active Noise Cancelling Headrest – Embedded PCB System

Designed a multi-stage power and signal-processing PCB for active noise reduction. Developed embedded logic for microphone and audio pathway integration, built prototypes, and established testing workflows.
Impact: Delivered functional hardware platform for ongoing acoustic system development.

Education

Bachelor of Engineering (Honours) – Mechanical and Mechatronics
University of Technology Sydney | 2022 – 2027

Higher School Certificate
Nepean Christian School | 2021

Technical Skills

Mechanical & Manufacturing
CNC programming and operation; laser cutting (Bystronic BySoft); sheet-metal fabrication (brake pressing, forming, cutting, jigging); MIG and laser welding; fixture, tool, and jig design (SolidWorks); rapid prototyping (FDM, SLA); mechanical commissioning and production tooling integration.

Electrical, Automation & Embedded Systems
PLC wiring and integration (Click PLC); industrial wiring, control circuits, sensors, and relays; PCB design and prototyping (KiCad, Altium); power electronics and signal conditioning; embedded systems development (Raspberry Pi, Arduino, FPGA); motion-control systems for CNC and welding; basic integration of UR3 and UR5 collaborative robots.

Software & Tools
C, C++, Python, MATLAB, LabVIEW, VHDL; HMI/PLC logic development; CAD (SolidWorks, Fusion 360); ECAD (KiCad, Altium Designer); Windows and Linux environments; documentation, testing, and commissioning workflows.

Referees

Available on request