

Brock Cooper

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Personal Profile

Mechatronics engineer with more than 6+ years of research and development experience across embedded systems, robotics and small uncrewed aircraft. UAS work includes payload design, aircraft modification, avionics and flight-control integration, systematic fault diagnosis, and support for structured ground and flight-test programs that captured data and verified performance against project objectives. Remote pilot across multirotor, aeroplane and helicopter platforms with more than 10+ years of practical experience.

Education

University of Wollongong (UOW)

BACHELOR OF MECHATRONICS ENGINEERING (HONOURS CLASS II, DIVISION 1)

Wollongong, NSW

Jan 2017 - Jul 2022

- Thesis designed a low cost 3D printed 6-degrees-of-freedom robotic arm and characterised its performance.

TAFE NSW

STATEMENT OF ATTAINMENT (CAD DESIGN AND MANUFACTURING)

Campbelltown, NSW

Mar 2016 - Dec 2016

Work Experience

The University of Sydney

TECHNICAL OFFICER - FACULTY OF MEDICINE AND HEALTH - (FULL TIME)

Camperdown, NSW

Mar 2023 - Present

- Led bespoke research-equipment projects from initial consultation and scope definition through concept design, manufacture, system integration, validation and delivery.
- Designed an MRI gustometer with custom PCBs, sensor feedback, pump control and fail-safe functions to provide precise fluid delivery across varied viscosities.
- Developed an assault-bike dynamometer with custom mechanical interfaces, electronics and data acquisition to support repeatable research measurements.
- Diagnosed mechanical, electrical and software faults through systematic isolation; refined each design to improve reliability, repeatability and data quality.
- Prepared technical documents, operation procedures, WHS records and risk assessments; instructed staff and students; and maintained delivered equipment.
- Converted research requirements into reliable experimental systems and technical support, which contributed to co-authorship of two peer-reviewed publications.

Flight Technologies

MECHATRONICS TECHNICAL SOLUTIONS ENGINEER - (CASUAL)

Wollongong, NSW

Jun 2021 - Sep 2022

- Led the design and construction of the Rotamarka payload for the Callisto 50 heavy-lift UAS, from concept and prototype manufacture through aircraft integration and test.
- Integrated the payload with the flight-control system, avionics and power distribution within mass, centre-of-gravity, structural, clearance and operational limits.
- Designed KiCad PCBs for power, signal and embedded control; selected components, assembled boards and validated circuits with oscilloscopes, logic analysers and multimeters.
- Helped plan and conduct ground, field and flight tests; defined test objectives, captured data, verified performance and applied improvements after each test.
- Resolved mechanical, electrical, software and control-system faults through systematic root-cause analysis with simulators, test instruments and bench checks.
- Produced schematics, bills of materials and operation documents, and built prototypes with CNC machines, laser equipment, additive manufacture and precision solder work.

The University of Sydney

MECHATRONICS PROJECT COLLABORATION - DRONE ON DEMAND - (INTERNSHIP)

Camperdown, NSW

Dec 2019 - Feb 2020

- Supported research into rapid UAV manufacture and assessed materials and production methods for lightweight aircraft structures and prototype parts.
- Used SolidWorks and additive manufacture to design and produce experimental UAV components for aircraft evaluation.
- Developed a Python interface to automate print preparation, improve process repeatability and support rapid production of aircraft components.

Rise Above

UNMANNED AERIAL VEHICLE (UAV) TECHNICIAN - (PART TIME)

Smeaton Grange, NSW

Feb 2019 - Jan 2020

- Designed and fitted custom payloads to commercial multirotor aircraft with CAD, C++, Python and embedded electronics to meet client and operational requirements.
- Integrated sensors, servos, rotary encoders, embedded controllers and mechanical payloads within aircraft clearance, centre-of-gravity and operational limits.
- Designed and produced mounts and interfaces for specialist payloads such as multispectral cameras with additive and CNC manufacture.
- Conducted workshop and outdoor tests on custom aircraft and modifications, isolated hardware and software faults, and refined systems to improve reliability.
- Provided hands-on support for enterprise UAS platforms and maintained 3D printers and workshop equipment used for aircraft modification and prototype work.

Austate Services

CONTRACT DESIGN AND PRODUCTION ENGINEER - (CASUAL)

Minto, NSW

Dec 2021 - Mar 2023

- Converted client requirements into custom heavy-transport designs, produced AS1100 technical drawings and verified compliance with the Road Vehicle Standards Act 2018.
- Coordinated workshop projects and instructed staff in the safe use of CNC machines, brake presses, cranes and related equipment.
- Inspected and maintained fibre laser systems, welders, grinders and workshop equipment under WHS procedures and risk controls to preserve operational readiness.
- Commissioned a high-power four-axis fibre laser and developed new production methods, software workflows and custom scripts to improve workshop capability.
- Explained technical constraints and design decisions to staff, clients and suppliers to resolve production issues and support project delivery.

Certificates and Professional Development

- **2017:** Alan Broady Memorial Prize (The University of Sydney)
- **2016:** South32 Illawarra Coal Sustainability (University of Wollongong)
- **2016:** HSC Shape Exhibition (Powerhouse Museum)
- **2015:** National WHS General Construction Induction Training (White Card)

Publications

- Yang, Y., **Cooper, B.**, Houghton, M. et al. "OpenStride: an inexpensive, open-source force plate actometry system for quantification of rodent motor activity and behaviour." *Scientific Reports*, 16, 15147 (2026). doi:10.1038/s41598-026-44953-z.
- Ghayomzadeh, M., Natera, A., Sabag, A., **Cooper, B.**, Davis, G. M. and Hackett, D. A. "Effects of isometric vs. dynamic resistance training on muscle performance and body composition: Protocol for a pilot study." *JSAMS Plus*, 6, 100108 (2025). doi:10.1016/j.jsampl.2025.100108.