

CONTACT

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EDUCATION

- 2019 - 2024
- The University of Newcastle, Australia
- Bachelor of Electrical and Electronic Engineering (Honours)
- Bachelor of Mathematics
 - Honours Class I
 - WAM: 95.21

HONOURS & AWARDS

- Best Final Year Project (2023)
- College Commendation List (2019, 2020, 2021, 2022, 2023)
- Institution of Engineering & Technology (IET) Prize (2021)
- Physics Staff Prize in PHYS1220 Advanced Physics II (2019)
- FEBE Summer Scholarship (2020 & 2021)
- SIPS Summer Scholarship (2022)

RELEVANT COURSES

- Programmable Logic Design
- Machine Learning
- Signal Processing
- Analog Electronics
- Analog and Digital Communications
- Non-linear Control and Estimation
- Partial Differential Equations
- Fourier Analysis
- Complex Analysis
- Abstract Algebra
- Statistics

* Please see transcript for an exhaustive list.

LACHLAN COOKE

Strategic and versatile engineer at the confluence of mathematics and engineering, applying analytical precision to distill complex ideas into real-world solutions. With expertise in hardware design, embedded systems, and machine learning, I bridge rigorous mathematical analysis with practical execution. Skilled in technical problem-solving and effective collaboration, I thrive where innovation, human dynamics, and real-world impact intersect.

EXPERIENCE

- Founder & Mechanical Engineer2025 - PRESENTTrefoilTechAU (eCommerce)
 - Created and strategised an eCommerce business which now has over 200+ customers across Oceania and North America.
 - Utilised 3D modelling and mechanical engineering skills to design replacement parts for a global appliance manufacturer.
- Electrical Engineering Intern2023 - 2024Reach Robotics
 - Worked under supervision of the electrical and mechatronics engineering teams in the R&D department on various technical aspects of subsea robotic manipulators.
 - Developed circuit schematics and designed PC boards in Altium Designer to handle data logging from various sensors.
 - Mathematically analysed and implemented both analog and digital filter topologies to attenuate noise and condition signals for analog-to-digital conversion.
- Teaching Assistant2021 - 2023The University of Newcastle, Australia
 - Taught laboratory and tutorial classes for a variety of first and second year courses across both engineering and mathematics. Notable courses include ELEC1310 (circuit theory) and MATH2310 (ordinary differential equations and multivariable calculus).
 - Responsible for lab demonstrations, marking, tutorials, project development and helping students with queries or concerns.

PORTFOLIO HIGHLIGHTS

- Rubik’s Cube Solving Robot (Honours Project)
 - Developed an integrated system able to scan the cube state (two cameras using OpenCV), compute a near-optimal solution using the IDA* algorithm, synthesise motor commands on a MCU and route commands to stepper motors on each face via a custom PCB.
- ‘Scratch-built’ MNIST Handwritten Digits Neural Classifier
 - Scratch-built a deep neural network to classify handwritten digits, deriving backpropagation equations from first principles using matrix calculus, the chain rule, and SGD. Implemented the entire training pipeline exclusively in Python, using NumPy — bypassing high-level ML frameworks like PyTorch, TensorFlow, and Keras. Achieved 94% test accuracy.

* Please see my website for the accompanying articles to these projects and others.

REFERENCES

- Dr. Stephan TornierMathematics Researcher / UoNPhone: (02) 4055 0960Email: stephan.tornier@newcastle.edu.au
- Prof. Zhiyong ChenProfessor (SEEC) / UoNPhone: (02) 492 16352Email: zhiyong.chen@newcastle.edu.au