Sophia Schulz

Mechatronics Engineering BE(Hons) Graduate

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Experience

Mechatronics Engineering Intern | Aethermotics *Nov. 2024 - Mar. 2025*
Auckland, New Zealand

- Designed and conducted experimental procedures to characterise cooling performance of wearable tech garment, providing company with invaluable data in a thorough report for furthering garment development. Conducted data collection and analysis using various pressure sensors, Microsoft Excel and Visual Basic for Applications (VBA).
- Designed and built fan control dial, integrating off-the-shelf and custom 3D-printed components to allow intuitive, stepwise switching between fan levels that improve user's thermal comfort. Enabled the development of a look-like, feels-like prototype for user testing and achieved a 47% reduction in hardware volume through part consolidation.

Research Assistant | University of Auckland *Apr. 2024 - Apr. 2025*
Centre for Automation and Robotic Engineering Science (CARES) | Auckland, New Zealand

- Designed and built a custom frame and mount to enhance camera stability and adjustability for plant disease detection in greenhouses. Responsibilities included CAD design using Autodesk Inventor and Onshape, sourcing parts, 3D printing, fabricating with aluminium extrusion, and conducting on-site testing.
- Designed subsequent prototype for autonomous camera movement through selection, testing and assembly of electronics and components, including a stepper motor, controller, driver and linear actuator. Developed software in C++ for autonomous operation, and designed and built new 3D printed camera mounts and aluminium frame.

Robotics and Autonomous Systems Research Intern | A*STAR *Dec. 2023 - Feb. 2024*
Institute for Infocomm Research (I2R) | Singapore

- Thoroughly analysed timing characteristics and performance of the wireless communication protocol ESP-NOW through conducting independent research and programming ESP32 microcontrollers in C++.
- Created and tested a successful C++ program for wireless bilateral tele-operation of two brushless DC motors using ESP-NOW and CAN communication and improved its performance through reducing timing latencies. Involved debugging of CAN lines and BLDC drivers. Video demonstration of this project: https://youtu.be/fLuXrNqsmR8
- Integrated barometric pressure sensor readings and real-time filtering techniques in Robot Operating System (ROS) and investigated their effectiveness for altimeter measurements of a Unitree Go1 legged robot.

Production Engineering Intern | Halter *Jul. 2022 - Feb. 2023*
Hardware Team | Auckland, New Zealand

- Validated and implemented waterproof test fixtures in production through pioneering Halter's first-ever Gauge R&R study and conducting ANOVA in R. Devised long-term timeline and detailed documentation of all stages, resulting in adherence to deadlines, replicability of testing processes, and increased confidence in waterproofness of hardware.
- Led the transfer of the entire Bill of Materials (BOM) system to Arena and trained senior engineers on BOM release process through comprehensive documentation, extensively improving efficiency and confidence in BOM accuracy.
- Led cross-functional teams to investigate electronic buzzer reliability issues. Successfully diagnosed buzzer failures in production through design and validation of the first buzzer testing fixture, achieving weekly savings of $7.5k.

Education

Bachelor of Engineering (Honours) | University of Auckland *Graduated May 2025*

- First Class Honours, specialising in Mechatronics Engineering

Volunteering

Video Director | Engineering Revue *Mar. 2024 - Feb. 2025*
University of Auckland | Auckland, New Zealand

- Directed and produced multiple video projects while adhering to tight deadlines and managing communications with numerous Revue departments, from actors and writing to costumes, makeup, dance and vocalists.
- Managed team of 6 to execute production of these projects through regular pre- and post-production meetings, writing and distributing call sheets, managing on-set roles and delegating storyboarding and editing tasks.
- Led creative direction of video projects through script writing, storyboarding, filming and editing.

Equity Team Co-Leader | Women in Engineering Network (WEN) *Dec. 2021 - Nov. 2023*
University of Auckland | Auckland, New Zealand

- Led team to implement first ever student Allyship Trainings and Equity Forums, raising awareness and sparking discussions about equity concerns and improving inclusivity within the engineering faculty.
- Implemented first ever period products initiative within the faculty building to provide free products to students.
- Organised WEN's first ever Accessible Design & Innovation event, featuring engineers from Aurecon, Movio and NDY, to educate and inspire students on incorporating accessibility considerations in engineering projects.
- Panellist at The Diversity Agenda's 2023 Accord Summit, discussing issues such as women retention in engineering.

Skills

Technical Skills: CAD in Onshape & Autodesk Inventor, C/C++, MATLAB, R, 3D-Printing (polymer-based FDM and SLS, metal-based SLS), Laser Cutting, Soldering, Technical Documentation (SOPs and BOMs)
Design/Other Skills: Digital Photography and Videography, Adobe Lightroom, Adobe Premiere Pro

Achievements

Blackbird Foundation Protostars Programme | Season 9 Alum *2025*

- Recipient of $1k AUD grant towards **res·o·nance**, a planned STEAM exhibition based in Auckland, NZ

Part IV Project CROWN Robotics Technology Centre Industry Award *2024*

- Awarded for Part IV Project titled "A Modular Robotic mechanism for discrete rock sample collection on Mars," completed at the University of Auckland under the supervision of Dr. Minas Liarokapis.

Sir Colin Maiden Scholar | Dean's Leadership Programme *2023*

- Awarded through participation in workshops and networking sessions with industry leaders in New Zealand.

Dean's Honours List *2021, 2022, 2023 & 2024*

- Top 5% of Part I Engineering cohort, Part II, Part III & Part IV Mechatronics Engineering cohorts.

Projects

Proximity-Controlled Interactive LED Display featuring vintage slide films, created as part of **res·o·nance**, a planned STEAM exhibition based in Auckland, NZ (for more, see https://www.sophia04.com/res-o-nance).

Modular Robotic Mechanism for Discrete Rock Sampling on Mars: BE(Hons) Final Year Research Project and recipient of the CROWN Industry Award (for more details, see https://www.sophia04.com/robotic-mars-sampling-mechanism).

Anthropomorphic prosthetic gripper utilising hybrid manufacturing techniques including silicone casting and 3D-printing, validated with various grasping tests (for more details, see https://www.sophia04.com/anthropomorphic-prosthetic-gripper).

STEM Take-Home Kits for students participating in workshops at the IEEE Women in Engineering International Leadership Summit (for more details, see https://www.sophia04.com/post/ieee-wie-ils-2023-student-stem-kits).

For more examples of current and past work, please visit https://www.sophia04.com.