

# Sophia Schulz

Mechatronics Engineering BE(Hons) Graduate

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## Experience

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### Research Assistant | University of Auckland

*Apr. 2024 - Present*

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 (e.g., linear actuators, drivers, controllers), software development for autonomous operation, and design and construction of new 3D-printed camera and sensor 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. 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 the first positive pressure waterproof test fixtures in production through pioneering Halter's first-ever Gauge R&R study and conducting ANOVA data analysis in R. Devised long-term timeline and detailed documentation of all stages from start to end, resulting in successful adherence to deadlines, replicability of testing processes, and increased confidence in hardware by accurately diagnosing waterproof issues in production.
- Single-handedly transferred entire Bill of Materials (BOM) system to Arena and trained rest of team 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.

## Volunteering

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### Video Director | Engineering Revue

*Mar. 2024 - Present*

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.
- Video editing in Adobe Premiere Pro and DaVinci Resolve; cinema camera and sound work for filming.

### 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.

**Partnerships Manager (2023), Co-Marketing Manager (2022) | Robogals Auckland** *Dec. 2021 - Nov. 2023*  
University of Auckland | Auckland, New Zealand

- Orchestrated collaborations with university clubs to organise Science and Engineering Day (SED) featuring robotics and engineering activities for students aged 8-12.
- Increased attendance by 200% from our first SED to our second by managing communications with all parties involved to implement key deadlines and coordinate regular meetings.
- Recruited and maintained 400+ volunteers by managing communications using graphic design, photography and social media, resulting in the successful running of 44 STEM workshops for Auckland children throughout 2022.

## Education

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**University of Auckland | Bachelor of Engineering (Honours) | GPA: 8.66/9.00** *Graduating May 2025*

**Pacific Academy | International Baccalaureate Diploma Programme | 44/45 points** *Class of 2021*

## Skills

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**Technical Skills:** Onshape, Autodesk Inventor, Fusion360, 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, Rhino 3D

## Achievements

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**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*

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

**Governor General’s Academic Medal Bronze Recipient (Canada)** *2021*

- Awarded for receiving highest average grade in high school graduating class

## Projects

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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>).

Currently exploring projects such as a mutual capacitance sensor-based interactive displays and self-directed/produced short films and photoshoots. For more examples of current and past work, please visit <https://www.sophia04.com>.