

## Sydney internship experiences

Students share a paragraph about their experience doing an internship as part of the Sydney sophomore program.

S'23: a you tube video of an internship experience! <https://youtu.be/-xDYhDfrHLc>

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S'23: During my internship in downtown Sydney, I gained a deep insight around the communication that medicine and engineering share to create extraordinary solutions to clinical problems. The goal of the company I worked with is revolved around creating ankle foot orthoses (AFO) for patients with mobility impairments. Now, with the complex anatomical structure of the human body and lower limbs, the team and I would work with clinical professionals to understand and implement the key anatomical landmarks into the AFO design. With the support from clinical professionals, computer design engineers, prototyping, complex 3D print manufacturing techniques, and more, the company produces impactful medical devices. My duties were predominantly in the computer design of new additions to the AFO componentry and its implementation to the production line, along with prototyping and AFO strength and impact testing. Acquiring the feedback from patients over time was eye-opening. This startup company and their amazing team of brilliant and passionate engineers nourish a powerful mission, which enables for the opportunity to positively alter the lives of their patients.

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S'23: I interned at the high voltage lab at the University of Sydney that was working with plasma deposition and implantation techniques in order to create effective materials for biomedical applications. I worked under Dr. Clara Thao and very closely with her PhD student, Alice Feng. In the lab, a lot of the tasks I had to complete focused on preparing samples to undergo plasma treatment, taking measurements before and after plasma treatments, and compiling and analyzing the data from the measurements. What I really liked about my internship was getting to know all the people in the lab; Australian work culture promotes a very social environment. My coworkers and I went out to dinner and got drinks at some point during the semester and it really helped me feel more comfortable in the lab after getting to know everyone. Another thing I really liked about this internship was its flexibility. I didn't have set days or times to be in the lab, I was able to come and go at my convenience as long as I completed the work given to me for that week. The only true negatives about working in a lab is that the work often gets repetitive, and you're working by yourself a lot and it can get lonely. Some people like independence but I found it a little isolating. But overall I loved my lab experience and would highly recommend it.

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S'23: While studying abroad in Sydney, I took part in a research internship at the Children's Medical Research Institute, CMRI. CMRI is a private institute, affiliated with The University of Sydney committed to combating genetic diseases facing children across Australia. I was focused on cancer research in the Genome Integrity Unit. I worked directly with Postdoctoral fellow on her project looking into chromatin mobility (how DNA moves and repairs itself). The project aims to understand methods of DNA damage

and repair for double-strand breaks at centromeres (the center of chromosomes). Understanding how cancerous and healthy cells are damaged and repair themselves is useful in developing cancer treatments that damage cancer cells more effectively and allow healthy cells to efficiently repair themselves. In this role, I learned many new technical techniques including immunofluorescence, cell culture and microscopy and became a part of a diverse team. The lab was very social, often having events and socials outside of work that let me get to know my coworkers better and immerse myself in Australian culture!

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S'23: While in Sydney, I interned with a small startup called Metakosmos. The company's goal is to reduce the lifespan of space mission preparation by creating a new generation of smarter, cheaper space suits. I worked with a team of interns on a research project where we had to investigate proposing a new thermal cooling system for the interior of the suit. Our work was done remotely with weekly meetings between us and our supervisor to catch up on the past week's progress. All our work culminated in a mid-project and final project presentation where our findings and proposals were shared with our internship coordinator and supervisors at the company. The project served as an opportunity to develop teamworking skills, explore existing aerospace technologies, and learn about the space product design process on a small scale.

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S'20: I worked in the Clean Combustion Research Laboratory at the University of Sydney under principal investigator Professor Assaad Masri and post-doctorate Dr. Mrinal Juddoo. The lab covers many projects involving studying the nature of fuel combustion, and how they can be made more sustainable to the environment and safer for those who work with combustible materials. My particular area of work was in studying the properties of the flames that result from combustion. I would design a combustion apparatus using the equipment in the lab, and run tests with the apparatus to vary the velocity of the flame and record my observations. For all of the time humanity has spent using fire as a tool, the dynamics of flames are still largely a mystery; the aim of this research would be to figure out more about the propagation of flames in the hope that the research can apply to developing new safety measures for fire detection and suppression. Assaad and Mrinal were pleasures to work with and I would recommend this lab for anyone interested in propulsion systems, as I am, as you will learn more about the fluid mechanics that are required for combusting fuels and oxidizers together, as well as the physics of exhaust flames that can result from jet and rocket propulsion.

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S'20: My internship was in the USyd School of Chemical and Biomolecular Engineering with a professor studying digestion. My work included researching the structure of animal stomachs (specifically chicken gizzards) and designing CAD models of them to be 3D printed and used in research.

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S'20: I interned at a start-up called Contactile, specializing in developing a tactile sensor with human dexterity capabilities. Below are some of my accomplishments during my time there. I think it was a unique experience in that I was able to experience an in-person and remote experience. I think remotely

interning in NYC, my hometown, for a company in Sydney is uncommon. Also, gaining exposure to engineering from a global perspective was a great opportunity. I learned a lot from a technical and personal perspective. Without the Sydney program, I would not have been able to gain such a special internship experience.

- Programmed a web application for a 3D graphic view of a sensor improving upon the legacy 2D version using JavaFX.
- Designed PCBs for a testing and force sensor component for a tactile sensor using KiCad progressing a working prototype.
- Executed projects globally across time zones with a self-managed team under remote supervision.

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S'19: My internship was really fun! I worked in Dr. Zihuai Lin's lab at the University of Sydney along with one other BU student. Dr. Lin was interested in using ultra-wide bandwidth radars to detect people behind walls. He had the radars and MATLAB code that made them run, but the versions didn't match up perfectly. We worked to debug the MATLAB code to work with the specific version of the radars that we had. Once we got those working, our job was to set up tests to determine the accuracy of the radars. Dr. Lin let us bring some back to the housing and show our friends how they worked.

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S'19: The company I worked with was called Smart Approved WaterMark. They are a water conservation label, promoting efficiency through the identification and certification of water efficient products and services. My responsibilities involved performing case studies and water audits on former and current clients, while I also dealt with the marketing and promotion for the Smart WaterMark certification scheme.

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S'20: While abroad I was working for a startup company working out of the University of New South Wales called Contactile Inc. They design force touch sensors based primarily for robotic applications. The sensors allow grippers to apply the optimal grip force to objects of different weight, size and friction without additional programming. I worked with other interns from the program and we were trained to use a 3D printer, design components using CAD software, and optimize sensor design. I received incredible mentorship and guidance from all the senior level employees and it was great insight into the world of tech startups. Once the semester went remote, my roll changed to focus more on graphic design and building the website. Overall, I learned a lot from this experience.