

Electrical Engineering and Telecommunications



UNSW ENGINEERING





Welcome from the Head of School

UNSW Electrical Engineering and Telecommunications is the largest School of its kind in Australia, and its international standing consistently attracts high calibre students from around Australia and the world. The School spans five research disciplines – Energy Systems, Telecommunications, Systems and Control, Nano / Micro Systems and Signal Processing.

Our education is recognised within UNSW and beyond for its quality and innovation, reflected in high student experience scores and many teaching awards. Our academic, professional and technical staff are internationally renowned experts in their fields and offer the widest range of specialised elective courses and honours thesis/masters project topics nationally.

Our research has received the maximum 5-star rating of “well above world class” in all Excellence in Research Australia evaluations: 2010, 2012, 2015 and 2018. Multiple university rankings list us as the top School in Australia, and within the top 50 globally. We work closely with industry globally on dozens of cutting-edge projects that underpin and advance our technological society.

With \$104M recently invested, we are now home to many cutting-edge laboratory facilities that are unique nationally and offer our students fantastic opportunities to develop as engineers. The School continues to provide a world-class, challenging and well-balanced learning environment that has produced excellent and valued engineering graduates since its inception.

Professor Jinhong Yuan
Acting Head of School
School of Electrical Engineering
and Telecommunications
UNSW Sydney

What we do

The School of Electrical Engineering and Telecommunications is a leading provider of world-class education and research; producing internationally recognised research and graduates. We work closely with industry at a global level on dozens of cutting-edge projects that underpin and advance our technological society.



No. 1 in Australia according to the 2021 QS Rankings and the 2021 Academic Ranking of World Universities



Largest electrical engineering school in Australia with 43 continuing academic staff



With \$104m recently invested, we are now home to many cutting-edge laboratory facilities which are unique nationally



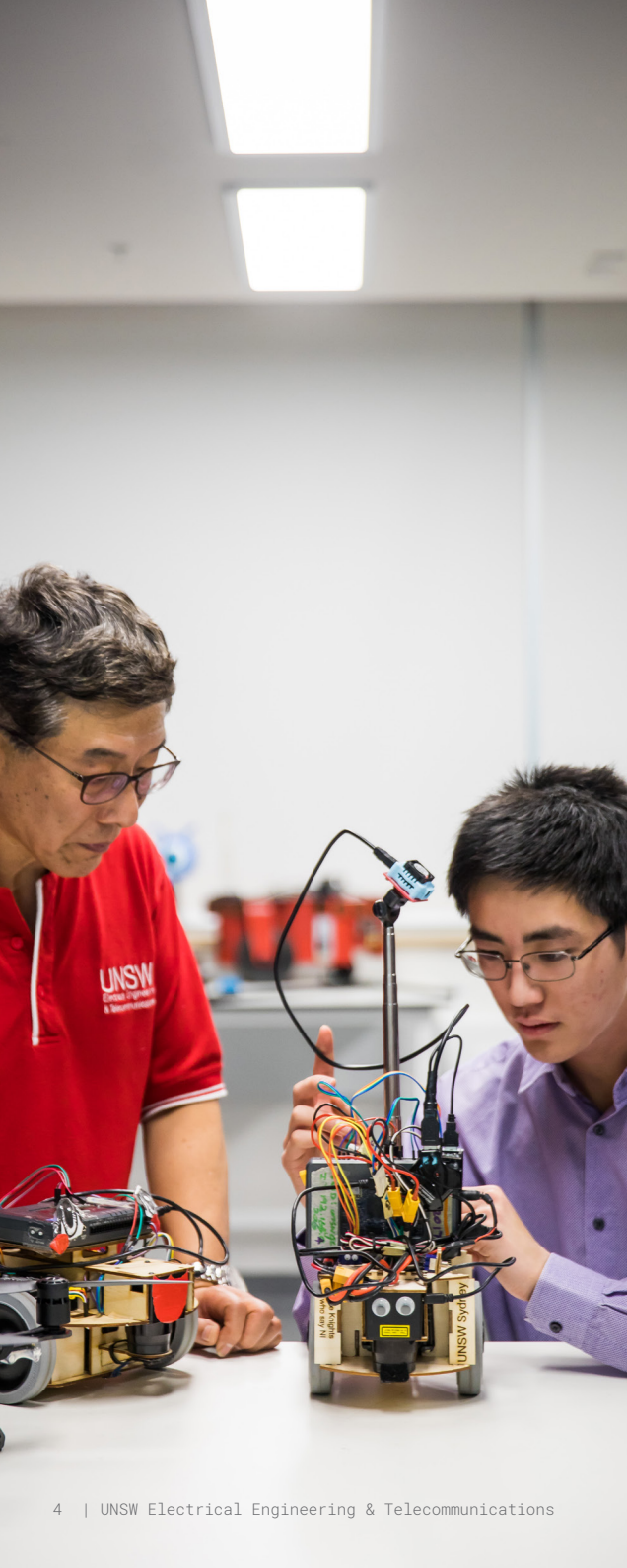
Our research has received the maximum 5-star rating as “well above world class” by the Excellence in Research Australia (ERA) evaluations in 2010, 2012, 2015 and 2018



The broadest range of electrical engineering elective courses in Australia



30% of our staff have received faculty or university teaching awards in the past 10 years



A Research Powerhouse



Energy Systems

Advanced power conversion and power systems applications which include the future energy efficient electricity grid, renewable generation and integration, automotive and aerospace applications, and marine systems.



Nano/ Microsystems

Devices from the nanometre scale to several hundreds of microns, including silicon-based quantum computing, Si nanoelectronics, MEMS-based optical interconnects, low power integrated circuits for biomedical applications and ultra-low temperature electronics.



Systems and Controls

Development of basic theory, algorithms and design, systems and control is fundamentally a cross-disciplinary activity that can be applied to any discipline involving dynamic systems.



Signal Processing

Compression, pattern recognition, enhancement and processing of image, video, speech, biomedical, radar and genomic signals, including space and satellite systems engineering research.



Telecommunications

Efficient, robust and secure, communications systems, including Software Defined Networks, 5G/6G Networks, Sensor Networks and Quantum Communication Systems.

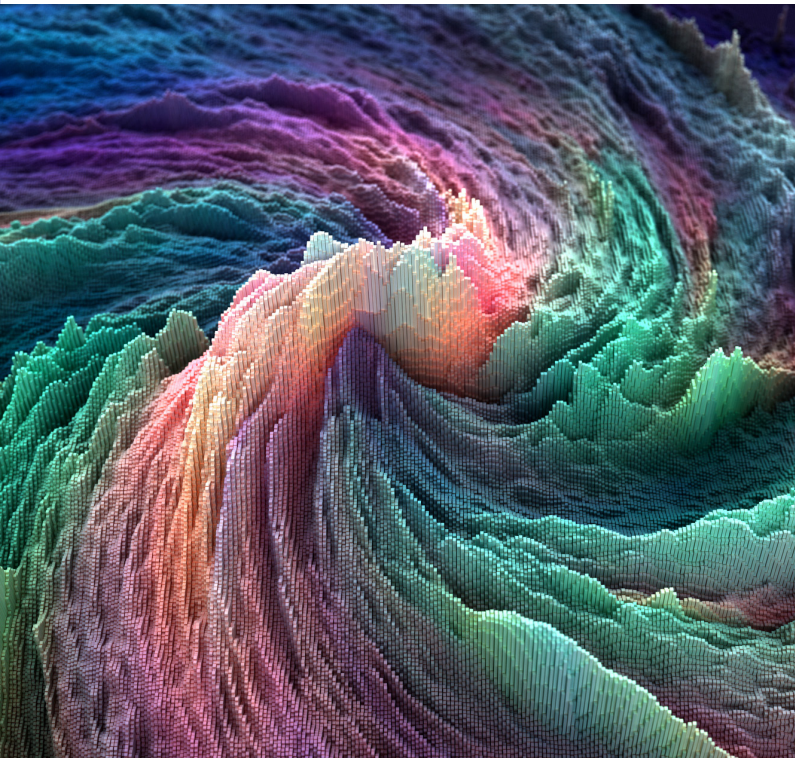
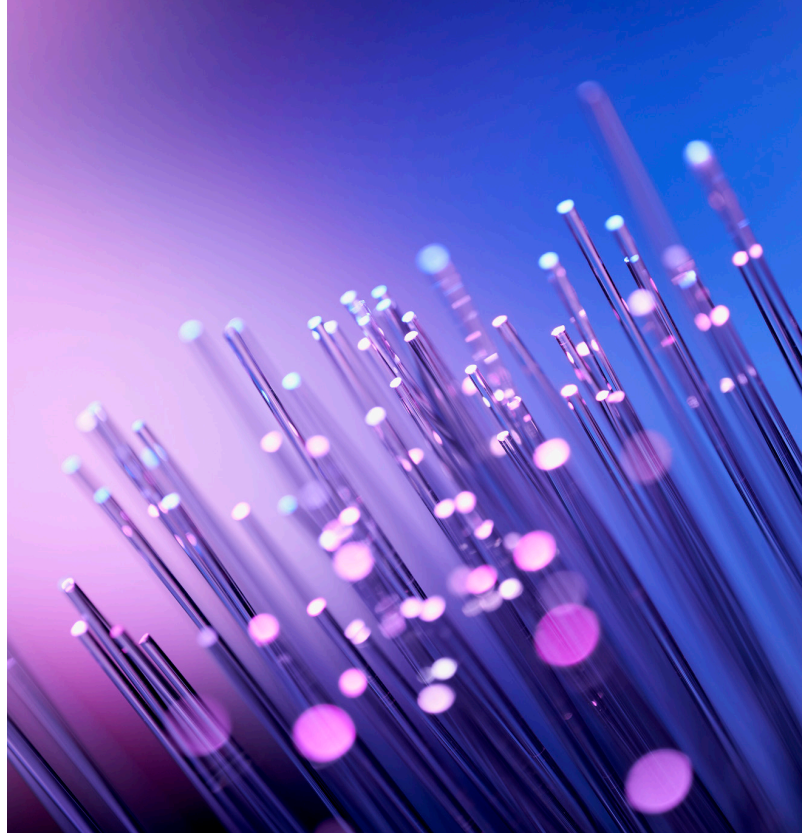
Research Highlights

Each year our academics and research centres work with businesses, government and community organisations on specific projects, transferring our research into practice. We are making an impact that matters with the following research:

1. Optical Sensors

Professor François Ladouceur's research has redefined what is meant by optical sensing networks. Traditionally, these networks are viewed as being enabled by optical sensors, i.e. sensors that use light as their probing mechanism. A better approach is to use light rather as a transducing mechanism, that is, a mechanism that allows to read the output of any traditional sensors optically. Once in the optical domain, data can then be transmitted with all the benefits that optical networks bring.

This approach has been successfully used in a number of hazardous environments (mining, ocean monitoring) with local and international industry partners. The upshot is better and safer monitoring for industrial players.



2. Image And Video Compression

To provide compact versions of large image and video files, a new multimedia compression standard called JPEG 2000 was developed. Professor David Taubman developed core algorithms of JPEG 2000, and created a software toolkit – known as Kakadu. He wrote the code in just six weeks to include with a book he was writing at the time. It has since evolved to more than half a million lines of code and over its lifespan, has sold more than 250 commercial licences for companies such as Dolby Laboratories, HBO, Sony and Disney.

Kakadu is enabling doctors to share and better analyse medical imagery; is helping security companies conduct surveillance activities with unprecedented clarity by interacting with CCTV footage in new and dynamic ways; and has been used by the Mars Rover Curiosity project. "JPEG 2000 provides all the flexibility that JPEG can't," says Professor Taubman. "It provides the capabilities you need for scientific, medical, geospatial and military applications."

State of the Art Facilities

Our facilities, recently refurbished with \$104m funding, offer 7000 sqm of the very latest in technology-enabled research, learning and teaching:

- › Australia's largest high voltage laboratory
- › Audio and RF anechoic chambers
- › Australian Centre for Space Engineering Research
- › Australia's largest optical fibre fabrication facility
- › Signal processing and Wireless Communications Systems laboratory
- › Australian National Nanofabrication Facility for <1 micron semiconductor fabrication
- › World's largest university-based real-time digital simulation laboratory, for simulating large scale power systems with complete hardware-in-the-loop testing of physical equipment
- › Hardware design project laboratories
- › Software defined networking laboratory

In 2019, we introduced ChallENG, a new program that builds a bridge between industrial training and our industry partners by connecting students, academics and companies through various project based learning initiatives.

This program will prepare our students for their careers by providing a multi-year, multidisciplinary approach to learning that hones their technical skills while expanding their professional experience.

ChallENG has five initiatives within its framework that students, academics and companies can participate in.



Some of our Industry Partners

- | | |
|-------------------------------|------------------------------|
| › Raytheon | › Cochlear |
| › US Office of Naval Research | › Goldwind |
| › Silanna Semiconductor | › China Datang Corporation |
| › Thales | › Google |
| › Ausgrid | › Jacobs |
| › Northrop Grumman | › HCF |
| › SondeHealth | › O&C Electric Technique |
| › Telstra | › Optus |
| › ABB | › Australian Power Institute |
| › Huawei | › Zedelf |
| › National Instruments | › CISCO |
| | › NBN |

Creating leaders & Innovators

We are focused on providing a diverse and innovative learning experience for our students. With more than 1000 coursework and 150 higher degree research students, we offer the widest range of electrical engineering disciplines and elective courses in Australia.

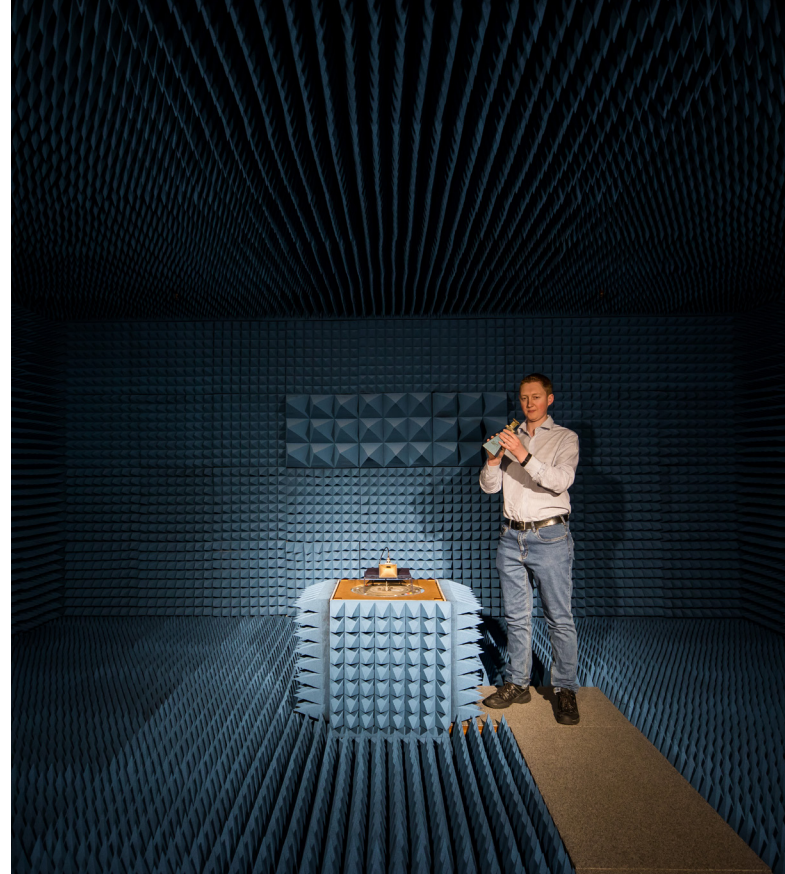
Programs

Undergraduate

- › Bachelor of Engineering (Honours) in Electrical Engineering
- › Bachelor of Engineering (Honours) in Telecommunications
- › Bachelor of Engineering (Honours) in Quantum Engineering
- › Bachelor of Engineering (Honours) Master of Engineering in Electrical Engineering

Postgraduate

- › Master of Engineering (Electrical Engineering)
- › Master of Engineering (Telecommunications)
- › Master of Engineering Science (Electrical Engineering)
- › Master of Engineering Science (Energy Systems)
- › Master of Engineering Science (Space Systems Engineering)
- › Master of Engineering Science (Telecommunications)
- › Master of Engineering Science (Systems and Control)
- › Graduate Diploma of Engineering Science (Electrical Engineering)
- › Graduate Diploma of Engineering Science (Energy Systems)
- › Graduate Diploma of Engineering Science (Telecommunications)
- › Graduate Certificate of Engineering Science (Electrical Engineering)
- › Graduate Certificate of Engineering Science (Energy Systems)
- › Graduate Certificate of Engineering Science (Telecommunications)



Customised Professional Development Programs

We are able to bring together the brightest minds in research and industry to create bespoke development programs that are tailored to your goals.

Our Alumni



"Studying EE&T at UNSW enabled me to enhance my technical skills in such a large array of industries (Power, Telecommunications and Control Systems) and has opened up so many wonderful opportunities for my future career."

Jaclyn Egan

Ernst and Young
San Francisco



"My degree enabled me to study in the US, get work experience with top companies in Australia (through the Co-op program and directly), and gave me a top-tier education that prepared me for my first role."

Ben Buchanan

Netflix



Get in touch

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Future Student Enquiries:

Ask a question

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 unsw.edu.au/engineering/study

 unsw.edu.au/ask