From research into wi-fi and robots to wearable antennas for medical applications and next-generation cellular systems, Macquarie’s engineering researchers are uniquely positioned to help shape the complex issues that define the future of humanity.

Our researchers are dedicated to creating technological solutions to problems relevant to society’s health and environment – solutions that expand the capability of people to achieve their goals.

We have research strengths in electromagnetic and antenna design, energy conversion and management, integrated wireless communication systems, nonlinear electronics, guided-wave optics and photonics, very-large-scale integration, and wireless communications and networking. We also have a strong research program in mechanical engineering related to precision manufacturing with an emphasis on medical devices and applications.

Our researchers are also involved with biomedical devices, biomedical imaging and mid-infrared photonics research. A number of our research projects are linked to our industry partners including Agilent Technologies, Applied Wave Research, BCS International, CSIRO ICT Centre, Intel, Jazz Semiconductor, M/A-Com Technology Solutions, NHEW R&D, Optus, TriQuint and many highly ranked international universities.

As a higher degree research candidate at Macquarie, you will have the opportunity to research alongside some of the world’s best scholars whose cutting-edge research continually pushes the boundaries of knowledge. You will also benefit from our working partnerships with many of the global companies neighbouring our campus in Australia’s largest high-tech precinct.
Highlights

• In 2010, we became the first university in Australia to forge a research partnership with CSIRO under the revitalised Science Industry Endowment Fund, when $2 million from the fund was awarded to create a Chair in Wireless Communications at Macquarie.

• Adjunct Professors Neil Weste and David Skellern’s research into WLAN IEEE 802.11 technology, which helped enable today’s high-speed wi-fi, resulted in Macquarie’s most successful IT-related commercial start-up, Radiata Communications, which Cisco Systems bought for a record $US295 million.

Support

You will be provided with individualised support, as well as a range of opportunities, at all stages of your research degree, including:

• higher degree research learning skills advisers who provide valuable training options such as workshops in research communication, presentation skills, academic writing skills, thesis planning and more

• inspirational supervision and mentoring

• a candidature management plan that closely supports progress, commencement programs, work-in-progress reviews, and presentations providing opportunities for feedback from a panel of academics

• real-world engagement with opportunities for cotutelle and joint degrees

• financial support for a range of research-related activities

• world-class facilities

• a transformative research experience that fosters cross-disciplinary collaboration.

RESEARCH PROJECTS

Higher degree research candidates have the opportunity to participate in a wide choice of research projects. Examples include:

Mechanical engineering
Computational and experimental fluid dynamics, microfluidics, development of advanced materials, mechanical design, thermal engineering, biomaterials and biomechanics. Projects in fuel cells, biosensors, bioimplants and bioimaging, and modelling of a wide range of fluid flow processes. Email: candace.lang@mq.edu.au

Optical and photonics engineering
Integrated optics and optical fibres, mid-infrared sources and systems, microstructured and nanostructured materials. Projects in, and applications of, broadband optical fibre, guided-wave optical sensors, microwave photonics, highly efficient high-power compact fibre lasers and supercontinuum sources. Email: stuart.jackson@mq.edu.au

Biomedical engineering
MR and other imaging, wireless and microfluidic implantable medical devices, biomaterials and biomechanics. Projects in novel radiation treatments, autonomously and wireless-controlled medical devices or wireless control. Email: yves.dedeene@mq.edu.au

Wireless and telecommunications engineering
Theoretical and applied next-generation wireless, mobile and telecommunications, analog-mixed signal device modelling, RF to millimetre-wave circuit design and CAD/EDA, antenna design and modelling, signal processing, communications algorithms and protocols. Email: eryk.dutkiewicz@mq.edu.au

Electronic power engineering
Projects in high-frequency power integrated circuits, energy harvesting, wireless power transfer, micro-grid and smart-grid design and optimisation. Email: graham.town@mq.edu.au

Computer engineering and VLSI
Projects to improve hardware computation and architectures in very-large-scale integration structures, utilising visual processing and cryptography. Email: yinan.kong@mq.edu.au

FIND OUT MORE

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