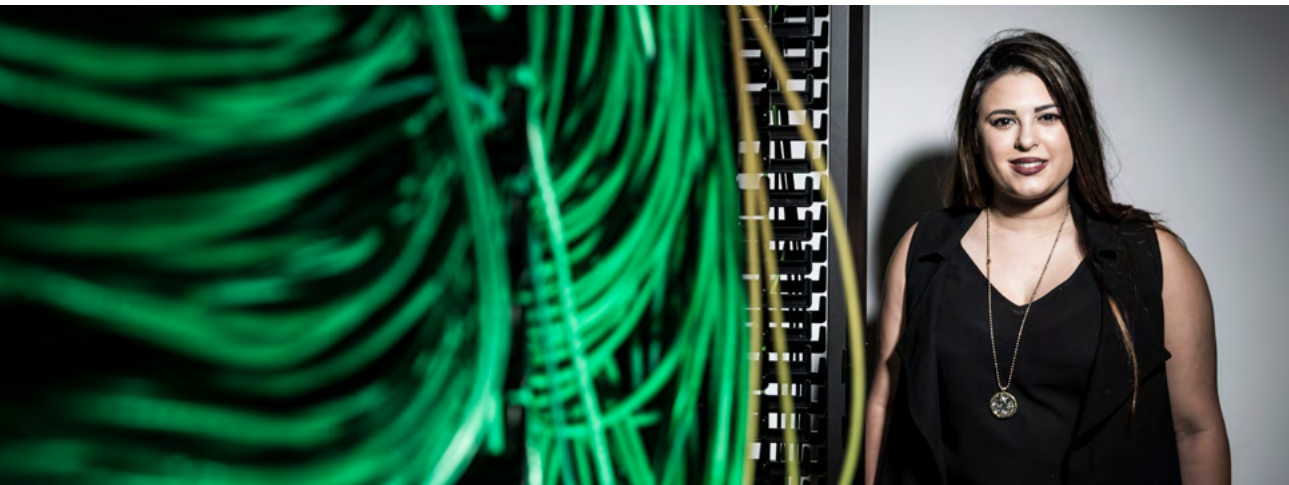


## CAPABILITY STATEMENT

# Information and Communications Technology



UNIVERSITY  
OF WOLLONGONG  
AUSTRALIA



**The University of Wollongong (UOW) has an international reputation for the size, strength and quality of its Information and Communications Technology (ICT) teaching and research.**

We are ranked as one of the top 250 universities in the world for Computer Science and Information Systems by the 2015 QS World University Rankings. In 2016, the Australian Federal Government's Quality Indicators for Learning and Teaching (QILT) ranked UOW as the best university in Australia for Computing and Information Systems.

The Faculty of Engineering and Information Sciences (EIS) has several research entities including Cooperative Research Centres (CRCs), ARC Centres of Excellence and research hubs, the SMART Infrastructure Facility and the Sustainable Buildings Research Centre. EIS also has 15 active research centres in the Faculty, including world-class research areas in operator algebras and partial differential equations, financial mathematics and statistical design and methodology.

The Faculty of Engineering and Information Sciences has six ICT-related Schools:

- The School of Computing and Information Technology offers a variety of industry relevant courses, including cyber security, game & mobile development, digital systems security, big data, software engineering, e-business, social & digital innovation, network design & development. Research areas include IT enabled transformation, advanced multimedia research, computer and information security, and intelligent systems research.
- The School of Electrical, Telecommunications and Computer Engineering has a mix of disciplines, including robotics and automation, microelectronics, industrial power infrastructure, radio networks and national fibre-optic pipelines. Research areas include power quality and reliability, advanced manufacturing technologies, and information and communication technology.
- The School of Mechanical, Materials, Mechatronic and Biomedical Engineering offers a unique mix of study areas with comprehensive programs onshore, and offshore mechatronic programs in China. Research is focussed on advanced manufacturing and robotics, biomedical instruments and

devices, engineering materials, defence materials technologies, intelligent polymers, and sustainable buildings.

- The School of Civil, Mining & Environmental Engineering has pioneered innovative approaches to teaching and learning. Their research is focussed on structural engineering, geomechanics, rail innovation, mining and mining safety, water engineering, and the associated technologies.
- The School of Mathematics & Applied Statistics offers degrees in applied mathematics, pure mathematics, statistics, medical mathematics, and mathematics and finance. World class research areas include environmental informatics, applied statistics, bioinformatics and biometrics, and financial mathematics.
- The School of Physics offers a range of study areas including medical radiation physics, atmospheric science, biomolecular physics, nuclear science and technology, photonics. The School is a world leader for research in medical radiation physics, condensed matter physics, terahertz science & technology and applied superconductivity.

### School of Computing and Information Technology

UOW's School of Computing and Information Technology (SCIT) was created in 2015 by merging the School of Information Systems and Technology (SISAT) and the School of Computer Science and Software Engineering (SCSSE).

Each year more than 1000 graduates complete our ICT degrees, which include Computer Science, Information Technology and Business Information Systems. Students can complete these degrees at our on-campus location in Wollongong and at our offshore campus locations and partner institutions in Dubai, Singapore, Malaysia and China, making the University one of the largest producers of ICT graduates in Australia and abroad.

The University of Wollongong has also recently opened a new South Western Sydney Campus at Liverpool, where we teach our undergraduate ICT degrees listed above.

We also teach postgraduate ICT coursework Master degrees in Computer Science; Information Technology; IT Management; Health Informatics; and Information and Communications Technology. In March 2017 our Master of Information and Communication Technology Advanced was the first degree in

Australia to receive the “Advanced Professional Accreditation” for an ICT course by the Australian Computer Society (ACS), the professional association for Australia’s ICT sector.

These degrees and students give ICT companies and organisations based in Wollongong and greater Sydney a crucial head start in staff recruitment and research - an advantage that has helped the University attract a number of multinational and national companies over the years.

The latest arrival is NEC, which officially opened its new corporate office at the Innovation Campus in September 2016, with the operation to create more than 130 new technology jobs and connect UOW students with graduate opportunities with NEC.

The University also has an on-campus business incubator, iAccelerate, which assists ICT students in their final-year, industry-sponsored team projects, and helps UOW staff, students and members from across the community put their ideas into action.

Research at the School of Computing and Information Technology (SCIT) is internationally recognised.

SCIT is headed by Professor Willy Susilo, who is also the Director of the Centre for Computer and Information Security Research.

Professor Susilo’s primary research interest is cryptography, information security and their applications. He has worked closely with Australian Signal Directorate, DST Group and Data61. The National Institute Standards and Technology (NIST), an agency of the USA Department of Commerce, recently awarded Prof Susilo significant research funding.

The University’s ICT research and training includes wireless networks, multimedia, cyber security, computer security, image processing, speech and audio processing, renewable energy, machine learning, pattern recognition, power system harmonics, pure mathematics, applied statistics, financial mathematics, community informatics, health informatics, social networks and game software development.

While this expertise is concentrated in our Faculty of Engineering and Information Sciences, researchers in UOW’s other Faculties of Business; Science, Medicine and Health; Law, Humanities and Arts; and Social Sciences are also involved in leading ICT research across all disciplines.

Our focus is on four main research themes:

- Information Security
- Artificial Intelligence and Distributed Systems
- Innovation Systems Innovation and Development
- Software Engineering

### Centre for Computer and Information Security Research

CCISR is one of the leading security research centres in Australia. Its research covers many important topics in cyber, computer and information security.

### Artificial intelligence and information processing

Our research contributes significantly to recent successes in Artificial Intelligence (AI). This provides excellent research opportunities for PhD students who want to make meaningful contributions to intelligent technologies that will support human activities in the

near future. Our academics are research leaders in the field of AI and provide the best possible mentorship for research students.

- The Intelligent System Research Centre (ISRC) is under the leadership of Professor Minjie Zhang, and the research interests of ISRC extend across distributed artificial intelligence, multi-agent systems and their applications, smart grid systems, smart modelling and simulations in complex systems, intelligent rescue resource deployment for accidental events, information retrieval, data mining and knowledge discovery in broad domains, machine learning, big data and Internet of Things, as well as computational intelligence.
- The Advanced Multimedia Research Lab (AMRL) focuses on fundamental and applied research in the areas of multimedia content analysis and retrieval, machine learning, computer vision, augmented and mixed reality, and medical image analysis. Ongoing projects include developing innovative algorithms and systems in environmental surveillance; object and concept-based search and retrieval; human motion analysis; real-time 3D modelling of objects and scenes; health monitoring; and human brain network connectivity discovery for prediction and early diagnosis of diseases.

### Information systems innovation and development research

- The Centre for IT-enabled Transformation consists of researchers investigating the IT-enabled transformation of human society. Information technology is one of the most significant forces shaping all aspects of modern society. Our key research areas include e-health, e-government, e-business and e-community.
- The Software Design Science (SDS) Research Centre is under the leadership of Associate Professor Khin Than Win. The research expertise of the Centre extends across information system disciplines such as human computer interaction, user-centre designed, ontology, social analysis approaches for improving system design, persuasive systems design, behavioural change support system, system modeling and operational research. SDS researchers have been working closely with researchers from University of Illinois Chicago, Texas A& M University, University of Oulu, other Universities and research network and organizations such as Telstra, Illawarra Shoalhaven Practice Research Network, Sydney Eye Hospital and Early Start.

### Software engineering

- The Decision Systems Lab (DSL), established in 1998, solves problems in the areas of business process management (specifically process analytics), software analytics, software testing, requirements engineering, service-oriented computing, service science, industrial optimization, database systems, formal knowledge representation and reasoning and agent technology. In addition, our DSL has a significant profile in clinical informatics, focusing on data mining in radiation oncology and clinical process analytics. DSL researchers work closely with some of the largest IT companies in the world, including IBM Research, Xerox Research, Infosys Labs and Samsung. DSL has also collaborated in the past with Telstra, SunCorp, Bluescope Steel, Actenum Corp as well as government agencies such as the NSW State Emergency Services.

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