Dear Friends and Colleagues

As you will see from the contents of this 2016 Annual Report, the School of Civil & Environmental Engineering had yet another stellar year in teaching, in research and in community and industry outreach.

Internationally ranked for the third year in a row as the premier School of its kind in Australia, and one of the world’s top twenty, we continue to forge ahead, with innovative research fields, new courses, and an ever expanding network of industry connections.

Engineers have always been people of action – driven to create, to solve problems, to make things happen, and to make a difference. Our current students and staff are no exception.

In the 21st century, the School is moving towards a blended learning approach - utilising creative, efficient and educationally sound digital teaching & learning methods as well as continuing our high quality embodied methods – lectures, laboratories, site visits and workshops. The School actively encourages and rewards good teaching – amazingly, almost one quarter of our academic staff have received UNSW Teaching Excellence awards. In 2016 Dr Ali Amin was the latest staff member to receive a well-deserved V-C Teaching Excellence award.

The School remains committed to advancing a more prosperous, safe and just society. Our Centres and discipline groups provide focal points for our researchers to contribute to global efforts in innovative civil, environmental and geospatial engineering research. Our strengths as engineering research leaders are evidenced by our ERA ranking of 5 out of 5, and grant funding success - with over $13 million awarded in 2016 to our research centres, including more than $3.6 million won in prestigious Australian Research Council grants. With strong internal and external collaborations - and with mentorship provided to our great young researchers – the School’s future excellence in research is ensured.

This Report provides only a small insight into our busy year and into the quality and resourcefulness of our staff; academic, research, professional and technical. A strong School does not happen without the efforts and collegiality of its staff; I thank them all for their amazing dedication and hard work.

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The UNSW School of Civil & Environmental Engineering is internationally ranked as Number 1 in Australia (QS & AWRU) and in the world’s top 20 (QS World University Rankings 2014-7). We are the largest School in the UNSW Faculty of Engineering, itself the pre-eminent centre for engineering studies and research in Australia.

From our foundation in 1949, the School has pursued excellence and innovation in education and research, and our alumni are to be found as leaders and decision makers in industry, government and the community.

With over 2,900 current students, we play a leading role in the delivery of undergraduate and postgraduate degree programs – with a focus on sustainability as well as core engineering knowledge, preparing our students to confidently face the challenges of contemporary global society. We believe that civil and environmental engineers are uniquely placed to understand, meet and solve those challenges.

The School is at the forefront of fundamental and applied research across the breadth of civil and environmental engineering with three internationally acclaimed research centres – in infrastructure (CIES), water (WRC) and transport (rCITI) and with several other vibrant, cutting-edge research hubs. Our academic staff are recognised world leaders in their fields, supported by over 80 full time researchers.

Each year we work with or on behalf of over 100 industry and government organisations on specific industry related projects and have won millions of dollars in federal funds in order to pursue investigations into issues of national importance.

We continue to forge new links with industry and community partners to ensure a continuing real-world focus for both our teaching and our research.

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Professor Stephen Foster
HEAD OF SCHOOL

About Us
The School is ranked first in Australia - by both the Quacquarelli Symonds (QS) World University Subject rankings (2015 - 2017) and the Shanghai Jiao Tong Global Rankings of Academic Subjects (2016) – also known as Academic Ranking of World Universities (ARWU).

Globally we are placed at 16th in the world by QS, an amazing achievement, and the only Australian Civil Engineering School to be included in the QS top 20 in 2017.

QS Rankings are based on the expert opinion of 76,798 academics and 44,426 employers, alongside the analysis of 28.5 million research papers and over 113 million citations sourced from the Scopus/Elsevier bibliometric database.

UNSW itself has a 5+ star ranking with QS, based on its achievements in eight categories: Research, teaching, facilities, access & inclusivity, employability, internationalisation, specialist excellence, and innovation.
The School Management Committee represents the peak decision-making body in the School with all key decisions relating to finances, staffing and overall direction debated and ratified by this group. The SMC is chaired by the Head of School and is made up of the Chairs of the School’s major committees, the Associate Head (Academic), the School Business Manager, the Student Centre Manager, the Directors of UNSW Centres based within the School, and other discipline group leaders.

Prof Stephen Foster
Chair

A/Prof Mario Attard
Associate Head

Prof S Travis Waller
Chair RMC, Director CITI

Dr Steven Davis
Co-Chair, TLC

Dr Kurt Douglas
Chair, ERC

Prof Chongmin Song
Chair, CIT&ETC

A/Prof Vinayak Dixit
Chair TSC

Prof Richard Stuetz
Director WRC (Kens); Co-Chair TLC

Prof Ian Turner
Director WRL

Prof Brian Uy
Director CIES

Dr Martin Andersen
Director CWI

A/Prof Ron Cox
Director AACARNSI

Prof Nasser Khalili

Prof David Carmichael

Prof Chris Rizos

Anthony Dever
Business Manager

Kristy Guia
Student Centre Manager

Betty Lai
EA to HoS

The School Executive Group (SEG) is an advisory group to the Head of School. It meets monthly with the Head of School to discuss key and current issues on matters of strategy, planning and policy directions for the School.

2016 School Executive Group Members

Professor Stephen Foster, HoS
Associate Professor Mario Attard
Professor David Carmichael
Mr Anthony Dever
Professor Nasser Khalili
Professor Richard Stuetz
Professor Ian Turner
Professor Brian Uy
Professor S Travis Waller

The School Board is chaired by the Head of School and comprises all academic and research staff in the School, together with student and professional and technical staff representatives. The Board meets twice a year; it provides advice to the Head of School about academic governance arrangements, on the quality of the School’s learning and teaching, and on research activities. It also provides advice to the Head of the School about the School Committee structure.

Committee Chairs report to the Board on the outcomes of committee activities, on decisions, and on strategic direction.

The Head of School reports to the Board on the management of the School and related activities and issues and direction.
Our Vision: To facilitate the coordination of the Australian research community in the field of Climate Change Adaptation for Settlement and Infrastructure – supporting multi-disciplinary research, building research capacity, and promoting open exchange of information and resources.

As an internationally recognised centre, focused on high-level research in structural engineering, geotechnical engineering, engineering materials and computational mechanics, CIES provides outcomes that improve the design, construction and maintenance of economic, effective, safe and sustainable civil engineering infrastructure.

Construction is the world’s largest industry and its efficiency and sustainability is of obvious importance. CIRI academics are actively engaged in industrial research on major construction projects in the region. We undertake basic and applied research in two broad areas - the design and management of large scale field processes and improved technology for construction activities.

An integrated understanding of groundwater is essential for the future of the Australian environment, our urban and rural communities, and for agricultural and mining activity. The Connected Waters Initiative Research Centre aims to help fill critical gaps in our knowledge through research, teaching and public education.

Our aim is to be a world leading organisation in integrated interdisciplinary transport research and development. Our five core research pillars are Planning, ITS, Communications, Infrastructure, Energy/Fuel and Computational Sustainability.

The Surveying and Geospatial Engineering (SAGE) Research group conducts world class research in the subdisciplines of geodesy, photogrammetry, positioning measurement and remote sensing. The group includes one of the world’s top satellite and wireless positioning research groups, and one of Australia’s premier Earth observation research teams.

The aim of the Sustainable Engineering Research Initiative is to explore, research, define, assess and resolve issues of sustainability in engineering problems, in particular the implications and implementation of sustainability concepts and practices for all areas of civil infrastructure - buildings, roads and transport, water supply, waste disposal – in the areas of planning, design, construction, operation and maintenance.

Australia’s water management needs innovative and integrated solutions in terms of environmental, energy and social considerations. WRC conducts pure and applied research in surface and groundwater hydrology, public health and water treatment, and civil and environmental hydraulics. We also undertake commercial activity in collaboration with industry.

Amin, Ali Lecturer BE (CIVIL) 1, PhD UNSW My research is centred upon the use of fibre-reinforced polymer composites or other new materials in concrete. By adding fibres to concrete, the primary objective is to bridge cracks once they form and prevent some post-cracking resistance in tension. My research has led to the development of new physical-mechanical models which describe this behaviour in a wide range of applications.

Andersen, Martin Senior Lecturer MSc in Engineering PhD DTU Denmark Research Interests: seismic response of physical & geotechnical processes at the surface groundwater interface; water quality and water dynamics on a local scale; reactive flow & transport modelling; developing methodologies for using heat as a tracer of groundwater flow; karst hydrology.

Attard, Mario Associate Professor Associate Head Academic BE PhD MIEE UNSW, MAEng, CEng, MIEEE, FEAMEst, MAusC Research Interests: Fine-Grain Isotropic & Anisotropic Hypermutable Modelling: Fracture in Concrete & Masonry: Crack Propagation due to Deep Drought: High Strength Concrete Columns: Building of Sandwich Columns: Lateral Bundle: Thin-Wall Columns: SCAI.

Carmichael, D. G. Professor PhD BE UNSW, PhD Cant, CEng, FEAMEst, MAusC Research Interests: Structures subjected to elevated temperatures, curved members, anisotropic, steel structures-concrete structures, concrete structures, numerical methods, stability, Non-linear effects of material behaviour, finite element techniques, design codes, structural optimization.

Castel, Arnaud Associate Professor BE MSc PhD Toulouse Research Interests: Durability of con- struction materials - Steel corrosion in concrete, concrete pathways, SCMs. Concrete construction in cold climates - Performance & service life design of reinforced/prestressed concrete. Constructions driven by steel corrosion: Repair & Strengthening using CFRP. Analysis & modeling of CFRP strengthened beams including reinforcing steel corrosion.


Khoshghalb, Arman Senior Lecturer Blg, MEng, Shariati Institute of Technology, Tehran, PhD UNSW Research Interests: Large deformation simulation of concrete structures, advanced numerical methods in geometries, advanced pre-processed tools & coupled analysis of porous media.

Lim, Samsung Associate Professor BSc MA (Mathematics) Seoul, South Korea, PhD UI Chicago Research Interests: Transportation networks, combinatorial algorithms, math- ematical programming and operations research. Travel time prediction models, sustainable travel behaviour in urban environments.

Moore, Stephen Senior Lecturer Director, Environmental Studies BE UNSW, MEng, CEng, MIEEE, MIAust Research Interests: Development of envi- ronmental accounting techniques, such as Material Flux Analysis, for region- al & corporate environmental management systems. Simulation & decision analysis applied to waste management systems.


Rey, David Lecturer BS, MSc EE & IT Montpellier: MSc Maths: UCL, Brazil, PhD USTIAS Lyon, Grenoble, France I am a water engineer interested in hydrogeophysical, hydrogeological, hydrotransport processes, subsurface heat transport, hydrogeological responses to different forcing factors, and fundamental transport of heat and solute in natural porous media. I love to get my hands dirty in the field in order to quantify properties and processes from real-world observations.

Rizos, Chris Professor BSc (Hons), PhD UNSW Research Interests: How geospatial technol- ogy such as satellite-based position- ing, mapping, digital photography & digital mapping is used for sciences, & by society in general; Political issues related to GNSS and geo- environmental management: Modern geodesy's technologies & applications: Australia's new mapping datum: The Russian & applications of satellite, wireless & inertial-based sensors for high-precision positioning: The use of GNSS (GPS, Beidou, Galileo, QZSS) for all classes of uses from Navigation to GNSS receiver design; GNSS positioning infrastructure.

Roberts, Craig Senior Lecturer Blg, MSc UNSW, University of South Australia, PhD UNSW Research Interests: IMGPS/GNSS positioning and leveraging CORS infrastructure for practical application to surveying and engineering. The implications of the geometrically modernization of both GNSS and mass market users. GPS for cadastral surveying. Kinematic positioning with robotic total stations.


Davis, Steven Lecturer Chair, Teaching & Learning Committee BE PhD UNSW Research Interests: Stochastic Systems: Engineering Applications: Parallel Computing Applications to Civil Engineering: Online Engineering.
Research Interests: Structures and Geotechnical Engineering, Energy & Environment. My main research question is how to achieve sustainable energy management in the built environment and how to design buildings, systems and networks that can function efficiently and safely in the future.

Valipour, Hamid
Associate Professor BE, MEngSc, PhD UNSW


Wallace, T. David
Scientia Professor, Deputy Dean, Research, UNSW Engineering

Research Interests: Separation processes involving colloids & particles in water & wastewater treatment: particulate matter, biochemistry, the solid-solution interface; photochemistry in aquatic systems; hydrogeochemistry & environmental/geochemical reactions & their impacts on the fate & effects of chemicals/pollutants; interactions between trace elements & microorganisms in aquatic systems.

Wallace, J. Andrew
Professor, Chair, Environmental Engineering

Research Interests: Environmental Engineering. My research focuses on urban water systems and their management, with particular emphasis on the integration of water, energy, and food systems. I am interested in developing innovative solutions to address water scarcity and pollution, and to promote sustainable development.

Wagner, Richard
Professor, Civil & Environmental Engineering

Research Interests: Water resources assessment, planning, and management. My research focuses on simplification and generalization in hydrologic modeling, especially using nonlinear dynamic and stochastic methods. My research interests include: 1) the development of new methods for model calibration and uncertainty assessment; and 2) the use of these methods for water resources management.

Wagner, C. Kevin
Associate Professor, Civil & Environmental Engineering

Research Interests: Coastal Engineering & Environmental Fluid Dynamics. My research focuses on the interaction of waves and currents with coastal structures, and the impact of this interaction on the design and performance of these structures. I am also interested in the use of numerical models to simulate coastal processes, and in the development of new techniques for the analysis and interpretation of these models.

Wang, Jiaping
Associate Professor, Civil & Environmental Engineering


Wiersmann, Jeremy
Associate Professor, Civil & Environmental Engineering

Research Interests: Microbial processes in natural and engineered systems, with a focus on the role of microorganisms in nutrient cycling, carbon sequestration, and environmental remediation.

Wu, Y. Brian
Professor & Director of CES BE (Hons 1), PhD UNSW

Research Interests: Composite steel-concrete structures, critical infrastructure protection systems, deconstruction techniques, habitability & strengthening techniques, steel structures, structural health monitoring systems, structural safety construction materials.

Wu, Jie
Associate Professor, BE, MEngSc, PhD UNSW

Research Interests: Water resources assessment, planning, and management. My research focuses on simplification and generalization in hydrologic modeling, especially using nonlinear dynamic and stochastic methods. My research interests include: 1) the development of new methods for model calibration and uncertainty assessment; and 2) the use of these methods for water resources management.
Dr Taehwan Kim

CVEN would like to welcome Dr Taehwan Kim to the 7th floor world of structural engineering. Originally studying and working in fast-paced, urban city Seoul, South Korea, he comes to us via the USA: working at Oklahoma State University and completing his PhD at Purdue University in Indiana. Dr Kim brings with him many strengths and much experience, but perhaps his two greatest strengths are his drive toward interdisciplinary research and his ambition to be a world leading researcher in the relatively new area of chemistry of cementitious materials.

Only speaking English for eight years, he learned this difficult second language through email, discussions with his supervisor and by reading and writing technical materials, but he is also quickly becoming accustomed to the colloquial nuances of Australian English. He has felt very welcomed and accommodated by CVEN staff and students who, he says, “are familiar with communicating with international staff”. Morning tea breaks with 7th floor colleagues are proving instructive and heart-warming, as the arrival of Dr Kim further enriches the global character of the CVEN community.

His overarching career interest is improving the durability and sustainability of construction materials. Concrete has a long history, perhaps beginning three thousand years ago as the Egyptians built their pyramids. Two thousand years ago Romans hit hard. No-one was hiring maths graduates. But as he sat on the Flight Deck building, is continuously scanning Narrabeen-Collaroy beaches where “a lidar, permanently mounted on top of the Flight Deck building, is continuously scanning and giving us data about how the beach changes wave by wave. During the big storms in June 2016, we measured the waves as they came into shore and could see how the beach responded and recovered. This is unique data that can help us better understand sediment transport in extreme events. Because we are collecting such high-resolution data, we can also look at how beaches evolve over a tide cycle.”

But the technology is getter cooler, more mobile. “I just purchased a new quadcopter to test out the concept of having moveable video imaging systems. Traditionally we mount cameras on towers but Kristen is chasing a new quadcopter to test out the concept of having moveable video imaging systems. Traditionally we mount cameras on towers but now we are collecting such high-resolution data, we can also look at how beaches evolve over a tide cycle.”

Kristen Splinter’s world is full of movement. “I’m fascinated by sand bars and perhaps currents.”

Kristen is an international academic, completing her undergraduate engineering degree in Canada at Queen’s University. It was here that her love of coastal and estuarine engineering took hold, after interning on a wetlands water quality project. This led to a Masters in Coastal and Oceanographic Engineering at the University of Florida and then to a PhD in Geological Oceanography at Oregon State University. It was during her PhD that she got her first taste of Australia: studying video imagery data from Palm Beach, NSW to develop models on sandbar migration. A post doc in Queensland followed until she was lured to WRL by the critical mass of talent and expertise. With the guidance of Professor Ian Turner Kristen has used her video imaging and modelling skills to develop practicably applicable shoreline forecasting tools. For instance, Kristen and Ian Turner are delivering a beach erosion forecasting system for NSW Environmental Trust over the next two years.

“When I tell people that I study beaches, they think that’s really cool, what they don’t understand is how much maths is involved.” Kristen sits at computers analysing data to get at the ‘why’ of a problem. Much of her research these days focuses on Narrabeen-Collaroy beaches where “a lidar, permanently mounted on top of the Flight Deck building, is continuously scanning and giving us data about how the beach changes wave by wave. During the big storms in June 2016, we measured the waves as they came into shore and could see how the beach responded and recovered. This is unique data that can help us better understand sediment transport in extreme events. Because we are collecting such high-resolution data, we can also look at how beaches evolve over a tide cycle.”

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Kristen Splinter’s role at the Water Research Laboratory (WRL) has been evolving since she first arrived in 2011. Moving from a purely research role, she has recently joined the CVEN academic team, accepting a full time lecturing position, teaching undergraduate and post graduate students a broad range of topics including sustainability and coastal engineering. Kristen Splinter’s role at the Water Research Laboratory (WRL) has been evolving since she first arrived in 2011. Moving from a purely research role, she has recently joined the CVEN academic team, accepting a full time lecturing position, teaching undergraduate and post graduate students a broad range of topics including sustainability and coastal engineering. Kristen Splinter is a woman who wants the practical application of her work to make coastal communities safer at a time when coastal living is potentially treacherous. “Recently I have been examining the hydrodynamics over reefs during cyclone conditions. This work is particularly important in the context of rising sea levels and climate change, where Pacific Island Nations become more vulnerable due to submergence and degradation.”

CVEN would like to congratulate Dr David Rey on becoming a Lecturer in transport engineering after being a research associate here for 3 years. It has been a smooth transition, as David has been teaching several classes since he arrived. Now, along with a new office come new opportunities. His office is not one of those well-worn rooms with years of collected artefact softening the corners. His is an office waiting to be filled with the stuff of his career.

Already, he has designed a new post graduate course for the Masters of Engineering Science Transport. Transport Logistics Engineering (CVEN9421) explores advanced methods applied to transport systems such as network algorithms, mathematical optimization and integer programming. This new module fills the current gap in transport logistics within the curriculum.

Surprisingly, David began his undergraduate studies as an electrical engineer. On completion of a BSc and a MSc from Universitá degli Studi di Milano, he developed a growing suspicion that he was not particularly enthused about electrical engineering. He was, instead, deeply drawn to mathematics and research. He completed a Masters of Mathematics at Pontificia Universidade Católica do Rio de Janeiro, but it was 2008 and the GFC had hit hard. No-one was hiring maths graduates. But as he sat on buses for too long, as he waited for late running trains, as he saw buses for too long, as he waited for late running trains, as he saw...
FAREWELL TO AN OLD FRIEND: DR UPALI VANDEBONA

Transport engineer Dr Upali Vandebona has worked at the School of Civil and Environmental Engineering for nearly 30 years. In 2016 he transitioned from full time academic to an Honorary Senior Lecturer, a kind of semi retirement from the life he has known for so long. He has worked under six Vice-Chancellors and seven Heads of School. He has survived sweeping redundancies, restructures, technological transformations and exploding student numbers and always with gentlemanly kindness, acceptance and fortitude. His colleagues will remember him as an intelligent, vigorous and patient academic, who developed trustworthy methods to find truth in the detail.

People are always happy to see Dr Vandebona and his relationship with the School has been one of mutual affection. He feels deeply supported by the School over his long career. “This School has always been a very nice place to work with very good support from the academic staff. They have always told me when a cyclone was coming and how to duck for cover. The administrative staff have always been cheerfully helpful and the technical staff have patiently assisted me with ever-changing procedures. There may have been many ripples, but the water has kept flowing. And my boat went with it.”

Born in Sri Lanka, Dr Vandebona completed his undergraduate studies in civil engineering in his homeland. A Masters degree in town planning took him to Thailand and his PhD in transport engineering was completed at Monash University.

“In 1987 transport engineering was an up and coming field. What attracted this young academic to transport was its modernity, its innovative thinking and its solution based approaches. There may have been many ripples, but the water has kept flowing. And my boat went with it.”

Just as his career was burgeoning so was computational technology. Hand written calculations were replaced with numerical animation techniques in 1987. “I was really wrapt in it, immersed, and it’s very satisfying. Very contradictory.” Upali sees contemporary academics achieving tremendous output, while they are squeezed by their demanding workloads. “We are burning them out. We no longer have the time for those important corridor conferences. It has become very difficult to sit and talk with students: to get to know the whole person.”

Just as he has witnessed the increasing workloads of academics so has he witnessed the changes in student culture. “Students today are very busy, with many constraints on their time and they cannot be blamed for not having the time to fully reflect on what they learned today. They are not taking notes, but taking pictures. They are not going over things one, two, three times like I did. But our students have always been very good and today so many of our students are successful in industry.” He has always had a quiet message of hope for all students: this is a huge field with so many opportunities: “you can find the right match.”

Upali Vandebona is a man who likes time to think and reflect. He likes walking through the stacks in the library just to see what can be discovered by wandering. He loves reading in other disciplines to cross fertilise his engineering knowledge and to create the open and free mind that all-too-busy human beings just don’t have time for anymore.

As he steps into retirement he knows he can have more time to ponder and witness and learn. Thirty years experience is not to be underestimated. He will continue to write papers, attend conferences and supervise student work. He knows that wisdom from the past is still relevant today. “There are gems from the 1980s that can still tell us something”. Projects which seem brand new actually have an intellectual lineage and “even though the language may have changed, historical projects are still relevant.”

So with more time he intends to travel with his wife, both in Australia and overseas. They love travel and both have large extended families living in many countries. Perhaps his one serious regret is not spending more time with this family. But as he came to work and succeed in a more affluent country, he helped support his family materially, remaining humble about his contribution to their wellbeing and thankful for their affection and community. CVEN would like to thank Dr Upali Vandebona for his decades of exemplary teaching and academic research, but perhaps most of all for being the gentleman and the poet.

The School’s Administration team had a successful year in meeting the high demand for advice and requests from all stakeholders associated with our School. Student numbers continue to grow with high demand for all our courses. The School has continued to deliver students with the best possible experience while studying at the School of Civil and Environmental Engineering. The Student Centre team ensured that all our students are supported and given the right guidance to assist them from when they accept their offer, right through to graduation. As our student numbers grow, we are increasingly aware how imperative it is to ensure that all of our students are provided with a personalised service each time.

One of the Student Centre’s initiatives in 2016 focussed on our postgraduate coursework students. We understand that although they are here for a short period of time, they deserve to feel included in the whole University experience. As such the School office piloted English Conversational Classes for all our international students and Networking Sessions to ensure they were aware of the services that are available to them while studying at UNSW. The Student Centre hopes to continue to provide these types of experiences in 2017.

The School ensured that our undergraduate students feel part of the School community by providing them with plenty of support. The School supported the student societies GEVSOC and SURVSOC through a number of events to ensure students have a well-rounded student experience. In addition to our undergraduate and postgraduate coursework student support, let’s not forget our wonderful PhD students who are excelling in research every day. We have a dedicated staff member who is always there to provide guidance and support on a daily basis.

Our IT team provided staff and students with the latest technologies to ensure their teaching and research can be performed at the highest level. We also continued to improve our websites across the School and Centres.

Health and Safety was a major focus in 2016 ensuring a safe working environment across the School’s facilities and laboratories. The School completed a successful audit by Safework NSW.

The School’s Administration team met all UNSW deadlines and requirements in 2016 while continuing to provide a high level of support to staff and students. The team will continue to provide top quality financial, administration, office accommodation and other workplace support to staff and students.

I am proud to lead such a dedicated and highly motivated team in the School of Civil and Environmental Engineering.

Anthony Dever, School Manager
FAREWELL LES BROWN

Les Brown has been a fixture at the School of Civil and Environmental Engineering for over two decades. But a fixture more akin to a chandelier than a light bulb. For over twenty years Les has been helping students at the front desk of the School office. He was the students’ first port of call. The one that helped solve their problems and ease their worries. A student can go through a whole degree without talking to their lecturers, but they would, inevitably, talk to Les, and with his wealth of information and unflappable character he has been the friendly face of the School to thousands.

He has a warm friendliness that made him a go-to guy for staff as well as students. Les knows the importance of a friendly chat. While his official title was admin officer, his true and unofficial title is “friend to all”. Les retired at the end of 2016. He will be sorely missed.

Fuller story here: https://www.engineering.unsw.edu.au/civil-engineering/news/farewell-to-les-brown

PROFESSIONAL STAFF CONT.

PROFESSIONAL OFFICERS

Dr Gautam Chattopadhyay, Manager, Water Quality Laboratories

Dr Zhen-Tian Chang, Manager, Randwick Heavy Structures Laboratory

Paul Gwynne, Manager, Infrastructure Laboratories, Kensington

Dr Yincai Zhou, Professional Officer SAGE

SENIOR TECHNICAL OFFICERS

Patricia Karwan WRC and CIES Administrative Officer

Anthony Macken

Laiz Paulette Pinto Coelho

Kevin Ong

William Terry

Greg Worthing

Ben Pauley

Facilities / Workplace Safety Staff

Denise Lee Facility Officer

Emilia Saliba Workplace Safety Officer

Irene Calais CIES

Maria Lee rCTI

Grantley Smith WRL

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CONGRATULATIONS

Congratulations Tricia Tesoriero

Tricia was awarded the 2016 UNSW Engineering Administrative Staff Excellence award for her work on the School’s external relations projects - particularly the annual Year 10 work experience week, an important outreach program. Her care for the young students involved, administrative efficiency, problem solving capacities, and above all, her amazing attention to detail, has taken the program from its tentative pilot stage to an inspiring, innovative and highly esteemed experience for high school students interested in engineering as a future career.

LEVEL 3 WORKPLACE SAFETY COMMITTEE

The provision of a safe work environment for all School staff and students remains the School’s highest priority. The School is committed to protecting the health and safety of all staff, students, visitors and contractors. The School consults staff and students in implementing safety practices and systems within the workplace. Inspections and training, combined with a wide range of communication methods, ensure that all staff and students are informed of their responsibilities.

The School of Civil and Environmental Engineering has a Workplace Safety Committee in accordance with the Work Health and Safety Act 2011. Committee representation covers all work groups within the School, including the Head of School, Academics, Laboratory Managers, IT, Administration, Postgraduates and Undergraduates. Membership also includes Centre Representatives, a First Aid Officer, and the Chief Warden (Emergency-Control Organisation.)
2016 - CIES STAFF

ACTING DIRECTOR
Professor Chongying Song, BE, ME Tsinghua, DENG Tokyo

RESEARCH DIRECTOR
Scientia Professor Mark Bradford, BSc BE PhD Sydney, DSc UNSW BTSE PEng CPEng CEng Dist. MASCIE FI Austral FINS Nh

DEPUTY DIRECTORS
Emeritus Professor Ian Gilbert, BSc PhD CEng UNSW PEng CPEng MASCIE FIAust MAV

Nasser Khalili, BSc MSc Birm PhD

Professor Arnaud Castel BE, MEngSc, PhD Toulouse

CENTRE MANAGEMENT
Irene Calaisiz, BCom UNSW

ADMINISTRATIVE OFFICER
Patricia Karwan

OTHER ACADEMICS
Professor David Carmichael, BE MEngSc UNSW, PhD CEng, FI Austral, MASCIE

Professor Stephen Foster, BE NSWIT, MEngSc PhD UNSW, FIAust

Professor Yang Lin Pi, Dr Tongji ME Wuhan PhD UNSW CPEng MIAust

A/Professor Mario Attard BE PhD MIE Aust, MIAust, CEng

A/Professor Wei Gao BE HDU, ME PhD Kielan, MRSW MA NSW

A/Professor Linlin Ge PhD UNSW, MSc Inst of Seismology, BEng WTUSM

A/Professor Adrian Russell BE PhD, MIAust, PG Cert Bristol

A/Professor Hamid Vaili Pour Goudarzi BSc MSc Tehran, PhD UNSW

Dr Ali Akbarzadeh, BE AUT, Tehran, PhD NUS

Dr Ali Amin, BE PhD UNSW, MIAust CEng, CPEng

Dr Kurt Douglas BE Syd, PhD UNSW

Dr Ehab Hamed, BSc MSc PhD Technion

Dr Arman Khooshhal BE, ME Shafir Univ of Tech, PhD UNSW

Dr Taehwan Kim, BSc, MSc KAIST, PhD Purdue

Dr Kositas Senetakis, BEng, MSc, PhD AUT

Dr Johnson Xuesong Shen BEng, Nanjing PhD, PKPU

Dr Sawekhlii Tangaramvong Chatulak, MEngSc PhD UNSW, MIAust

OTHER RESEARCH STAFF (alphabetical order)

Dr Ankit Agarwal, B-Tech IT Kanpur PhD UNSW

Dr Abdorreza Ataei, BSc, MSc, PhD, PhD UNSW

Dr Farhad Aslani, BSc, MSc, PhD UT

Dr Zhen-Tian Chang, BE ME Hunan PhD AUTSW

Dr Huichan Chen, BEng, ME PhD, Southeast University

Dr Yu Huang, BEng MPhil CityU, PhD UNSW

Dr Mohammad Khan BSc, BEng MSc NUS PhD UNSW

Dr David Kellerman BE, PhD UNSW

Dr Mahbub Khan, BE ME UOA(NZ), PhD UNSW

Dr Imranullah Khan, BSc MEngSc PG Toulouse

Dr Nina Khorsandnia, BSc MSc BHE, PhD UT

Dr Xinpei Liu BE SCUT, MEngSc PhD, UNSW

Dr Yan Liu, BE ME DLIT, PhD UQ

Dr Alex Huy-Mann Ng, PhD UNSW, MEngSc, BE UQ

Dr VIPukumar Patel, BE, PhD VU

Dr Ahsan Parvez, BSc, PhD UNSW

Dr Alberto Saputra, BE PhD UNSW

Dr Babak Shahbodaghkhani, BSc, KU, Tehran, PhD Kyute

Dr Hossein Talebi, BSc, PhD BUW

Dr Tai H. Thai, BE ME HCMUT, PhD Sejong

Dr Mohammad Vahab, BSc, MSc, PhD SUT (Iran)

Dr Thanh Vu BE/BComSyd, MEngSc, PhD UNSW

Dr Du Vu BE PhD UNSW

Dr Chengwei Yang, BEng UNSW, PhD UNSW

Dr Gustavo Yang, BE PhD Tongji

TECHNICAL TEAM
John Gilbert Ron Monty

ben Pauley Greg Worthing

EMERITUS PROFESSIONALS
Francis Tin-Lui BE PhD, UNSW, MIAust

Firooz Sattari, BSc MPhil, PhD UNSW

Other UNSW Members
Professor Alan Crosky School of Materials Science & Engineering

Professor Gangadhar Prusty School of Mechanical Engineering

Professor Mahdouz Asfari School of Engineering and Information Technology (SEIT), UNSW

ADJUNCT MEMBER
James Aldred, Adjunct Associate Professor - CIEMS - School of Civil & Environmental Engineering, UNSW

Dr Yao Yen Lei, Adjunct Associate Professor - School of Civil Engineering, UNSW

VISITING ACADEMICS
Professor Xiaotao Peng, School of Civil Engineering and Architecture, University of Jinan, China

Professor Qu Hui, School of Civil Engineering, University of Technology, Yantai, China

Professor Bazayr Mansoor Khani, Department of Civil Engineering, Faculty of Engineering, Yasouj University, Iran

Professor Zhaoqiu Liu, School of Civil Engineering, Yanshang University, China

Professor Chao Zhang, School of Information Engineering, Inner Mongolia University of Science and Technology, China

Professor Jian Chen, School of Civil Engineering, Harbin Institute of Technology, China

Professor Duraj Peric, School of Civil Engineering, Colorado Kansas State University, USA

Dr Hauke Gravenkamp, University of Duisburg-Essen, Germany

Dr Yi Wang, Shenyang Agriculture University (SAU), China

Dr Zhihua Zhang, Ningbo University of Technology, China

A/Professor Guanyue Ma, Wuhan University of Technology, China

A/Professor Dr Zheng Wei, University of Macau, Macau

A/Professor Dr Tengfei Xu, Faculty of Civil Engineering, Southwest Jiaotong University, China

Dr Chen Wu, College of Civil Engineering, Fujian University of Technology, China

A/Professor Zhiquan Huo, Dalian University of Technology, China

Dr Yiyan He, Department of Engineering Mechanics, Dalian University of Technology, China

Professor Yoshikio Ikeda, Department of Human Habitat, Faculty of Environmental & Sustainable Sciences, Prefectural University of Kumamoto, Japan

Dr Junyu Liu, Dalian University of Technology, China

Dr You Qian Huang, Guangzhou University, China

Dr Jin-Woo Lee, Composite Research Division, Korea Institute of Materials Science, Korea

Dr Kargeun Lee, Composite Research Division, Korea Institute of Materials Science, Korea

Dr Kazuhiro Wajiyaraya, Research Associate

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Dr Melissa Duell, Research Associate

Dr Harmeet Griswobrasa, Research Associate

Dr Mojtaba Maghrirbi, Research Associate

Dr Emily Moylan, Research Associate

Dr Zhizhong Xiong, Research Associate

Dr Kasun Wijayaratne, Research Associate

PROJECT OFFICER
Sylvia Brohi

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Professor S. Travis Waller, Adjunct Professor of Transport Innovation

DEPUTY DIRECTOR
Associate Professor Vinayak Dixit, Director - TRACS/Lab@ UNSW

CENTRE ADMINISTRATOR
Maria Lee

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Dr Lauren Gardner, Senior Lecturer

Dr Taha Hosseini Rashidi, Senior Lecturer

Dr David Rey, Lecturer

Dr Upali Vandeloba, Honorary Senior Lecturer

Dr Ken Doust, Adjunct Senior Lecturer

Dr Chen Cai, Conjoint Lecturer

Associate Professor Jay Katihupiya, Head of Mechatronics, UNSW School of Manufacturing and Mechanical Engineering

Professor Claudia Mattamart, Higher Education, Artificial Intelligence Research Group and Deputy Director of the Cinema Centre for Interactive Cinema Research

Dr Steven Most, Senior Lecturer, Aerospace fellow, UNSW School of Engineering

Professor Fidelis T. Suorinimi, Chair of Mine Geotechnical Engineering, School of Mining Engineering

Jaymee Harrison, Adjunct Professor

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Dr Andreas Bota, Research Associate

Dr Melissa Duell, Research Associate

Dr Harmeet Griswobrasa, Research Associate

Dr Mojtaba Maghrirbi, Research Associate

Dr Emily Moylan, Research Associate

Dr Zhizhong Xiong, Research Associate

Dr Kasun Wijayaratne, Research Associate

PROJECT OFFICER
Sylvia Brohi

2016 - WRC STAFF

WRC - KENSINGTON CAMPUS HUB

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BUSINESS MANAGER
Robert Steel

ADMINISTRATION
Patricia Karwan

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Dr Fiona Johnson Dr Stuart Khan

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Associate Professor Sven Lundie

Dr Aj Amini Dr Radiosha Barczak Greece

Dr Mark Bligh

Dr Richard Collins

Dr Juan Carlos Gonzalez Gaitan

Dr Shikha Garg

Dr Michalis Hadiotakis Greece

Dr He

Dr Adelle Jones

Dr Konstantinos Tsiolas

Dr Kovalys

Dr Hung Viet Le

Dr Nabil Al Ayri

Dr Xiaomin Li

Dr Smith Malekina

Dr Lucy Marshall

Dr James McDonald

Dr Rajeshwar Mehta

Dr Christopher Millar

Dr Parinussa

Dr An Ninh Pham

Dr My Manhui Rashid

Dr David Roser

Dr Hazel Readley

Dr Xu Yuan

Dr Xabier Vazquez Campos

Dr Xingyuan Wang

Dr Yuan Wang

Dr Conrad Wasko

Dr Arash Zamyadi

Mohammed Hassan

Zayed Khan

Gough Lui

Daniel Micovski

Judith Schinabeck

Jeffrey Yu

VISITING ACADEMICS
Professor Nicholas Ashbolt, University of Alberta, Canada

Professor R. C. Burford, ETH Zurich, Switzerland

Professor Amin A. Elshobary, University of Saskatchewan, Canada

Professor Gary Jones, eWater Limited, Australia

Professor Venkat Lakshmi, University of South Carolina, USA

Professor Michele Prevost, Polytechnique Montreal, Canada

Professor Jane Nelson Santos, Federal University of Espirito Santo, Brazil

Professor Ataur Rahman, Western Sydney University, Australia

Dr Baichuan Cao, Beijing Jiaotong University, China

Dr Heath Coleman, University of Ulster, United Kingdom

Dr Stuart Dever, Kimberley Resource Recovery Centre, Australia

Dr Manabu Fujii, Tokyo Institute of Technology, Japan

Dr Alexandra Gkimitzi, Mechanical Engineering, Université de Strasbourg, France

Dr Wejia Gong, Harbin Institute of Technology, China

Dr Jing Guan, Beijing University of Water Technology, Beijing

Dr Heng Liang, Harbin Institute of Technology, China

Dr Feng Fan, Nanza University, China

Dr Liang Liu, Changzhou University, China

Dr Tongwu Liu, Guangdong Institute of Eco-Environmental and Soil Sciences, China

Dr Stephan Pfister, ETH Zurich, Switzerland

Dr David Poulson de Sousa, University of Southern Denmark, Denmark

Dr Michael Short, University of South Australia, Australia

Dr Garrett Swarbrick, Pels Sullivan & Meynik, Sydney Australia

Dr Jacqueline Thomas, University of Sydney, Australia

WRC - NORTHERN BEACHES CAMPUS HUB

Water Research Laboratory WRL

DIRECTOR
Professor Ian Turner

BUSINESS MANAGER
Grantly Smith

ACADEMICS
Associate Professor Ron Cox

Dr Stefan Felder

RESEARCH STAFF
Dr Xavier Barthelemy

Dr Mitchell Harvey

Dr Kristen O'Sullivan

PROFESSIONAL ENGINEERS

PRINCIPAL ENGINEERS
Doug Anderson

Matt Blacka

James Carley

Associate Professor William Gore

Ben Modra

Grantley Smith

OUR PEOPLE CIVIL ANNUAL REPORT 2017 - 21
"He was a most memorable character, a wonderful teacher, an extraordinary problem solver and someone whose company was so stimulating and enjoyable. He was unique!"

Colleague Bruce Cathers agrees, ‘Ray’s door at UNSW was always open to help students. Every so often he would challenge the students with unusual and interesting problems. I know of one time he came up with a problem in Engineering Computations related to Richardson’s extrapolation method – and promised a slab to the first student to come up with the solution. And he also had high standards to which he firmly adhered in terms of exams and assignments.’

Ray was famously camera shy, and refused to let the School put his picture on the fledgling internet. To tease him a little, Mario Attard put a picture of the Australian polar explorer Douglas Mawson on Ray’s door. The image did look quite a bit like Ray, perhaps channeling some of Ray’s fierceness when faced with any hint of student plagiarism. Interestingly Ray didn’t take the picture off, and eventually the image found its way into a student yearbook as one Dr Ray Lawther.

Our sincere condolences to Ray’s wife Chris and his family.
Five out of Five - School research found to be well above world standard

The most recent Australian Government’s Excellence in Research for Australia (ERA) gave the School the highest possible five-point ranking—confirming our ‘outstanding performance well above world standard’.

The result reflected the hard work and energy of all in the School over these past years, as well as the excellent research that we do and the respect in which it is held.

POSTGRADUATE RESEARCH STUDENT MANAGEMENT

An important aspect of the Committee’s work involves the management of the School’s postgraduate research student program. At the end of Semester 2 2016, the School had 206 higher degree research students enrolled in either ME (20) or PhD (186) programs. 2016 also saw 33 of our PhD students and 6 ME degree research students enrolled in either ME (20) or PhD (186) programs. The RMC met every month to oversee and progress all research related aspects of the School’s operation.

Each student is assigned a review committee of three academic staff chaired by a member of the RMC. The review committee meets to interview the student and supervisor(s) at 6 or 12 monthly intervals, depending on the student’s progress, and, at these reviews, the student is invited to present a brief seminar outlining progress since the last review. Most academic staff and several research only staff participated in the student review panels in 2016. Much of the heavy work load in this area is carried by the School’s Postgraduate Coordinator Associate Professor Arnaud Castel, his deputy A/Prof Samsung Lim, and the Postgraduate Research Student Administrator Ms Pattie McLaughlin.

The School’s Research Management Committee (RMC) manages and supports research activities within the School, including research undertaken by both the School’s postgraduate research students, and liaises with and contributes directly to the Faculty’s Research Management Committee. In 2016, the RMC met every month to oversee and progress all research related aspects of the School’s operation.

The RMC also administered the 2016 School Minor Equipment Grants Scheme (SMEG). This scheme is designed to provide and maintain School academic staff and researchers with a world-class research environment to attract and retain a critical mass of research excellence and investment in equipment (and critical software). It is a strategic investment to enable our researchers to work at the cutting edge of local, national and international research.

In 2016 $388,274 was awarded by the RMC to academic staff for a range of new equipment to support ongoing and new research projects in all our research hubs and centres. Some examples:

- As part of their 2016 SMEG grant, A/Prof William Glamore’s team at the School’s Water Research Laboratory were successful in obtaining an ISCO auto-sampler. Over the past 12 months they have used the kit to sample catchment runoff parameters over various runoff events as part of a large research hydrodynamic modelling study in collaboration with the Hunter Water Corporation. The fundamental research project will be critical in estimating pollutant loads in catchments. Additional research is underway to examine the role of emerging contaminants using the equipment obtained.
- Using state-of-the-art research sustainability software GaBi®/ecoinvent purchased with their 2016 School Minor Equipment Grant, researchers in the School’s Sustainable Assessment Program Research Associate, WHO.
- Dr Juan Pablo Alvarez-Gaitán, Centre for Photovoltaics
- Sustainability, received an ISCO auto-sampler for the Hunter Water Corporation project under a major research hydrodynamic study. The equipment obtained will be critical in estimating pollutant loads in catchments. Additional research is underway to examine the role of emerging contaminants using the equipment obtained.
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In 2016 the School continued its amazing track record in winning ten highly sought after Australian Research Council Grants – 4 in Discovery, 1 Discovery Early Career; and 3 in Linkage – to the total value of $3.60M.

The objectives of the Discovery Projects scheme are to encourage high-quality research environments; to enhance international collaboration in research to expand Australia’s knowledge base and research capability, and to enhance the scale and focus of research in the national Science and Research Priorities. Under the Linkage scheme, industry partners can make a significant cash and/or in-kind contribution to research projects. The collaboration is essential to transforming industries, building communities and strengthening the Australian economy.

The School’s success contributed to the strong performance of our Faculty and University. In 2016 UNSW received more Discovery Project grants than any other institution in the country – 88 grants worth $32 million. UNSW Engineering won 27 of those grants worth $32 million. UNSW Engineering won 27 of those grants worth $32 million.

In the ARC Linkage grants, UNSW outperformed every other university in the State and ranked third across the country – 88 grants worth $32 million. The Faculty of Engineering won 13 of those 25, to a value of $4.06M.

School staff across the disciplines of water, structures and transport engineering received a Discovery Early Career Research Award (DECRA) of $358K.

Head of School Professor Stephen Foster congratulated all those who were successful and thanked all those staff who submitted. “We all know how competitive these grants are,” he said, “with a success rate of just 17.8% across the country in Discovery and 16.7% for DECRAs. So well done to all!”

Staff involved in the three successful CVEN Linkage grants were A/Prof Arnaud Castel, Dr Vinayak Dixit, Prof Stephen Foster, Dr Taha Rashidi, Prof David Waite, and Prof S Travis Waller. Their projects involve research into human factors influencing the success or otherwise of automated vehicles; developing innovative low carbon cement formulations for the Australian construction industry; and a policy appraisal tool that shows the consequences of land use decisions.

School academics Prof Chongmin Song, A/Prof Stuart Khan and Prof Ashish Sharma were involved in three successful Linkage projects with external academic and industry colleagues. Details are listed below.

In Transport Engineering received a Discovery Early Career Research Award (DECRA) of $358K.

LIST OF 2016 ARC GRANTS AND PROJECTS

Discovery Projects

Professor Stephen Foster: Professor Frank Vecchio, “Characterisation of shear and tensile fracture of ultra-high performance fibre reinforced concrete”: ARC DP 170104618 - $379,500

This project aims to investigate the shear-tension interaction performance of ultra-high performance fibre reinforced concrete (UHPFRC). In January 2014, the draft Australian Standard for the design of concrete bridges was released; this is the first standard in Australia, and one of the first in the world, to include comprehensive design procedures for steel fibre reinforced concrete (SFRC). Rules allow conventional, strain softening SFRC, but exclude the use of strain hardening UHPFRC because of insufficient research on core aspects of the materials when conventionally reinforced. The study expects to provide vital data engineers and Standards bodies need to adopt UHPFRC.

Associate Professor Stuart Khan: Associate Professor Frederic Leusch, “The effect of wastewater treatment on the ecotoxicity of chiral chemicals”: ARC DP 170103537 - $376,000

This project aims to assess the environmental implications of pharmaceuticals discharged in effluents from wastewater treatment plants. Trace levels of human pharmaceuticals occur in sewage and urban waterways, but during sewage treatment, some pharmaceuticals can undergo a chemical transformation known as ‘chiral inversion’. In some cases, this may convert relatively benign environmental contaminants to more ecologically toxic species. This project will investigate why and how some pharmaceuticals become susceptible to chiral inversion and assess ecotoxicological differences. This work is expected to determine the significance of considering chiral inversion in environmental risk assessment, with applications to a broader range of chemicals including pesticides and industrial chemicals.

Dr Lucy Marshall: Dr Hoori Ajami, Dr David Nott, “Uncertainty quantification in terrestrial hydrologic systems”: ARC DP 170103512 - $340,000

This project aims to develop a framework to simulate, quantify and analyse the uncertainty in streamflow and vegetation dynamics via approximate Bayesian computation. Water is a fundamental resource, and a difficulty in water resource management is to make predictions in a changing environment. Uncertainties in predictions of natural systems due to observational and model error make this more difficult. It is anticipated that the results from this project will advance uncertainty analysis in hydrology and help understand how different types of data and different models can inform model characterisation. This will be useful in providing vital information on the attributes and extent of uncertainty to inform water resources analysis, management and decision making.

Professor Chris Rizos: Associate Professor Ahmed El-Mowafy, Associate Professor Jining Wang, Professor Michael Meurer, “Trustworthy positioning for intelligent transport systems”: ARC DP 170103341 - $460,000

This project aims to develop a holistic approach for reliable positioning for Intelligent Transport Systems (ITS). This project will address the challenges of integrity monitoring in ITS when using satellite-based technology, its integration with other sensors, and when supported by the proposed Australian National Positioning Infrastructure. It will consider Australian geography, large area, and sparse population, and emphasise rural transport. Expected primary outputs include algorithms, a detailed analysis of required systems and recommendations that will help prepare Australia for the importation of self-driving vehicles.

Professor Brian Uy: Dr Ehab Hamed, Professor Zhong Tao, Dr Won-Hee Kang, “Coupled service and ultimate behaviour of high strength composite columns”: ARC DP 170100001 - $435,000

This project aims to improve the coupled service and strength behaviour of high strength composite columns used in building and bridge infrastructure. Taller and longer buildings and bridges need efficient and safe material. Australian Standards for concrete and steel now allow higher strength materials of 100 and 690 MPa. This project will consider coupled service and strength load issues incorporating time-dependent effects and ductility, and extend the range of concrete and steel strengths to 150 and 960 MPa for world-class heavy infrastructure. This project is expected to improve the safety and economy of tall buildings, bridges and large infrastructure.

Professor David Waite: Dr Richard Collins, Dr Peter Nicos, “Reactive oxygen species production on oxygenation of subsurface sediments”: ARC DP 170103512 - $335,000

This project aims to examine the nature, extent and effect of redox processes in subsurface environments. Reactive oxygen species, including hydrogen peroxide, superoxide and hydroxyl radicals, transform and affect redox-active substances in the environment such as arsenic, uranium and natural organic matter (which may be oxidised to carbon dioxide). Production of significant quantities of reactive oxygen species on oxygenation of subsurface sediments through actions such as aquifer recharge and high flow events may alter the form and mobility of trace elements and influence the cycling of carbon and eventual efflux of carbon dioxide to the atmosphere. This project will examine the nature, extent and effect of these redox processes in selected subsurface environments. This research could have implications for contaminant transformation and fate and carbon cycling.

DECRA: Dr Taha Hossein Rashidi, “Integrating social media with conventional data sources to model land use”: DE170103466 - $358,000

This project aims to design a framework linking urban pattern development to changing demographics. This multi-level modelling framework for housing, job and school searches is linked to a demographic evolution module providing information about household lifestyle changes. The framework benefits from detailed behavioural models which capture interactions among household members’ decisions. This project examines the capacity of social media data to complement the existing data resources. The expected outcome is a tool for policy appraisal for city planning.
CVEN-led successful ARC Linkage projects

Dr Vinayak Dixit; Professor Travis Waller; Professor Michel Blumen; Dr Steven Most; Professor Andrey Rakotonian; Professor Michael Regan; Mr Benjamin Barnes; Ms Victoria Pytla; Mr Carl Liersch

LP160101021: This project aims to explore three human factor issues critical to the successful deployment of automated vehicles: factors influencing driver choice of automated vehicle control; interactions between automated and manually controlled vehicles; and driver detection, recognition, and reaction to automated vehicle system failures. Automated vehicles are predicted to be transformative, but their ultimate success and expected societal benefits will depend on drivers’ trust in them and on how people choose to use and interact with them. Insights from this research should prepare our society for more automated vehicles on the roadways.

Industry partners: ARRB Group Ltd; Transport For NSW; Robert Bosch (Australasia) Proprietary Limited; Road Safety Commission; GoGet Carshare; Suncorp Group Limited; VicRoads Design; Transport Accident Commission; Liberty Mutual Research Institute For Safety
Award: $456K

Professor David Waite; Professor Stephen Foster; Associate Professor Arnoud Caust; Professor Christoph Ars; Dr Louise Keyte; Dr Redmond Lloyd

LP160101153: This project aims to develop innovative low carbon cement formulations for the Australian construction industry. It will design new binder formulations that include a high level clinker replacement and achieve high early strength by controlling early hydration reactions (< 24 hrs) through combining admixtures. Using geochemistry to improve early hydration, it will use commonly available supplementary cementitious materials to prepare low carbon concrete. This research is expected to transform the Australian construction industry by developing higher performing, more durable structures with dramatically lower embodied carbon dioxide and improved life-cycle costs.

Industry partner: Boral Construction Materials Limited
Award: $450,000.00

Dr Taha Hossein Rashidi; Dr Vinayak Dixit; Dr James Cook

LP160100450: This project aims to develop a policy appraisal tool that shows the consequences of land use decisions. The proposed integrated multi-level modelling framework — linked to models that monitor demographics evolution, travel demand, energy, labour, economy, housing and household dynamics — can assess sustainability, equity and economy. This framework is expected to help people make better decisions about housing, maintain system level properties such as price equilibrium, show expected to help people make better decisions about housing, energy, labour, economy, housing and household dynamics — can maintain system level properties such as price equilibrium, show expected to help people make better decisions about housing, energy, labour, economy, housing and household dynamics — can transform the built environment by improving decision making, enhancing urban systems efficiency, and reducing costs.

Industry partners: Defence Science And Technology Organisation; Pacific Engineering Systems International P/L
Awarded: $550,000.00

Nationally, ARC Linkage applications had an overall success rate of 31% in 2016.

Other ARC Linkage projects CVEN staff are involved in:

UNSW Chemical Engineering: Professor Gregory Leslie; Dr Rita Henderson; Professor Ashish Sharma; Professor Kenneth Gratian; Professor Tong Sun; Dr Peter Jarvis; Dr Henberto Bustoamante; Dr Peter Cox; Dr Bala Vigneswaran

LP160100620: This project aims to make the water industry capable of foreseeing and managing adverse raw water organoleptic matters from the treatment plant. This catchment to plant approach is expected to make existing treatment assets more productive and defer additional treatment costs.

Industry partners: Sydney Water Corporation; Water NSW
Award: $450,000

Western Sydney University: Associate Professor Avanumgan Sathasivan; Professor Brajesh Singh; Associate Professor Stuart Khan; Professor Jens Coorsen; Professor Linda Blackall; Professor Bruce Rittmann; Dr Maneesha Girige; Dr Peter Cox

LP160100659: This project aims to develop an adaptive, real-time control system for managing disinfectant residuals in chloraminated water supply systems. The project will develop and demonstrate a real-time control technology which delivers micro-biologically safe, cost-efficient drinking water to people in warmer climates, despite warming climate and increasing population.

Industry partners: Commonwealth Scientific And Industrial Research Organisation; Sydney Water Corporation; Central Sewer Distributor-Retailer Authority; South East Queensland Water; Logan City Council; Unitywater
Award: $710,000

University of Newcastle: Professor Robert Melchers; Professor Chongmin Song; Mr Damian McCugquin; Dr Stuart Cannon; Professor Martin Renton

LP160100391: This project will research the deterioration of structural integrity and remaining life of marine assets such as ships and offshore energy facilities, by integrating structural response analysis methods with aged-structure assessment techniques. This research is anticipated to develop superior safety, expected lifetime and economic benefits of maritime assets.

Industry partners: Defence Science And Technology Organisation; Pacific Engineering Systems International P/L

Awarded: $550,000.00

SAGE - SURVEYING AND GEOSPATIAL ENGINEERING RESEARCH

The Surveying and Geospatial Engineering (SAGE) Research group conducts world-class research in the subdisciplines of geodesy, photogrammetry, positioning measurement, laser scanning, geospatial information systems and remote sensing. The group includes one of the world’s top satellite and wireless positioning research groups, and one of Australia’s premier Earth observation research teams.

Group leader: Prof Chris Rizos - Professor of Geodesy and Navigation

RESEARCH GRANTS

TOTAL RESEARCH GRANT INCOME 2016 $13.4M

Network Convenor - Associate Professor Ron Cox
Network Coordinator - Tamara Rouse
Research Associate - Dr Kate Panayotou

Researcher Topic Granting Organisation Funds in 2016
A/Prof Run Cox Australian Climate Change Adaptation Research Network for Settlements and Infrastructure - ACCARNSI – promote adaptation research and build capacity NCCARF – Griffith University for Commonwealth Dept of Environment and Energy $160,625
A/Prof Run Cox Review of finance mechanisms for climate change adaptation Griffith University – Department of the Environment $4,500
A/Prof Run Cox Optimisation of seawalls and beach nourishment for coastal adaptation Office on Environment and Heritage (OEH) – NSW Adaptation Research Hub: Coastal Processes Response Node $136,000

TOTAL $301,125

Researcher(s) Research Topic Granting Organisation 2016 Income
Chris Rizos Next Generation Australian and New Zealand Datum Cooperative Research Centre for Spatial Information 5,000
Chris Rizos Underground Mine Environments ARC Linkage Project – ARC contribution 115,844
Chris Rizos Underground Mine Environments ARC Linkage Project – Industry Partner contribution 30,000
Jining Wang Indoor Positioning and Navigation with Beidou Pseudolites China Human Engineering Research Center of Navigation Instrument 16,300
Linkin Ge Accuracy and applicability drone-based photogrammetry NSW Department of Industry 11,000
Linkin Ge Accuracy and applicability drone-based photogrammetry Propeller Aerbiotics 11,000
Linkin Ge Research Centre for Transformation of Urban Ports and Harbours (TUPAH) Australia-China Council, Department of Foreign Affairs and Trade, the Commonwealth of Australia 35,000
Linkin Ge Monitoring Invasive Species North West Local Land Service NSW 20,545

Total 264,789
The centre aims to promote multi-disciplinary collaboration across the Facilities of Engineering, Science and the Built Environment at UNSW and to foster international and interdisciplinary research collaborations and partnerships with industry.

We undertake advanced and strategic consultancies with industry, utilising our analytical and laboratory testing facilities, many with the support of Australian Research Council (ARC) Linkage Project funding.

CIES consists of 130 staff and researchers, including fifty academic and research staff, 6 professional support staff and more than seventy-five PhD students, making it Australia’s largest research centre for infrastructure engineering and safety.

In 2016, CIES continued to engage with and to promote the application of research outputs and deliverables to industry and to provide an outstanding research and learning environment.

Research Director: Professor Chongmin Song
Centre Manager: Irene Calaizis
Website: http://www.cies.unsw.edu.au/
Email: i.calaizis@unsw.edu.au

CIES Centre for infrastructure Engineering and Safety
CIES is a leader in national and international research in infrastructure engineering, with an interdisciplinary research team supported by advanced analytical, computational and experimental techniques and facilities.

As Australia’s premier high level research group in structural engineering, geotechnical engineering, engineering materials and computational mechanics, CIES provides outcomes that improve the design, construction and maintenance of economic, effective, safe and sustainable civil engineering infrastructure. At CIES, we apply our skills to engineering and safety assessments of infrastructure. In particular we look at the risk management of buildings, bridges, dams, roads and other infrastructure when subjected to both in-service conditions and overload (or limit) conditions, such as in fire, earthquake, cyclone or blast situations, or when structures are exposed to hostile environments.

CIES consists of 130 staff and researchers, including fifty academic and research staff, 6 professional support staff and more than seventy-five PhD students, making it Australia’s largest research centre for infrastructure engineering and safety.

**RESEARCH GRANTS**

<table>
<thead>
<tr>
<th>Researcher(s)</th>
<th>Research Topic</th>
<th>Granting Organisation</th>
<th>Value at 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Gilbert, E Hamod</td>
<td>Time-dependent behaviour of precast concrete sandwich panels</td>
<td>ARC Discovery</td>
<td>$134,576</td>
</tr>
<tr>
<td>W Gao, Y-L Pi, S Tangaramvong</td>
<td>Unified nondeterministic dynamic safety assessment of softening structures</td>
<td>ARC Discovery</td>
<td>$124,226</td>
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<tr>
<td>M Bradford, H Vaii Pour</td>
<td>Composite steel-timber structural system</td>
<td>ARC Discovery</td>
<td>$150,106</td>
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<tr>
<td>Chongmin Song</td>
<td>Scaled boundary framework for adaptive and multicore structural analysis</td>
<td>ARC Discovery</td>
<td>$134,576</td>
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<tr>
<td>A Castel, A Mukhoreje (Curtin)</td>
<td>Modelling and testing corroding reinforced concrete structures</td>
<td>ARC Discovery</td>
<td>$69,589</td>
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<tr>
<td>C Song, F T Lin-Looi, S Tangaramvong</td>
<td>From CAD and digital imaging to fully automatic adaptive 3D analysis</td>
<td>ARC Discovery</td>
<td>$129,091</td>
</tr>
<tr>
<td>A Russell, D Muir Wood</td>
<td>Internal erosion of soils: microstructural modelling</td>
<td>ARC Discovery</td>
<td>$109,216</td>
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<tr>
<td>MA Bradford</td>
<td>Buckling capacity of high-strength steel flexural members</td>
<td>ARC Discovery</td>
<td>$139,029</td>
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<tr>
<td>S Foster, H Vaii Pour</td>
<td>Rotation Capacity of Joints in SFRC Moment Resisting Beams and Frames</td>
<td>ARC Discovery</td>
<td>$89,339</td>
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<td>B Uy</td>
<td>The behaviour and design of innovative connections to promote the reduction and reuse of structural steel in steel-concrete composite buildings</td>
<td>ARC Discovery</td>
<td>$181,305</td>
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<tr>
<td>A Russell, N Khalili</td>
<td>Shallow foundations in unsaturated soils: mechanistic design through numerical modelling, analysis and experimental investigation</td>
<td>ARC Discovery</td>
<td>$154,642</td>
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<tr>
<td>W Gao, Y-L Pi, F T Lin-Looi</td>
<td>Stochastic, geostatistically nonlinear, elastoplastic buckling and behavior of curved grid-like structures</td>
<td>ARC Discovery</td>
<td>$143,977</td>
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<td>G Ranzi (USYD), A Castel, R I Gilbert, D Dias-da-Costa</td>
<td>Stiffness degradation of concrete members induced by reinforcement corrosion</td>
<td>ARC Discovery</td>
<td>$50,000</td>
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<tr>
<td>A Castel, S Foster, A Alkarnazadeh, R Lloyd</td>
<td>A mix design approach to reduce early-age thermal cracking of concrete</td>
<td>ARC Linkage</td>
<td>$196,704</td>
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<tr>
<td>S Foster, Hamid Valipour, Graeme McDougall</td>
<td>High-Strength Concrete Beams-Columns with High-Strength Steel Reinforcement</td>
<td>ARC Linkage</td>
<td>$194,151</td>
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<tr>
<td>M Bradford, B Uy, Yanlin Guo, Li Xuan Dai</td>
<td>Composite steel-timber structural system</td>
<td>ARC Linkage</td>
<td>$347,810</td>
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<tr>
<td>A Mukhoreje, B Lui, V Karagiozis, A Stanco</td>
<td>Laser Ultrasonic Health Monitoring for Australia’s Infrastructure Assets</td>
<td>ARC Linkage</td>
<td>$27,849</td>
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<tr>
<td>N Khalili, A Khoshghalbi, J Rubtsov</td>
<td>Experimental investigation and constitutive modelling of weak rocks subject to mechanical and moisture degradation</td>
<td>ARC Linkage</td>
<td>$141,726</td>
</tr>
<tr>
<td>C Zhang, B Uy, W-H Kang, W Huang, P Lv</td>
<td>Development of novel viscoelastic sprayed material for the effective blast resistance of critical and resource infrastructure</td>
<td>University of Western Sydney</td>
<td>$40,153</td>
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<tr>
<td>S Foster, A Castel</td>
<td>Performance based Criteria for Concretes: Creating Pathways for Low Carbon Concrete Manufacture with Existing Standards</td>
<td>Cooperative Research Centre for Low Carbon Living Ltd</td>
<td>$187,905</td>
</tr>
</tbody>
</table>

**TOTAL**

$3,274,265
RESEARCH CENTRE

The Centre bases its research activities around five core research pillars:- Transport Planning – ITS Communications – Infrastructure – Energy/Fuel – Computational Sustainability.

The Centre bases its research activities around five core research pillars:- Transport Planning – ITS Communications – Infrastructure – Energy/Fuel – Computational Sustainability.

Through strategic partnerships with government and industry, and some ground-breaking innovations, the team at RCITI are shaping the way forward for the future of transport. The Mission of the Research Centre for Integrated Transport Innovation (RCITI) is to be a world-leading organisation in integrating interdisciplinary research and development. This is being achieved through a range of research initiatives made possible by the group’s investigation of sustainable approaches to transport infrastructure and operations, as well as its extensive liaison with government and industry.

RCITI's vision is to reshape the field of multi-modal transport engineering and planning, by introducing new innovative techniques and technologies. This will enhance society by integrating methodologies across disciplines and contextual considerations.

**RCITI Senior Investigator(s) / Advisor(s) / Researcher(s)**

<table>
<thead>
<tr>
<th>Subject Area / Research Topic</th>
<th>Granting Organization(s) / Industry Sponsor(s)</th>
<th>In Kind Value 2016</th>
<th>Value for 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP/Dr Vinayak Dixit</td>
<td>Specification Linear Programming for Traffic Signal Performance reporting</td>
<td>Roads &amp; Maritime Service</td>
<td>$95,475</td>
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<tr>
<td>AP/Dr Vinayak Dixit</td>
<td>Traffic Networks</td>
<td>Google Maps Outreach Grant</td>
<td>$1M</td>
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<tr>
<td>Prof S. Travis Walter; AP/Dr Vinayak Dixit</td>
<td>Travel network and demand integration: dynamics, stochasticity, adaptivity</td>
<td>Modulla Soft Technologies Pvt Ltd (India)</td>
<td>$90,000</td>
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<tr>
<td>AP/Dr Vinayak Dixit</td>
<td>Mobile Phone Distractions</td>
<td>Victoria Roads</td>
<td>$20,000</td>
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<tr>
<td>Prof S. Travis Walter</td>
<td>M4 Managed Motorway Evaluation</td>
<td>Roads and Maritime Services</td>
<td>$38,398</td>
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<tr>
<td>Prof S. Travis Walter</td>
<td>Adaptive Stochastic Dynamic Traffic Assignment</td>
<td>DP15104687 Australian Research Council (ARC) Discovery Project</td>
<td>$89,200</td>
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<tr>
<td>Prof Michiel Bliemer, Prof S. Travis Walter, Al/ Dr Vinayak Dixit, Prof Stephan Heiss, Prof Hans Van Lint.</td>
<td>Investigating Travel Choice Behaviour: A New Approach</td>
<td>DP15102399 University of Sydney / ARC Discovery Project Shared Grant</td>
<td>$93,276</td>
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<tr>
<td>AP/Dr Vinayak Dixit, Dr TaHa Hosseini Rashidi, Prof S. Travis Walter</td>
<td>Planning and operational models for food rescue and delivery to the poor</td>
<td>LP150102166 ARC - Linkage Project Ozt Harvest - ARC Linkage Project Industry Partner Contribution</td>
<td>$50,612</td>
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<tr>
<td>Prof Raina Macintyre, Dr Lauren Gardner, Dr Anita Haywood</td>
<td>Real Time Models To Inform Prevention And Control Of Emerging Infectious Diseases</td>
<td>ARP1190254 National Health &amp; Medical Research Council, Project Grant</td>
<td>$85,466</td>
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<tr>
<td>Or Meedar Saberi; Dr TaHa Hosseini Rashidi</td>
<td>Predictive Modelling of Vehicle transaction volume for food rescue</td>
<td>Royal Automobile Club of Victoria</td>
<td>$20,000</td>
</tr>
<tr>
<td>Prof S. Travis Walter</td>
<td>A Collaboration to Develop and Deploy Novel Integrated Network Techniques to Enhance the NSW Transport System</td>
<td>RG1314213 Transport for NSW</td>
<td>$250,000</td>
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<tr>
<td>Prof S. Travis Walter, Prof Michel Bliemer, AP/Dr Vinayak Dixit, Prof Michael O Brien, Al/ Dr Alexandre Torday</td>
<td>Methodologies for the Incorporation of Congestion Propagation and System Reliability into Transport Network Models for Corridor Multi-Scale Planning</td>
<td>LP13010148 ARC Linkage Project / TSS-Transport Simulation Systems Australia P/L - ARC Linkage Project Industry Partner Contribution</td>
<td>$113,746</td>
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<td>Prof S. Travis Walter, AP/Dr Vinayak Dixit, Dr Lauren Gardner, Dr TaHa Hosseini Rashidi, Dr Bruce Jeffreys</td>
<td>Integrating Network Modelling with Observed Choice Data for Multi-Criteria Optimization of Complex Carsharing Systems: Cost, Mobility and Transit Usage</td>
<td>LP130100983 - ARC Linkage Project / GoCoil CarShare - ARC Linkage Project Industry Partner Contribution</td>
<td>$55,996</td>
</tr>
</tbody>
</table>

**Total** | $18,163 in kind | $1,002,369

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RESEARCH GRANTS

The Water Research Centre (WRC) is an international leading university centre that provides multidisciplinary research in water resources, engineering, management and the development of tools for environmental management and sustainability for improving aquatic and atmospheric environments. We also undertake commercial activity in collaboration with industry.

The Centre Director: Advisor Professor of Transport Innovation Prof S Travis Walter

Centre Manager: Manager Maria Lee

Website: http://www.rciti.unsw.edu.au

**Granting Organisation**

- ARC Linkage Project
- Australian Research Council (ARC)
- UNSW / ARC LIEF Central Contribution
- UNSW / ARC LIEF Equipment Contribution
- NSW Government
- Australian Research Council (ARC)
- Australian Research Council (ARC)
- UNSW / ARC LIEF Equipment Contribution

**Research Topic**

- Optimising CDI water treatment for ion removal and energy recovery
- Reducing flood loss - A data-assimilation framework for improving forecasting capability in sparse-gauged regions
- Enhanced modelling capacity for the Industrial Ecology Virtual Laboratory
- Assessing future drought risk for water resources system management
- What will the future be? Projecting environmental change in a warming world for semi-arid landscapes
- Assessing future drought risk for water resources system management
- Innovative hybrid membrane-based pretreatment strategies for remote community groundwater supplies
- Development of innovative cement binders with low carbon footprint
- A decadal to inter-decadal streamflow prediction system

**Cash received 2016 (ex GST)**

- $241,184
- $191,170
- $180,000
- $144,151
- $130,000
- $72,340
- $71,900
- $75,850
- $69,221

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**WRC WATER RESEARCH CENTRE**

Australia’s water management needs innovative and integrated solutions in terms of environmental, energy and social considerations. The Water Research Centre (WRC) is an international leading university centre that provides multidisciplinary research in water resources, engineering, management and the development of tools for environmental management and sustainability for improving aquatic and atmospheric environments. We also undertake commercial activity in collaboration with industry.

With its two research locations, WRC at the Kensington campus and the Water Research Laboratory (WRL) located at Manly Vale, we operate as an externally funded UNSW research centre within the School of Civil and Environmental Engineering. Our history as a leading Australian water research organisation forms the base on which we have grown - we are now able to apply our experience and critical thinking across more than just water, into diverse (yet related) fields - Civil and environmental hydraulics; Water quality and treatment processes; Lifecycle assessment and sustainability; Waste management; Hydroclimatology; Carbon and water footprinting; Issues concerning atmospheric emissions and odour; Coastal engineering; Risk assessment.

WRC (Kensington) Centre Director: Professor Richard Stuezt

WRC (Kensington) Business Manager: Robert Steel

Website: http://www.water.unsw.edu.au

Email: water@unsw.edu.au

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**Kensington Campus Hub Investigators**

- D. Waite, J. Petcher (UNSW), P. Kovolcy (Micronbi, Jiru Zhao (Pang)
- A. Sharma, F. Johnson, Y. Liu, M. Marshall (UNSW), H. Moradihaki (Portland State University), S. Muddu (Indian Institute of Science), Q. Wang, D. Robertson (CSIRO)
- T. Wiedmann (UNSW), M. Lenzen (Sydney University), S. Kenway (University of Queensland), P. Lant (University of Queensland), A. Halog (University of Queensland), P. Perez (University of Wellington), R. Crawford (University of Melbourne), M. Disendert (UNSW), M. Balatbat (UNSW), G. Monroe (UNSW)
- F. Johnson, A. Sharma (UNSW), S. Chowdhury, R. Beecham (DPI Water)
- A. Sharma (UNSW), S. Muddu (Indian Institute of Science)
- D. Waite, G. Leslie (UNSW), X. Wang (Tsinghua University), J. Guan (Beijing Origin Water Technology), C. McInnes (Water Research Australia), P. Spencer (DPI Water)
- A. Sharma, F. Johnson, Y. Liu, M. Marshall (UNSW), H. Moradihaki (Portland State University), S. Muddu (Indian Institute of Science), Q. Wang, D. Robertson (CSIRO)
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- A. Sharma (UNSW), S. Muddu (Indian Institute of Science)
- D. Waite, G. Leslie (UNSW), D. Waite, G. Leslie (UNSW), X. Wang (Tsinghua University), J. Guan (Beijing Origin Water Technology), C. McInnes (Water Research Australia), P. Spencer (DPI Water)
- A. Sharma, F. Johnson, Y. Liu, M. Marshall (UNSW), H. Moradihaki (Portland State University), S. Muddu (Indian Institute of Science), Q. Wang, D. Robertson (CSIRO)
RESEARCH GRANTS

Kensington Campus Hub Investigators | Research Topic | Granting Organisation | Cash received 2016 (ex GST)
---|---|---|---
S. Westra (Uni. Adelaide), F. Johnson (UNSW), F. Zierler (Uni of Victoria, Canada), H. Fowler (Uni Newcastle) | A spatially explicit framework for predicting sub-daily rainfall intensity | University of Adelaide | 41,192
L. Ngiem (University of Wollongong), W. Price (University of Wollongong), R. Stuetz (UNSW), H. Busdamante (Sydney Water), S. Murthy (District of Columbia Water and Sewer Authority) | Analytics to predict anaerobic codigestion & down-stream process performance | University of Wollongong | 32,805
R. Crawford (Uni Melbourne), T. Wiedmann (UNSW), A. Stephan (Belgian National Fund for Scientific Research, Free University of Brussels (French)) | Improving the environmental performance of Australian construction projects | University of Melbourne | 25,406
A. Jones, R. Collins, D. Waite | Using mediated electrochemistry to correlate the reduction of trichlorophenol to the reduction potential of various Fe(II)-Fe oxide systems | Australian Synchrotron | 1,314
A. Jones, R. Collins, W. Xia | Transformation kinetics of ferricyanide induced by the dissimilatory Fe reducing bacterium Shewanella oneidensis and comparison with abiotic transformation kinetics | Australian Synchrotron | 1,198
R. Stuetz (UNSW), R. Barczak (Warsaw University of Technology), G. Rundblad (Kings College London) | City carbon footprint networks using the Global Carbon Tracking | UNSW / Tonghua University Collaborative Research Fund - Seed Grants | 20,000
R. Stuetz (UNSW), R. Barczak (Warsaw University of Technology) | OxidOCOB - Odour characterization of odontans from biosolids | European Commission / Marie Curie International Outgoing Fellowships for Career Development (IFOP) | 18,523
S. Khan | Strategic analysis of water quality in the Parmamatta river catchment | Jacobs Group (Australia) Pty Ltd / Paramatta City Council Subcontract | 13,500
S. Khan (UNSW), J. Drewes (Technical University of Munich) | Modelling contaminant removal during wastewater treatment | UNSW / Australia-Germany Joint Research Cooperation Scheme | 12,500
M. Hadjikakou | Our ‘foodprint’ matter – Australian diets and their environmental, economical and health impacts | Australian Academy of Science / WH Gladstones Population and Environment Fund | 12,000
A. Ancero | Multi-functional reactor systems for liquid and gas phase treatment of agroindustrial and municipal effluents: toward pollution and odour abatement with energy cogeneration | UNSW, VC PostDoc Support | 9,228
S. Khan | Emerging contaminant research prioritisation decision framework | Water Environment and Reuse Foundation (WEMF) / International Contract | 8,602
A. Sharma | Flood inundation data assimilation - Scholarship for Sahani Pathria | CSIRO / Postgraduate Studentship | 8,344
R. Stuetz | Optimisation of granular sludge for energy efficient wastewater treatment and reuse - Scholarship for Benjamin Thwaites | WQRA Postgraduate Scholarships | 5,000
L. Marshall | Plaxton catchment improvement program: Peer Review | Hunter Water Corporation / State Government Contract | 4,772
A. Sharma | Watermeter model independent expert review | WRENA Pty Ltd / Contract Research | 5,000
S. Khan | From collection system to tap: Resiliency of treatment processes for direct potable reuse | Sustainable Systems LLC - Consulting | 4,114

CRC GRANTS

R. Stuetz (UNSW), Partner Organisations: University of SA, Sydney Water Corp., SA Water, Prospect Water Partnership, Department of Environment, Water and Natural Resources, AECOM, AEA, Water & Sewerage Authority, Water Environment Fund | Beneficial reuse of solids from wastewater treatment operations | CRC for Low Carbon Living Ltd | 186,224
T. Wiedmann (UNSW), University of Melbourne, University of SA, AECOM, AEA, City of Port Adelaide, City of Onkaparinga, City of Gawler, City of Playford, City of Salisbury, City of Norwood, City of Mount Gambier, City of Mount Barker, City of Victor Harbor, City of Loxton Waikerie, City of Whyalla, City of Port Augusta, City of Port Pirie, City of Kadina, City of Port MacDonnell, City of Port Lincoln, City of Port Lincoln, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City of Port Augusta, City 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**RESEARCH GRANTS**

<table>
<thead>
<tr>
<th>Kensington Campus Hub Investigators</th>
<th>Research Topic</th>
<th>Granting Organisation</th>
<th>Cash received 2016 (ex GST)</th>
</tr>
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<tbody>
<tr>
<td>N. Le Minh</td>
<td>Odour analysis</td>
<td>ARIBGROUP Contractors &amp; CHIM Hill Aus Pty</td>
<td>72,405</td>
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<td>N. Le Minh</td>
<td>Odour analysis</td>
<td>ExcelPias Pty Ltd</td>
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<td>S. Khan, J. McDonald</td>
<td>Trace Organics analysis</td>
<td>Water NSW</td>
<td>13,500</td>
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<td>N. Le Minh</td>
<td>Odour analysis</td>
<td>The Odour Unit</td>
<td>14,330</td>
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<td>D. Roser</td>
<td>Consulting</td>
<td>Office of the Environment</td>
<td>11,375</td>
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<td>N. Le Minh</td>
<td>Odour analysis</td>
<td>Peter Stephenson &amp; Associates Pty Ltd</td>
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<td>Q. Waite</td>
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<td>Norton Rose Fulbright</td>
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<td>REHAU Pty Ltd</td>
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<td>R. Henderson</td>
<td>LOCCD analysis</td>
<td>University of Queensland</td>
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<td>N. Le Minh</td>
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<td>Sydney Water Corporation</td>
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<tr>
<td>R. Henderson</td>
<td>LOCCD analysis</td>
<td>Ecolab Pty Ltd</td>
<td>120</td>
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</table>

Total 2,966,080

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**APPLIED RESEARCH**

**WRL**

*We are the Water Research Laboratory (WRL) - a world-leading academic research and consulting laboratory that endeavours to tackle the most challenging and pressing water-engineering problems faced by the world today relating to water and the environment.*

As part of UNSW Civil & Environmental Engineering’s Water Research Centre, we aim to deliver world leading water engineering research that results in real positive impact on a global scale. WRL is at the frontier of water engineering research. We pride ourselves on paving the way to discover and deliver new ideas, leading conversations and delivering solutions that have a global positive impact, be it new technologies to monitor and quantify changing coastlines, or restoring wetlands to preserve wildlife and ecological communities.

Based on Sydney’s Northern Beaches, our globally-esteemed laboratory spans four hectares and is home to state-of-the-art facilities and equipment. Our personnel are comprised of the most experienced and creative problem solvers in their respective areas of research and industry. Our expertise extends (but is not limited to): Estuarine, coastal and ocean hydrodynamics and sediment transport; Coastal zone monitoring, foreshore protection and management; River flow and floodplain management; Groundwater research and management; Civil engineering hydraulics; Catchment hydrology; Environmental studies and climate adaptation; Wetland restoration.

Our prestigious record built over more than 50 years has made us what we are today, a leading global think tank. We’re a band of pioneers and experts driven by a passion to finding grand breakthroughs for a better tomorrow.

**WRL Director:** Professor Ian Turner  
**Centre Manager:** Grantley Smith  
**Website:** [http://www.wrl.unsw.edu.au/](http://www.wrl.unsw.edu.au/)  
**Email:** info@wrl.unsw.edu.au

---

**Northern Beaches WRL Hub Researchers**

**Research or Project Topic** | **Granting Organisation(s)** | **Funds received in 2016**
---|---|---
**Coastal Engineering**  
Matt Blacka, James Carley, Ian Coghlan, Kristen Spiteri, Ron Cox, Dan Howe, Ian Turner, Ben Modra, Chris Drummond, Alisa Harrison, Mat Deibert, Toby Tucker, Mitch Harley, Matt Phillips, Josh Simmons, Will Giammore, Duncan Rayner | Asian Development Bank via Torkin and Taylor, Aurecon, Beatty Legal Pty Limited, Bega Valley Shire Council, Byron Shire Council, Central Coast Council, City of Gold Coast, Clarence City Council, CMS Surveyors, Coasts and Ports 2015 c/- Torkin & Taylor Ltd, Department of Environment, Land, Water & Planning (Vic), Ecosystems Australia Pty Ltd, GHD Pty Ltd, Origin Solutions, Norton Consulting, HWL Ebsworth, James de Suyres & Associates Pty Ltd, JKG Geotechnics, Manly Hydraulics Laboratory, Moyle Shire Council, Northern Beaches Council, NSW Department of Primary Industries - Fisheries, Fisheries, NSW, Office of Environment and Heritage, Office of Strategic Lands Department of Planning & Environment, Pitt & Sherry, Shoalhaven City Council, Sydney Water, Torkin and Taylor, Tweed Shire Council, Water, WRL | $1,296,152

**Civil Engineering Hydraulics**  
Brett Miller, Grantley Smith, Chris Drummond, Stefan Felder, Bruce Cathers, Matt Blacka, Toby Tucker, Alice Harrison, Mat Deibert, Dan Howe, Ian Coghlan, James Carley, Prion Rahman | Drying Green Alliance, ACO Polycr Oty Pty Ltd, Golder Associates, NSW Fisheries, SPEL, Sydney Water Corporation, ACO Polycr Oty Pty Ltd, Australian Water Partnership, Jindex Pty Ltd, Golder Associates | $587,718

**Hydrology, Flooding and Water Resources**  
Grantley Smith, Brett Miller, Stefan Felder, Bruce Cathers, Ron Cox, Doug Anderson, Alice Harrison, Ben Modra, Prion Rahman | NSW SES, NSW OEH, City of Newcastle, WMAWater | $142,520

**Environmental Engineering**  
Will Giammore, Duncan Rayner, Brett Miller, Jamie Ruprecht, Alisa Harrison, Toby Tucker, Doug Anderson, Ian Xong, Grantley Smith, Doug Anderson, Prion Rahman, Chris Drummond, Martin Anderson, Stefan Felder | ARUP Pty Ltd, Clarence Valley Council, Department Of Commerce (for Clarence Valley Council), Ferrier Hodgson, Griffith University, Horsnby Council, Hunter Water Corp, National Climate Change Adaptation Research Facility (NCCARF), National Parks and Wildlife (OPH), Newcastle City Council, Newcastle Coal Infrastructure Group, North Coast Land Local Land Services, NSW Department of Primary Industries (Fisheries), NSW Environmental Protection Authority, NSW Office of Environment & Heritage, NSW Office of Water, DPI, Shoalhaven City Council, Sutherland Shire Council, NSW Office Of Environmental And Heritage: Parks And Wildlife Div, Sydney Water Corporation | $1,620,184
## RESEARCH GRANTS

<table>
<thead>
<tr>
<th>Northern Beaches WRL Hub</th>
<th>Research or Project Topic</th>
<th>Granting Organisation(s)</th>
<th>Funds received in 2016</th>
</tr>
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<tbody>
<tr>
<td>Beach Erosion and Recovery: Quantifying the Hazard</td>
<td>Australia Research Council – Discovery (DP150103399)</td>
<td>$158,200</td>
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<tr>
<td>Integration of airborne hyperspectral imagery with an airborne LiDAR in a UNSW owned aeroplane</td>
<td>NREII (UNSW Major Research Equipment and Infrastructure Initiative Scheme)</td>
<td>$82,500</td>
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</tr>
<tr>
<td>Coastal Erosion – A STEM education initiative to promote school &amp; community engagement</td>
<td>Office on Environment and Heritage (DEH) – UNSW Adaptation Research Hub: Coastal Processes Response Node</td>
<td>$33,000</td>
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<tr>
<td>Publicly available datasets: Online photogrammetry web portal</td>
<td>Office on Environment and Heritage (DEH) – UNSW Adaptation Research Hub: Coastal Processes Response Node</td>
<td>$112,000</td>
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<tr>
<td>Groundwater organic matter: carbon source or sink?</td>
<td>Australia Research Council – Discovery (DP160101379)</td>
<td>$148,000</td>
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<tr>
<td>Research to inform the assessment of ecologically-relevant responses to coal seam gas extraction and coal mining</td>
<td>Shared grant: Research program funded by the Office of Water Science, Department of the Environment and Energy, Commonwealth of Australia - RS150063 ($1.9M total)</td>
<td>$364,000</td>
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<tr>
<td>NCRIS Groundwater Infrastructure Project</td>
<td>Department of Education NCRIS scheme</td>
<td>$433,500</td>
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<tr>
<td>The role of organic carbon for determining water quality in an artificially de-stratified dam, Chichester Dam</td>
<td>Hunter Water Corp</td>
<td>$10,000</td>
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<td>Groundwater infrastructure program NSW</td>
<td>RAAP supporting NCRIS Funding - NSW Department of Industry - RS1505198</td>
<td>$50,000</td>
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<tr>
<td>Fate of engineered nanoparticles: Challenges in informing human and ecological health risk assessments</td>
<td>Australia Research Council – Future Fellowship (FT140109837)</td>
<td>$223,000</td>
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<tr>
<td>Emerging Contaminant and Water Quality Laboratory</td>
<td>Research Infrastructure Scheme</td>
<td>$111,307</td>
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<td>2016 UNSW Faculty of Engineering Silverstar Award for ARC DP16 application</td>
<td>Faculty of Engineering UNSW</td>
<td>$30,000</td>
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<td>Australian Climate Change Adaptation Research Network for Settlements and Infrastructure - ACCARNSI – promote adaptation research and build capacity RG150174</td>
<td>NCCRF – Griffith University for Commonwealth Dept of Environment and Energy</td>
<td>$160,625</td>
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<tr>
<td>Review of finance mechanisms for climate change adaptation RG162235</td>
<td>Griffith University – Department of the Environment</td>
<td>$4,500</td>
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<tr>
<td>Optimisation of seaways and beach nourishment for coastal adaptation</td>
<td>Office on Environment and Heritage (DEH) – UNSW Adaptation Research Hub: Coastal Processes Response Node</td>
<td>$136,000</td>
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<tr>
<td>Total</td>
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<td>$5,890,091</td>
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## PHD GRADUATES

<table>
<thead>
<tr>
<th>STUDENT / [SUPERVISORS]</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alqurashi, Muwaffaq [Wang, Jin]</td>
<td>Modelling and quality control for 3D UAV mapping</td>
</tr>
<tr>
<td>Bai, Yun [Shuai, Nasser]</td>
<td>Coupled thermo-hydro-mechanical (THM) model for multiphase flow through deformable porous media with double porosity</td>
</tr>
<tr>
<td>Bracs, Melissa Anne [Turner, Ian L]</td>
<td>Efficient monitoring of sandy shoreline variability at the regional scale</td>
</tr>
<tr>
<td>de Burgh, James Matthew [Foster, Stephen J]</td>
<td>Hydro-thermo-mechanical study of concrete elements subject to elevated temperatures: assessment of spalling risk and moisture interactions</td>
</tr>
<tr>
<td>Do, Duy Minh [Gao, Wei]</td>
<td>Stochastic Interval Analysis of Structures in the Presence of Uncertain Fields</td>
</tr>
<tr>
<td>Figueroa, Ligaya Leah [Lim, Samsung]</td>
<td>Spatial modeling for understanding the correlation between school facilities and academic performance in the Philippines</td>
</tr>
<tr>
<td>Sharib, Mohammadmahdi [Foster, Stephen J]</td>
<td>Time-dependent numerical modelling of corrosion initiation in reinforced concrete structures under projected climate change impacts</td>
</tr>
<tr>
<td>Hallet, Landon James (Sezzy) [Andersen, Martin &amp; Rau, Gabriel]</td>
<td>Heat tracing in the variability saturated shallow subsurface</td>
</tr>
<tr>
<td>Hasan, Mohammad Mahdi [Johnson, Fiona &amp; Sharma, Ashish]</td>
<td>Radar rainfall estimation: consideration of input and structural uncertainty</td>
</tr>
<tr>
<td>Hashemideharsi, Seyed Komeil [Bradford, Mark]</td>
<td>Structural response and mitigating techniques for long-span cable-stayed bridges subjected to blast loading</td>
</tr>
<tr>
<td>Henderson, Ian E J [Uy, Brian]</td>
<td>Use of innovative anchors for composite action in rehabilitated steel structures</td>
</tr>
<tr>
<td>Howe, Daniel [Blenkensopp, Christopher E &amp; Turner, Ian L]</td>
<td>Bird shear stress under wave runup on steep slopes</td>
</tr>
<tr>
<td>Khan, Mahbub [Uy, Brian]</td>
<td>Behaviour and design of composite columns coupling the benefits of high strength steel and high strength concrete</td>
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<tr>
<td>Khan, Mohammad Zaved Kaiser [Sharma, Ashish]</td>
<td>Modelling seasonal rainfall forecasts with improved predictive ocean surface temperature</td>
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<tr>
<td>Kobayashi, Yumi [Khan, Stuart &amp; Peters, Gregory]</td>
<td>Holistic Environmental Health Impact Assessment: Hybridisation of Life Cycle Assessment and Quantitative Risk Assessment using Disability Adjusted Life Years</td>
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<tr>
<td>Le, Hung Viet [Stutzer, Richard]</td>
<td>Rate of volatile sulphur compounds in odour bags</td>
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<tr>
<td>Lui, Joseph Yomu [Rover, David &amp; Corkish, Richard]</td>
<td>Investigating photocatalytic-powered light-emitting diode based disinfection of water for point-of-use application</td>
</tr>
<tr>
<td>Maheshwar, Pradeep [Wang, David]</td>
<td>Experimental and computational investigation of the formation, transformation and reactivity of iron oxides in wastewater treatment</td>
</tr>
</tbody>
</table>

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O UR RESEARCH CVEN ANNUAL REPORT 2017 - 39
PHD GRADUATES

**STUDENT / [SUPERVISORS]** | **TOPIC**
---|---
Rana, Mohammad Masud [Uy, Brian] | The effects of bond and anchorage on the behaviour and design of composite slabs
Rocheta, Eytan [Sharma, Ashish & Evans, Jason P] | On Low-Frequency Rainfall Variability Bias in Climate Model Simulations
Saputra, Albert Artha [Song, Chongmin] | A scaled boundary polyhedral element for three-dimensional analyses
Sepasgozar, Samed [Davis, Steven] | Technology adoption in construction.
Tang, Yi [Russell, Adrian] | Numerical Modelling of Shallow Foundations in Unsaturated Soils
Yeo, Tiffany Li Lee [Khan, Stuart J & Coleman, Heather] | Chemical contaminants in swimming pools: Occurrence and health risk assessment
Tsarev, Sergey [Collins, Richard N] | Uranium interactions with reduced iron species: electron transfer between uranium and Fe(i)-Fe(II)-Fe(III) in natural clays and nanoscale zerovalent iron
Wasko, Conrad [Sharma, Ashish] | Continuous rainfall simulation in a warmer climate
Wijayaratna, Kasson [Ouat, Virayak & Waller, S Travis] | Modelling disrupted transport network behaviour

**STUDENT / [SUPERVISORS]** | **TOPIC**
---|---
Wijesiri Pathirana, Indika [Uy, Brian] | Use of innovative shear connectors in construction and rehabilitation of steel-concrete composite beams
Yang, Chengwei [Gao, Wei & Tangaramvong, Sawelchaj] | Interval elastoplastic analysis of structures
Yousefnia Pasha, Amin [Khalili, Nasser & Khoshghalb, Arman] | Study of water retention curve for deformable porous media

ME or MSc

**STUDENT / [SUPERVISORS]** | **TOPIC**
---|---
Alize Barat, Ruken [Rizos, Chris] | Space observation and Coulomb Stress Change Modelling: application to the Izmit earthquake
Chen, Kai [Wang, Jinling] | Stochastic modelling for vision-based indoor navigation
Liu, Youlian [Ge, Linlie] | InSAR technique for earthquake studies
Lu, Xueqing [Davis, Steven] | The effects of sound and priming on user safety decisions in virtual construction simulators
Norzahari Nur Fadhillah [Lim, Samsung/Trinder, John & Turner, Russell] | Stem Classification and Modelling from Lidar for a Semi-Automated Forest Inventory
Shakeel, Kiran [Waller, S Travis & Rashdi, Taha] | Modelling mode and route choice behaviour with adaptive data collection
The Teaching and Learning Committee (TLC) of the School is responsible for all academic matters relating to all undergraduate and postgraduate coursework programs; these involve:

- encouraging teaching quality,
- providing teaching aids to staff,
- monitoring courses through student focus group surveys,
- interaction with student representatives of CEVSOC and research student demonstrators through CERSA,
- setting policy regarding academic aspects of undergraduate and postgraduate examinations and enrolments,
- providing a focal point for student assistance in undergraduate and postgraduate coursework matters.

The major drive behind the Committee’s agenda is to improve the learning experience of students. The members of the committee in 2016 were:

**CVEN Teaching and Learning Committee 2016**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Steven Davis</td>
<td>Co-Chair (Operations &amp; Scholarships)</td>
</tr>
<tr>
<td>Prof Richard Stuetz</td>
<td>Co-Chair (Technology &amp; Innovation)</td>
</tr>
<tr>
<td>A/Prof Mario Attard</td>
<td>Associate Head (Academic)</td>
</tr>
<tr>
<td>Dr Lauren Gardner</td>
<td>Civil Engineering Program Coordinator</td>
</tr>
<tr>
<td>Dr Bruce Harvey</td>
<td>Surveying Teaching Representative</td>
</tr>
<tr>
<td>A/Prof Stuart Khan</td>
<td>Civil with Architecture Program Coordinator</td>
</tr>
<tr>
<td>Dr Arman Khoshghal</td>
<td>Water and Environmental Teaching Representative</td>
</tr>
<tr>
<td>A/Prof Tommy Wiedmann</td>
<td>Postgraduate Coursework Coordinator</td>
</tr>
<tr>
<td>Dr Hamid Valipour</td>
<td>Year 1 Coordinator</td>
</tr>
<tr>
<td>Dr David Rey &amp; Dr Johnson Shen</td>
<td>Year 2 Co - Coordinators</td>
</tr>
<tr>
<td>Dr Ehab Hamed</td>
<td>Year 3 Coordinator</td>
</tr>
<tr>
<td>Dr Taha Rashidi</td>
<td>Year 4 Coordinator</td>
</tr>
<tr>
<td>Dr Kostas Seneetakis</td>
<td>Industrial Training Coordinator</td>
</tr>
<tr>
<td>Dr Fiona Johnson</td>
<td>Elite Student Coordinator</td>
</tr>
<tr>
<td>A/Prof Jining Wang</td>
<td>Faculty IRC Rep</td>
</tr>
</tbody>
</table>

In 2016 the Committee continued with the innovative School Teaching Initiative Grant Scheme (STIGS) – the aim being to develop and implement innovations in School teaching and learning, and to support the improvement of the student experience through teaching related activities. The six successful 2016 projects – involving twelve teaching staff – included:

- Online teaching innovations and improvements within undergraduate and postgraduate courses, including:
  - the creation of Online Assessment Tools for Graphical Modelling Problems in construction courses (Dr Steven Davis)
  - the development and integration of visualization and online simulations tools (animations) for enhancing the education experience of second year transport design, planning, and modelling courses (Drs Taha Rashidi and Lauren Gardner);
  - an online, user-oriented design and evaluation framework for ENGG1400 workshops and assessments. ENGG1400 is a first year course in optimization and modelling for engineering students who desire a higher capability in the application of the modelling of engineering systems, and seek to acquire a set of optimization tools that can then be applied to various engineering applications. School teaching Staff involved - Dr David Rey, Dr Lauren Gardner & Prof S Travis Waller - aim to create a tool that can automatically assess, grade, and provide feedback for student computer models.


- Doing:
  - the development of an End of Life Computers Re-use and Recycling Social Enterprise as a model for future similar student enterprises.

- Prof Richard Stuetz, Dr Anh Nin Pham, Stephen Moore and Lila Azouz’s STIGs project will use Unmanned Aerial Vehicles (UAVs) to obtain video footage of water and wastewater treatment operations – this will be incorporated into the existing online scenario based flowsheet learning activities and used as a 3D teaching tool for Water and Wastewater Treatment infrastructure investigations.

- Dr Ali Amin and A/Prof Mario Attard will purchase video camera equipment to allow live demonstrations of structural tests conducted in the School’s laboratories to be transmitted to the lecture theatre where students will engage in prediction contest for strength and response of reinforced concrete beams.

- VC Teaching Excellence Award winner Stephen Moore’s Learning Engineering Business and Consulting Skills by Doing which aims to support students in the establishment of an End of Life Computers Re-use and Recycling Social Enterprise as a model for future similar student enterprises.

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- The members of the committee in 2016 were:

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TEACHING AND LEARNING COMMITTEE CONT.

EDUCATIONAL EXCELLENCE – A DISTINCTIVE CVEN MODEL

It was another busy, active and inspired year for the dedicated teachers at the School and the hardworking Committee. It began with the 2016 School Teaching Retreat, held on 18 Feb at Coogee Surf Lifesaving Club. The theme was “Educational excellence – a distinctive CVEN model.” The Retreat was oriented towards the UNSW 2025 Strategic Plan’s commitment that we will deliver: “Exemplary education for every student through integrating the most innovative developments in digital and face-to-face learning into novel solutions, to improve educational quality and the student experience.” UNSW 2025 Strategy, Commitment 3, p7


Sharing their expertise and experience with us, David Cullen from Open Learning spoke on ‘Using technology for the development of a personalised learning experience’ and Lila Azouz – Education Developer Consultant UNSW Learning Centre, presented on ‘Education technology in the delivery of a blended learning experience and the development of on-line modules’. University and Faculty Perspectives were provided by Prof Geoffrey Crisp – PVC (Education) and Prof Maurice Pagnucco – Deputy Dean (Education).

Small Group Discussions were held throughout the day considering, amongst other things what is the most effective method for improving teaching quality and learning outcomes and where and how should the School be investing in teaching? Staff from each discipline were then asked to select one discipline based course for implementation of a blended learning (or other) model, and asked to map the learning outcomes, dissect the curriculum and present a preliminary implementation on a week by week basis – mindful of the UNSW 2025 educational strategy.

The awards recognise excellence in: approaches to teaching and the support of learning that influence, motivate and inspire students to learn; development of curricula, resources or services that reflect a command of the field; evaluation practices that bring about improvements in teaching and learning.

‘Excellence in teaching is an essential and fundamental mission of our University, and it is very pleasing to be able to formally recognise your contribution this way.’ President and Vice-Chancellor Professor Ian Jacobs said on congratulating Dr Amin.

Dr Amin has been lecturing subjects in Construction and Structural Analysis and Design within the School since 2013. He has redeveloped courses and introduced a number of blended learning initiatives to the courses he teaches by utilizing videos, animations and construction site visits and field trips – all of which encourage student engagement, motivation and deep learning.

Ali is a firm advocate in empowering our students with the skills and competencies required to meet society’s demand for high quality and responsible engineers. He does so by providing demanding, high quality courses with a high level of interaction. Students value the real-world emphasis in the courses he teaches and consistently rate Ali’s enthusiastic and innovative teaching extremely highly.

Fifteen of the School’s academics have been awarded the prestigious UNSW Vice-Chancellor’s Award for Teaching Excellence since its introduction in 1989. With only fifteen Awards presented each year – and with UNSW academic staff members numbering over 2,600 – the School of Civil & Environmental Engineering has been very well represented.

DEVELOPMENT OF NEW FOURTH YEAR COURSES

In 2016 the School made a significant investment in the development of three new fourth year courses – integrating new learning methods and providing us with more flexibility in delivery. The three courses are: CVEN4060 – Student Led Project, CVEN4300 – Structures Practicum, and CVEN4106 – Construction Practicum. These courses will involve more practical subjects, where the students have the opportunity to work in teams, design and implement a project, and the implement the data drawn upon. They have been designed so that students will have hands on learning experience that enables learning by doing. The student groups will be required to make or build something, and then focus on assessing how successful the whole process has been. Students will only be allowed to do one of these subjects.

VC AWARD FOR TEACHING EXCELLENCE

In 2016 Dr Ali Amin won a UNSW Vice-Chancellor’s Award for Teaching Excellence (Early Career). The awards recognise excellence in: approaches to teaching and the support of learning that influence, motivate and inspire students to learn; development of curricula, resources or services that reflect a command of the field; evaluation practices that bring about improvements in teaching and learning.

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ADVICE TO GRADUATES

Dr Robert Caren, CVEN alumnus and Strategic Geographies Leader of global consulting group Arup gave an inspirational occasional address at the November 2016 graduation ceremony for UNSW civil and environmental engineering students.

In his urgent graduates to understand that an engineering career is not, will not and cannot ever be a narrow focus on technical issues, but rather a facing of the planetary and societal issues – resource scarcity and security – water, food, energy – poverty, growing inequality, urbanisation and climate change. All are engineering challenges.

Dr Care shared honestly from his own personal journey as an engineering leader, and advised graduates to ensure they took care of themselves, sought help when needed, and selected wisely those elements which form a balanced life.

You have chosen a great calling,” he said, “designing and building our future – in consulting or in contracting, in industry, in finance, in management consulting, or even in politics. You have all the skills to make a huge difference, a major contribution to the people on our tiny, cool, blue planet. There are wonderful opportunities out there for you. Take those opportunities. Embrace change. Embrace failure. Grow. Learn. Give and receive. And one final message – just go for it.

STUDENT LIASON

In 2016 the T&L Committee organised regular student focus groups, with a new position created in CEVSOC for TLC liaison – giving undergraduate students a voice in the structure and delivery of courses.

The Committee also supported the student organisation CEVSOC including: CEVSOC International Night: The focus was on assisting international students finding jobs for IT and after graduation. There was also a focus on how they can get more involved with University and School life. There were around 40 students in attendance.

Thesis Information Night: Ron Cox and Ian Turner attended to discuss the two Thesis options in the new program. Students completing Thesis also spoke of their experiences. 130 students were in attendance.
STUDENT PRIZES

CVEN STUDENT PRIZES 2016

University Medal Winners

Congratulations to our two 2016 University Medalists for their outstanding academic performance - soaring above even the rigorous standards of an Honours Class 1.

Year 1 prize

Nikolay Kusmatov
Jacob N Frentel prize: for the best achievement in Civil Engineering for a first year student

Year 3 prizes

Griffen Mallows
Welding Technology Institute Of Australia Prize: for the best performance in CVEN3303 Steel Structures

Zoe Gillespie
The Full Time Class Of 1962 Civil Engineering And Surveying Alumni Prize: for the female student with the highest WAM at the end of 3rd year

David Morgan
The JK Geotechnics Prize: for the best performance in CVEN3202 Soil Mechanics

Karim Ching
The Crawford Munro Memorial Prize: for the best performance in CVEN3501 Water Resources Engineering

Darren Pham
The ASI Undergraduate Steel Design Award: for the best performance in CVEN2301 (Mechanics of Solids) & CVEN3303 (Steel Structures)

Final Year prizes

Camellia Wong
Alexander Wargon Prize: for Best performance in the Structures Discipline in the BE Civil Engineering degree

Ebony Catalano
The Engineers Australia Civil and Structural Engineering Prize: for the best performance in Structural design in the final year of the degree

SAGE prizes

Luke Chidzey
EGM Memorial Prize: for outstanding performance in GIS courses

Allen Qi
Assos Of Public Authority Surveyors: for the best performance in SAGE courses in first year

Belinda Serafin
Consulting Surveyors NSW - Land Development: Awarded to the graduating SAGE student with the best mark in Cadastral and Land Development courses

Alec Xie
SSSI - For Photo & R & R: Awarded to the student with the best total mark in the Photogrammetry and Remote Sensing course

Eloise Harch
R.S. Mather Memorial: Awarded to the student with the best total mark in Geodesy courses: GMAT2700 and GMAT3700.

Belinda Serafin
The Bossi Medal: for the best performance in the final year of the Bachelor of Surveying & Spatial Information Science

Eryan Chen
Maurice Maughan Prize: Awarded to the student with the total mark in GMAT2500 and GMAT2669

Belinda Serafin
Institution of Surveyors NSW Inc Prize: for the best performance by a graduating student in the BE in Surveying and Spatial Information Systems

Year 4 Industry Sponsored prizes

Madeline Hart
The Civil & Environmental Engineering (CVEN) Civil with Architecture Discipline Prize, sponsored by ARUP

Cassandra Murphy
The CVEN Environmental Engineering Discipline Prize, sponsored by Royal HaskoningDHV

Katherine Hannigan
The CVEN Construction Management Discipline Prize, sponsored by Multiplex

Julian Ng
The CVEN Geotechnical Discipline Prize, sponsored by PSM

Nurinda Suastha
The CVEN Structures Discipline Prize, sponsored by Aurecon

Belinda Serafin
The CVEN Surveying Discipline Prize, sponsored by RPS

Navreet Virdi
The CVEN Transport Discipline Prize, sponsored by AECOM

Thomas Darley
The CVEN Water Discipline Prize, sponsored by GHD

Carla Frankel
The CVEN Practice Prize, sponsored by Cardno

Other prizes

Chaitanya Baldeo, Randil Pohorambage, Yuyi Liu, Steve Jun Jie Lu
School of Civil and Environmental Engineering Display Prize: for the best student group to create a business proposal and display that defines and promotes the School

Name Program name

Ming En Chin Bachelor of Engineering/Bachelor of Arts
Josiah Blas Fajarado Bachelor of Engineering/Bachelor of Laws
Ray Fu Bachelor of Civil Engineering/Bachelor of Science
Jeffy Haim Bachelor of Civil Engineering (Honours)
Jianan Jiang Bachelor of Civil Engineering
Jason Wahay Ko Bachelor of Engineering/Bachelor of Commerce
Jason Lam Bachelor of Civil Engineering
Monica Laut Bachelor of Civil Engineering/Bachelor of Environmental Engineering
Kevin Liu Bachelor of Engineering(Hons)/Bachelor of Science (Computer Science)
David Michael Morgan Bachelor of Engineering/Bachelor of Commerce
Daniel Christian Setioso Bachelor of Engineering/Bachelor of Commerce
Dan Su Bachelor of Engineering (Honours)
Clinton Ngo Tran Bachelor of Engineering (Hons)/Bachelor of Commerce
Athiththyan Vigneswaran Bachelor of Engineering (Honours)
Charlize Zeng Bachelor of Engineering (Hons)/Bachelor of Commerce
ENGINEERING STUDENTS

CEVSOC SPORTS & CHARITY

CEVSOC Sports & Charity Manager for 2016 CEVSOC Mary Hadjiangeli was busy during the year – coordinating amongst other things, the World’s Greatest Shave – which fundraises for the Leukaemia Foundation - and the annual Cardno Cup football match between staff and students. Old age and cunning won over youth and beauty again in the Cardno cup where CVEN staff and students played a scintillating game. Both sides displayed a high level of football skills, team work, discipline, commitment and style. Staff won 5 -3. Condolences and thanks to the student team, the ref, and to our loyal industry supporters and annual sponsors Cardno.

Staff and Students get ready for the Cardno Cup 2016

E-REUSE

Environmental engineering student Charlotte Wang and Rohan Pala (civil engineering/commerce) were at the forefront of a new campus-wide scheme (eReuse Inc) to save UNSW computers from landfill – refurbishing and then recycling them for people who lack access to computers. The School of Civil and Environmental Engineering was the first UNSW group to sign up for e-Reuse. Moreover, valuable funding and support for the development process was provided throughout 2016 by the Head of School Professor Stephen Foster and the School’s Teaching and Learning Committee.

Mary and hairdressing assistants with brave shavee Jeff Thomas

GROUNDWATER RESOURCE INVESTIGATION CVEN 4503

The fourth year course in groundwater involves a program of field work and data analysis undertaken at the UNSW Farm in Wellington, NSW.

COASTAL ENGINEERING STUDENTS VISIT BOTANY BAY AND CRONULLA

In May 2016, 60 budding coastal engineers from the CVEN9640 Coastal Engineering class were taken on a tour of Botany Bay and southern Sydney by Water Research Laboratory Director Professor Ian Turner and Senior Research Associate Dr Mitch Harley. Among the places visited were the Banksmeadow Revetment, where they observed the 20 tonne tri-bar and dolos units placed along the revetment to protect Port Botany from wave attack. This was followed by a visit to various groyne structures around Lady Robinsons Beach and Kurnell. To finish the day, the students had a close inspection of the “seabre” seawall in Cronulla and observed different beach processes in action.

Groundwater Resource Investigation CVEN 4503

SUSTAINABLE INFRASTRUCTURE

The VC, Professor Ian Jacobs, was impressed when he visited the showcase of the fourth year course Planning Sustainable Infrastructure. Reflection on and celebration of the Mer Island culture and the development of learning and engineering outcomes were the themes of this year’s showcase. The Mer Project was approached by final-year students in technical and consultative ways that recognised the importance of culturally responsive and integrated solutions.

SAGE TRIGS TRIP

So how does laser radiation propagate through the atmosphere? Students investigated exactly that during a surveying practical exercise with their lecturer Dr Craig Roberts at the North Bondi trigonometric station measuring to colleagues at Clovelly and Maroubra trig stations.
CEVSOC Office Bearers for 2016:

George Chard: President
Alex Warren: Vice-President
Claudia Burbidge: Treasurer
Jessica Vorreiter: Secretary
Guy Baumber: Arc Delegate
Shabab Jahan: Promotions Manager
Joe Zheng: ENGSOC Representative
Mary Hadjiangeli: Sports & Charity Manager
James Mallett: Major Social Events Manager
Zoe McLaughlin: Technical Events Manager
Simon Chan: Weekly Events Manager
Aurelia Israel: International Student Manager
Charlotte Wang: Teaching & Learning Representative

A suite of changes were made to promote diversity and inclusion within CEVSOC. Most notable was the establishment of the first-ever international student position on the main committee, to give these students a voice in the direction of the society. This led to the introduction of professional information nights dedicated to international students, the modification of our current events to be more sensitive to different cultures and the translation of our marketing material into other languages.

We also introduced a Teaching and Learning Committee position to give our students a voice in the structure and delivery of courses. This position saw huge interest and led to the running of a number of student focus groups to get our members’ voices heard.

CEVSOC collaborated with over 10 student societies in 2016, including PsychSoc, WIESOC, CSESOC and EWB. Collaboration with other societies allowed our members to meet new people and discover extra-curricular opportunities outside of their scope of study. Our collaborative events proved to be extremely successful and created a vibrant social atmosphere for those involved.

Networking is tough for undergraduate students. However, networking is simultaneously one of the most important skills to develop before entering the engineering industry. To try and remedy this issue, CEVSOC introduced our first-ever Third Year Camp in 2016. This event involved taking 120 students and a group of 10 industry representatives for a weekend away filled with networking, engineering challenges and team building activities. Networking over drinks and canapes can be tough, but networking over a scavenger hunt or an archery competition proved to be much easier! This event saw huge interest from students and even went on to win the coveted Arc Club Activity of the Year award for 2016!

Leading CEVSOC was an amazing experience and I can’t be anymore grateful for the opportunity to give back to my student body. I would like to give my thanks to our dedicated member base for their enthusiasm and involvement, this year’s committee for their exceptional hard work and dedication, and finally our industry sponsors and School for their unwavering support of our unique student community. 2016 was a great year for CEVSOC and I can’t wait to see what the new committee achieves in 2017.

George Chard
CEVSOC President 2016

SURVSOC- THE SURVEYING SOCIETY

2016 Office-Bearers

Luke Chidzey: President
Luke Haavisto: Vice-President
Jacky Chan: Treasurer
Hannah Pearce: Secretary
Conor Molloy: ARC Delegate
Tim Cook: AUSIM/Industry Representative
Mitchell Bradac: 4th Year Representative
Angus Baxter: 3rd Year Representative
Karats Eisenmenger: 2nd Year Representative

Another good year for SurvSoc, which set up a Facebook page to better connect and communicate.
The School’s industry-subsidised annual Year 4 dinner was held at the Shangri-La Hotel at Circular Quay, and a good time was had by all. Industry sponsored prizes were awarded at the dinner to outstanding students in several disciplines (see pp46-47 for full list). Our congratulations to them and to all our wonderful hard working students, and thanks to our generous industry sponsors for their continuing support.
In keeping with our commitment to raise the community profile and the enrolment levels of surveying and geospatial degrees - in the 2016 ERC / IAC met with NSW Surveying task force in March to discuss current and future strategies. The year showed some improvement in undergraduate surveying fortunes, with student enrolments almost doubling in the three years since the School of Surveying and Geospatial Engineering had re-merged with CVEN.

Members of the IAC also provided support and feedback for the School during its successful EA Accreditation process in May 2016.

In May the Dean, Professor Mark Hoffman, made a presentation at the IAC meeting, and we raised with him our ongoing concerns about the continuing decline in high school students studying extension mathematics. Along with numerous other professional and industry groups, the Committee regards this as a serious crisis and will continue to actively promote the study of extension mathematics in schools.

In August we were delighted when IAC member and CVEN alumnus Kourosh Kayvani was awarded the 2016 John Connell Matha prizes in primary schools, Year 10 visits to engineering organisations and 2009. Kourosh is a Visiting Professorial Fellow at UNSW, a Laureate of the IABSE Prize awarded by the International Laureate Professor at INFRASTRUCTURE & SPACE, Built Environment, Power Consulting organisation (incl. SKM) for over 18 years. His experience covers a variety of technical disciplines, including environmental impact assessment and design, and long-span lightweight roof structures.

James is a director with the Engineering Excellence Group at Lining R’Rourke, an global team of technical specialists and innovators that seek smarter ways to do things, by challenging traditional practice. He sits in between the blue sky thinkers and he projects teams and brings them together so that the innovative ideas and innovations and thoughts can be manifested in real situations.

After studying a combined undergraduate degree in civil engineering and geology, it was the Thredbo Landslide in 1997 which drew James to a PhD in geotechnical engineering at UNSW and really focused his career. He took a stage of behaviour prior to a landslide, and developed step risk management tools that have been used by various agencies for better managing landslide risk, instilling a passion for innovation which has remained to this day.

James relishes the conversations he has with clients about how new ideas and technologies could be integrated into projects to provide greater efficiency. He focuses on innovative engineering solutions that can provide smarter, faster, cheaper and safer delivery, increased quality and improved performance.

Ross Jones was recently listed in the top 10 of the BRW Most Innovative Companies, in part due to some of the ground-breaking work happening within their Engineering Excellence Group.

Ross Jones is Jacobs’ Vice President Eastern, responsible for leading the Jacobs business across Australia’s Eastern States. He oversees the major business lines of Water, Transport Environment & Spatial, Built Environment, Power Consulting and Project Management/Construction Management.

Ross is a Jacobs graduate, having been involved in the organisation (incl. SKM) for over 18 years. His experience covers a variety of technical disciplines, including environmental impact assessment and design, and long-span lightweight roof structures.

Laurence Kaye is Global Director of Excellence & Expertise at Aurecon. In his 28 years in the industry, he has played key roles in the engineering of many iconic, complex structures across the globe, including Westernbly Stadium in the UK, West Kowloon Terminals in Hong Kong and in Australia at the Sydney Opera House, nuclear reactor, the Sydney Hockey Stadium, Brookfield Place, Civic Tower, 5 Martin Place, UBS Place and Melbourne Star Observation Wheel. He specialises in long-span structures, tall buildings, stadium structures, seismic, acoustics and forensic engineering. Laurence is a Fellow of the Institute of Engineers Australia and a Laureate of the IABSE Prize awarded by the International Association for Bridge and Structural Engineering for his work on long-span structures worldwide. He has also been listed in Engineers Australia’s Top 100 most influential engineers in 2009. Laurence is a Visiting Professorial Fellow at UNSW, a Director of the Australian Steel Institute, and the President of the Lightwight Structures Association of Australasia.
David Kinniburgh – GHD’s Australian Market Leader – Transportation

David Kinniburgh is GHD’s Australian Market Leader – Transportation, responsible for overseeing the development and delivery of GHD’s regional transportation strategy. David has worked with GHD for more than 25 years and has strong experience ranging from concept development to detailed design and construction management, predominantly in the transportation sector. Previously, he was the Operating Centre Manager for GHD’s Sydney operations, responsible for business in Sydney, Parramatta, Wollongong, Dubbo and Orange. Other roles within GHD have included Operating Centre Manager for GHD’s Tasmanian business and Victorian Manager for Transportation and Municipal Engineering.

Paul Harcombe

Paul Harcombe holds a Bachelor in Surveying from UNSW and a Master of Geomatics from the University of Melbourne. He is a Fellow of the Institution of Surveyors Australia (now the Surveying & Spatial Sciences Institute SSSI). In 2010 he was awarded the SSSI Professor’s Medal for services to the industry. Paul is also a Fellow of the Institution of Surveyors NSW Incorporated.

The University of Melbourne awarded Paul in 2010 with the Thornton Smith Medal for his outstanding contribution to the education and advancement of the transportation engineering in the field of geomatics.

In 2016 Paul was a member of the NSW Board of Surveying and Spatial Information which regulates land and mining surveying activities and advises Government on Spatial Information matters.

Garry Mostyn

Garry Mostyn graduated from UNSW in civil engineering in 1973. He subsequently completed a master’s degree in geodetic engineering at UNSW and a bachelor’s degree in geology and statistics at Macquarie University. He worked with the NSW Department of Public Works and with consulting geodetic engineers from 1973 until 1986. He then joined the Civil Engineering at UNSW where he lectured in civil and environmental engineering practice and geotechnical engineering. He joined PSM in 1997 as a Principal Consultant while retaining a part time appointment at UNSW. Garry’s fields of specialist expertise include slope engineering; foundation engineering; rock mechanics; geotechnical risk analysis; and forensic engineering. He has authored or co-authored over 90 journal and conference papers. He has worked on major projects throughout Australia and in Thailand and PNG. He has been an active member of several national and international committees and conferences as well as the highest levels of the Australian Geomechanics Society and the International Society for Rock Mechanics.

Paul Plowman

Paul Plowman is the General Manager, Liveable City Solutions at Sydney Water. Paul has led strategies to enable the delivery of products and services to Sydney Water customers to ensure that Sydney remains one of the most liveable cities in the world.

Paul’s team oversee the Sydney Water’s ‘long term strategy, planning, and infrastructure delivery. Sydney Water is Australia’s largest utility, providing drinking water, recycled water, wastewater and stormwater services to its customers, extending from Sydney to the Blue Mountains and the Illawarra.

Paul is currently the chair for Program Officer2017 and is a Waterlink Ambassador.

Paul has held previous senior executive roles in the Northern Territory Power and Water Corporate and Melbourne Water Corporation. Paul is a qualified Civil Engineer and also holds a Masters of Business Administration.

Iain Scoolar

Iain Scoolar is the General Manager, Group Services, CIMIC

Iain has more than 35 years’ experience working with major contractors in the Australian construction industry. As a General Manager with Leighton Holdings for ten years, Iain was responsible for leading specialist engineering teams covering the fields of Pre-Contracts, Insurance and Risk Management, Planning and Controls, Carbon and Environmental Management, with the overriding objective of raising the standards of project delivery performance. Iain’s ‘hands on’ project experience includes road and railway infrastructure construction, dams and water supply, large multi-function public entertainment complexes and the restoration of heritage-listed buildings.

Iain has an Honours degree in Civil Engineering from UNSW, is a Member of the Institution of Engineers Australia and is a Chartered Professional Engineer.

Narelle Underwood

Narelle Underwood is the Surveyor-General of NSW and Director of Survey Operations at Spatial Services, a division of the NSW Department of Finance, Services and Innovation. She graduated from UNSW in 2003 with a BE Honours 1 Surveying & Spatial Information Systems and the University Medal. She became a Registered Land Surveyor in 2010.

Prior to joining Spatial Services, Narelle worked in both private industry and state government. She was at NSW Road and Maritime Services for over 7 years and held a number of senior roles, including Southern Region Survey Manager and Principal Surveyor.

Throughout her career Narelle has been actively involved in the surveying and spatial professional organisations in NSW.

Narelle has won a total of nine industry awards for her innovation and commitment to quality outputs, including the Asia-Pacific Spatial Excellence Awards Young Professional of the Year in 2011, which she won from amongst a highly capable international field.

As Surveyor General she is the President of the Board of Surveying and Spatial Information (BOSSI), Chair of the Geographical Names Board, NSW Surveying Taskforce and the Surveying and Mapping Industry Council.

Athina Venios

Athina graduated from UNSW with a BE (Civil) Honours degree in 1997. She currently manages a team of 240 consulting professionals at AECOM servicing the transport market in NSW, including roads (including bridges and tunnels), aviation, rail, ports & marines.

Harry Young

Harry Young is the Regional Director, Construction + Development, Multiplex

Harry Young graduated from UQ in 1995 with a BE in civil and structural engineering, and went straight to work for international contractors Multiplex. He has acted in a variety of roles for Multiplex and is now Regional Director, Construction & Development, for NSW and ACT.
The strategic objectives of the External Relations Committee (ERC) of the School of Civil & Environmental Engineering (CVEN) include the development of effective outreach and profile raising programs, as well as building and maintaining strong relationships with industry and our alumni community.

ERC members represent and promote the School at many presentations and functions on and off campus. These include UNSW and Engineering Information Days, UNSW Open Day, High School visits on and off campus, the Indigenous Australian Engineering Summer School, UNSW Nura Gili Winter School, and working closely with the Women in Engineering camp – an annual week-long event coordinated by UNSW Engineering.

Numbers had been boosted – from 30 young women in 2015, to 90 in 2016. During the week, CVEN alumnus Eva Hanly gave a presentation on the Trans Urban tunnels, while ERC Chair Dr Kurt Douglas gave a mega talk (pictured) on Sydney civil infrastructure, past, present and future.

2016 saw the continuation of promotion of the Surveying degrees following the integration of the School of Surveying and Geospatial Engineering (SAGE) into CVEN in 2013. The new dual award program civil engineering/surveying, which began in 2016, has greatly assisted a rise in undergraduate enrolments. A meeting between the ERC, IAC and the NSW Surveying Taskforce was held in March to acknowledge and to further progress. Since 2013, student enrolments have doubled within the SAGE degrees.

In 2016 the ER Manager Mary O’Connell produced a Social Engagement @ Civil & Environmental Engineering booklet - as hard copy and a series of online stories - which showcased just some of the ways in which the School is involved in advancing a prosperous, safer and more just society. From our participation in Engineers without Borders, to a social justice project at home – the inspirational student-led project eReuse – to academics who work with disadvantaged and marginalised communities in Australia and around the world, the School is very socially engaged. Moreover our top scholars positively influence global trends in areas such as safe building structures, GPS systems, international water quality guidelines, transport modelling, real measurement of national footprints, and effective transnational waste management. The booklet was mailed out to NSW careers advisers and secondary schools, as well as to alumni, industry partners and UNSW colleagues.

The annual Year 10 work experience week was held in June. Designed and organised by the School’s external relations and industry advisory committees, and approved by the NSW Department of Education and Communities, this fantastic outreach project has been running since 2010. It is coordinated by Ms Tricia Tesoriero, who won a 2016 Faculty of Engineering Staff Excellence award for her amazing organisational skills – and patience.

In 2016 we accepted 60 students from 57 high schools in Sydney and regional NSW including Armidale, the Blue Mountains, Forbes, Jindabyne, Newcastle, Tamworth, Wagga Wagga, Wollongong and Woolgoolga. The students appreciated visiting a wide variety of civil engineering sites – in progress, accomplished and in creative incubation – including Laing O’Rourke’s ‘Innovation Space’, Lend Lease’s development at Darling Harbour, several UNSW Laboratories, Port Botany, Centennial Parklands, Seacliff Bridge, Sydney Harbour Bridge, the Opera House, and the NSW Transport Management Centre. Students also tried their hands at their own structural design – as pictured.

Feedback remains overwhelmingly positive – One young participant wrote, ‘everything we did was amazing, not only the places we went but the people I met and the things I learnt too. I really feel like I’ve found my place in the world which is such a huge relief. I’m almost certain that I will be attending UNSW based on this trip. Thank you so much for this. It really has changed my life.’

Our special thanks to Advisian, ARUP, Barangaroo Delivery Authority, Centennial Parklands Education Precinct, Darling Harbour Live, Laing O’Rourke, Lendlease, Multiplex, Sydney City Council, NSW Transport Management Centre, and the UNSW Water Research Centre for making the time to welcome and inspire the interest of these potential engineers. The ERC also coordinates the annual Elite Student/Industry Breakfast, the CVEN Primary School Maths prize, and IAC...
meeings. We also continue to develop the School’s relationship with our graduates through the Annual Report and the annual CVEN Alumni newsletter - distributed to all engineering alumnii at the end of each year through the University's magazine UNSW World. The 8 page 2016 newsletter had some great stories – including Ian McIntyre sharing his thoughts on the HSC maths issue, profiles of Athena Venos, winner of the 2016 Judy Raper Award for Engineering leadership, alumnus Mark Combe, listed in EA 2016 Top 50 most innovative engineers, and history making SAGE alumnii Narelle Underwood who became NSW’s 25th Surveyor General— the first woman SGG in the country.

The ERC also provides support for Alumni group reunions – in 2016 the School was delighted to be able to support the alumni reunion organised by the CEVSOC president of 1986 Pete Bailey, and his indefatigable aide Greg Stanmore, with prizes, commemorative histories and a few rounds at the thirsty bar. See fuller story and pics on last page.

For further information on external relations, alumni, the IAC and our Industry Partnership Program contact Dr Mary O’Connell at m.connell@unsw.edu.au

A total of 85 NSW primary schools participated in the seventh year of the CVEN and Faculty of Engineering Maths Primary Prizes, ably coordinated by Tricia Tesoriero. Members of the School’s Industry Advisory Committee, School staff and alumni presented 300 students with their awards at end of year ceremonies, further raising the profile of the profession to hundreds of young people, their families and community.
ALUMNI CONGRATULATIONS

SAGE ALUMNI – DOING VERY WELL, THANKS!

ALUMNUS GRAHAME CAMPBELL MEMOIR

“one is - you’ve got to listen, two is - you’ve got to be on time, three is - you have to work in groups”

As a successful engineer and a talented jazz musician, Grahame says, “People always ask me, ‘What’s the thing about music?’ and I say, ‘It’s three things: one is you’ve got to listen, two is you’ve got to be on time, three is you have to work in groups’. These are exactly the same things you need to be a success in business.”

In his memoir Clarinets, Pipelines and Unforeseen Places, alumnus Grahame Campbell (BE (Civil) 1965, MEngSc ’72) tells his extraordinary life story. From selling ice creams at the beach to planning a pipeline in a war zone, and from playing the clarinet in the Trinidad Symphony Orchestra to running a multi-billion-dollar business, Grahame’s stories tell not just the evolution of an engineer; but the evolution of an industry from 1965 to 1996.

“there is this undercurrent within the industry” says Grahame, “that nobody talks to engineers and nobody is interested in engineering” and I think it’s largely because engineers are not great communicators. I feel strongly that as an industry we can do this better so I decided to tell my story.”

Legendary surveying academic Dr Bruce Harvey caught up with quite a few of his ex-students at an RMS in-house surveying seminar in May 2016. The award winning lecturer who has taught students at UNSW for nearly thirty years said, ‘it was nice to see them all doing so well.’

LtoR, Back Row: Armin Derivcic (BE ’07), Steve Robinson (BSurv ’91), David Burke (BSurv ’86)
Middle: Jason Pripps (BE ’08), Kit Panya (BE ’07), Michael Waud (BE ’04), James Ward (BE ’11), Ryan Fifield 2009, Pat Shaw (BE ’95)
Front: Mick Dunn (BE ’95), Dr Bruce Harvey, Narelle Underwood (BE ’09), Helen Pollock (BE ’97), David Jenkins (BSurv ’87)

Also present but not in the photo: Peter Netelevskov (BSurv ’94), and Alastair Linke (BE’06).

WINS IN 2016

Congratulations to our high achieving alumni including:

Mark Combe (BE Civil ’87 UNSW, MIE, MIPENZ, RPEQ.)

In 2016 Mark Combe was acclaimed by Engineers Australia as one of Australia’s Top 50 most innovative engineers. In 2015 his company Fibercon won a prestigious Shell and Australian Department of Industry, Innovation & Science Innovation Challenge Award for their development of a recycled macro-plastic fibre reinforcing material entirely from industrial plastic wastes. Fibercon was the industry sponsor of a three-year PhD program at James Cook University to develop Emesh - whose fibres can reinforce concrete in footpaths, cycleways, shotcrete and small prestressed members. The company also tested its Macro Poly and Steel fibres with researchers at UNSW.

“The construction industry is not nearly as innovative as it could be,” Mark says. “despite the fact that our future depends upon it. It tends to stick with what it knows, and what has worked in the past. Understandable, perhaps, but no longer defensible. We all need to play a role in reducing the carbon footprint of construction.”

In 2016 CVEN alumnus and Professional Visiting Fellow Dr Kourosh Kayvani, (MEngSc ’92, PhD ’97) won the John Connell Gold Medal Award from Engineers Australia - Structural College.

The steep eligibility criteria included that the recipient must have "made a significant contribution nationally and internationally to the standing and prestige of the structural engineering profession". With a career spanning over 25 years, Kourosh, Global Director of Excellence and Expertise at Aurecon, has played key roles in the design and delivery of many innovative, complex and award winning projects across the globe, including Wembley Stadium in London UK, West Kowloon Terminus in Hong Kong, and in Australia; ANSTO OPAL nuclear reactor at the Sydney Hockey Stadium, Brookfield Place, 5 Martin Place, Liberty Place and Melbourne Star Observation Wheel. He specialises in long-span structures, tall buildings, stadium structures, seismic design and forensic engineering.

In 2016 UNSW surveying alumnus Narelle Underwood (BE (Surveying & Spatial Information Systems) Hons 1, 09) was appointed NSW Surveyor General. She has the distinction of being the first female Surveyor General in Australia. Throughout her career Narelle has been actively involved in the surveying and spatial professional organisations in NSW.

Narelle has won a total of nine industry awards for her innovation and commitment to quality outputs, including the Asia-Pacific Spatial Excellence Awards Young Professional of the Year in 2011, which she won from amidst a highly capable international field.

As Surveyor General she is the President of the Board of Surveying and Spatial Information (BOSSI), Chair of the Geographical Names Board, NSW Surveying Taskforce and the Surveying and Mapping Industry Council.

As a successful engineer and a talented jazz musician, Grahame says, “People always ask me, ‘What’s the thing about music?’ and I say, ‘It’s three things: one is you’ve got to listen, two is you’ve got to be on time, three is you have to work in groups’. These are exactly the same things you need to be a success in business.”

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In memory Clarinets, Pipelines and Unforeseen Places, alumnus Grahame Campbell (BE (Civil) 1965, MEngSc ’72) tells his extraordinary life story. From selling ice creams at the beach to planning a pipeline in a war zone, and from playing the clarinet in the Trinidad Symphony Orchestra to running a multi-billion-dollar business, Grahame’s stories tell not just the evolution of an engineer; but the evolution of an industry from 1965 to 1996.

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REUNION OF THE CLAN

Once a community leader, always a leader – so it proved when the CEVSOC president of 1986 Pete Bailey, and his indefatigable aide Greg Stanmore set out to reunite the brotherhood and sisterhood of the graduate class of ’86 (and ’87... and ’88 ... yes, those were less frantic times!) to celebrate their thirtieth anniversary with a gathering down at Harts Hotel on the Rocks.

Sixty staunch alumni of the School of Civil & Environmental Engineering turned up to mix and mingle – network and share. Hard to believe it was thirty years since graduation – the crowd looked so young and handsome!

Out of a possible 89 graduates, Pete Bailey was very happy with the night’s turnout. As he said, the result was better than a PASS Conceded, indeed well over CREDIT Level.

Another 80’s hero, Dr Alex Heaney turned up to hand out the lucky door prizes and to receive belated but very sincere thanks for his teaching. Timber engineering is on its way back! Also representing the School was retired staff member Dr David Robinson and external relations manager Dr Mary O’Connell.

The School was delighted to be able to support the gathering with prizes, complimentary histories and a few rounds at the thirsty bar.

Above: The School in 1986 photo by Adrian Bull
Below: Alex Heaney calls out the lucky door prize – event organiser Peter Bailey behind photo by Adrian Bull