

# EXCITE

CONNECTING  
ENGINEERING  
DESIGN AND BUILT ENVIRONMENT



News from the School of Engineering, Design and Built Environment.

eNewsletter | March 2021 | Issue 4



## Message From The Dean

As we are progressively returning to campus and the new business-as-usual, I am very pleased to introduce this edition of EXCITE. It is very good to note the significant progress made over the last few months. It is also a great pleasure to introduce this edition as the new School of Engineering, Design and Built Environment is established. The combination of robust interdisciplinary areas provides the context for significant opportunities for the future. It is my pleasure to present our first edition as the new school. For now, I wanted to thank all of my colleagues for their excellent work, which this issue highlights, and all of our partners across government, public and private organisations, NGOs and other Universities for their collegiality and desire to improve our sectors and society as a whole.

Mike Kagioglou  
Dean, School of Engineering, Design and Built Environment



## The Buzz | Science and Engineering Challenge

The Engineering team from School of Engineering, Design and Built Environment participated in the Science and Engineering Challenge in collaboration with University of Newcastle. There were 120 high achieving students from 4 high schools which participated in this event. The challenge aims to attract and promote students to the world of Science and Engineering.

Students participated in workshops consisting of Future Power, Hover Board, Turbine, Bridge Building, Confounding Communications, Grasping at Straws, Stringways and Helter Skelter Shelter. A big thank to you our engagement team and our Engineers Without Borders student volunteers for facilitating this event.



[Find out more >>](#)



Mrs Joanne Carmichael

Mrs Joanne Kellock

Ms Idy Li

A/Prof Golshah Naghdy



Ms Navodana Rodrigo

Ms Maryann Aziz

Ms Brittany Wells

Ms Karen McKerlie

## Celebrating International Women's Day

School of Engineering, Design and Built Environment celebrated International Women's Day with success, organising two wonderful events, Women Transforming the Built Environment Breakfast Event on 5<sup>th</sup> March 2021 and Women of Wisdom International Women's Day on 8<sup>th</sup> March 2021.

Tying in with this year's International Women's Day theme, #ChooseToChallenge, our amazing keynote speakers and student panel raised the right questions and shared their experiences, inciting the rest of our audience to take charge, and make a change.



## Learning & Teaching

Online orientation was a huge success and the Autumn 2021 classes have begun. While online lecture sessions are continuing this semester, the campuses are once again buzzing with students attending face-to-face tutorial, workshop and laboratory classes. It's good to see the students following the health guidelines.

Arrival of the vaccine will help us get to the regular lifestyle we're used to in near future. Student support remains the priority of the School. Both the academic and the professional staff are keen to provide the best possible experience to our students; reinforcing the university's motto of 'student-centeredness.' Students are encouraged to make the best out of their university experience.

## Student Success | Priyadarshini Das

Priyadarshini Das was nominated for Western Sydney University's Women of the West Award's 'Young Woman of the West' category. This nomination was recommended by Associate Professor Mary Hardie, who has been an inspirational change-maker in the school. Western's Women of the West Awards recognise the outstanding contributions women make to the development of the Western Sydney region. The nomination was based on the many milestones throughout Priya's research journey at the Centre for Smart Modern Construction at Western Sydney University.



## Research News

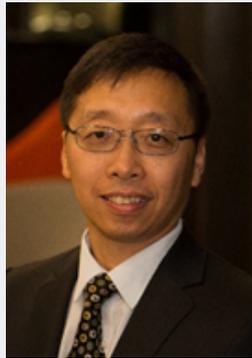
In 2020, 15 Engineering and 4 Built Environment HDR students graduated with PhD or MPhil degrees. In the last quarter of 2020, we were successful in securing research grants at different categories – one ARC DECRA's success from CIE at Category One, one 2-year defence research fund under Small Business Innovation Research for Defence (SBIRD) Program, Next Generation Technologies Fund, from the Defence Industry & Innovation led by A/Prof Sarah Zhang in collaboration with researchers from UNSW, Imperial, Airbus, DSTG, Metrologi and Australian Defence Force and three Innovation Connections funds led by A/Prof Sarah Zhang, Dr Mariam Darestani and Prof Richard Yang at Category Two. At the same time, Dr Dharma Hagare and A/Prof Sarah Zhang secured several Co-founded HDR scholarships with their industrial partners, which greatly open a new mode for us to recruit HDR students and establish partnerships with industry. At the last research event, the School organised the School HDR Forum on Wednesday 16th Dec 2020 to summarise the year with an outlook to the future with HDRs and supervisors together.

In 2021, we are merging our research themes from both Engineering and Built Environment for the new School of Engineering, Design and Built Environment as well as merging the two research centres – C4MSC and CIE. School of Engineering, Design and Built Environment has research focuses on Construction Management, Industrial Design, Architecture, Civil Engineering, Mechanical Engineering and Electronic and Electrical Engineering. Overall, we have received over \$2.7 million research income in 2020. Over 75% of our publications are Quartile 1. We are currently hosting over 162 HDR students across disciplines. We are continuing our successes on getting research funds and one of them is "Recycling of waste latex paint in concrete" as one of 11 projects selected by Smartcrete CRC for funding of about \$450,000 over two years engaging researchers from Macquarie, Western Sydney and Swinburne Universities with Paintback as the main industry partner and Professor Bijan Samali and Dr. Hadi Hosseinamoli are the representatives from Western Sydney University.

## Western Experts Corner

### Development of an Integrated Automatic CAD Package for Custom CPAP Mask Design | Professor Richard Yang

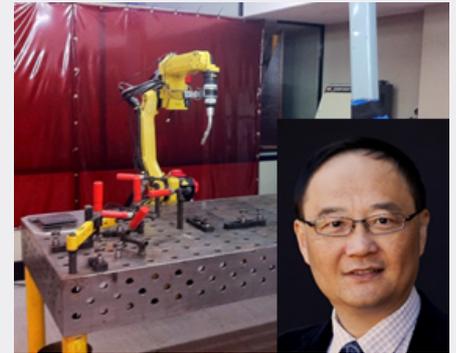
There is an urgent need from Bespoke Medical Innovations Pty Ltd to develop an Integrated Automatic CAD Package for the custom CPAP mask design. In this project, in order to reduce the largest labour costs of CAD work in producing ApneaSeals at Bespoke Medical and further improve the efficiency and shorten the production period for the customised product development, a Python-based integrated automatic CAD tool and plug-in package for Bespoke Medical on its custom CPAP mask design have been successfully developed by the Research Team, which also has a module of deep learning. The project exactly falls into the Industry 4.0 and Advanced Manufacturing research themes in the School and it has been successfully finished in 2020.



### Computer vision based autonomous robotic welding | Professor Gu Fang

To improve the productivity in robotic welding for small batch sized products, Engineering staff in Western Sydney University worked collaboratively with Lincoln Electric Australia and international researchers to develop an autonomous welding system that uses computer vision to automatically detect and locate the welding joints.

The developed system can also utilise the welding arc light to track the joints during the welding process. This project was a part of the ARC Linkage Project.



### Vibration Diagnostics of Shaft Crack in a Rotating Machine | Dr. Helen Wu

Shafts are amongst components subjected to perhaps the most arduous working conditions in high-performance rotating equipment used in process and utility plants such as high-speed compressors, steam and gas turbines, generators, pumps, etc. Shafts in operation are sometimes susceptible to serious defects that develop without much apparent warning. Consequences of total shaft failure can be catastrophic with enormous costs in down time. The objective is to develop on-line and off-line diagnostic techniques to effectively detect shaft cracks before they cause serious damage. The project was supported by a mining industry.



### Fracture Mechanics for Biomaterials | Dr. Leo Zhang

Our team tackled the quantification of damage and fracture in load-bearing prostheses by creating a new constitutive model that automatically encompassed micro-damage and stress fracture.

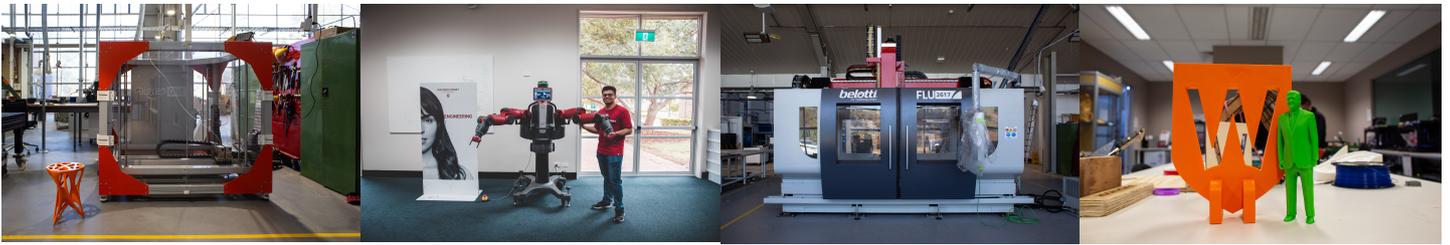
The prescription of the failure zone is no longer required. This work led to exciting finding, including the determination of resistance to thermal shock and crack paths in layered ceramics. This research was jointly funded by the ARC Linkage Projects scheme and a leading dental company Sirona.



## Facilities

The Mechanical, Robotic and Mechatronics Discipline is closely working with the Technical Services Team and managing the following advanced facilities in various Labs:

- Advanced Manufacturing Precinct and 3D printing Hub/MakerSpace – 3D Printers, 5-axis CNC Machines, Autoclave, Water Jet Cutter, Laser Cutter.
- Automation and Robotics Lab – Baxter Robot and Industrial Standard Automated Production Line.
- Autonomous Vehicle and UAV Lab.
- CNC Machining Lab – Material Removal.
- Formula SAE-A Student-centred Learning Hub.
- Material Testing Lab – 5/25/30/100 kN Uniaxial Testing Systems, Toughness Tester, Torsion Tester, and Hardness Tester.
- Mechanical Lab – Dynamics and Vibration.
- Mechatronics Lab – PLC and Microcontrollers.
- Nano Technology Lab – Equipment for Fabrication of Nano Materials, Moulding Injection Machine, Thermal Press.
- Thermal-fluid Engineering Lab (shared with Civil and Environment Discipline).
- Solar Car Student-centred Learning Hub (shared with Electrical and Electronic Discipline).



## International News

Over the student's summer break, the School's International team has been involved in collaboration with international partners; communicating with and looking after our international students; and recruiting more students. School has organised several Meet and Greet sessions with our continuing and commencing students. We have also run a few information sessions for our education agents and potential students. These events have been highly appreciated by our students. They have praised the School for providing the extra care in enhancing their study experience.

As part of Australia India Water Centre, Dr. Dharma Hagare and Prof Sathaa Sathsivan from the school were involved with the organisation of Water Conclave in collaboration with JSS Science and Technology University, Karnataka, India on 15-16 March 2021.

## Alumni Achievement | Samantha Stojanovski

When asked to introduce herself, Samantha Stojanovski replied, "Hi my Name is Samantha, but Sam for short! I am currently a graduate civil engineer at Aurecon, and Alumni of Western Sydney University where I studied Civil engineering and specialised in Structural Engineering. I have always loved maths, visual arts, designing and being creative which led me to civil engineering. I love to cook all different types of food, do bead crochet especially creating traditional Macedonian dancing items called "kjostek", I like to read and listen to inspirational and personal development books."



Sam completed work experience in year 10 at an architecture firm however something was missing. She seeks advice from her art teacher and he convinced her to go down the engineering pathway and she never looked back. She was fortunate to do engineering studies in high school which bloomed her passion for engineering even more. She always wanted to contribute to society in a way and build a better future that is more sustainable. Sam chose Western as she lives in the West and went to school in the West. In addition, she saw the potential and growth the West has to offer, especially in the engineering and construction area. Her best memories at University were eating, studying and hanging out with classmates in the library [with a laugh]. She loved the hands-on classes that Western provided. She really enjoyed and had fun with those classes. Some of the subjects that impacted most were her Surveying subject and all the design classes where student could design your own building projects using popular Software by Industries.

When asked about her thoughts regarding Women and Engineering, she responded with "Women are under-represented in the field as there is not enough role models in engineering for women to look up to, where in other fields there is. I think because engineering and construction is seen as a masculine field, women feel it is not for them as they look for work that is able to accommodate for them during pregnancy and children." She is changing this by working closely with A/Prof Olivia Mirza as a part of the Women of Wisdom Initiative (WoW) at Western, an initiative with an aim to support and retain women in engineering. She is also contributing to the women in engineering events where she aims to be a role model for future female engineers.

## People Who Inspire | Sepani Senaratne

Dr Sepani Senaratne is the Director of Academic Program, Undergraduate Construction Management at Western Sydney University (WSU), Australia. Sepani is also in the leadership team at the research centre for Smart Modern Construction (c4SMC) at WSU. Prior to joining WSU, Sepani was a Senior Lecturer and Director of Postgraduate Research studies at the Faculty of Architecture, University of Moratuwa. Sepani has diverse experience in teaching, research, leadership and engagement in quantity surveying, construction management and project management disciplines over the last 20 years as a university academic.



### What makes you passionate about Quantity Surveying?

You get to deal with numbers and work in both an office environment and gaining practical experience out in the field. Since, I was good at Maths in high school and was exposed to construction industry through my father who was an Architect, I felt it was the right profession for me. After graduating, I found myself more interested in teaching, so I ended up being a lecturer in quantity surveying.

### How do you inspire future/ junior female in BE?

I believe that 'leading by example' is the best way to inspire and influence junior females. Being approachable, giving time to listen, willingness to share our experiences and, coaching them towards personal development are further ways to inspire them.

### How do you get the balance right, making time for yourself and switch off from work?

Sometimes, it is hard to switch-off from work. But, as a wife and a mother of two high school sons, I have learned by now how to balance family commitments with work commitments. Spending enough time to plan work and being methodological has helped me a lot to reduce extended time at work and find that quality time for my family and myself.

**What was your favourite subject at school? And your most detested subject? Have these perceptions changed?**

My favourite subject at school was Maths as I was naturally good at it. The most detested subject was Chemistry as I did not like learning by heart scientific names. Well, I don't see that my perceptions have changed lately.

**What is your most memorable project you have undertaken?**

Among many, I like to mention my PhD research project as the most memorable one. Being attached to a larger collaborative project, it gave me valuable opportunities to work with many leading built environment academics in UK. The most interesting memory was I gave birth to my first son during my 3.5 years PhD journey and he was just 5 months, when I was facing my PhD viva. It taught me that all you need is a fixed determination to achieve the goals that you set for yourself.

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