# WESTERN SYDNEY UNIVERSITY

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## IMAGINING THE FUTURE IN DIGITAL

**2.5 QUINTILLION** 

**BYTES OF** 

**DATA CREATED EVERY** 

DAY

7.3 BILLION

HUMANS

Learn how to harness the power of data to show patterns and trends, predict the future and change human behaviour.

90%

**NINETY PER CENT OF** 

**THE WORLD'S DATA** 

CREATED IN THE LAST 2 YEARS Western Sydney University knows the future is digital. Ranked in the top 2% in the world and 79<sup>th</sup> in the world's top young universities, Western prepares graduates for the workplace of the future by equipping them with digital skills no matter what career they choose.

By 2020, one third of Australia's Gross Domestic Product is expected to derive from the digital economy, valued at US\$482 billion.<sup>1</sup>

In this data-rich landscape, there is enormous opportunity but also risk. Never before has so much personal, business and government data been captured and analysed. Our greatest strength can also be our greatest weakness. Knowledge and skills are needed, not only to manage and interrogate data, but to secure it. Governments and business are investing in systems and people to protect data assets from the threat of cybercrime.

## CROWDSOURCING BIG DATA

WORKPLACES AND SOCIETY WILL BE TRANSFORMED BY AN EXPLOSION OF DATA AND COMPUTATIONAL POWER THAT CAN 'PREDICT, INFER, THINK AND LEARN BY EXPERIENCE'.<sup>2</sup>

Western is working with Dimension Data to develop a sophisticated data management platform called 'Mass Observations' that will support the crowdsourcing of data and analysis. The platform allows students and researchers to collect, submit and interrogate data. Students will be encouraged to join Big Data crowdsourcing research projects.

Imagine a media report is released that says our public transport is failing and we ask all those in our network of 'Mass Observers' who are standing on a train platform to tell us what they see? How crowded is it? Is the train on time? Is it safe? Their realtime, real-world observations will generate the data to support evidence-based decisions, investment and policy. NEARLY HALF OF AUSTRALIAN BUSINESSES EXPECT ARTIFICIAL INTELLIGENCE TO COMPLETELY TRANSFORM THEIR INDUSTRY IN THE NEXT 3 YEARS.<sup>3</sup>

TECHNOLOGY FOR BEHAVIOURAL CHANGE What does an Australian diabetes patient have in common with a Sri Lankan farmer? Both are participating in Western's pilot projects based on crowdsourced data. They receive real-time contextspecific information by mobile to help them make decisions, whether it's about what to plant or how to manage their diabetes.

The participants' engagement with the program generates big data which feeds back into the 'digital knowledge eco-system'. This closed feedback loop, powered by machine learning algorithms and artificial intelligence, takes aggregated user experience data to generate new actionable information.

Read more: page 19

 Accenture Digital Economic Value Index, January 2016
 The Changing Landscape of Disruptive Technologies – Part 2: Innovation convergence unlocks new paradigms, KPMG, 2017
 Is Australia at a technology tipping point?, Accenture, 2016

vesternsydney.edu.au

## WESTERN SYDNEY DIGITAL SUPER STARS

Digita<mark>l</mark> Futures

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ACS Awards – The Australian Computer Society (ACS), Australia's peak body for ICT professionals, honours the efforts of Australia's ICT professionals, recognising teams and individuals at the forefront of digital disruption.





#### **Dr Anton Bogdanovych**

Dr Bogdanovych works in the rapidly expanding field of artificial intelligence and virtual reality. His projects include creating artificial intelligent avatars, using motion capture technology to control robots remotely, and intelligent car and pedestrian modelling for interactive hazard prevention.





#### GOLD DISRUPTOR AWARD 2015

#### Dr Tomas Trescak

Dr Trescak's projects create interactive virtual worlds and specifically normative virtual worlds, intelligent virtual agents, crowd simulation and computational design techniques. Several of Dr Trescak's techniques and methods are being used in cutting-edge software around the world.

#### GOLD DISRUPTOR AWARD 2016

#### **Professor Athula Ginige**

Athula Ginige is a Professor of Information Technology in the School of Computing, Engineering and Mathematics. His research includes using Big Data Analytics to solve the problem of agricultural overproduction.

Read more: page 19.

#### GOLD DISRUPTOR AWARD 2016

#### Associate Professor Gu Fang

Gu Fang is an Associate Professor in Mechatronics Engineering producing world-renowned research in computer vision for robotic applications, neural network and fuzzy logic control in robotics, robotic welding and particle swarm optimisation in robotics.

Read more about our awardwinning robotics student team led by Associate Professor Gu Fang on page 11.

Read more: page 11.

## WORLD SOLAR CHALLENGE BRINGS DATA TO THE DESERT



Five days, 20 Western Sydney University team members, 3,022 kilometres. The World Solar Challenge welcomed the greatest minds to design and drive the cars of the future from Darwin to Adelaide – powered only by the Sun.

Western Sydney University crossed the finish line sixth in the world, and first of the Australian challenger teams.

Western's students designed and built the car, and used data and real-time decision making to anticipate how the car would perform throughout each day.

Over 50 sensors delivered data by wireless ethernet from the race car to the strategy vehicle, while two other vehicles carried weather stations. Using only solar power, the team needed to extrapolate from raw data on solar power input, motor drive output, battery state of charge, conversion efficiency, tyre pressures and critical temperatures to compare against a mathematical model built in Matlab to simulate the race. Custom software converted and interpreted raw machine code in the strategy vehicle to alert the strategy team of changes in the car's performance, to help calculate the impact of elevation, inclement weather and damaged or failing components.

The constant input of data and on-the-go analysis and prediction was critical to the success of the University's solar car team.



## **EMERGING CAREERS**

'Digital culture shock is being felt around Australia and the world. And it's only just getting started.'<sup>1</sup>

Data is increasingly embedded in every aspect of our lives and across every sector from energy and retail to healthcare and government. With the explosion of Big Data, cloud computing, machine learning and artificial intelligence, recruitment companies forecast sustained demand for people with knowledge and skills supporting platforms, Data Analytics, digital transformation and intelligent systems.<sup>1</sup>

Dr Wayne Fallon from the Western Sydney University School of Business knows that to succeed in this digital future, 'workers will need to be technically proficient and data literate. But digital skills alone are not sufficient. Our graduates need to be adaptable, open to change, able to build networks and identify opportunities.'

The top three attributes Australian leaders are looking for in a digital environment are fast learning (42 per cent), being able to shift gears at short notice (41 per cent) and proficiency with digital technologies (35 per cent).<sup>2</sup>



Brooke Brady, PhD student, Western Sydney University



**Risk Analyst** 

Chief Medical

**Bio Statistician** 

Disease Ecologist

**Genetic Engineer** 

Nutrition Consultant

**Biosecurity Specialist** 

Informatics Specialist

Public Health Advisor

Environmental Health

Professional

Community Health Worker

Statistical Research Analyst

**Population Health Management** 

3 INTERNET OF THINGS

Health

### \$140,000 **AVERAGE AUSTRALIAN DATA** SCIENCE SALARY

1 Hays Quarterly Report, Hays, January-March 2016

2 Is Australia at a technology tipping point?, Accenture, 2016



**Business** and IT

Chief Food Innovation Officer **Environmental Health Supervisor Environmental Scientist** Sustainability Engineer Forensic Pathologist Food Inspector **Food Scientist** 

Chief Analytics Officer Social Technology Officer **Community Consultant** Social Media Specialist Digital Media Manager User Design/Testing Animator/Illustrator Software Designer **Desktop Publisher Graphics Designer Creative Director** 

Chief Al Officer **Robotics Engineer Business Analyst Process Manager** CYBER **Change Manager** St base of the second security Quality DRONES GAMIFICATION AI AUGMENTED REALTY UNDER QUALITY **Technical Officer** Simulation Engineer e-Commerce Specialist **Applications Developer** Quality Assurance Consultant Quantum Computing Researcher **Computer Systems Engineer Business Systems Analyst Cloud and Data Specialist** Database Administration **Mechatronics Engineer** Software Architect

# A ONE OF A KIND DEGREE IA CIENCE

In the world of tomorrow, data skills will be essential – no matter what other qualifications you have and what career you follow. That's why Western Sydney University offers a combined degree in data science with every undergraduate course.

#### **BACHELOR OF DATA SCIENCE**

Western Sydney University's new Bachelor of Data Science is a one of a kind. It's unique because it can only be studied in conjunction with another degree.

You can blend Data Science with courses like Marketing, Engineering, Information and Communications Technology, Technology Entrepreneurship, Science or Psychology to graduate with a combined degree.

#### **GIVE YOURSELF A COMPETITIVE EDGE**

This is a real advantage in a competitive environment. Graduates who know how to embark on data-driven investigations and understand the intricacies of extracting information and knowledge from data are highly sought after, whatever their discipline.

Become the graduate employers want with a Bachelor of Data Science.

westernsydney.edu.au/datascience

### Next generation of robotic engineers take out robot awards



The University's Unlimited Robotics team won the Best Robot Design Award in 2016 for a robot capable of navigating a simulated hospital ward in the quickest time possible.

In a world of driverless cars and artificial intelligence, the next generation of robotic engineers gathered at the 2016 NI Autonomous Robotics Competition.

'I was very shocked and surprised. I thought we were done for the day and was sitting up in the grandstand when they said we had won the award,' says team member Alex Dibb.

Coming to the end of his Computer Science degree, Alex says he believes the University has prepared him well for life after university.

'The University has done a good job in giving us the facilities to explore our talents. I think they've given us a great platform to launch careers after our degree.'

## Alumni Success

### **Online Gravity**

#### Paul X. McCarthy

Western Sydney University Alumnus, Paul X. McCarthy is a technology consultant and author of Online Gravity. 'Online businesses are fuelled by starkly different economic rules to those existing purely offline,' Paul says. 'I call this force "Online Gravity" which favours the creation of planet-like super businesses like Amazon and Google. Every day more of our traditional industries are consumed by these online enterprises, transforming the way we do things. This is the pull of online gravity.'

When Paul is not writing best-selling books and consulting with businesses, universities and governments on technology and its impact, he's running start-ups like The League of Scholars – a researcher recruitment business.

'People now recognise that data can inform better decisions when it comes to understanding customers, markets and entire industries. Leading companies in all industries are using advanced data techniques pioneered by quantitative global hedge funds to understand which companies are most likely to grow and succeed. This helps them to better understand their competitive environment.'

In 1994, Paul completed his Master of Design in Digital Media at Western Sydney University. 'The Master of Design in Digital Media was an exceptional program at the cutting–edge of digital. What I experienced in that degree informed a lot of what I do today.'

## HARNESSING DATA FOR BUSINESS AND IT

### **'DATA IS INCREASINGLY THE MOST VALUABLE CURRENCY OF BUSINESS – IT'S THE NEW OIL'**

Paul X. McCarthy, Western Sydney University alumnus 'Digitisation of the business' and 'becoming more data driven' score in the top five strategic priorities for global companies'.<sup>1</sup>

The top technology transforming business over the next three years will be the Internet of Things (IOT) – networks of low-cost sensors that will impact business models, reduce costs, accelerate innovation and underpin new products and services.<sup>1</sup>

Western Sydney University researchers are working with IOT pioneer, John Galloway, to analyse data generated by sensors on industrial machinery. The sensors continuously stream data which enables early detection of issues, reducing downtime and improving productivity.

Digital competencies and data-driven decision-making will be core to organisations leveraging data insights for competitive advantage.

Studying Data Science gives our graduates the digital edge in a competitive global market.

### BY 2020 THERE WILL BE 20 BILLION THINGS CONNECTED WORLDWIDE.

1 KPMG's 2017 Global CEO Outlook, KPMG, 2017



## Using Data to Determine Credit Demand

Associate Professor Oliver Obst

Associate Professor Oliver Obst from Western Sydney University's School of Computing, Engineering and Mathematics is creating new ways to apply data to business. His current research into credit demand is investigating ways data can be used to identify when consumers want a new credit product, or to change products.

Credit demand is often linked to life events and the business lifecycle. That's why Associate Professor Obst's research doesn't just look at financial data, it also examines individuals' trade, web, property and demographic data.

'One of the great things about this research is that we are able to place students into businesses, like global company Dun and Bradstreet, to work on this research,' Associate Professor Obst says. 'This experience is invaluable to students.'

## Virtual Reality, AI, and Robotics

#### Dr Anton Bogdanovych

Machines are becoming more like us. Rather than being programmed with instructions, machines are increasingly being trained, learning from associations and patterns – much like the way people operate.

At the forefront of research into humanmachine interaction is Western Sydney University's Dr Anton Bogdanovych. Anton leads research projects related to virtual reality, artificial intelligence, robotics and motion capture. His Robot Tele-Operation project is gaining a lot of attention.

'Robots controlled remotely are perfect for getting to places humans can't or shouldn't,' Dr Bogdanovych says. 'For example, if there's a dangerous rescue mission, or a chemical spill, we could send in a robot which is controlled remotely using motion capture, thereby reducing the human risk of the mission.'

Real-time full-body motion capture control makes the robot precisely mimic the movements of the person controlling it, in real time. This provides a much more intuitive mechanism to control a robot's action, without putting the controller in danger.

Western students are loving learning from Dr Bogdanovych too. 'When students see the amazing things we can do with AI and virtual reality, they develop a love for computer programming they didn't have before.'

Dr Bogdanovych won the 2015 Australian Computer Society ICT Higher Education Educator of the Year Award.

## KEEPING SAFE IN A DIGITAL VORLD

'The number one issue for executives working in business continuity and resilience is the threat from hackers.'<sup>1</sup>

The benefits of artificial intelligence automation, Big Data Analytics, the Internet of Things (IoT) and the Internet of Value (IoV), come with greater threats from cyber attacks, industrial and personal espionage, and increasingly sophisticated ransomware designs. This makes cybersecurity one of the fastest growing industries globally.

In 2017 the UK's health system was caught up in a global ransomware attack which froze computers at hospitals across Britain. Wards were shut down, emergency rooms were closed and many medical treatments were brought to a halt. It's more important than ever that cyber security form part of our education.

'One of the major obstacles to combating these cyber security threats is the lack of cyber security professionals with the level of knowledge required to mitigate attacks.<sup>2</sup>

The world needs people who can stay ahead of cyber criminals and keep data safe.

## **BACHELOR OF CYBER SECURITY AND BEHAVIOUR**

Western Sydney University has addressed employer demand to train a generation of future graduates with expertise in managing and preventing cyber security issues. Cyber security is as much about people as it is about technology.

A recent survey by cyber security group Kroll found '31% of Kroll's data breach response cases in 2014 were due to simple yet costly [human] mistakes'.<sup>3</sup>

The Bachelor of Cyber Security and Behaviour develops technical skills along with knowledge of psychology, criminology and social sciences for addressing cyber security and promoting internet safety.

## **Cyber Security in Space Technology**

#### **Professor Steven Freeland**

There aren't too many people you could call a global 'space lawyer' but Western Sydney University's Dean of the School of Law, Professor Steven Freeland, is one of them. He's working for governments around the world to design and draft their national space laws and represents Australia at UN space meetings.

'Space is highly commercialised and has become a vibrant part of a global economic landscape,' Professor Freeland says. 'The worldwide space economy is around \$400 billion and growing at over 9% per annum. That's more than three times the growth of the world economy!'

Data generated from space is crucial for every country and sector - telecommunications, weather forecasting, locationbased services, broadband connectivity, earth observation, the conduct of military activities, financial transactions. disaster management, the internet, geological exploration, critical infrastructures... the list goes on. It's not surprising we need space lawyers.

Professor Freeland is a member of an Expert Reference Group making recommendations on Australia's recently announced space agency, ensuring, amongst other things that the technology is secure.

'There's a close link between cyber security and space technology,' Professor Freeland says, 'The world has a lot of vital infrastructure up there generating significant amounts of data upon which we all rely. If we don't ensure it is secure. it could be disastrous for every country on the planet.'

Threat of Cyber åAttack Is Biggest Fear for Businesses, Bloomberg, 21 February 2017 4 Cyber Security Threats for 2017. University of San Diego, 2016 Data Security Statistics, Kroll, 2014

**500 MILLION** 

Yahoo accounts hacked (2016)

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**CYBER SECURITY THREATS ARE COMING** FROM ALL AROUND THE GLOBE

ENDY 6 billion

**BILLIONS ANNUALLY** 

FEAR CYBER ATTACKS, WHICH CAN COST BUSINESS CYBER SECURITY SALARY IN **JSTRALIA 2017**  BER ATTACKS I **AUSTRALIA IN IFORMATION** 

19.000 EMAILS

095

People are social creatures. However, an increasing amount of our productivity and communication is conducted by or with computers. When we interact more with websites and systems than we do with other people, how does that affect our culture and its future?

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Business and government are facing a dilemma. How do we use Big Data and technology to drive efficiency, without losing the human touch? How do we remember our pre-data history? In a world that is increasingly digital, Western Sydney University Humanities and Social Science courses are more important than ever. We work closely with businesses to offer real-world experiences for our students, providing opportunities to apply knowledge in a way that has an impact on real people in the community.

ITIES

### Language in 3D Virtual Reality

#### Dr Rachel Hendery

Western Sydney University's Digital Humanities Research Group uses Big Data to create simulations and to design and build immersive experiences. Cutting-edge Digital Futures researcher, Dr Rachel Hendery, recently teamed up with a new media artist to create a virtual reality exploration of Pacific languages. The project used large collections of data to create immersive experiences in which people could walk through language in 3D virtual reality.

'Big Data and Data Analytics are allowing us to see relationships between different kinds of data that we were previously unable to bring together,' Dr Hendery says. 'This opens up new areas of research that we could not even have dreamed about in the past.'

## Circles of Sustainability

**Professor Paul James** 

Western Sydney University's 'Circles of Sustainability' initiative is changing the way cities understand sustainability. The University's Professor Paul James is leading the project with Dr Liam Magee.

'Assessing urban sustainability is extraordinarily difficult,' Professor James says. 'There are a lot of pieces to the puzzle, and data is at the heart of understanding how sustainability affects our social lives.'

Accordingly, Circles of Sustainability's approach considers social life as a holistic series of relations that link ecologies, economies, politics and cultures. Data is collected and analysed before being used to guide cities in their sustainability initiatives. The impact of the project's innovative approach is far-reaching. Many cities have used the method, from New Delhi to New York. Meanwhile, Lyon, Barcelona and Berlin have used the method to develop their approaches to climate change and to develop a 'No Regrets Charter' of principles for action.

## **SMARTER JUSTICE**

Western Sydney University's research has found ways to incorporate technology to create smarter justice processes and environments.

The way video technology is currently used in courts can make witnesses and others feel isolated. It inhibits communication and makes it difficult to assess evidence and the plausibility of the person on the screen.

The new 'Distributed Courtroom' concept creates a video-linked court hearing that is as similar as possible to a face-to-face hearing. This is done by placing participants' screens in appropriate places around the court, keeping traditional, best practice sightlines and soundscapes.

South Australia has announced the state will be building an immersive courtroom, based in part on Western Sydney University's research.



The Mayor of Berlin describes the Circles of Sustainability as 'a brilliant [project] that will be used by cities such as Berlin as we seek a better world together'.

## DATA FOR FOOD SECURITY

Where will we find enough food for 9 billion people? According to the UN, we need to work this out before 2050 when they predict Earth will be home to 9.6 billion of us.

But the answer doesn't just lie in simply creating more food, instead it is to be smarter in the way we produce it. Western Sydney University has a long agricultural history and its academics are at the forefront of research to reduce waste and produce the food the world needs.

For modern farming to succeed, the agriculture industry needs well-educated, innovative thinkers to solve one of the biggest crises humanity has ever faced. Western Sydney University teaches students to not just think outside the box, but to reinvent it. This approach means our students become the type of graduates employers want and the world needs.

#### BACHELOR OF SUSTAINABLE AGRICULTURE AND FOOD SECURITY

This innovative degree merges topics of agriculture, food and health to empower students to design solutions for international development, community education and the urban-rural interface.

## **Big Data Improving** Farming and Agriculture

#### Associate Professor Zhonghua Chen

Western Sydney University's Associate Professor Zhonghua Chen is passionate about agriculture in the digital age, which uses Big Data and technology to improve farming and agriculture practices. 'Our traditional farming systems soon won't be able to feed the world's growing population,' Chen says. So, he is contributing to the solution by leading research projects including one which designed and developed an advanced greenhouse horticulture research facility.

Chen incorporates Big Data and Data Analytics into his teaching. 'My students use one of the most sophisticated greenhouse controlling systems in the world – Priva. The system allows students to obtain large datasets from experiments running in Western's state-of-the-art greenhouse facility. Students are also able to practise data storage and analysis using computer servers at the University and at Priva in the Netherlands.'

Western Sydney University's commitment to incorporating Digital Futures and Big Data in their courses has helped put the University in the world's top 100 universities for agriculture.

THE UNITED NATIONS ESTIMATES THAT WE WILL NEED TO INCREASE WORLD FOOD PRODUCTION BY 60–70% TO FEED 9 BILLION PEOPLE.

### Digital Knowledge Ecosystems for Agribusiness

#### Professor Athula Ginige

Overproduction of agricultural produce was common in Sri Lanka. So, in 2011, Western Sydney University's Professor Athula Ginige, and fellow researchers, embarked on a project to address the problem. The project, Digital Knowledge Ecosystem (DKES) for Agribusiness, provides farmers with easy to understand data on farm production and industry in their area.

'Two of the main causes of low efficiency in agriculture production are coordination failure and difficulty obtaining the right information at the right time,' Professor Ginige says. 'For farmers to be successful they need access to market information and the ability to translate it to market intelligence.'

A simple mobile application lets farmers access DKES to answer questions like 'how much carrot has been planted in my district?' or 'which market will give me the best price for my beetroot crop?' or even 'where can I get a loan to purchase fertiliser?' This is achieved through farmers not only drawing data from the system, but also putting data into it, by recording their own farming activities.





## SAVING LIVES WITH BIG DATA

Big Data has the potential to empower hospitals and healthcare providers to drive smarter care.

Collective health information is a powerful tool that can improve trial safety, disease surveillance and patient outcomes. Being smart with data can completely change the structure of healthcare systems – saving billions of dollars. We are sitting on the cusp of a revolution and it will take truly innovative thinkers to overcome the obstacles and realise what's possible. Hospitals are struggling, care is unaffordable and expectations are rising. Western Sydney University is forging a new breed of graduate to be part of the evolution, to join an industry that is looking for leaders, thinkers and change makers.





## **Preventing Suicide** with Big Data

Professor Andrew Page

Western Sydney University's Professor Andrew Page has investigated the epidemiology of suicide since 2000.

Suicide is one of the leading causes of death in young people. What if there was a single tool to bring together information about suicide risk factors, who is at risk, and what interventions work best? And what if that tool could be localised to a specific community, providing information relevant to that community? The good news is...there is, and Professor Page was part of its creation.

'Preventing suicide is enormously complex and there is no easy solution,' Professor Page says. 'But what we can do is collect good data and information from as many resources as we can, and apply it on a local level.'

There are so many factors that lead to suicide, such as mental health, social, cultural, economic and environmental. The project, run in collaboration with the Sax Institute, recognises that a one-size-fits-all approach will never succeed. The tool uses Big Data to create 'what if' scenarios whereby users can see possible outcomes from applying different approaches to suicide prevention in their area.

This important project can inform decision making at critical moments, helping people and saving lives.

## **Big Data Curing Cancer**

#### Dr Quang Vinh Nguyen

Cancer is now the biggest killer in the world. But researchers like Western Sydney University's Dr Quang Vinh Nguyen are bringing us closer to a cure by breaking down genomics data to help medical practitioners make better decisions.

'The human genome is complex with thousands of genes containing information about the biological mechanisms of disease,' Dr Nguyen says. 'But we can use Big Data Analytics technology to help give patients the right intervention at the right time.'

A priority in Dr Nguyen's research is to find new ways to battle childhood cancers that are safer, less toxic and more effective. Preliminary results from his data analysis have shown that patients who survived cancer tended to have different genomic properties compared to those who did not.

This is an exciting discovery and we can thank Big Data for it. By comparing one patient's biological information to a group of others who have already been treated and have a similar biology, we can determine how a new patient might respond to similar treatment and develop a personalized approach to their cancer treatment.

We are unleashing the potential of Data Analytics to support better cancer treatment so we can hopefully stop children dying from this dreadful disease.'

## WESTERN SYDNEY UNIVERSITY UNIVERSITY

#### YOUR FUTURE SUCCESS IN A DIGITAL WORLD STARTS HERE.

#### WE ARE WESTERN SYDNEY.

Located in the heart of one of Australia's fastest growing economic regions, Western Sydney University offers unlimited potential to students with the talent, drive and ambition to succeed.

Western Sydney is an exciting place to be. As the nation's third largest economy and one of the fastest growing population and employment centres, it is an increasingly important, dynamic and culturally diverse hub of business, industry and innovation. With a large multicultural population of more than two million people from 170 nations, Western Sydney's global links are creating unlimited opportunities for international business, investment, education and cultural exchange.

#### WE EMBRACE TECHNOLOGY ENRICHED LEARNING.

From our innovative social learning spaces, online learning environments and use of digital technologies to enhance the study experience to on-campus computer laboratories and state-ofthe-art research and clinical facilities, we adopt new and emerging technologies to provide a richer educational experience.

#### OUR RESEARCH HAS GLOBAL IMPACT.

Western Sydney University values academic excellence, integrity and the pursuit of knowledge. We are globally focused, research led and committed to making a positive impact on the communities we engage with.

### UNLIMITED DIGITAL CAREER OPPORTUNITIES.

We'll show you how to harness every asset you have to open up fantastic career opportunities for the digital world. We'll give you the tools to make your future and go wherever you want to go.





**TOP 20** FOR RESEARCH PERFORMANCE





#### LEARN MORE

For information about studying at Western Sydney University including course details, how to apply, tuition fees and financial requirements, assessment methods, accommodation options and living in Australia, please visit **westernsydney.edu.au/international** 



## WESTERN SYDNEY UNIVERSITY



#### Western Sydney International

westernsydney.edu.au/international +61 2 9852 5499 internationalstudy@westernsydney.edu.au

Admissions westernsydney.edu.au/international/apply

> Research grs.enquiries@westernsydney.edu.au westernsydney.edu.au/research

Western Sydney University International College westernsydney.edu.au/college +61 2 9685 9883 mypathway@westernsydney.edu.au

Sydney City Campus westernsydney.edu.au/city +61 2 8236 8037 study@city.westernsydney.edu.au Facebook westernsydneyuinternational

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