

iPREP WA PRESENTATION EVENT

ROUND 1, 2019

The team at iPREP WA acknowledges the Traditional Owners of the lands on which we meet and work, the Whadjuk Noongar people, and pay our respects to the Elders past, present and emerging.

TABLE OF CONTENTS

About iPREP WA	04
AutiSense	06
Cinglevue	10
Department of Local Government, Sport and Cultural Industries (DLGSC)	12
Ideology	16
Landgate	20
udrew	24
Get Involved	28
Partners & Sponsors	30
Acknowledgements	31

ABOUT iPREP WA

Connecting Researchers and Industry

THE CHALLENGE

With under 40% of PhD graduates obtaining employment in academia (graduatecareers.com.au), there is a need to equip them with competitive skills for industry and government organisations. Industry feedback suggests universities need an increased focus on developing non-technical skills in their doctoral candidates to prepare them for a wide range of future careers.

THE INDUSTRY PARTNERS

Industry partners range from start-ups and SME's through to large corporations and government departments. The industry partners benefit from:

- Value for money consultancy from an interdisciplinary team of experienced researchers
- Innovative, creative and credible solutions to problems
- Increased engagement with WA universities to optimise knowledge translation from research outcomes
- Potential to recruit outstanding PhD graduates

THE INNOVATION

iPREP WA is a unique collaboration between the five WA universities. iPREG WA has been established for PhD candidates who may not have had previous industry engagement opportunities. They participate in an induction program focussed on business skills, prior to commencing a six-week team project under the supervision of an industry mentor. The teams share the outcomes of their project with the industry partner at the conclusion of the program through a formal presentation, written report and other deliverables.

THE PhD CANDIDATES

Participating PhD candidates are in the late stages and hence possess extensive research expertise. The PhD candidates gain greater and more diverse career opportunities through developing skills and experience in:

- Business acumen
- Project management
- Strategic problem solving
- Interdisciplinary teamwork
- Leadership

THE PROJECTS

iPREP WA projects focus on solving authentic workplace problems.

Projects range from blue sky design thinking to highly technical projects.

Examples include:

- Concept design
- Pilot study
- Needs assessment
- Review market trends
- Create or test a product
- Develop or evaluate a service
- Prepare a publication
- Apply for a grant or tender
- Program evaluation
- Feasibility study

THE FUTURE

Through a regular program of industry based projects, iPREP WA will maximise benefits for PhD candidates, industry partners and the universities of Western Australia.

If you would like to become involved in iPREP WA, further information can be obtained by:

Email: iprepwa@ecu.edu.au

Website: www.iprep.edu.au





AUTISENSE

Mentor: Joanna Granich

Students: Lara Nahma, Melanie Tarr, Enrico Ianni

Project Title: Digital oral health and behaviour screening to assess the dental health status of young children

At AutoSense, our vision is to improve dental health literacy and transform preventive dental care through early screening, empowerment and better communication between consumers and clinicians leading to optimal dental health outcomes for all young children.

The team were assigned an advanced technical task: To create an algorithm to screen for dental diseases in young children, especially those with a developmental disability who find regular dental check-ups a challenging and anxiety provoking experience. Given it was such a tangible and impactful concept, the team were determined to tackle this problem head-on and create a proof-of-concept solution that can make a difference to young children's oral health and lives.

The outcome of the six-week project was to fast-track future validation studies to refine the screening algorithm, providing AutoSense with real-world innovation for oral and dental health problems. Our next steps are to integrate this digital solution into an app-enabled platform called the 'Dental Detective Check' app.

Lara Nahma

My dissertation developed speech enhancement techniques to improve the speech quality in applications such as mobile communications, teleconferencing and smart loudspeakers, for which suppressing noise and reverberation are necessary. The contribution of this research is twofold: a single channel speech enhancement system which exploits the temporal and spectral diversity of the received microphone signal for noise suppression, and a multi-channel speech enhancement method that employs spatial diversity to reduce reverberation.



What were your motivations for studying a PhD?

The main motivation was to improve my ability to understand and solve problems, increase my confidence, improve my communication and gain skills that will lead to a better job.

What is one skill that you excel at?

Critical thinking.

What is your ideal profession?

A job that provides an opportunity to learn, make progress and contribute to the organisation.

Melanie Tarr



My thesis gathered data across eight high school groups in Perth to understand computer programming through visual communication. It was accompanied by over 200 pages of visual communication on technical complexity. The knowledge transfer was successful for 70% of the participants, and the university level programming concepts were understood by most of the adolescent participants. Graphic design techniques featured throughout my work as I experimented with complex communication, as a Universal Design and Learning practice to include most students most of the time.



What were your motivations for studying a PhD?

To measure and publish ways of understanding complexity through visual communication. I had begun teaching iOS application development in 2012 to high school students and wished to produce a best practice curriculum under elite graphic design supervision.

What is one skill that you excel at?

Designing iOS (app development) learning materials for adolescents.

What is your ideal profession?

Digital Health Designer (preferably paediatrics or medical).

Enrico Ianni

Due to its thermodynamic, hydrogen- specific weight and volumetric properties, NaAlH_4 is a promising solution for storing hydrogen in vehicle applications. However, NaAlH_4 suffers from slow hydrogen absorption/desorption kinetics, so I developed a simple and cost-effective method for the synthesis of porous Mg and Ti-enriched porous Al scaffolds. NaAlH_4 was melt-infiltrated inside the porous Ti-enriched Al scaffold to investigate the combined effects of catalysis and nanoconfinement on its hydrogen desorption kinetics and thermodynamic properties.



What were your motivations for studying a PhD?

I am interested in renewable energy and I wanted to enhance my knowledge and learn new skills that I can use in future projects.

What is one skill that you excel at?

Critical thinking and data analysis.

What is your ideal profession?

Data scientist or scientific instruments developer.



CINGLEVUE

Mentor: Michael Garrett

Student: Subhra Majhi

Project Title: Provide guidelines for integrating Djinn & Tonic Suite with the Virtuoso platform

Subhra was required to explore the application of Djinn and Tonic Suite, an open-source tool for deep learning as a service, as it relates to our Virtuoso platform. He explored how Djinn and Tonic Suite can be utilised in relation to Sense & Respond, a new framework we are developing that provides structure and clarity to the collection and analysis of data. Sense & Respond provides an integrated and whole-of-system framework for the ingestion, analysis, and application of data at the organisational level to enhance teaching and learning processes.

Subhra examined the technical underpinnings of Djinn and Tonic Suite and developed guidelines for integrating it with the Virtuoso data lake, taking into account the purpose and objectives of the Sense & Respond framework. A series of requirements were identified, outlining what needs to be in place (e.g. data, contextual factors, metadata, etc.) in order to utilise the capabilities of Djinn and Tonic Suite throughout Virtuoso in accordance with a variety of use cases. The outcome was that a report was developed, encompassing all of the above based on engagement with the research literature and previous experience and expertise within the teaching and learning domain.

Subhra Majhi

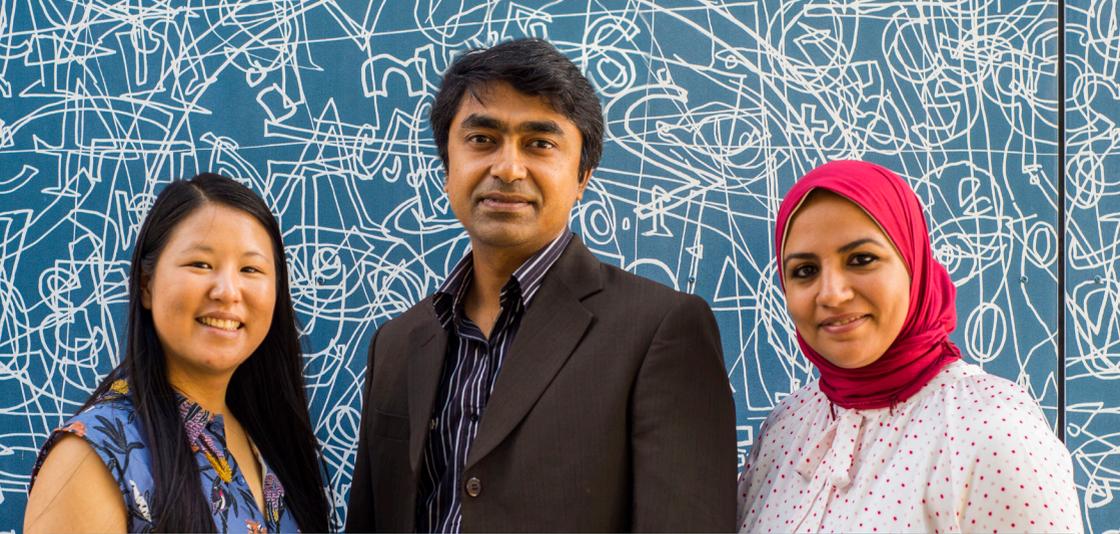
Australian infrastructure located close to the coast is at risk of corrosion, and current visual monitoring practices require improvements. Ultrasonic waves rely on the interaction between waves and the substrate structure. In reinforced concrete they can travel through embedded rebar and surrounding concrete. Processing these waves revealed their traits and characteristics. Representative images were developed, and a synergistic wave-based monitoring scheme, through rebar and concrete, was shown to mitigate against corrosion.



What were your motivations for studying a PhD?
Understanding the thought processes involved in formulating a research problem and finding a solution.

What is one skill that you excel at?
Critical thinking to establish causal relationships.

What is your ideal profession?
Research and development leading to innovative solutions for engineering problems.



DEPARTMENT OF LOCAL GOVERNMENT, SPORT AND CULTURAL INDUSTRIES (DLGSC)

Mentors: Caroline O'Neill, Tina Askam

Students: Talisha Goh, Abu Yousuf Swapan, Fatmaelzahraa Hussein

Project Title: A strategic gap analysis of arts, culture, heritage, sport and recreational infrastructure within regional and or local government boundary

DLGSC funds arts, cultural, heritage, sport and recreational infrastructure across WA. Arts, culture and heritage services are provided by the statutory authorities and local governments who principally own and operate regional arts and cultural infrastructure. A map that locates and describes all the available data regarding this infrastructure is currently not available. The project required students to produce a report and review the available data of DLGSC-funded infrastructure across WA.

To demonstrate an approach that could be scaled up to include state-wide data in the future, the focus of the gap analysis was to identify creative hotspots of the City of Greater Geraldton; Shire of Broome; City of Busselton; the Albany Statistical Area 3 (SA3), which consists of the City of Albany, and the Shires of Denmark, Plantaganet, Cranbrook, Kojonup, Broomehill-Tambellup, Gnowangerup, Kent, Woodanilling and Jerramungup; and Fremantle SA3, which consists of the Town of East Fremantle and City of Fremantle. This information may also be used to inform the development of the WA Cultural Infrastructure Strategy.

Talisha Goh

In my thesis, I explored the ways in which gender and feminism have interacted with Australian women composers and musicology in the present and recent past. Founded upon feminist standpoint theory, women composers' gendered experiences and feminist attitudes are explored. A principal case study of composer Kate Moore examines how gender has shaped her career trajectory. Finally, a neo-Riemannian analysis of Moore's work, *Violins and Skeletons* (2010) speculates upon the fraught relationship women composers have with the conventions of Western Art music and canonicity.



What were your motivations for studying a PhD?

I really enjoy the research process, and I was intrigued by the lack of women's representation in the canon of music composition. Doing a PhD allowed me to explore this further.

What is one skill that you excel at?

Critical thinking and challenging assumptions.

What is your ideal profession?

Researcher/Musicologist.

Abu Yousuf Swapan

Based on a case study in Subiaco, Western Australia, my PhD by Publication explored the relationship between the physical and social aspects of residential neighbourhoods. It re-conceptualises the importance of house front yards as semi-private-public spaces that facilitate building a sense of community. Using a mixed-method approach covering observation and perception, the thesis develops form typologies of front yards, arguing that urban design for sustainability should no longer neglect these valuable spaces.

What were your motivations for studying a PhD?

Current trends in the Australian building industry are endangering traditional built forms (veranda, front yard, front garden etc.) with serious impacts on social interaction in Perth's residential suburbs. I was inspired to fill this gap.

What is one skill that you excel at?

Developing a perception survey-based taxonomic tool to measure the frequency of socialising and to inform urban planning policy.

What is your ideal profession?

Sustainable environmental consultant, academic or researcher.



Fatmaelzahraa Hussein

What is the role of cultural memory in achieving human well-being? Do current historic urban landscape practices maintain cultural memory and contribute to human well-being?

My thesis aims to answer the above questions by exploring current conservation practices for historic urban landscapes. This was achieved by examining three case studies in Alexandria, Egypt. The approach included observational techniques, open-ended onsite interviews and social media analysis to provide an understanding of the intangible psycho-social effects of cultural memory on achieving well-being. The findings from this study could be used as a model to improve the Historic Urban Landscape plans.

What were your motivations for studying a PhD?

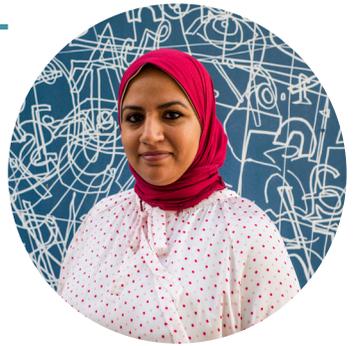
My passion is for research and teaching as these encompass my ideal professions. In addition, my aspirations are to discover and learn new things in my field of research and deepen my knowledge.

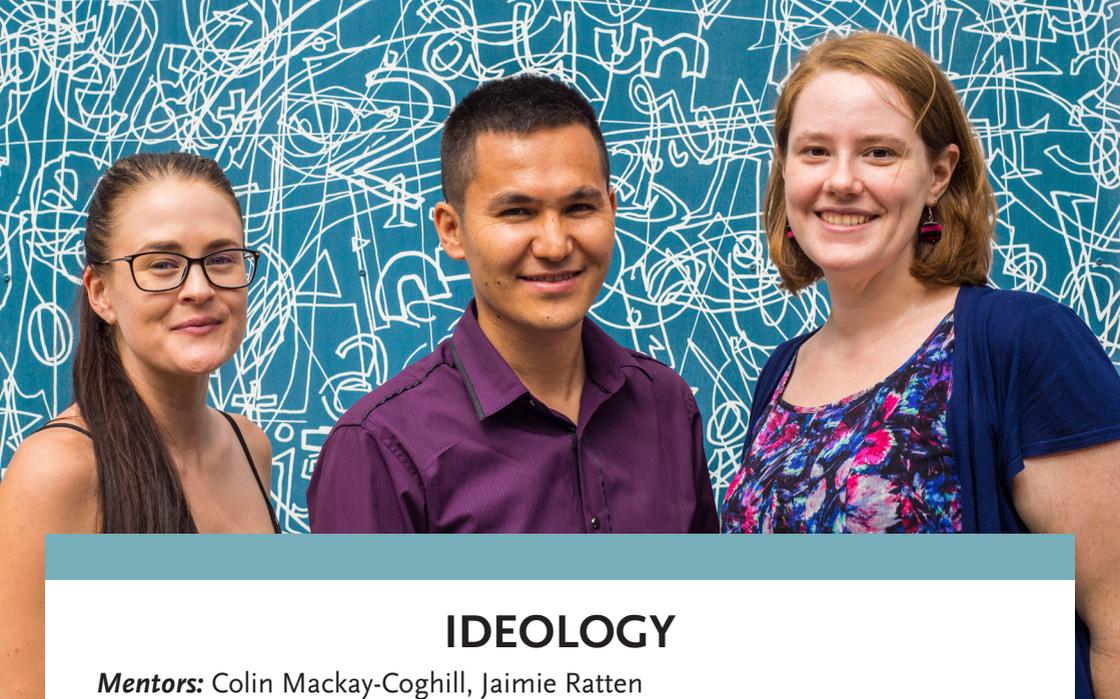
What is one skill that you excel at?

SWOT Analysis (Strengths, Weakness, Opportunities and Threats) for urban projects to generate new urban development plans.

What is your ideal profession?

Academic teaching is my ideal profession, as it gives me the opportunity to influence and inspire others. It also allows me to continue learning.





IDEOLOGY

Mentors: Colin Mackay-Coghill, Jaimie Ratten

Student: Alie Male, Shukrullah Fassehi, Serena McClellan

Project Title: Ideology Definition

As a management tool developed in the 1940s, 'Mission, Vision, Values' is no longer effective for defining organisational direction in today's digital economy. For this reason, business consultancy Ideology has developed a new leadership model for setting organisational direction and articulating it through strategy, brand and culture.

In order to scale, Ideology identified the need for a more rigorous approach, and the iPREP WA team was engaged to help refine the research methodology to deliver more consistent, accurate and reliable data.

"As first time iPREP WA participants, we were unsure exactly what to expect, but we've been blown away by the entire experience. They quickly assimilated into our team and rapidly came to grips with the complexity of both the category and the task at hand. Each one brought a different set of skills and perspectives which, in combination, proved absolutely invaluable. All-in-all it was a privilege having them in the office and it's fair to say that in just six weeks, they've helped move the business forward 12 months." **Colin Mackay-Coghill, Partner and Head of Strategy**

Alie Male

Using electroencephalography (EEG), I investigated how the brain processes different visual irregularities and whether contextual aspects affect their processing. EEG reveals which irregularities are pre-attentively detected (detected without attention) and which can only be detected once the brain has encoded the corresponding regularity. Therefore, my research shows which visual regularities the brain is learning from its environment.



What were your motivations for studying a PhD?

Working in academia.

What is one skill that you excel at?

Programming and analysis.

What is your ideal profession?

Professor of Neuroscience.

Shukrullah Fassehi

Knowledge is commonly regarded as a key source of sustained competitive advantage. However, the processes involved in the transfer of knowledge from team to team (or unit to unit) are still under-developed in research. In my PhD research, I have developed a process model that allows organisations and teams to manage knowledge transfer more effectively.

What were your motivations for studying a PhD?

I am passionate about knowledge and how it is effectively acquired, transferred, created, and integrated in organisations and teams. My PhD research allowed me to gain in-depth understanding of the processes, and factors that enhance or constrain the transfer, creation, and integration of knowledge. Beyond my research, my passion for teaching allowed me to develop the teaching techniques that foster student learning, teamwork, problem solving, and critical thinking skills.

What is one skill that you excel at?

I have a high level of competence in synthesising, analysing, and interpreting qualitative data to help make informed decisions.

What is your ideal profession?

My ideal profession is to turn my research into potential business, and enjoy the entrepreneurial journey.



Serena McClellan

It has long been thought that there is a universal human nature. However, traditional certainties about the human and our place in the world have been challenged by rapid techno-scientific changes, academic inquiry and fears of environmental destruction. In this context, it is crucial to critically question the very concept of being “the human”. This thesis interrogated the boundaries of humans and life itself by considering prevailing biases and unresolved problems as we face the prospect of becoming “posthuman”.



What were your motivations for studying a PhD?

Too often, we learn things only to discard them from our minds immediately. I saw a PhD as the opportunity to have the time needed to think more deeply on complicated issues, and to learn more about interesting concepts that I was introduced to in my undergrad which I never got the chance to fully explore.

What is one skill that you excel at?

The interdisciplinary nature of my research and teaching means that I excel at synthesising complex information from diverse sources, distilling and translating this knowledge so that it is accessible to a range of audiences.

What is your ideal profession?

My dream is to work as a research consultant, or in a capacity which would allow me to research interesting topics and share knowledge with others.



LANDGATE

Mentors: Michael Britton, Keith Moss, Tim Teather

Student: Sofyan Sahrom, Chunmei Chen, Ibraheem Al-Jadir

Project Title: Making Data Great Again

Under the Western Australian Government's Open Data Policy, Landgate is responsible for serving out data from a wide number of government agencies through its "DataWA" portal. Landgate currently facilitates around 1680 data sets and makes these available to other government agencies, industry, citizens, start-ups and academic/not for profit organisations.

With the advent of Machine Learning and Artificial Intelligence, the iPREP WA team was asked to undertake an assessment of the DataWA portal and its functions in comparison to other jurisdictions and industries in order to develop a path forward in getting this data future-ready for emerging technologies.

The iPREP WA team analysed a large volume of government data and developed a strategic plan to help the Western Australian Government agency determine its next steps for data management in light of emerging technologies.

Sofyan Sahrom



The vertical jump is one of the most commonly used physical capacity tests for the lower limbs. However other than jump height, not much else is known. My research attempted to understand the anatomical (e.g. limb length, joint movement arms), mechanical (e.g. muscle and tendon stiffness) and neuromuscular (e.g. rate of force development) effects of performing different types of vertical jumps, allowing practitioners to draw appropriate inferences for detecting technique faults, guiding exercise programs, diagnostics, etc.

What were your motivations for studying a PhD?

I was confronted by athletes who were seeking answers to a research question at work and decided to pursue a PhD to learn new techniques and methods for addressing that research question.

What is one skill that you excel at?

Seeking and assimilating new information and understanding where it all fits into the grand scheme of things.

What is your ideal profession?

A profession that allows me to deeply explore new knowledge for increased efficiency and speed, and most importantly, solve problems.



Chunmei Chen

This research develops a novel theoretical framework for modelling train station choice under uncertainty for park and ride users. Three uncertain factors, travel time to station, parking search time and crowding on trains, are modelled to estimate station choice probabilities, the risk attitudes of respondents and the preference heterogeneity of individuals. This study may support planning decisions on the location, price and capacity of P&R facilities, and provide evidence for evaluating P&R investment decisions.



What were your motivations for studying a PhD?

I am keen to study a PhD as the interests of the research I would do are an excellent match for my transport background. More importantly, my PhD study helps improve my knowledge, research skills, and gives me better qualifications in this research area.

What is one skill that you excel at?

Research skills. After many years of training, I can quickly identify key issues, analyse them with different ways (especially statistical analysis), explain them/or predict their trend with mathematical models developed within theories in different fields, and solve them.

What is your ideal profession?

My ideal profession is to become a data analyst or transport modeller to align with my geoscience and transport backgrounds.

Ibraheem Al-Jadir

My research focused on text document clustering. As text data are highly dimensional and semantically overlapped, optimisation methods are important for reducing high text sparsity. In order to obtain optimal document clustering my research focused first on using Memetic algorithms as an optimisation method to reduce extra text features. Experiments were conducted against a benchmark e-text corpus to compare the results with state-of-the-art methods.

What were your motivations for studying a PhD?

My motivation was to be a scientific researcher, and to acquire new knowledge in my field that gives me a greater chance to engage with both academia and industry in the future.

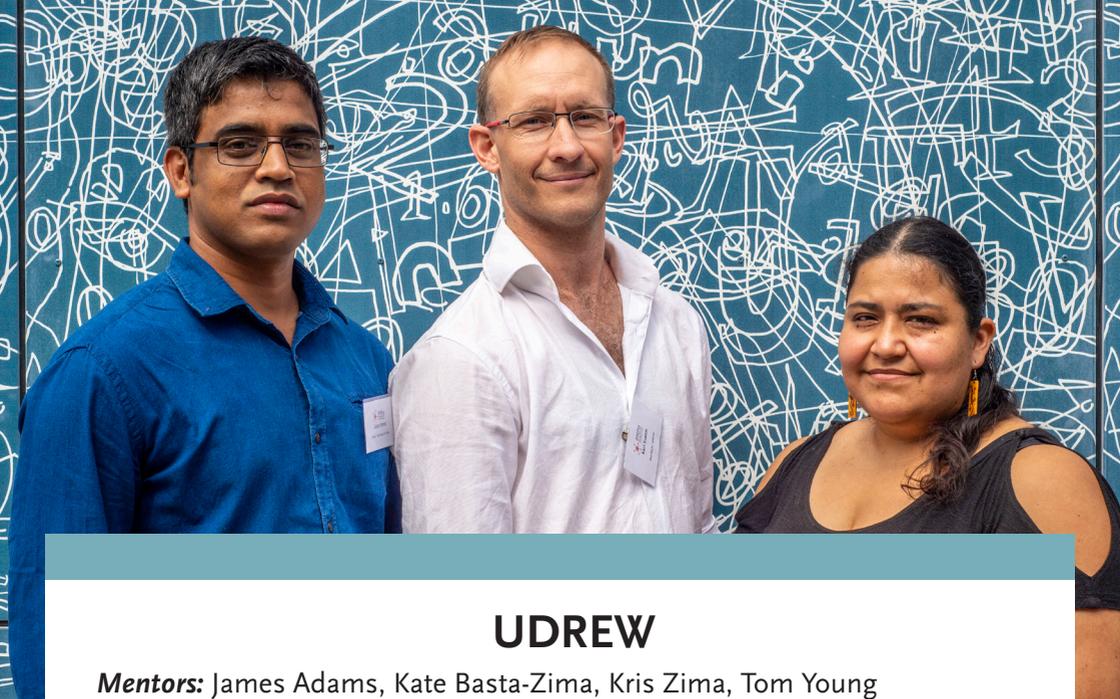
What is one skill that you excel at?

Programming and coding.

What is your ideal profession?

My ideal profession is one that allows me to use the skills I obtained during my PhD study.





UDREW

Mentors: James Adams, Kate Basta-Zima, Kris Zima, Tom Young

Student: Zubair Ahmed, Karl Svatos, Angela Recalde Salas

Project Title: Explore the feasibility in replacing the need for lab testing and physical site inspections with a mathematical model used to predict sediment composition and geological characteristics of a building site, remotely

Udrew is a Perth-based start up, that created software using integration of data from multiple sources, as well as custom drawing generation algorithms into the one platform. Through the implementation of custom developed world first technologies, scientific methodologies, metadata, satellite imagery and Spatial Data, combined with professional partnerships, the system gives the user full control of their project from start to finish in one location.

“We have been absolutely privileged to be part of the 2019 iPREP WA program, with the students contributing their invaluable expertise through their extensive and diverse expert backgrounds... Their persistence and teamwork has created real world benefits and uncovered several other exciting aspects of new areas of research in which we hope to continue exploring. We could not be happier with the outcome and the whole experience has been phenomenal in every sense.”

Tom Young, CEO, udrew

Zubair Ahmed

My PhD study was a detailed investigation that quantified key micro-structural parameters of the unconsolidated granular media and their relationship with the grain-shape factors calculated from micro-CT images. These parameters were combined with the contact-based effective medium models to calculate the elastic properties of the constituent grains after utilising stress dependent ultrasonic velocities of the samples. Thus, developed techniques produce good results for mono-mineral quartz sands and one of the poly-mineral rock powder.



What were your motivations for studying a PhD?

I find it quite exciting to work on new ideas and implementing those with innovative approaches.

What is one skill that you excel at?

I always consider finding multiple angles to deal with a particular problem.

What is your ideal profession?

Researcher.

Karl Svatos

Microsatellite validation of 5G IoT 65nm LSI environmental sensor instruction set can provide real time, remote, accurate logging of high-resolution visualised phenotype data through virtualised kernelisation of EFI micro-chip architecture.

What were your motivations for studying a PhD?

I am doing a PhD to further my knowledge in environmental science and industrial automation.

What is one skill that you excel at?

Experimental design, mobile telecommunications networking and presenting, PR acting.

What is your ideal profession?

Chief AI actor and consultant to multinational and government agencies.



Angela Recalde Salas

My PhD thesis aimed to advance the acoustical ecology knowledge of two baleen whale species – humpback and pygmy blues – during their migration through Geographe Bay, Western Australia. Sounds produced by each species were described. Vocalisation rates and detection probabilities were estimated; their variability influenced by behavioural, ecological and temporal parameters. Correlations between sound energy and visual observations were low for both species, but the findings showed that in general, humpback whales producing song were more likely to be detected than pygmy blue whales. This suggests that optimal monitoring protocols for passive acoustics should be species specific.



What were your motivations for studying a PhD?

I have always been a curious person and undertaking a PhD was one way of answering some of my questions, improving and learning new research skills. Another motivation was to learn more about engagement with stakeholders and how to develop scientific tools tailored to the needs of stakeholders.

What is one skill that you excel at?

Ecological / statistical modelling

What is your ideal profession?

My ideal profession is one that blends knowledge, academic training and scientific concepts with real-life applications. Aiming to transform ecological/biological knowledge into tools for guiding stakeholders in conservation, management and decision making processes will be my ideal job.

GET INVOLVED WITH iPREP WA

Industry Partners

Do you have a business problem to solve or an opportunity to address? Could your organisation benefit from university expertise? Do you want to expand R&D capacity on a tight budget?

iPREP WA supports research engagement between the universities and industries of Western Australia. The program involves interdisciplinary teams of PhD students, from all five WA universities, working on a 6-week project with an industry partner. Industry Partners are expected to submit a short project outline that can be further scoped once students are selected, provide a mentor from the organisation who is available during the 6-week program, and provide space for the team at your workplace.

We offer two different levels of engagement for industry partners who wish to be involved with the iPREP WA program.

\$10,000 + GST PARTNERSHIP

- Team of 3 PhD students for 6 weeks full-time
- Prominent position of logo and link to company website on iPREP WA home page, industry partner page and promotional materials
- Project profile and short video on iPREP WA website
- Opportunity to include flyer in Induction pack
- Banner to be displayed at final celebration event

STARTUP & NOT-FOR-PROFIT SPONSORSHIP OPPORTUNITY

- 50% off for eligible startups and not-for-profits (\$5000 + GST)
- All applications will be assessed for the reduced fee



TAKE PART IN iPREP WA

PhD Candidates

WHY PARTICIPATE IN iPREP WA

- Diversify your career opportunities
- Develop new networks and contact
- Gain new skills in project management, team work, interdisciplinary problem solving, business awareness and leadership
- You may be eligible for a \$3000 scholarship

ELIGIBILITY

- Enrolled as a PhD candidate at a university in Western Australia
- Applicants should have submitted their thesis for examination prior to the program commencement but their degree must not be conferred before the end date of the program
- Domestic students who have completed 2 EFTSL of their research degree program may also be eligible for iPREP WA
- Must be available to complete the project on a full time basis during the scheduled six-week program

Student guidelines and online application form are available on the iPREP WA website. Check back to see when applications open: www.iprep.edu.au

PARTNERS & SUPPORTERS

Industry Partners



Department of
Local Government, Sport
and Cultural Industries



Supporters



Government of Western Australia
Department of Jobs, Tourism, Science
and Innovation

Atomic Sky | 



CENTRE FOR
ENTREPRENEURIAL
RESEARCH AND
INNOVATION



INNOVATION CLUSTER 

Special thanks to:

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The iPREP WA Team

iPREP WA Coordinator: Narelle Jones

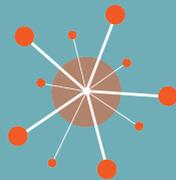
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iPREP_{WA}

Industry and PhD
Research Engagement Program



Curtin University



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NOTRE DAME
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