

Undergraduate Research News Australasia

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Editorial

Welcome to URNA Issue Number 26, the second issue for the 2024 year which, as is the tradition, showcases our ACUR Undergraduate (UG) Research Conference. The timing of the Conference moved to December rather than the earlier traditional September time slot of prior years. A December timeslot for the ACUR Conference ongoing will allow for students to complete their research projects and for local institutional events to feed into this Australasian-wide opportunity. This year's conference was hosted by the University of Sydney with great attendance levels and interest in the focus theme on adaptive change and generative AI. Read the report from the Conference Convenor, Professor Pauline Ross and get a sense of how much this opportunity means to UG students by reading the eight reflections provided. You can also read about our ACUR presenter award winners and find out about the academic who received the inaugural

ACUR medal in recognition of their outstanding contribution to UG Research.

Each year the ACUR annual general meeting (AGM) is held at the conference and this year major changes to the Executive Committee leadership and structure were announced. These changes are outlined on page 7 by our descending Chair of 11 years, Emeritus Professor Angela Brew. Our new ACUR Chair Professor Denise Wood AM, provides a fitting tribute to the vision and strong stewardship provided by Angela during this time. Other ACUR events and initiatives of note include the successful launch of the ACUR UG Student Mentoring Program, and the launch of an ACUR UG Student Handbook, an initiative of the Student Committee members. Then please do read on, for three inspiring stories from UG students about their research-based learning experience and the inquiry questions that have motivated their learning as well as two academic articles

aimed at sharing insights into the integration of research into teaching practice.

Finally, I would like to welcome Sonali Varma, a prior ACUR Student Committee member who has now joined our Executive Committee and will also support the development of the URNA newsletter as Associate Editor.



Lucia Ravi
URNA Editor
The University of Western Australia



Sonali Varma
URNA Assistant Editor
The Australian National University

The 2024 ACUR Undergraduate Research Conference



ACUR 2024 Conference: Exploring 'Undergraduate Research in the Age of Adaptive Change and Artificial Intelligence'

ACUR 2024 Conference Convenor's Update

The 12th Australasian Conference of Undergraduate Research, ACUR2024, was held at the Camperdown Campus of The University of Sydney on 2-3 December 2024. The Conference was generously supported by Professor Marcel Dinger, the Dean of the Faculty of Science and the Conference Chair, Professor Pauline Ross, Director of Academic Leadership and Innovation. ACUR provided a platform for undergraduate students across Australasia to showcase their research, exchange ideas, and engage in scholarly discussions. A total of 131 delegates registered, overwhelmingly undergraduates (118), with a few supervisors and family members (13) attending to show their support.

This year's theme was 'Undergraduate Research in the Age of Adaptive Change and Artificial Intelligence' inviting students to reflect on how their research might address the challenges confronting contemporary society. A total of 137 submissions were received, with 111 being selected to present at the conference. Of these, 85 were selected as oral presentations and 26 as poster presentations. Delegates represented the following institutions:

Macquarie University – 34
The University of Sydney – 22
University of Queensland – 20
Swinburne University of Technology – 12

Western Sydney University – 8
University of New South Wales – 7
University of the Sunshine Coast – 3
Canberra University – 2
The University of Notre Dame – 2
University of Technology Sydney – 1
Edith Cowan University – 1
Australian National University – 1
Australian Catholic University – 1
University of New England – 1
Australian College of Applied Professions – 1
Australian College of Applied Psychology – 1

Conference Programme

The Conference was formally opened by Professor Pauline Ross (Conference Chair) and a Welcome to Country by Aunty Joan from the Metropolitan Lands Council, followed by a few words from Emeritus Professor Angela Brew, Chair of ACUR, and a short presentation by Professor Louise Sharpe (PVC Researcher Training, The University of Sydney). Professor Susan Rowland, Vice Provost at The University of Sydney, presented a keynote lecture on 'the importance of undergraduate research – especially in the age of AI'.

Students presented their research in a series of concurrent sessions loosely grouped

around the themes of Medicine/ Health, Psychology, Chemistry/ Biology, Technology, Physics/ Mathematics, Arts/ Media, Science/ Environment, Education, Arts/ Law. Poster presentations were available to view outside the Mesel Lecture Theatre (Sydney Nanoscience Hub) over both days of the Conference. Delegates were encouraged to interact with poster presenters and to vote for the best poster in the People's Choice Award.

Presentations were of an outstanding quality and students demonstrated a high level of professionalism in conveying their ideas and keeping to time! They covered a wide range of topics reflected in the award-winning presentations, from the *Longitudinal Assessment of Medical Students Perceptions of Social Isolation and Wellbeing*, to *A Machine Learning Paradigm for mRNA Display Selection* to *Educator Gesture Use and Infant-Educator Conversational Balance in Australian Long-Day Care Centres*, to *Decoding Attention Lapses in Dynamic Environments: Insights from EEG and Multivariate Analysis* and a systematic review of *Digital Psychological Interventions in Youth with Neurological Conditions*.

The first day included a one hour workshop on Science Communication by Associate Professor Alice Motion who has extensive experience in communicating science to the public and is a regular guest on the ABC. Alice provided students with strategies to improve their communication of science and science research.

On the second day of the Conference, besides talks and poster displays, delegates attended a keynote presentation from Professor David

James (Charles Perkins Centre, The University of Sydney) who talked about the importance of interdisciplinary research. This was followed by a panel discussion of the 'The opportunities and challenges that AI provides in Undergraduate Research' facilitated by Professor Pauline Ross. The panel included Emeritus Professor Angela Brew, Dr Ben Miller, Professor Adam Bridgeman, Sara Wardak, and Dr Lilia Mantai. The importance of undergraduate research in curriculum is even greater in a world of AI because undergraduate research provides students with the opportunities to distinguish between fact and fiction through understanding how knowledge is created by research.

Organising Committee

Thanks to the Organising Committee behind this successful event: Professor Pauline Ross, Dr Dan Johnstone, Dr Fran Van den Berg, Dr Vicky Tzioumis, Emily Kerrison, and Sara Wardak.

Sponsorship and Prizes

The event was heavily subsidised and supported by the Faculty of Science and the Organising Committee acknowledges the unwavering support of Professor Marcel Dinger, the Dean of the Faculty of Science.

We express our deep appreciation to Western Sydney University for their Gold Sponsorship and the University of Technology Sydney for their Prize and Travel Sponsorship.

Thanks to HERDSA for providing the Student Prize for the Best Paper in Education Research.

Professor Pauline Ross
ACUR2024 Conference Chair and Director of Academic Leadership and Innovation in the Faculty of Science, The University of Sydney

Inaugural winner of the ACUR Medal 2024

Professor Kevin Brooks of Macquarie University was awarded the inaugural ACUR Undergraduate Research Medal at the ACUR 2024 Conference. The Medal is awarded to an academic who had made an outstanding contribution to undergraduate research. The judging panel was impressed by Professor Brooks' strong promotion of and advocacy for undergraduate



research, not just in his teaching in Psychology but across the university. They also commended his consistent support for students attending the annual ACUR Conference.

Professor Brooks has supervised more than 50 Psychology honours research projects, publishing with many of his honours students, and contributed to a working group at Macquarie that led to the University hosting the ACUR conference in 2012-13. He continues to be a strong advocate of undergraduate student attendance at the annual conference, establishing a travel scheme in his department

and providing coaching support for students attending. At the university level, Professor Brooks is a member of a working party for undergraduate research, with his contributions being recognised at the university level and nationally through teaching awards.

One of his referees – a senior colleague – confirmed Professor Brooks' passion for undergraduate research and the instrumental roles he plays in promoting undergraduate research both within his department and across the university. The other – a student who was supervised by Professor Brooks – relayed how Professor Brooks was “an exceptional mentor and advocate for students engaged in research” citing his expertise and enthusiasm, as well as the professional development he offered students.

Professor Brooks said he was delighted and humbled to receive the medal when it was presented to him at the final session of the recent ACUR Conference.



Professor Kevin Brooks receives the ACUR medal from Dr Lilia Mantai and Emeritus Professor Angela Brew

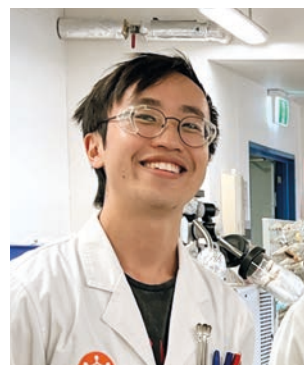
Professor Rachel Spronken-Smith,
NZ Representative, ACUR Committee
University of Otago

ACUR 2024 Student Prize Winners



Best Oral Presentation – Winner (sponsored by Western Sydney University)

Minha Lee
Western Sydney University
Longitudinal Assessment of Medical Students' Perceptions of Social Isolation and Wellbeing: A 5-Year Analysis of FRAME Surveys (2017-2022)



Best Oral Presentation – Runner Up (sponsored by University of Technology Sydney)

Tommy Lu
The University of Sydney
A Machine Learning Paradigm for mRNA Display Selection



Best Poster Presentation – Winner (sponsored by University of Technology Sydney)

Kendall Stead
Macquarie University
Decoding Attention Lapses in Dynamic Environments: Insights from EEG and Multivariate Analysis



People’s Choice Best Poster Presentation – Winner (sponsored by Western Sydney University)

Asmitha Sivaneswaran
Macquarie University
Digital Psychological Interventions in Youth with Neurological Conditions: Systematic Review



The HERDSA Prize for Best Education Presentation – Winner (sponsored by HERDSA)

Claudia Bonaccorso
Macquarie University
Educator Gesture Use and Infant-Educator Conversational Balance in Australian Long-Day Care Centres



Professor Susan Rowland, ACUR 2024 Keynote Address

Vox Pop: Student Experiences at ACUR 2024

This two-day conference was an invaluable experience that deeply improved my understanding of scientific research. I used to perceive research as a lonely and self-directed pathway where one simply does the necessary work to try to solve unanswered questions, but after meeting so many wonderful students and having interesting conversations with them, I was fascinated by their diverse backgrounds and how they integrated research as part of their personal growth. I also realised that there are many more opportunities to share my research, which would also provide immense benefits. While I was listening to other presenters, I sincerely felt the need to host conferences like this where novice researchers can have the chance to share their project and receive

inspirations from different fields. I too was inspired by other students on the ways to improve my research methodologies. In addition, the research workshop reinforced my understanding of scientific communication and encouraged me to communicate more often my research/projects to the general public. I believe this will be an important skill regardless of the profession I will work with in the future, and I'm grateful that we had the opportunity to learn from one of the best science communicators in the field. Overall, this was an amazing experience and I hope to attend future ACUR conferences and continue to learn from others!

Jinyang Yang, Graduate, Bachelor of Advanced Science (Honours) degree (Major in Biomedical science), The University of Queensland



Jinyang Yang, at the ACUR Conference 2024

I had the pleasure of presenting my research at ACUR 2024. Over two days, attendees explored the current state of undergraduate research in Australia, as well as the challenges and opportunities AI offers for students and society. This aligned with the conference theme which was “Undergraduate Research in the Age of Adaptive Change and Artificial Intelligence.”

Presenters from 18 Australian universities showcased research spanning a wide range of disciplines. The conference provided a

safe and supportive environment where students could connect, exchange ideas, and reflect on each other’s work. I was impressed by the level of engagement from my peers and the insightful questions following my presentation and others.

Some standout moments for me included the inspiring keynote speakers, an engaging research communication workshop, and a panel discussion tied to the conference theme. The enthusiasm of the keynote speakers and the ACUR organising committee was



Students attending ACUR’s 2024 UG Student Research Conference, L-R Laetitia Carlile-Purcarea (Macquarie University), Daniel Somerville (Macquarie University), Jemima Davis (The University of Queensland); Eloise Cicero (The University of Queensland)

infectious, setting a positive and energising tone throughout. As my first conference, ACUR 2024 has set a high bar! It was incredible to network with passionate students and learn

about research beyond my usual field. The University of Sydney provided excellent facilities that made the experience even more enjoyable.

Jemima Davis, Honours Graduate, Bachelor of Psychological Science, The University of Queensland.

This experience as a presenter allowed me to go through the entire conference process, which felt very much like a real academic event. I clearly remember the keynote speaker's opening words: "I hope this is your first conference in your research journey." This really resonated with me.

The entire process, from choosing the paper I wanted to present to submitting the abstract and preparing the presentation, was both engaging and exciting. My research aims to explore how we can transform Australia's

Lending sector by exploring key drivers and AI driven innovations.

I am grateful for the opportunity to participate and for your continuous support throughout the process. Thank you once again for making this experience possible.

Yaxin Zheng, Graduate, Bachelor of Finance (honours) College of Business and Economics, Research School of Finance, Actuarial Studies and Statistics, The Australian National University.



Yaxin Zheng showcasing her research at ACUR 2024

Attending the ACUR conference has truly broadened my understanding of the scope of practice we, as students, can integrate into our academic and professional journeys. My conversation with Angela about the "illusion of knowledge" highlighted the importance of mastering foundational principles in research, rather than succumbing to the temptation of taking easier pathways—something AI can sometimes encourage.

The experience of connecting with undergraduate researchers was both influential and enriching. Each researcher had their own area of expertise and demonstrated remarkable ability in articulating their

findings. This not only expanded my perspective but also inspired me to continue honing my skills.

Moreover, I gained valuable feedback on my presentation, which will undoubtedly contribute to my growth as a researcher. I also developed new skills that I am eager to apply moving forward.

Thank you for the opportunity to participate in this enlightening conference.

Afnaan Mohamad, 3rd Year Student, Pharmacy, School of Pharmacy, The University of Queensland.



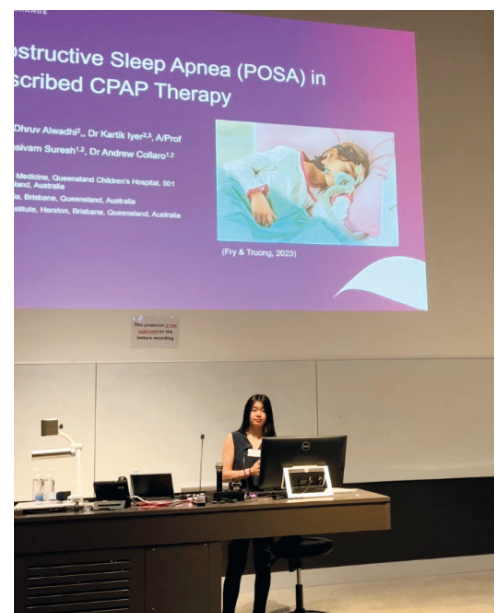
Attending the 2024 ACUR Conference was a truly transformative experience, made possible by the generous travel bursary provided by the University of Technology Sydney (UTS). The conference offered a unique platform to engage with diverse research perspectives, fostering a vibrant exchange of ideas among students and academics from across the country.

One of the highlights was the opportunity to present my research on Positional obstructive sleep apnea (POSA) in children prescribed CPAP therapy and receive constructive feedback from peers and seasoned professionals alike. The discussions not only challenged my understanding but also deepened my insights, inspiring me to refine my work further. The workshops and keynote sessions were particularly enriching, with thought-provoking topics that expanded my academic horizons and reinforced the importance of interdisciplinary collaboration.

Networking with fellow delegates was equally invaluable. Sharing experiences and learning about the innovative projects of others has motivated me to pursue further research opportunities and consider new methodologies in my work. It was heartening to see such passion and dedication among the next generation of researchers.

I am immensely grateful to UTS for their support, which alleviated the financial burden of attending and allowed me to focus on making the most of this experience. The ACUR Conference has been a pivotal moment in my academic journey, leaving me inspired and eager to contribute further to the research community.

Ai Xin Chew, Graduate, Bachelor of Biomedical Science at The University of Queensland (School of Biomedical Sciences, Faculty of Medicine)



Zi Xin Chew sharing insights during her session at ACUR 2024.

What's it like to meet the best undergraduates in Australasia at your first academic conference?

As mentioned in the title, this was the first academic conference of my life. Generally speaking, academic conferences are single discipline, gathering the best talents and scholars within that discipline. However, ACUR is open to all disciplines, which allows it to bring together Australasia's best undergraduates from all directions.

At this conference, I was the only attendee presenting research related to sports science. My research topic aims to explore The Acute and Long-Term Effects of Repeated Non-Concussive Impacts on the Mental Health of Athletes. As I watched students from other disciplines report on their research, I was amazed at the



presentation style, the depth of research, and even the level of PPT production. It was the first time I felt the gap between me and the top students so directly.

Fortunately, everyone was interested in my research. At the end of my presentation, everyone was racing to ask questions. I also answered their questions one by one from the perspective of a sports science researcher. I felt honoured to be able to present some sport-related knowledge and evidence to students from other disciplines.

As the first academic conference I attended, ACUR made me realise my shortcomings, broadened my academic horizons, and allowed me to meet with like-minded people. It was certainly a valuable experience for a student who has just graduated from undergraduate school and aspires to an academic path.

Ojije Shen, *School of Health and Medical Sciences, Edith Cowan University*

Being able to attend the ACUR conference was such a privilege, and I thoroughly enjoyed my time. I was able to not only hear about and engage with research from across disciplines, but also connect with those presenting their research in a friendly, professional, and passionate way.

Each person I spoke to was as equally excited to share their ideas as they were to listen. I was able to connect with the few attendees from my own discipline, and even make plans for future collaboration and friendship. Not only were students able to present their own research and to hear about others', but the conference

hosted a research workshop which provided innovative research communication skills, and a panel of speakers which allowed students to ask questions that they would otherwise not have had a chance to ask.

The conference has not only provided an invaluable opportunity to connect with others and listen to their ideas, but the chance to challenge my own research boundaries and pathways as an academic.

Kiara Gormlie, *Honours Graduate, Colonial History and Literature, The University of Notre Dame*



Kiara Gormlie delivering her presentation at ACUR 2024

I'd first like to start this reflection by thanking Professor Pauline Ross, the organiser for hosting an incredible 2024 ACUR Conference. I both really enjoyed presenting my summer research work as well as watching all the presentations. Every presentation was of very high quality and all delegates were polite and professional during the Q&A section, which allowed for a very safe and open environment. The room moderators also did an excellent job in organising the section and supported the organic flow of questions. I also enjoyed that there was no specific poster session, which allowed for viewing the posters at any time during the conference. The set-up also allowed for people to be drawn in. I was really impressed by the breadth of poster topics at the conference. A really outstanding poster presentation I saw was about nicotinamide's

contribution to fertility in mice and its implications for humans. Personally, I also very much enjoyed presenting at the ACUR Conference myself. I have previously presented at the ACUR Conference 2023, however, I think some really noteworthy improvements have been made to the conference. Most notably, the space was developed to really have an open discussion with the presenters and numerous delegates were open to asking questions for my presentation and all other presentations I saw. This not only really supported me improving my public speaking skills, but the questions also prompted me to look at my research in different perspectives.

Elena Ninkovic, *Bachelor of Engineering / Master of Engineering (Chemical and Bioprocess Engineering) - Penultimate year - The University of Queensland*.



Elena Ninkovic highlighting her work at ACUR 2024

ACUR Activities, Events, and Initiatives

Letter from the Chair

All our efforts in ACUR to engage individuals, organisations, including universities and students, are based on the idea that undergraduate research is a learning process where students actively create disciplinary knowledge and understanding through carrying out inquiries and investigations. Practices vary according to the level of the students, the technical requirements of different disciplines, the strategic intents of universities, and local curriculum requirements and constraints. However, driven by a vision of a higher education that prepares students to confidently address the challenges of an uncertain, unpredictable, and ever-changing world, ACUR always strives to work in an inclusive way.

This is the twelfth year that I've had the privilege, as the Chair of ACUR, of welcoming student researchers at the annual ACUR Undergraduate Research Conference, held recently at The University of Sydney. Two years ago, I announced my intention this year not to contest the position of Chair that I had occupied for eleven years. I am pleased to say that during those two years, the ACUR Executive has worked

hard to establish a sustainable structure where the work of ACUR is shared around.

At the recent AGM, ACUR members including many new student members who were present in the lecture hall, accepted all the nominations for new Executive positions. Some of these, like our new Chair of ACUR, Denise Wood; Vice-Chair, Lilia Mantai; and in the new role of Awards and Recognition Officer, Rachel Spronken-Smith, have provided valuable service to the work of ACUR and supported me as Chair for many years. This is a strong leadership team to take ACUR forward. Dan Johnstone, who was conference host in 2019 and 2022 has taken up the position of Conferences Director. François Malherbe who was conference host in 2023, takes up the new position of Events and Publicity Director. He will be supported in this role by our Newsletter (URNA) Editor, Lucia Ravi. This year's conference host, Pauline Ross becomes our new Research Director. Our new Treasurer, Oliver Hervir, our Mentorships Project Officer, Seak Lin Ly, and General Executive member Sonali Varma, all came to know ACUR initially when they were ACUR undergraduate student

presenters. Each then went on to be members of the ACUR Student Committee before taking up their present roles as full members of the ACUR Executive. It is wonderful to know that the legacy of ACUR is being carried forward by former student members. Doreen Chandra who is new to ACUR is the New Zealand Representative. At the AGM we also welcomed the new Head of the Student Committee, Fiona Wylie. I will continue in the role of Memberships Director and look forward to fostering ACUR's ongoing vital relationship with the university and broader networks.



It is wonderful to see such a strong team of highly committed people now leading the ACUR Community. Despite the challenges that Australasian higher education faces, despite the big questions facing our world, the need for undergraduates to have research experiences doesn't diminish. I know the future of ACUR is in good hands and wish the new Executive all the very best.

Emeritus Professor Angela Brew,
Descending Chair, ACUR Executive Committee

Emeritus Professor Angela Brew's Enduring Legacy to Undergraduate Research

As the incoming Chair of ACUR, it is timely that my first article as Chair should focus on the legacy that our Foundation Chair, Emeritus Professor Angela Brew, has made to the field of undergraduate research over her academic career.

I first met Angela in late 2008. I was at the time already in awe of Angela's impressive academic achievements as Head of the Academic Development Centre at the University of Portsmouth in the United Kingdom and, from 1995 to 2008, as Associate Professor at the University of Sydney, leading strategic projects relating to the scholarship of learning and teaching, research-enhanced learning and teaching and graduate research supervision.

Angela has been a prolific contributor to research and publications with many sole-authored prestigious journal articles, and she is a sought-after keynote speaker at national and international conferences. As someone who has shared Angela's passion for the scholarship



Angela Brew talking with a poster presenter at the 2023 ACUR Conference

of learning and teaching and undergraduate research throughout my career, we quickly

struck up a long and enduring professional relationship as academic colleagues, and it has been my privilege to count Angela as a role model and mentor over the last 16 years.

I was honoured to be invited by Angela to contribute to her Australian Learning and Teaching National Senior Teaching Fellowship entitled "Enhancing undergraduate engagement through research and inquiry", which Angela led at Macquarie University in 2009, where she now holds the prestigious position of Emeritus Professor. I was also privileged to be nominated to serve as Angela's Vice-Chair of the Australasian Council for Undergraduate Research in 2013, a position I have held consecutively leading to my election as Chair at the 2024 Annual General Meeting.

I am immensely grateful to Angela for her immeasurable contributions to the higher education sector through her scholarship, research and mentorship. I follow in the footsteps of a true trailblazer in the promotion

of undergraduate research and an academic whose accolades include Australian and UK Fellowships, HERDSA life membership and an impressive body of research publications attaining a Google Scholar index of 39 and an i10 index of 68 – a particular impressive

attainment for a researcher whose primary focus is learning and teaching.

I join with my fellow past and present ACUR Executives in thanking Angela for her contributions to the sector and as Chair of ACUR for well over a decade and for her generosity

in agreeing to remain an active member of the ACUR Executive in her new role as Memberships Director.

Adjunct Professor Denise Wood, Ascending ACUR Chair, School of Law and Society, University of the Sunshine Coast

ACUR Colloquium Event Wrap Up

The 3rd Australasian Council of UG Research Colloquium, the 2nd in collaboration with the 'UWA Community of Practice on Embedding Research into Curriculum' was a great success with 70 attendees from across the Australasia and Internationally.

This demonstrated strong interest in exploring the topic theme: The Imperative for UG Research in the Age of Generative Artificial Intelligence.

A summary of the themes from the panel presentations and later discussion included the importance of developing students' research-thinking mindsets, strategies to integrate research based learning (RBL) into curriculum, student perspectives on the value of RBL and the good, bad and ugly potential of Generative AI.

The imperative for UG RBL in the Age of Generative AI

3rd ACUR Colloquium Series



UWA CoP on Embedding Research into Curriculum

22nd October 2024

You can read about these themes on the ACUR website (<https://www.acur.org.au/colloquium-2024/>).

Lucia Ravi
*Student Learning Librarian,
University of Western Australia*

Student Committee

Update from the Student Committee

The mission of the Australasian Council for Undergraduate Research is to promote and advance the spread of undergraduate research in Australasia. The ACUR Student Committee for 2023-2024, in its capacity of representing undergraduate researchers in the region and fulfilling ACUR's mission, has had the privilege of being a point of contact for both the student members of ACUR, as well as other students across Australasia who have taken an interest in our values and vision. Many students have been sharing with us that they want to get involved in undergraduate research but are not sure how to. Our team has multidisciplinary experience from universities across Australia, and the ways that we have come to be involved in undergraduate research are diverse. While



in our time as members of the ACUR Student Committee, we have had the privilege of sharing our own stories of how we got involved in undergraduate research with the readers of URNA, these stories often only represent a certain kind of way to get involved in the area that is relevant for a certain context, discipline, or region. Therefore, I am in the

process of leading the creation of an ACUR Student Handbook, which will fill this gap by sharing with students from all disciplines across Australasia about the different kinds of undergraduate research, how one can get involved in each, as well as incorporating the lived experience of our members with tips and tricks on undergraduate research involvement. We launched the handbook during the 2024 Australian Conference of Undergraduate Research which was hosted by the University of Sydney. To our knowledge, this is the first student-focused undergraduate research handbook in Australasia.

In conclusion, the ACUR 2023-2024 student committee and I are grateful for the opportunity to have built on the service of our predecessors in promoting undergraduate research across Australasia in 2024.

Sara Wardak
*Descending Head of Student Committee
The University of Sydney*

Meet Fiona, Ascending Head of Student Committee

As an undergraduate student since 2017, and researcher since 2021, I am thrilled to be ACUR's Ascending Head of Student Committee for 2025. During my undergraduate studies, I have had the privilege of being immersed in both undergraduate life and research. I am a strong advocate for undergraduate participation in research as a means of promoting critical thinking, learning about research as a potential career path, and facilitating mentoring relationships within the field.

My personal research interests lie in the field of chemical senses in psychology, researching topics such as the psychological bases of hunger and satiety, and individual differences in olfactory perception. I am also involved in forensic psychology research, investigating topics such as the wellbeing of correctional officers and perceptions of exonerees. These



are topics I had never considered before volunteering and working in labs! As such, my exposure to research during my undergraduate studies, and the development of strong mentoring relationships with academics, has

been integral to my university experience and assisted me in developing career goals aligned with my strengths and passions.

As Head of Student Committee, I am looking forward to drawing on my experience to address challenges undergraduates face in pursuing research. I hope to increase visibility of ACUR by liaising with student representatives of different universities and assist in building community. I also hope to develop more resources for undergraduate students interested in research, to assist with finding relevant volunteer and paid roles, networking and developing valuable skills in research.

Fiona Wylie
*Bachelor of Laws/Psychology (Honours),
Macquarie University*

ACUR UG Research Mentoring Program: Empowering the Next Generation of Researchers

Mentorship goes beyond simply offering advice or sharing experiences. It is the genuine connection and unwavering support mentors provide, helping mentees navigate uncertainties and empowering them to achieve new heights. A mentor's guidance can offer invaluable kindness and protection, particularly for young individuals at the start of their careers.

I have personally benefited from mentorship from several members of Sydney Water's leadership team. Dr. Peter Beatson has been instrumental in listening to my ideas, supporting my initiatives, and involving me in key projects. I have also received immeasurable support from my team leader Tanzin Ahmed, manager Belinda Kinneally, and the Genomic Lab's Research Lead Sudhi Payyappat, who have all patiently listened to my continuous improvement suggestions. Their advice, guidance, and encouragement have shaped my professional development as I strive for excellence.

Inspired by the profound impact of mentorship, I sought to provide similar support to students through an ACUR's mentoring program initiative. My goal was to expand the experience of presenting at an ACUR conference by offering students the opportunity to connect with potential mentors.



ACUR Executive Committee Member Seak Lin Ly with her work colleagues at Sydney Water this Festive Season

In early 2024, I launched ACUR's first mentoring program. With its established connections across Australia and New Zealand, ACUR is well-positioned to support such an initiative, drawing on the strong belief in the value of

undergraduate research. The program has already seen two successful rounds, with numerous mentors and mentees participating. These mentors come from diverse career stages, ranging from PhD candidates to Deputy Vice

Chancellors, and represent a wide array of disciplines, including psychology, business, medicine, environmental policy, and chemistry. In addition, professionals from government and industry, including scientists, business consultants, environmental policy officers, and financial managers, have joined the ACUR Mentorship Initiative.

Each year, many student conference attendees approach the end of their degrees, seeking guidance as they transition to the next stage of their careers. The mentorship program offers students the opportunity to connect with academic and industry professionals, expanding their support networks. Students benefit from their mentors' career insights, career advice,

and guidance on CVs and interview skills. Most importantly, mentors provide encouragement and support, helping students navigate their future career paths with confidence.

We welcome mentors from all stages of academia and industry, with no restrictions on field, career stage, or institution. All knowledge and experience are valuable. Interested individuals can simply complete the Mentor EOI form on the ACUR website at <https://www.acur.org.au/mentoring/>.

The third round of the mentoring program is scheduled for the first half of 2025, and we are seeking mentors across Australia and New Zealand. The program requires a minimum

commitment of four 1-hour sessions, held fortnightly over two months, either in one-on-one or group formats. This small-time investment from mentors can have a significant impact on students, supporting them as they embark on the next phase of their careers.

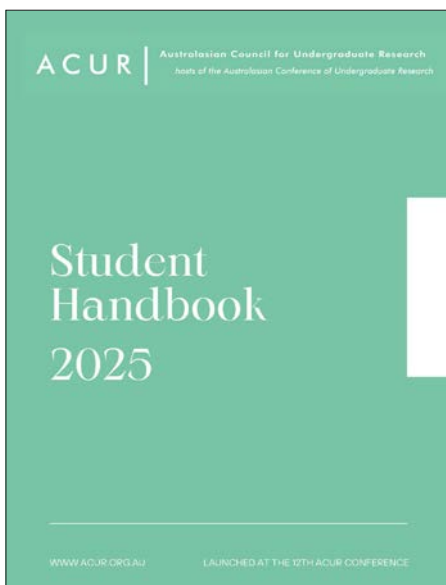
By offering mentorship, we can continue to empower the next generation of researchers and professionals, providing them with the guidance and encouragement needed to succeed.

Seak Lin Ly
ACUR Executive General Committee Member and Mentorship Program Coordinator

Announcements

ACUR Student Handbook Launched

The 2024 ACUR Student Committee have recently created a Student Handbook. Launched at ACUR 2024, this resource provides insight for students from all disciplines across Australasia about the different kinds of undergraduate research, how one can get involved, as well as incorporating the lived experiences of our members with tips and tricks. Once this handbook is available online, it will be announced ... stay tuned!



2025 ACUR Mentoring Program - Call for Mentors

After two successful rounds in 2024, Round 3 of ACUR's mentoring program will run in 2025. ACUR wants to support student researchers with the opportunity to receive mentorship from professionals in all fields in academia and industry. The deadline for Mentor EOI's will be the **28 March 2025** with the selection process to occur during April.

The mentoring program will be 4 x 1-hour fortnightly mentoring sessions between **May to July 2025**. For more information or if you are interested in becoming a Mentor or Mentee, please fill out the [Expression of Interest](#).

Research Teaching Nexus Seminars - University of Nottingham, UK

The Society for Research into Higher Education (SRHE), Student Access and Experience Network (SAEN) are running a special seminar series on the topic of the Research Teaching Nexus. Please see the following seminars, noting the first and last are held in-person in the UK:

[The research and teaching nexus in diverse subject areas and contexts](#) (IN PERSON) – 7 February 2025

[Integrating research and teaching – opportunities and pitfalls, as seen by students and staff](#) (ONLINE) – 7 March 2025

[The research and teaching nexus from novel perspectives](#) (IN PERSON) – 3 April 2025

Creation of a European Network for Undergraduate Research

A European network for undergraduate research is being developed by Professor Harald A. Mieg, Dr Susanne Haberstroh and Assistant Professor Femi Odebiyi, among others. A Poster in Brussels event through Erasmus+ will take place between 11-12 December 2026, where undergraduates will present their research at their national parliaments and at the European Parliament.

You can read more about this network and upcoming events on [Mastodon](#) or [Instagram](#). For those interested, Professor Mieg and colleagues, including ACUR's Emeritus Professor Angela Brew, have published [The Cambridge Handbook of Undergraduate Research](#).

Undergraduate Research Stories

Shaping Futures Through Undergraduate Research

As an undergraduate student at Edith Cowan University (ECU) Sri Lanka, my research journey began when I was selected for the School of Medical & Health Science (SMHS) Student Research Cadetship program, hosted annually by the school. My research project was 'Examining the Scope of Undergraduate Research Experiences (UREs) at Australian Universities'

Undergraduate Research Experiences (UREs) provide extracurricular opportunities for students to engage directly with the research process, gaining skills beyond traditional learning that allow students to develop critical thinking, analytical, and problem-solving skills, preparing them for successful research careers. UREs also create a nurturing environment for academic staff to mentor future researchers and enrich the university's research profile.

I aimed to explore the variety and availability of UREs across Australian universities. Under the guidance of my supervisor, Dr. Ruth Wallace, I set out to achieve two main objectives:

- To investigate the extent of extracurricular UREs across Australian universities.
- To compile a database of URE opportunities to inform future development of the SMHS Student Research Cadetship program.

The process began by reviewing Australian university websites. Of 42 universities, 31 had clear information on UREs but an identified gap was the lack of evaluation data with most

programs. Evaluation is essential to understand the true impact and effectiveness of UREs.

I then explored the Australasian Council of Undergraduate Research (ACUR) website resources page and Scopus, EBSCO, and A+ Education databases to gather academic articles on UREs. With the support of an ECU librarian, who advised on forward searching and effective keyword identification, I was able to collect 33 relevant articles.

This project was not without its challenges. Website search and article filtering are meticulous processes that require attention to detail, patience, and persistence. Yet, it was during these moments that I learned the importance of precision and discipline in research. Each search deepened my appreciation for the value of well-organised, data-driven research.

Moreover, reviewing URE opportunities across Australian universities helped me realise how transformative these programs can be for students like me. It inspired me to think about my future, guiding my interest toward educational program development and research. The journey affirmed my belief in the importance of accessible and impactful research experiences for all students. It was motivating to see the dedication of universities to fostering research skills but also eye-opening to realise how much more could be done to strengthen UREs.

Moving forward, this project will inform a scoping review to evaluate trends and



Tharushi Wijerathna, ECU Undergraduate Student from Sri Lanka

identify potential opportunities for improving UREs. The findings will contribute to the body of knowledge about Australian UREs and contribute to broader research efforts to evaluate them.

I want to extend my deepest gratitude to the School of Medical & Health Sciences at ECU, the SMHS Student Research Cadetship program, and my supervisor, Dr. Ruth Wallace, for their unwavering support. This research journey has been more than an academic exercise; it has been a path of growth, inspiration, and the beginning of new aspirations.

Tharushi Wijerathna, Bachelor of Biomedical Science Undergraduate – 3rd year, School of Medical & Health Science (SMHS) Student Research Cadetship program, Edith Cowan University, Sri Lanka

Change is in the Air: The Need for Greater Awareness

A lot can change in a year. In January I was planning to graduate with my degree in chemistry and become a high school science teacher. Then, as a part of my final year project, I discovered some of the joys and, let's be honest here, challenges of research. I also faced some uncomfortable truths. Every day, we take an average of 20,000 breaths. But how much do we know about the air that we breathe? In 2019 Ella Kissi- Debra, a nine-year-old girl from South London, became the first legally recognised casualty of air pollution.

In the years since Ella's death, her mother, Rosamund, has campaigned tirelessly to increase recognition for the dangers of air pollution. In this endeavour, she has achieved some major successes: the United Kingdom passed Ella's Law, formally the 'Clean Air (Human Rights) Bill (2022)'². The United Nations soon followed suit and passed a unanimous resolution recognising the fundamental human right to clean air³.

In spite of the progress made by Rosamund Kissi- Debra, awareness of the sources and potential risks of air pollution are still sorely lacking. The research undertaken by my team and I this year is an Australian first effort to understand the relationship between rainwater pollution and air quality metrics including aerosols, metals, and particulate matter.

We first had to tackle the issue of sample collection. Our solution to this was designing a funnel which would be self-supporting, and could be easily attached to our standard 50 mL centrifuge tubes. We then printed the funnels using sustainable PLA filament.

Once we had sampling worked out, our goal was to establish a methodology which could be simply and reliably replicated in any analytical laboratory, across Australia and abroad. To this end, ion chromatography and inductively coupled plasma-optical emission spectroscopy provide the bulk of analyses conducted.



Sample Collection Funnel for Collection of Rainwater for testing.

This allowed us to measure a range of pollutants in rainwater collected from various locations across Victoria. While the concentrations detected were in all cases below the World Health Organisation's guidelines, we came to a simple conclusion: when the impact is so severe, and has the potential to cost the lives of children like Ella, any amount of air pollution is too much.

This is how an undergraduate research project changed the trajectory of my life: Technological development and urbanisation, while providing great convenience, have also brought about

new and complex challenges. In the face of such challenges, we must harness the capabilities of science, along with wisdom and compassion to rise to the occasion. We must continue to work to, in the words of Rosamund Kissi-Debra, "guarantee [our] children the chance to live full and healthy lives. To be able to fully and safely breathe"⁴.

Jack Henwood
*Department of Chemistry & Biotechnology,
Swinburne University of Technology.*

Breaking Down the Bottle - My journey into the use of NMR Spectroscopy Techniques

My interest in the complexities of the molecular composition of fermented soy sauce stems from the desire to analyse and monitor labelling regulations for cultural and religious considerations, ensuring that ethanol content is consistent with halal certification and consumer confidence. Benchtop NMR spectroscopy is an analytical technique that provides unparalleled precision in the examination of chemical composition in fermented food products while ensuring compliance with safety and regulatory standards. My research explored using NMR Spectroscopy Techniques to quantify the ethanol peaks in commercial soy sauce fermentation processes. Monitoring traces of ethanol in specific food products is critical to ensure the product adheres to food safety regulations, labelling procedures, and regulatory compliance, while also respecting religious and dietary preferences (Mansur et al., 2021).

Enhancing the involvement of food regulations in the fermentation process.

The study aims to investigate and quantify the ethanol content of commercial soy sauce using advanced NMR spectroscopy techniques to accurately quantify ethanol concentrations. The study evaluates each solution's overall complex macromolecular components by comparing the absence of ethanol peaks in non-alcoholic soy sauce variants to a conventional solution (Park et al., 2017). This comprehensive analysis will provide insight into the factors influencing ethanol peaks in diverse soy sauce brands and evaluate the effectiveness of eliminating all traces of ethanol. (Uddin et al., 2024).

The samples were qualitatively selected from popular brands of Kikkoman, Lee Kum Kee (Premium and gluten-free alternatives), Coles, and Sushi-OK soy sauce. The primary focus on verifying compliance with halal certification standards for wheat and soy sauce products that contained no traces of alcohol. The samples were collectively compared with ethanol standard solutions and those containing



NMR Spectroscopy Lab, Western Sydney University.

a minimal amount of alcohol to provide a comprehensive analysis. A 60MHz Benchtop NMR spectroscopy is used for specific NMR techniques and parameters, including 1D Proton, COSY, and PTSGE. Each spectrum's data set was evaluated to establish the overall integration points of the relevant peaks and eliminate any overlapping signals from the samples (Uddin et al., 2024).

This investigation will help clarify misconceptions and potential mislabelling by confirming the presence or absence of alcohol in halal-certified products for regulatory compliance. This also assists with food safety regulations and quality control by assessing if manufacturers exceed permitted ethanol levels in complying products.

Reflection

This research enhanced my understanding of the manufacturing of diverse soy sauce samples resulting from various fermentation techniques.

As a student interested in both Chemistry and Food Science industries, I have gained a better understanding of the importance of technique optimisation and reliable analytical analysis while calculating, determining, and integrating ethanol peaks.

Being involved in research has taught me the value of endurance, critical thinking, and adaptation, as challenges frequently result in improvements and deeper comprehension. My advanced understanding of NMR spectroscopy has not only improved my technical skills but has also prepared me for future research by enhancing my ability to solve complex queries, conduct precise analyses, and communicate scientific findings effectively. This knowledge will be beneficial as I pursue further studies or embark on a professional field that requires analytical precision and innovative problem-solving.

Adam Samir Sabouni,
Bachelor of Science student majoring in Chemistry at Western Sydney University

Sharing UG Research in Teaching Practice

Connecting Minds: The Global Undergraduate Research Network

During her keynote address at the 12th ACUR Conference at The University of Sydney, Professor Susan Rowland delivered an outstanding presentation on how undergraduate research experiences contribute to personal development, growth, and ultimately, employability. The oration also underscored the significant role of ACUR in advancing undergraduate research in Australasia. Established in 2013, ACUR provides a unique platform for Australasian undergraduates to explore the intricacies of embarking on research projects and to engage with their peers live via Discord. This is just a glimpse into the global undergraduate research network.

In the US, the Council of Undergraduate Research, founded in 1980, has been providing, through its members, “high-quality and collaborative undergraduate research, scholarly, and creative activity opportunities for faculty and students.”

In Europe, the development of initiatives offering undergraduate research as a vehicle for international collaborations can be linked to the Bologna Process. The harmonisation of higher education, involving 48 countries, has significantly advanced undergraduate research by emphasising student-centred learning and fostering critical thinking and inquiry.

Additionally, its focus on international mobility and collaboration created opportunities for students to engage in cross-border research initiatives, thereby promoting a culture of academic inquiry and global scholarly exchange at the undergraduate level.

Building a global undergraduate research network is not merely about linking students; it is about creating a shared platform for innovation, knowledge exchange, and cross-cultural understanding. The rapidly evolving challenges of the 21st century (climate change, technological innovation, global health crises, and more) demand collaborative, interdisciplinary approaches. While graduate and professional researchers often spearhead these efforts, the potential of undergraduate students as contributors to global problem-solving remains underutilised. Undergraduate research networks can bridge this gap, cultivating a new generation of globally minded scholars who collaborate across borders to tackle pressing issues.

Networks are not isolated silos; they are dynamic ecosystems of interconnected nodes that thrive on collaboration and shared knowledge. Connecting networks is often easier than connecting people because networks rely on standardised systems, protocols, and technology that facilitate seamless integration.

This interconnectedness fosters innovation, accelerates problem-solving, and opens exciting opportunities for collaboration that transcend geographical, disciplinary, and organisational boundaries. They offer incredible opportunities for immersive experiences by placing participants in diverse cultural and academic settings, making the learning experience both transformative and impactful.

In an era of globalisation, the development of such extended networks is both a necessity and an opportunity: to connect minds, build a community of young researchers, and unlock the limitless possibilities of shared intellectual growth. Embarking on undergraduate research, especially within a global context, is an adventure that promises personal growth, academic discovery, and meaningful connections. It's an opportunity to explore new ideas, challenge assumptions, and contribute to solving real-world problems. For those ready to step beyond the familiar, this journey offers the chance to make a difference while shaping your future.

Look for opportunities promoted on [ACUR's website](#) and take the leap! Your curiosity and passion can open doors to a world of endless possibilities!

Associate Professor François Malherbe, Academic Director Student Experience, School of Science, Computing and Engineering Technologies, Swinburne University of Technology.

Empowering Undergraduate Researchers: AI as a Bridge Between Disciplines and Discoveries

Artificial Intelligence (AI) has emerged as a powerful enabler across industries, with its applications stretching far beyond traditional engineering fields. The potential of AI lies not just in its algorithms but in how it empowers students to address real-world problems with innovative solutions. Over the course of my teaching and supervision, which spans more than a decade of industry-academic collaborations, I have had the privilege of mentoring over 30 students on interdisciplinary projects across various schools and faculties. During this time, I have witnessed a growing enthusiasm and curiosity among students to

engage with AI-driven projects, to explore its capabilities and implications.

The Need for Cross-Disciplinary AI Education

AI, though rooted in mathematical and computational theories, needs to go beyond its disciplinary silos. Students from diverse fields will need to become familiar with AI's applications and understand its responsible use. While engineering students may have the technical background to adopt open AI platforms, students from other disciplines

might require more structured guidance. Introducing AI effectively into a curriculum will help ensure all students benefit equally and can navigate AI ecosystems in both academic and industry contexts.

Beyond technical know-how, these projects allow students to engage with ethical challenges of using AI technology both responsibly and inclusively. Introducing AI tools and encouraging students to experiment with and adapt their use within research projects has helped them to critically evaluate their use and led to a profound understanding of AI's ethical

considerations, limitations, and transformative possibilities.

Empowering Students Research Across Disciplines

AI education must adapt to different learning contexts and student backgrounds. Cross Disciplinary Projects provide a way for students from different backgrounds to explore state-of-the-art tools like Generative AI, enabling them to understand their applications and limitations in real-world scenarios.

For instance, introducing students to tools like Google Colab or high-performance computing clusters (e.g., SLURM) levels the playing field for those who may not have prior experience with AI platforms. Tackling challenges like data scarcity, students have also explored generating synthetic data for training machine learning models using generative AI tools in fields such as small-scale sports analysis. Another project utilized AI to analyze the compound impact of public transport infrastructure on housing markets, providing actionable insights for urban planning.

This commitment to interdisciplinary learning is exemplified by a project where a student



Dr. Mehala Balamurali.

adapted AI applications from mining to address challenges in biomedical research. For the student “This experience, while challenging, has pushed me to understand how existing technology can be applied to novel problems and will be a driving force behind future work in the biomedical field.” These initiatives underscore the versatility of AI-driven research and how it can encourage students to explore the ethical dimensions of AI to ensure they are not only technically proficient but also socially conscious in their approaches.

Bridging Disciplines, Building Futures

Undergraduate research is not just about the projects themselves; it’s about inspiring curiosity, fostering resilience, and equipping students with the tools they need to make meaningful contributions to society. AI is a powerful catalyst in this journey, offering a lens through which students can view the interconnectedness of the world’s challenges and solutions.

As educators, our role is to guide students across these bridges, helping them connect their interests with impactful applications of AI. By nurturing interdisciplinary collaboration and emphasizing responsible AI practices, we empower students to become the researchers, innovators, and leaders of tomorrow.

Through these efforts, AI becomes more than a tool—it becomes a medium for discovery, a bridge between disciplines, and a foundation for a better future.

Dr. Mehala Balamurali
Senior Research Fellow, Australian Centre for Robotics
Faculty of Engineering, The University of Sydney

Recommendations for Undergraduate AI Education

Here are some key recommendations for using an inclusive and interdisciplinary approach to maximize the potential of AI in undergraduate research:

- 1. Promote Diverse Applications of AI:** Encourage students from all disciplines—not just engineering or computer science—to explore AI’s applications. Whether it’s analyzing satellite data for land use classification or enhancing medical diagnostics, the possibilities are endless.
- 2. Provide Access to AI Tools and Resources:** Introduce students to versatile array of AI tools. From spatial data analysis, design and modelling, statistical computations, to platforms for exploring creative and technical application. This can level the playing field for students from non-technical backgrounds.
- 3. Focus on Ethical AI Practices:** Equip students with the knowledge to critically evaluate AI outputs, understand biases, and prioritize ethical considerations in their projects.
- 4. Integrate AI into the Curriculum:** Design courses that focus on AI applications in specific domains. This can serve as a blueprint for incorporating AI into interdisciplinary education and equip students for academic and industry roles

Contact Us

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