MONASH University

MALAYSIA

SYNC

Say Yes N' Collaborate

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RESEARCH LONGEVITY

Navigating a Sustainable & Evolving Career

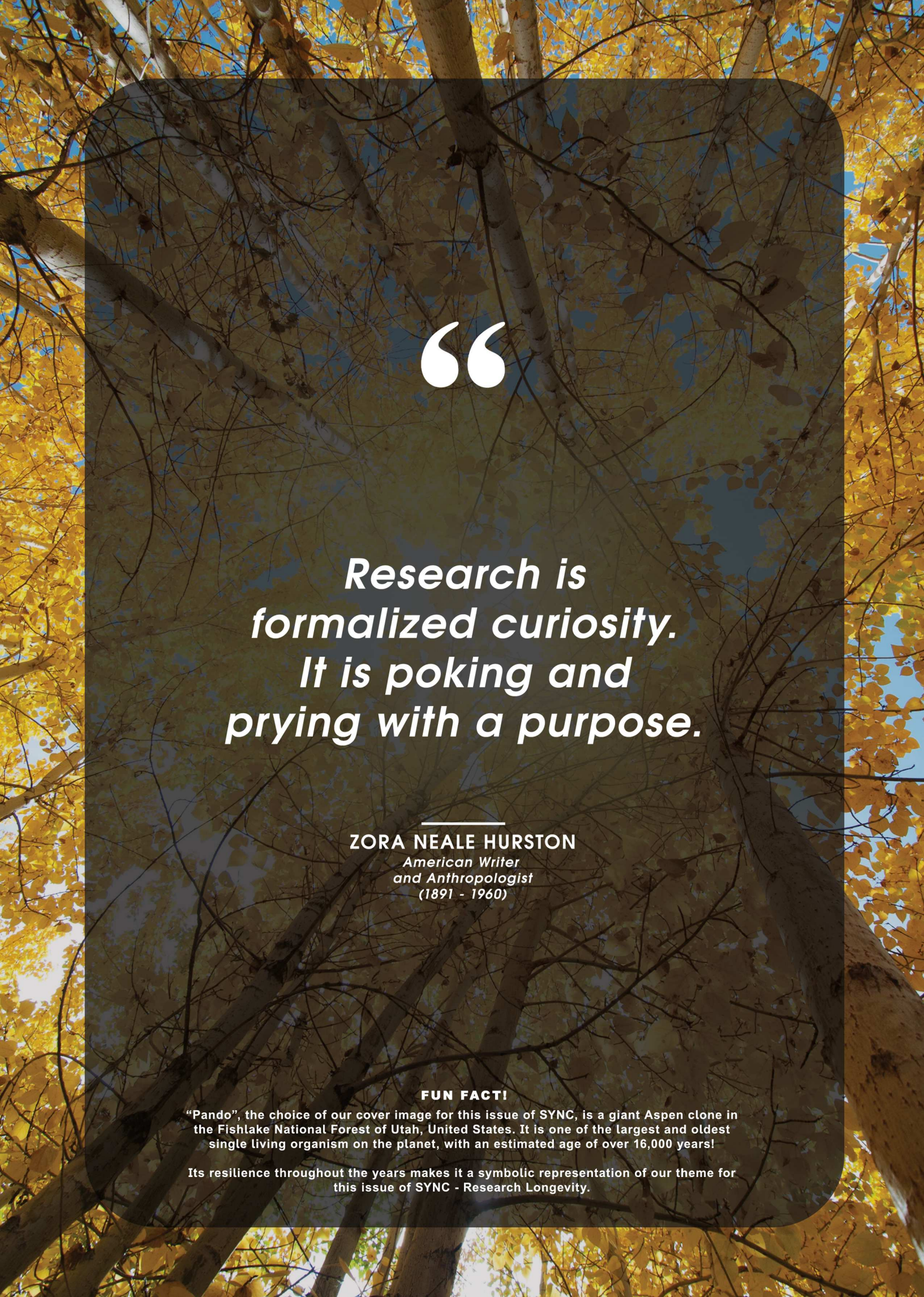
IN THIS ISSUE..

FEATURING INSIGHTS FROM..

PROF. EDWIN TAN

DR. NG WEN CAI

ASSOC. PROF. M.E. RAGHUNANDAN



Research is formalized curiosity. It is poking and prying with a purpose.

ZORA NEALE HURSTON
American Writer and Anthropologist (1891 - 1960)

FUN FACT!

"Pando", the choice of our cover image for this issue of SYNC, is a giant Aspen clone in the Fishlake National Forest of Utah, United States. It is one of the largest and oldest single living organism on the planet, with an estimated age of over 16,000 years!

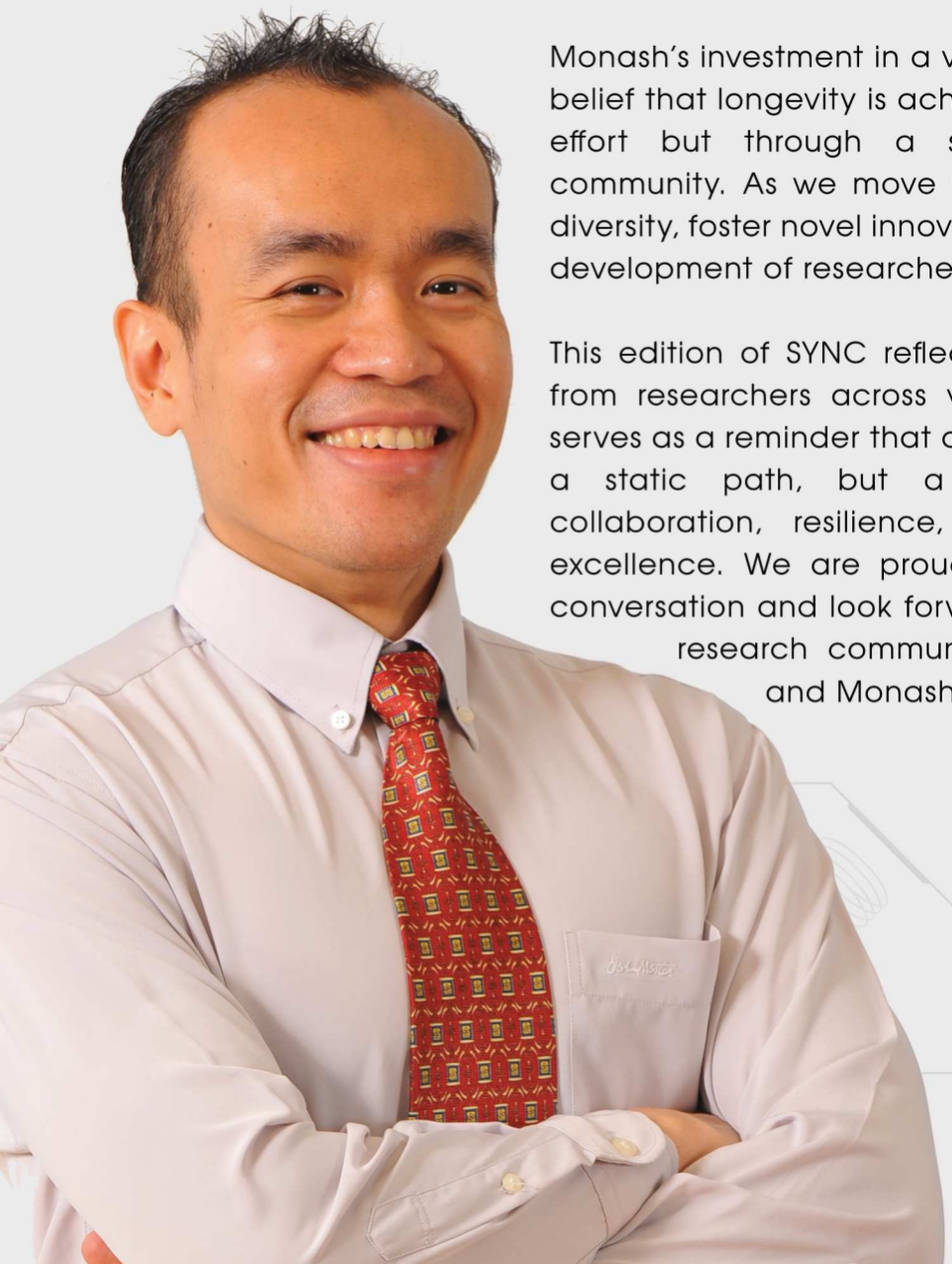
Its resilience throughout the years makes it a symbolic representation of our theme for this issue of SYNC - Research Longevity.

>> FOREWORD BY THE ASSOCIATE HEAD OF SCHOOL (GRADUATE RESEARCH), SCHOOL OF ENGINEERING

Prof. Wu Ta Yeong

In an increasingly dynamic and interconnected world, sustaining a long-term research career demands adaptability, sustainable collaboration, and a commitment to continuous growth. Researchers must not only advance knowledge within their disciplines but also embrace a possible change in funding trends, technologies, and societal needs. Additionally, ethical research is fundamental to the responsible advancement of knowledge. By upholding integrity in research, we not only protect the credibility of our findings but also ensure a healthy research longevity.

Within the School of Engineering at Monash University Malaysia, we are committed to cultivating an environment that supports sustainable and impactful research careers. Through comprehensive mentorship, interdisciplinary initiatives, and strong industry engagement, we aim to equip our researchers, especially early career researchers with the skills, resilience, and networks needed to navigate an evolving landscape. By fostering collaboration across Departments and Schools we create opportunities for innovation and broaden the real-world impact in our research.



Monash's investment in a vibrant research culture reflects our belief that longevity is achieved not solely through individual effort but through a supportive and forward-thinking community. As we move forward, it is crucial to champion diversity, foster novel innovation, and support the professional development of researchers at every stage of their careers.

This edition of SYNC reflects these themes, offering insights from researchers across various stages of their journey. It serves as a reminder that a sustainable research career is not a static path, but a dynamic journey shaped by collaboration, resilience, and the continual pursuit of excellence. We are proud to contribute to this important conversation and look forward to the ongoing growth of our research community in the School of Engineering and Monash University Malaysia.

The SYNC Team

Dr Tan Wen Shan
Advisor

Dr Mohammed Ayoub Juman
Advisor

Abdulwaheed Tella
Editor

Jeffrey Ruzain Md Yazid
Co-Editor & Journalist

Jeremy Chin Shi Hau
Designer

Ng Jian Yew
Journalist

Louis Gautama Lie
Journalist

>>>IN THIS ISSUE

{ EDITOR'S NOTE }

What does it take to build a research career that endures, adapts, and continues to inspire across years, disciplines, and disruptions?

This is the central question we explore in this May 2025 issue of SYNC, themed "Research Longevity: Navigating a Sustainable and Evolving Career." In this issue, we dive into the lived experiences of researchers at different stages, senior academics reflecting on decades of transformation, and early-career researchers carving out resilient paths in a fast-changing world.

From the lab bench to industry boardrooms, from theory to implementation, our contributors offer practical insights and honest reflections on what sustains research over time. We highlight perspectives on mentorship, innovation, mental wellbeing, work-life balance, and the quiet (but crucial) role of institutional support. You'll also read about Monash initiatives helping researchers thrive in their careers, such as the PhD Global Mobility Program and the vital role of cross-sector partnerships.

If you're feeling stuck or uncertain in your research journey, this issue is for you. If you've been thriving and want to give back, it's also for you. In this issue, you'll find stories that highlight both the challenges and enablers of longevity in research, reminding us that success in this space is not solely defined by output but by adaptability, purpose, and connection.

As always, the editorial team extends sincere thanks to all our contributors and reviewers. Your continued support and engagement keep SYNC thriving. We welcome your feedback and suggestions via our Google form as we work together to make each issue better than the last.

Continuing the SYNC journey – Say Yes 'N' Collaborate.

Thank you.

Warmly,
Abdulwaheed Tella
Editor
SYNC Newsletter
mum.sync.soe@monash.edu

SYNC FEEDBACK

NAVIGATING A SUSTAINABLE & EVOLVING

RESEARCH CAREER

In a rapidly transforming research landscape, academic researchers must manoeuvre their careers with continually evolving research goals, aspirations, and challenges. This segment features an outlook on the academic research scene from Monash researchers at different career stages – early career researchers (ECRs) and senior researchers. Drawing from experience, their perspectives on navigating the academic journey will serve as pockets of wisdom for readers.

PART 1: In the Early Days of Research

Dr Low Liang Ee serves as a lecturer in the Department of Chemical Engineering. He received his PhD in Chemical Engineering from Monash University in 2018. Dr Low then worked as a postdoctoral researcher at Monash University Malaysia and Zhejiang University for three years. Dr Low's research focuses on (i) the design of magnetic nanomaterials for tumour-targeted imaging, drug delivery, and hyperthermia, and (ii) the micro-/nano-encapsulation and preservation of bioactive ingredients in bio-nanoparticle-based hydrogels and emulsion systems as smart food supplements for post-tumour recovery.

Having joined Monash University Malaysia in November 2020, **Dr Goh Kek Boon** is currently a senior lecturer in the Department of Mechanical Engineering. Dr Goh received his PhD in Computational Mechanics from Nanyang Technological University in 2019. He then spent a year at the University of Freiburg as a postdoctoral fellow, focusing on theoretical and computational physics. Dr Goh's research focuses on computational modelling of chemical systems, covering mass transfer, kinetics, and thermodynamics, with a strong emphasis on membrane science and soft material behaviour.

Career Journey

The dynamic nature of teaching and research in academia, comprising a cycle of learning, adapting, and improving, convinced Dr Low to pursue an academic career. This aspect also motivates Dr Low to push the boundaries of his research while updating his teaching materials each year to reflect the latest advancements in both research and teaching. For instance, the core engineering principles in the subjects he teaches – despite not being directly related to medicine – have alone proven invaluable in his research for the development of smart nanomaterials, whilst his interactions with his

students often spark new ideas too. That said, Dr Low finds that his most formative experience was his time as a postdoctoral researcher at Zhejiang University, where he developed crucial skills that refined his thinking and understanding about integrating diverse knowledge to enhance both his research impact and its relevance to the scientific community and healthcare sector.

Despite his young career, Dr Goh reflects: "Setbacks have been some of my greatest teachers, and I don't think that gets talked about enough". Dr Goh feels that setbacks and failures, while frustrating, should be embraced as they are just part of the process in attaining progress – "exciting breakthroughs come only after failed simulations, rejected papers, and navigating different cultures and expectations in collaborations". He also states that two important lessons he has gathered from people he has worked with along the way are (i) rejections are just redirections, wherein feedback, even the tough ones, only make it better, and (ii) setbacks make you sharper. Dr Goh also adds: "The best researchers I've worked with don't have all the answers right away – they're just relentless in figuring things out." Nonetheless, a career in academia also comes with its attractive perks, like the generous vacation days that motivated Dr Goh to enter the world of academia – in addition to the simple love of learning and nurturing of young minds.

Measuring the success of their research/contributions

Dr Low considers that an important key indicator of impact is the practical application of his research findings in the industry and in shaping new methodologies to solve real-world problems, as they resemble tangible signs of value beyond just academia. Dr Low adds that the citation frequency of his publications is not only an important indicator of their relevance and influence but also the confidence the academic community and industry professionals place in his contributions. Dr Goh instead measures his success from having top researchers in his field reach out for collaboration. Apart from considering it as a huge compliment, Dr Goh finds those moments rewarding as it is a testament to his work making a difference while being able to really connect with others in the academic community.

Navigating the academic pressure

Dr Low and Dr Goh both agree that the research and academic landscape is rapidly gearing towards collaborative interdisciplinary research, technological and AI-driven advances that influence research methods and interpretation, and the prioritisation of research with societal relevance and real-world impact. To keep up and adapt to these shifts, Dr Low plans to embrace AI and machine learning within his work while exploring new research methods. Whilst these shifts tend towards applied research, Dr Goh personally believes that the neglect of fundamental research cannot be afforded as it builds the foundation for long-term innovation. He adds that a right balance between fundamental and applied research is key, as both are essential for meaningful progress.

These shifts also pressure researchers to remain competitive in securing funding, publishing, and academic reputation.

To navigate this, Dr Low stays informed about emerging research trends by attending conferences and engaging with colleagues, while emphasising the importance of fostering interdisciplinary collaboration to stay competitive. He also prioritises quality over quantity and open-science initiatives in publications, while engaging in peer reviews, academic services, and student mentorship to build his reputation. Overall, Dr Low balances these strategies to remain adaptable and competitive while making meaningful contributions in his field.

For Dr Goh, having a close group of friends and collaborators makes the "academic grind" feel less overwhelming. He says that they serve not just to bounce fresh and exciting ideas off each other, but also as a safety net during the nadirs, like when rejections pile up. Dr Goh adds, "Academia can sometimes feel like a never-ending race, but with the right support system, it shifts from being all about competition to more about growing together. And that, for me, is what makes it all fun and worth it."

Balancing & managing short- and long-term goals

Dr Low states that his short-term goals, such as communicating results and completing specific research milestones, allow him to maintain a strong foundation for his work and stay focused on immediate priorities. His long-term goals, such as establishing a recognised research niche, provide him with a broader direction. In balancing and managing his goals, Dr Low says: "I approach balancing them by ensuring that short-term goals align with my long-term vision, allowing for flexibility while maintaining a clear trajectory. I also reassess both types of my goals regularly to adapt to changes in the research landscape while keeping my overall career strategy focused and purposeful."

Dr Goh says that his short-term goals – small tasks like finishing a paper or running a simulation – are his daily fuel. On the other hand, his long-term goals, such as spearheading a major project and publishing a groundbreaking study, are the things that keep him inspired. Dr Goh says, "Balancing the two is where the real challenge lies – it's like trying to master Tetris." He adds that breaking ambitious goals into manageable chunks is key. "If I get too caught up in short-term tasks, I might lose sight of the bigger picture. But if I only focus on the long-term vision, I'll never actually get anything done today." He goes on to say that in research, it also comes down to figuring things out as you go.

In the face of challenges

Dr Low faces a major challenge in securing funding due to the high monetary investment required for his medical research. To boost his chances, Dr Low is exploring international grant opportunities and adapting digital tools like IoT and machine learning into his work. He also emphasises research collaboration across different labs as a strategy for more efficient outcomes with reduced time and cost. Meanwhile, Dr Goh finds data management a major challenge, likening data to "that one friend who always shows up uninvited and never behaves the way you expect". However, he started treating them like small puzzles to solve and figure out along the the way. He says another challenge is balancing the shiny, dreamy ideas with pragmatism – "It's like wanting to build a

spaceship but realising you're still figuring out how to glue popsicle sticks together" – which he breaks down into small ideas that are achievable but also exciting enough to continue motivating him.

On the key challenges faced by academics, Dr Goh sees those working in silos as one of them. He posits that interdisciplinary collaboration is a key solution, such as institutions encouraging cross-departmental projects. When it comes to ECRs, Dr Goh feels that a heavy reliance on their mentors can restrict their growth as independent researchers. He suggests that ECRs break that sole dependency by fostering their own chain of networks and external mentorship, and to take ownership of their research journey, be it by leading small projects or managing collaborations. Conversely, Dr Low feels that the current trend of research institutions focusing on expeditiously commercialised projects poses a major challenge for ECRs, whose works are typically in the development stage. He states that this can potentially relegate research topics that are less commercially driven, in turn limiting an ECR's options in identifying their future research directions – "To address this challenge, it is crucial for all stakeholders to collaborate in establishing regulations that ensure the continued growth and diversity of all research fields."

Self-reflection & advice to young and aspiring researchers

Dr Low mentions that a successful researcher requires continuous passion about their work, perseverance through challenges, and an open mindset to evolving technologies and trends. He also states that building a lasting career requires effective collaboration and networking, along with having a strategic approach towards funding and obtaining resources. "For the next generation, my advice would be to remain committed to their research vision while being adaptable to shifts in the field, seeking out collaborative opportunities, and continually honing both technical and soft skills to make a meaningful and lasting impact", Dr Low conveys.

Dr Goh mentions that having a thick skin is beyond helpful when faced with criticism and setbacks. Rather than taking them personally, Dr Goh advises reframing how one sees criticism and failure, such as viewing them as opportunities for self-improvement. He says that while the life of a researcher can be like an emotional rollercoaster, it is those tough moments that often highlight blind spots or weaknesses that might have been unknown to us. He adds that experiencing setbacks comes with building resilience, where it is about learning to feel and process the sting, learning from it, and to keep going – "developing resilience means learning to laugh, or at least not cry, when things go sideways and knowing that every misstep is just another step closer to success. It's also about not letting the fear of failure hold you back from taking risks or thinking big."

PART 2: Decades Through Discovery

Prof. Edwin Tan Chee Pin began his research career in 1999 and has been with Monash University Malaysia since 2002 and is currently the Head of the Robotics and Mechatronics Department. Prof. Edwin received his B.Eng (Electrical & Electronic) in 1998 and PhD in 2002, both from Leicester University, UK. His research focuses on optimally estimating the internal states of a dynamic system, based on a mathematical model of the system, and available sensor measurements of the system which can be applied to condition monitoring and fault diagnosis of the system. His research is motivated by a strong interest and passion for system dynamics related to control theory.

Assoc. Prof. Sudharshan N. Raman received his B.Eng (Civil and Structural Engineering) from Universiti Kebangsaan Malaysia, Master's degree in Structural Engineering from Universiti Sains Malaysia, and PhD in Structural Engineering from The University of Melbourne, Australia. Prof. Sudharshan started his academic career in 2002, after working for about 3 years in the industry. Assoc. Prof. Sudharshan joined Monash University Malaysia in 2020 after serving in three universities in Malaysia and Australia. Presently, Assoc. Prof. Sudharshan is the Head of the Civil Engineering department of Monash University Malaysia. His research focuses on decarbonization in construction particularly, concrete materials, resources and structural systems to achieve a low-carbon living. Assoc. Prof. Sudharshan is driven by the recent push and motivation towards sustainability and climate change.

Prof. Hung Yew Mun holds a PhD in Engineering from Multimedia University, Malaysia, M. Tech in Materials Science from the University of Malaya, and a B.Eng (Mechanical) with First Class Honours from the University of Malaya. Additionally, Prof. Hung has a Graduate Certificate in Higher education from Monash University. Presently, Prof. Hung is the Head of the Department of Mechanical Engineering in Monash University Malaysia. Prof. Hung has been with Monash University Malaysia since 2010, progressing from Lecturer to Professor. His research focuses on heat and fluid flow, micro/nanoscale thermal management, electronics cooling, and phase-change heat transfer, with a particular interest in graphene-based materials. The main motivation for pursuing this field stems from the growing demand for efficient thermal management solutions in high performance electronics and energy applications. Additionally, the potential of carbon nanomaterials in enhancing heat transfer efficiency has driven his work towards developing next generation cooling technologies.

Career Journey

Prof. Edwin's research remains rooted in control theory, with extensions into traffic control, predictive maintenance, and artificial intelligence which evolved from control theory. While high-quality publications remain a key priority, securing funding to support a growing research team has become equally important. A pivotal moment in his career was the novel use of serial state estimators, which led to significant findings and the publication of several high-impact papers. Beyond research, Prof. Edwin finds deep fulfillment in teaching and student engagement, valuing the shared journey of discovery and intellectual development. He also praises Monash University Malaysia for its supportive and high-caliber academic environment. To effectively balance institutional leadership responsibilities with active research engagement, Prof. Edwin strategically prioritizes collaborative partnerships.

Assoc. Prof. Sudharshan's early research career, spanning seven years, focused exclusively on concrete technology. During his PhD, he transitioned into protective technologies and blast and impact engineering, with postdoctoral work emphasizing structural resilience. Over the past five to six years, his research has evolved to address the climate resilience of infrastructure. A pivotal moment in his doctoral studies was the realization of the societal and human dimensions in structural engineering, which prompted a shift toward interdisciplinary research connecting climate resilience with human well-being and sustainable living. Despite his current academic standing, Assoc. Prof. Sudharshan did not initially envision a career in academia. His outlook changed after two formative experiences: a six-month teaching role after completing Form 6 (Year 13), and the encouragement of a university lecturer who recognized his potential. Although he spent three years in industry, this period was always intended to provide practical exposure before returning to academia. Today, he actively integrates industry insights into his teaching and research, emphasizing their practical relevance. As an academic leader, he strategically balances administrative and research responsibilities, viewing leadership roles as opportunities to foster strategic thinking and align his research with institutional priorities, thereby amplifying its impact and relevance.

In the early stages of his academic career, Prof. Hung focused on fundamental investigations in heat transfer and microfluidics. Over time, his research transitioned toward applied thermal management, particularly in electronics cooling technologies. A notable milestone was his demonstration of enhanced boiling heat transfer using graphene-nanoplatelet coatings, which significantly improved thermal performance in microchannel and micro heat pipe systems. This achievement addressed practical thermal challenges and highlighted the broader potential of nanomaterials in engineering applications. Prof. Hung's enduring commitment to academia is driven by three core motivations: the tangible impact of research on real-world problems, the opportunity to mentor future researchers, and the inherently collaborative nature of academic work. His engagement is further sustained by translating research innovations into sustainable technologies with industrial relevance. Balancing research and institutional leadership, Prof. Hung emphasizes clarity of purpose, strategic delegation, and adaptability. Prof. Hung emphasizes that aligning administrative duties with a broader research vision allows both to be mutually supportive. Building independent

research teams, protecting time for research, and fostering interdisciplinary collaboration are key strategies. He believes continuous learning, curiosity, and adaptability are essential for sustaining a meaningful academic career. His approach exemplifies how academic leadership, and innovative research can be mutually supportive, resulting in work that is both institutionally aligned and socially relevant.

Measuring the success of their research/ contributions

Prof. Edwin, Assoc. Prof. Sudharshan, and Prof. Hung underscore the importance of high-impact publications as a foundational element of academic achievement. Beyond publication metrics, Prof. Edwin considers the successful application of his research in industry as a key indicator of its practical value and relevance. Similarly, Assoc. Prof. Sudharshan gauges research success through the capacity to deliver meaningful, practice-oriented solutions that contribute to societal improvement and human well-being. Prof. Hung offers a multifactorial view, citing citations, successful grant acquisition, and industry partnerships as essential benchmarks. He further notes that the true impact of research lies in its ability to influence industrial practices and respond to pressing real-world challenges. Altogether, their perspectives reflect a comprehensive view of scholarly success that balances academic rigour with societal and industrial relevance.

Navigating the academic pressure

Prof. Edwin, Assoc. Prof. Sudharshan, and Prof. Hung offer distinct yet complementary strategies for navigating the demands of academia and sustaining research excellence. For Prof. Edwin, the most effective way to manage academic pressures is through active engagement in research and the strategic utilisation of opportunities such as research funding and student collaboration. He illustrates his approach to time management through the "stones and sand" analogy: "If one fills a jar first with sand, there will be no room for stones. However, if one begins with the stones, sand can still fill the remaining spaces". In practice, this means prioritising core research activities before addressing routine administrative or teaching duties. He underscores that reserving only "leftover time" for research is counterproductive, as such time rarely materialises. For instance, he makes it a point to respond to student or collaborator submissions within 24 hours to maintain research momentum. Assoc. Prof. Sudharshan, meanwhile, articulates a values-driven view of academic research. He contends that the essence of scholarly inquiry lies in generating new knowledge, addressing real-world challenges, and making a lasting contribution to both society and the discipline. In his view, research funding and high-quality publications are not ends in themselves, but rather natural outcomes of conducting meaningful and impactful research. Prof. Hung emphasizes the importance of continual growth and adaptability within the academic landscape. He identifies lifelong learning, strategic collaborations, and the diversification of funding sources as essential components for remaining competitive. Maintaining research momentum, he notes, is further supported through active engagement with industry partners, participation in international conferences, and the mentorship of research teams.

Collectively, their perspectives highlight the importance of purposeful time management, societal impact, and strategic engagement in shaping a sustainable and impactful academic career.

Adapting to the changing academic and research landscape

Prof. Edwin, Assoc. Prof. Sudharshan, and Prof. Hung reflect on how the evolving research landscape requires adaptive strategies for sustaining relevance and impact. Prof. Edwin observes a notable decline in funding opportunities for fundamental research and, in response, has recalibrated his approach to engaging with multiple funding bodies. He now frames his research proposals from an industrial perspective, emphasising practical applications and problem-solving potential over purely academic interests. This shift aims to align his work with the priorities of both government and industry stakeholders. Assoc. Prof. Sudharshan highlights that while shifts in the educational and research ecosystem bring inherent challenges, they also present new opportunities. His guiding principle is to embrace change as a pathway to growth, underscoring that it is never too late to relearn, adapt, and acquire new skills. This mindset, he notes, is essential for academics to remain dynamic and resilient in an evolving environment. Prof. Hung underscores the importance of staying attuned to emerging trends, particularly the rise of interdisciplinary research, AI-driven simulations, and sustainability-oriented innovations. To remain competitive, he advocates for strengthening interdisciplinary collaborations, integrating artificial intelligence into heat transfer analysis, and aligning research trajectories with global sustainability objectives.

In the face of challenges

Across their academic journeys, Prof. Edwin, Assoc. Prof. Sudharshan, and Prof. Hung have encountered a range of challenges that reflect the evolving demands of research and higher education. Prof. Edwin highlights the difficulty of running out of ideas or facing a "roadblock", while emphasising how collaboration would provide him with a fresh perspective on resolving that issue. Assoc. Prof. Sudharshan reflects on the ongoing difficulty of recruiting and retaining talented researchers, particularly given the perceived funding instability and uncertainty surrounding research careers. He notes that attracting the right candidates requires sustained persuasion and mentorship, while addressing funding uncertainties calls for the expansion and diversification of income sources. Prof. Hung identifies the dual challenge of obtaining research funding and bridging the gap between fundamental research and industrial application. To address these issues, he highlights the importance of cultivating strategic industry partnerships, broadening the base of funding sources, and ensuring that research agendas are closely aligned with practical, real-world demands.

As earlier emphasised by Prof. Edwin, the growing scarcity of funding for fundamental research highlights the urgent need for increased collaboration between early-career and senior researchers to address industrial challenges and attract industry funding. He argues that such collaboration is mutually beneficial as the young researchers offer energy and new ideas, whereas senior researchers bring in experience and tricks on navigating the game (publishing and attracting funding). Assoc. Prof. Sudharshan highlights how good and meaningful research can get "diluted" in the ocean of new

knowledge and discoveries. He posits that it can be challenging for good work to be recognised, as a reputation takes a very long time to build, even longer in a developing economy. Prof. Hung underscores the growing pressures on current researchers, including the need to publish, secure funding, and demonstrate tangible real-world impact. To navigate these demands, he advocates for expanding collaborative networks, strengthening institutional support, and fostering a culture of interdisciplinary cooperation. Prof Hung also states that maintaining research momentum while fulfilling administrative responsibilities presents an ongoing challenge for senior academics. He stresses the importance of effective delegation, cultivating capable and autonomous research teams, and aligning leadership roles with long-term research objectives. He further highlights continuous learning and adaptability as essential for sustaining academic relevance and impact in an ever-evolving research environment.

Self-reflection and advice

Prof. Edwin highlights curiosity and resilience as essential traits for sustaining a long-term research career. He captures this mindset with the phrase, "Keep calm and keep going," emphasising the importance of persistence in the face of academic challenges. He also underscores the value of interpersonal skills, noting that effective communication and relationship-building not only facilitate the formation of strong professional networks but also open doors to opportunities beyond academia. Assoc. Prof. Sudharshan takes a reflective view on success in academia, asserting that its true measure lies in generating new knowledge, resolving real-world problems, and creating lasting societal and disciplinary impact. He pictures research like a marathon, an endeavour that requires continuous effort and focus on long-term goals. His guiding questions for early career researchers are: "Where will this effort lead in five or ten years?" and "Always begin with the end in mind." These questions, he suggests, help ensure that one's scholarly efforts are both purposeful and enduring. Prof. Hung identifies adaptability, perseverance, collaboration, and a firm commitment to research ethics as key qualities for a successful academic career. His advice to early career researchers is to cultivate a strong professional network, actively seek mentorship, and embrace interdisciplinary collaboration. He further emphasises the importance of aligning research efforts with real-world challenges, as this not only enhances scholarly impact but also ensures the long-term relevance and sustainability of one's academic career.

PART 3: Transitioning between Academia & Industry

The opportunity to shift between the academic field and the industrial scene may also present itself at certain junctures in a researcher's career. Making that jump may be filled with different sorts of considerations to bear in mind, let alone the prospect of encountering varied expectations and challenges. Some researchers within the Monash community have nonetheless gone on to walk down that path, including Dr Catherine Van Tze Che from the department of civil engineering, and Dr Lee Chern Leing, formerly of the department of chemical engineering.

Dr Catherine Van previously worked as a structural engineer after her PhD degree, where she provided technical expertise in seismic analysis and and assessment. Currently, Dr Catherine Van focuses on investigating the seismic behaviour of masonry-infilled reinforced concrete frames with openings – an extension to the research conducted during her PhD studies.

Dr Lee Chern Leing currently works as a process simulation engineer at Petronas Research Sdn Bhd (PRSB), acting as a process simulation lead for several projects on a task force basis. Projects he has worked on span over a plethora of fields, such as in gas separation, desanding, and microalgae production.

Making the transition

Dr Catherine Van considered her transition to academia as a long-term fulfilment of her passion in research and knowledge building. As opposed to her role in the industry, a career in academia serves as the perfect fit to focus on advancing the boundaries of knowledge and fostering innovation in her areas of interest. As construction projects often span several years, Dr Catherine Van found that tasks could become repetitive and lead to a plateau in the learning curve. It was based on this realisation that she recognised the right moment to transition to academia, to maintain a dynamic pace of growth and revitalise her learning.

On the other hand, Dr Lee's main considerations were based on a role that not only aligned with his research interest but also on financial comfort and security. With a family to provide for, careful planning and thorough evaluation of all job opportunities were needed on his part before even discussing making a switch. So, when is the right time to transition? "The reality is that we are living in an employer's market. The right timing will always be when you have a solid job offer in hand from a reputable employer, who is less likely to revoke your job offer, before you make the decision to transition", personally opines Dr Lee. He also notes that priorities might change over different stages in one's life, as they did for himself, where more emphasis on the excitement over learning opportunities was placed during his younger days, but with age, it has now progressively been placed on financial gain.

The biggest challenges for Dr Lee were always related to his family and providing for them, carefully considering the risks associated with making a new move. Dealing with the fear of uncertainties was also another challenge, with having to discover heads-on whether the new job is a better or worse fit while also not having full assurance about one's job security in a new environment, especially when the job market is bad. For Dr Catherine Van, adapting to the different expectations in academia was the most challenging aspect. She personally found that the shift in mindset required can be significant, as academics are expected to take on independent teaching and research and publishing responsibilities almost instantly. This differed from her time in the industry, which involved mostly working with a team to deliver solutions to complex construction challenges within tight deadlines.

Finding success post-transition

Different attributes and factors can be typically more emphasised in either academia or the industry, while also lacking in the other. Dr Catherine Van feels that a deep thirst for knowledge is the key to success in academia, as a deeper exploration of underlying principles and complexities is encouraged for long-term knowledge and innovation. Contrastingly, the industry requires working around tight deadlines, which often prompts engineers to offer quick solutions that address the surface of a problem. Dr Lee feels that the ability to negotiate, present, and sell one's ideas is an attribute that leads to finding success in the industry, but is often neglected in academia, especially in the STEM field. Nevertheless, Dr Lee also states that contrary to popular beliefs, it is not that difficult for an academic to land an industry role. The important point is not about what one does, but knowing how to sell one's skill set to industrial players and demonstrating that those skills are relevant to the role one is applying for.

Evolving relationship between academia and industry

Bridging research endeavours and transferring knowledge between academia and industry has increasingly become a major talking point, and for good reasons. Dr Lee posits that effective collaboration between academics and industry players to leverage on each other's strengths may be the only means to survive in an increasingly competitive environment, especially as our nation ascends the value chain. He adds that establishing such collaborative efforts requires a change in mentality, specifically one of working in silo and complacency. Dr Catherine Van feels that academia and industry could also become more integrated and collaborative with progressive advancements in technologies, such as AI, robotics, and virtual reality. Such technological advancements could provide common projects and avenues between the two, like virtual workshops, simulation modelling, or AI-driven construction methodologies. She also goes on to add that the rapid emergence of innovation also serves as a drive for the mutual dependence between academics and industry players – the former can help with R&D and produce competent workforces that align with industry needs, while the latter can offer real-world insight for practical and scalable innovations.

Nuggets of wisdom

For researchers who are considering a career between academia and industry, Dr Catherine affirms that aligning one's professional and personal goals with the lifestyle and type of work that one finds truly exciting is the key to making that decision. She adds that staying flexible and open to adjusting one's mindset, especially when it comes to long-term goals, is equally important. "Be prepared to redefine your understanding of passion and satisfaction, as academia offers a different set of rewards and challenges compared to the industry", says Dr Catherine Van. For those who are considering a research career in the industry, Dr Lee asserts that planning and a careful understanding of the industry needs applicable to the role of interest are crucial. This, however, must also be followed by hard work towards acquiring the necessary relevant skills. Dr Lee adds that it all ultimately boils down to what one is willing to sacrifice to attain what one wants in life.

OPINION

///.CORNER

NAILING THAT FIRST SUCCESSFUL GRANT PROPOSAL

with Dr Ng Wen Cai

Dr Ng Wen Cai, a research fellow under the department of chemical engineering, recently attained her first ever grant. This grant, Kajian Jangka Pendek Kementerian Ekonomi awarded by the Economic Planning Unit under the Ministry of Economy, is designed to strengthen collaborations between academia and policymakers while advancing research on socioeconomic development within the framework of the Thirteenth Malaysia Plan (RMK-13). We gathered Dr Ng Wen Cai's insights and tips on securing a first-time grant as an early career researcher.

Q1

Can you first tell us more about the project that this grant is funding?

12:54 p.m.

The project I'm leading – "Advancing Malaysia's Green Hydrogen: Data-Driven Strategies for Circular Economy Integration and Sustainable Implementation" – seeks to identify key gaps and opportunities in the current landscape and offer insights that can shape the planning and execution of RMK-13. The aim is to lay a robust foundation for shaping future energy policies and strengthening national strategies to advance the adoption of green hydrogen technologies in Malaysia. This project will attempt this by leveraging data-driven approaches to accelerate the scalability of green hydrogen technologies.

12:59 p.m.

Q2

How can one identify the right grant opportunity that is aligned with their research goals? 01:05 p.m.

Sign up for newsletters, follow national research portals, and join professional networks that share grant announcements – and set up email alerts for keywords related to your research area. 01:10 p.m.

Secondly, leverage your institution's resources – that is how I found out about this opportunity. Grant announcements are constantly circulated at Monash, so make it a habit to check the university's REU newsletter or internal mailing lists. Lastly, align your research goals with the grant's objectives. Not every grant will be a perfect fit, so prioritise those that resonate with your expertise and long-term vision. 01:11 p.m.

Q3

How does one approach crafting a compelling proposal that effectively communicates the value and impact of their research? 01:15 p.m.

A successful grant proposal explains why your research matters and tells a story that resonates with the funder's goals and addresses their pain points, positioning it as a solution and not just as an idea. Funders also invest in studies that bring fresh perspectives or solve pressing challenges. This makes identifying gaps in existing research or policy crucial and by framing your research to fill these gaps, you can demonstrate its relevance and urgency. 01:20 p.m.

Finally, seek feedback from mentors, colleagues, and even non-experts. Fresh eyes can catch gaps or ambiguities that might remain. Breaking down my proposal for a non-expert audience helped me identify parts that needed more clarity. 01:22 p.m.

Q4

What common mistakes should early-career researchers avoid when preparing their first grant application?

01:42 p.m.

Avoid turning your proposal into an information dump. Avoid technical jargon and focus on communicating your ideas in a simple and compelling manner. If the guidelines specify a word limit, respect it – it is a test of your ability to prioritise and articulate. Focus on an achievable objective that aligns with the funder's priorities and be honest about what you can achieve within the grant's timeframe and budget.

01:51 p.m.

The budget section taught me some hard lessons. While initially having some optimistic estimates, my mentor helped me understand the importance of including some contingency for unexpected costs. Bottomline, your budget is more than just numbers – it reflects your planning and foresight.

01:54 p.m.

Q5

How important are mentorship and collaboration in strengthening a grant proposal, and how did you leverage them throughout your grant application?

03:04 p.m.

Mentorship and collaboration are not just helpful but essential. I was fortunate to have Prof Chong Meng Nan as my supervisor to guide me with his invaluable experience and insights. He encouraged me to think strategically about aligning my project with the funder's priorities, proving a game-changer. I also had the privilege of working with Dr Yaw Chong Siang, an experienced researcher whose ideas and expertise added depth to the proposal, and helped form a cohesive project.

03:34 p.m.

Collaboration also shows funders that your project has a strong support network and the potential for a more significant impact. After all, the best proposals are often the result of many minds working together toward a common goal.

03:36 p.m.

MASTERING POST GRADUATE MENTORSHIP

with Assoc. Prof. M.E. Raghunandan

SYNC 24/04/2025 04:16PM

What key attributes and practices do you believe are essential for effective mentorship of postgraduate students?

M.E. Raghunandan 24/04/2025 04:19PM

My philosophy and approach to postgraduate mentoring (or supervision) align closely with Albert Einstein's saying: "I never teach my pupils; I only attempt to provide the conditions in which they can learn." This, in my opinion, encourages students to pursue self-learning. I believe that patience is essential when mentoring postgraduate students.

Over the past twelve years, I have learned that listening is more important than speaking. Postgraduate studies can be demanding and unpredictable, which can cause students to feel anxious. My role is to ease their concerns through patient and flexible mentoring. Throughout my mentoring experience, I have discovered that my research expertise allows me to offer valuable guidance on various topics, such as research methodologies, research ethics and professionalism, publication processes, and strategies for overcoming obstacles. My primary focus has been on effectively addressing complex problems.

Based on my knowledge and experience, I believe that a mentor should confront challenges directly and provide strong support. As a mentor, I think it is crucial to frequently review my postgraduate students' work and conduct, providing constructive feedback whenever possible. By offering critiques of their work in a supportive and constructive manner, I can help them enhance their research thinking and execution skills, ultimately preparing them for success in the academic landscape.

SYNC 24/04/2025 04:34PM

What type of mentorship approach/model do you think is best and how do you tailor it to meet the diverse needs and goals of your postgraduate students?

M.E. Raghunandan 24/04/2025 04:52PM

I firmly believe that my students are my greatest strength. Rather than simply providing solutions, I create an environment encouraging them to explore various options before arriving at the best answer. My role and responsibility have always been to guide them toward discovering the best possible solutions. To be honest, this approach has been effective for me and my research group. The mentorship approach can differ among students based on what works best. I believe it is essential to support my students both professionally and personally. When exploring a new field of study, mentorship evolves into a partnership between my students and me, where we both engage in the learning process. During this journey, we discuss potential challenges and the direction of the research. To accommodate their varying working and learning styles, I make sure to communicate my mentoring messages clearly to my students.

SYNC 24/04/2025 06:12PM

What role does mentorship play in enhancing the academic and professional development of both students and mentors?

M.E. Raghunandan 24/04/2025 06:32PM

Reflecting on my journey as a postgraduate student in 2006 and evaluating my current research career, I emphasize that effective and constructive mentorship is crucial in shaping students' research paths and developing their expertise. For students, engaging in engineering research offers a first-hand opportunity to tackle novel challenges using cutting-edge technologies. This experience enables them to propose and test potential solutions, enhancing their critical thinking and research communication skills.

Additionally, students can discover various research and career opportunities available in academia and industry, aiding their career growth. As a mentor, I gain insights from my students' research and experiences, enhancing my expertise. Mentoring provides me with a sense of purpose and fulfillment as I help prepare the next generation of professionals and contribute to strengthening the research community.

SYNC 24/04/2025 06:55PM

How can academic researchers provide quality mentorship while balancing the demands of their own research?

M.E. Raghunandan 24/04/2025 07:11PM

To ensure the highest quality of mentorship, I focus my efforts on a select group of research students. I believe this allows academic researchers to dedicate sufficient time and resources to support student's growth and success, preventing them from stretching themselves too thin across various students and their needs. By prioritizing meaningful interactions, I can get to know my students better. At the same time, I recognize the importance of managing time effectively between academic commitments and mentorship. We can establish specific time slots dedicated to student mentoring by carefully planning the daily tasks.

Lastly, I promote peer mentorship among students to foster a supportive learning environment. This co-mentoring approach encourages them to assist each other more effectively instead of relying solely on my guidance. For example, I ask my students to circulate their draft manuscripts among one another for internal review before submitting the manuscript to me.

SYNC 24/04/2025 08:16PM

What long-term benefits do you believe a strong mentor-mentee relationship brings to the academic community as a whole?

M.E. Raghunandan 24/04/2025 09:12PM

I firmly believe that my students are my greatest strength. Strong mentor-mentee relationships facilitate the development of robust professional networks, enhancing collaboration, supporting career advancement, and promoting knowledge sharing. These relationships are essential for cultivating future research leaders and contributing positively to the research community.

Additionally, strong mentor-mentee relationships help ensure that knowledge, skills, and research norms are transmitted to the newer generation, which is vital for advancing research findings/output and engineering solutions.


SPOTLIGHT
NEW RESEARCH HUBS IN MONASH

CENTRE FOR NET-ZERO TECHNOLOGY (CNZT)

The director of the CNZT, Professor Chong Meng Nan

CNZT

ROADMAPS

The Centre for Net-Zero Technology (CNZT) at Monash Malaysia is at the forefront of research aimed at achieving net-zero emissions. Under the leadership of its director, Prof. Chong Meng Nan, CNZT is structured into three key research teams addressing different aspects of sustainable technology:

- The Advanced Energy Materials team explores new materials and catalysts to enhance energy efficiency and storage.
- The Biotransformations team leverages Malaysia's abundant palm oil waste to convert bio-waste into valuable energy resources.
- The Sustainable Urban Energy Solutions team develops technologies that support the design of net-zero-emissions cities.

In addition to these three key research teams, CNZT plans to establish a Techno-Economics and Communications team to assess the feasibility of emerging technologies and effectively communicate their findings to stakeholders. Currently, one of CNZT's flagship projects, funded by PETRONAS, focuses on advancing electrolyser systems to minimise energy consumption in chemical reactions by optimising catalysts and materials. Other key research areas that are also pursued include green H^2 production, CO^2 reduction, sustainable ammonia production, biowaste conversion, and solar photovoltaic (PV) technologies.

CNZT actively fosters innovation through international collaborations with researchers from Australia, China, and beyond – for instance, via their Net Zero Speaker Series that further enhances its global engagement by featuring renowned professors and experts, fostering partnerships, and driving new research initiatives. Looking ahead, CNZT has ambitious goals. While it is currently in its formative stages, the centre aspires to become the first full-fledged research centre at Monash Malaysia and achieve recognition as a High-Impact Centre of Excellence (HICoE), a prestigious programme initiated by the Ministry of Higher Education Malaysia to promote research excellence within higher education institutions in specific niche areas. For students, researchers, and industry partners, CNZT provides numerous opportunities. Industry collaborations offer access to expertise, state-of-the-art facilities, and skilled human resources. Academics integrate real-world projects into their teaching, enriching student learning. Students involved with CNZT gain hands-on experience, bridging the gap between academia and industry and positioning themselves for careers in the rapidly growing net-zero technology sector.

With its pioneering research, strategic collaborations, and commitment to sustainability, CNZT is set to play a crucial role in shaping the future of clean energy and net-zero solutions in Malaysia and beyond.

MEDICAL ENGINEERING & TECHNOLOGY (MET) HUB

The director of the MET Hub, Associate Professor Ooi Ean Hin

Clinical and healthcare challenges often require a multidisciplinary solution, which is the motivation behind the establishment of the MET hub in May 2024. The hub unites academics with different expertise from the School of Engineering and School of Information Technology to advance healthcare research and address unresolved clinical challenges by fostering interdisciplinary collaboration, driving pioneering innovation and integrating engineering and technology with medical sciences. The vision and mission of the MET hub align with Monash's ten-year strategic plan, Impact 2030, by addressing the Thriving Communities global challenge. The three core focus area of the MET hub are:

- Disease diagnosis and therapy, where innovative and improved techniques for disease detection and treatment are explored. This includes developing new technology for disease screening, discovering new biomarkers that are mechanical and/or pathological, and exploring new technological solutions to effectively eradicate diseases.

- Medical devices and technology, which focuses on enhancing healthcare and well-being of the population through technological revolution. A significant aspect is the biomechanics of human motion for the elderly and mobility impaired. Collaboration with clinicians to identify and address end-user problems in healthcare is also made.

- Medical imaging and bio-signal processing, where AI is adopted to enhance medical imaging analysis and bio-signal data processing. Novel AI models and algorithms are utilised to improve the accuracy and efficiency of medical image reading.

MET

INAUGURAL WORKSHOP

MERCi

The MET hub strives to translate engineering and technological solutions into practical solutions. Hence, one key activity is to establish collaborations with healthcare institutions, along with medical devices and healthcare-related industry partners for resource and expertise sharing, and to identify and address current and future healthcare issues. The hub also aims to become a platform for undergraduate and postgraduate students interested in biomedical engineering research to tackle real-world clinical and healthcare challenges.

One of MET hub's initiatives is to organise annual workshops for students, academics, and industry professionals. The themes for these annual workshops vary each year and are aimed at equipping participants with cutting-edge knowledge and practical skills that are relevant to solving problems in healthcare. The MET hub conducted its inaugural workshop on the 13th of November 2024, that featured sessions on computational modelling, AI in healthcare, and hands-on applications such as motion capture and mechanical ventilation. As it grows, the MET hub envisions expanding these annual workshops into a comprehensive summer school to attract participants from around the world. Due to aligned pursuits, the MET hub also supports the Medicine-Engineering-Information Technology Research Collaboration Initiative (MERCi), a joint initiative by the School of Engineering, School of Information Technology and School of Medicine to address unresolved clinical challenges.

A Mindset of Discovery: The World Through a Researcher's Eyes

Written by Wei Zhe Ng
PhD Candidate - Chemical Engineering

Have you ever noticed that when someone questions your research, there is always a lingering doubt in your mind? No matter how much you know, you never quite feel like you have all the answers. The vastness of your field can feel overwhelming, and every unexpected question reminds you that the road to understanding is endless. But what if true research is not about knowing everything? What if the real mark of a researcher lies not in the sheer volume of facts stored in their mind but in their ability to approach problems critically and methodically?

At its core, research is more than just data, experiments, and publications. It is a way of thinking that goes beyond the lab, uncovering hidden patterns and refining approaches. Research is often seen as formal and controlled, but it is also part of everyday life, influencing routine decisions without us realizing.

Consider: how much sleep do you need to function without craving an afternoon nap? Through personal experimentation, you likely have a rough answer. When choosing where to eat, you instinctively analyze various data points to make an informed decision. Before an exam, you might experiment with different rituals. These small trials follow principles of observation, hypothesis, testing, and conclusion. This is the essence of research: an ongoing, iterative process dedicated to enhancing our comprehension of the world. The distinction between a researcher and others lies not in the presence of specific habits, but in their profound awareness. A researcher discerns patterns, interrogates assumptions, and fine-tunes their methodologies to extract meaningful insights from the seemingly ordinary.

Recognizing that research is everywhere can shift the way we see our journey. The frustration of not knowing everything is not a weakness; it is what makes a researcher. Research growth is not about reaching an endpoint but about sharpening problem-solving abilities, pattern recognition, and adapting to new information.

So, when feeling lost in your field, remember research is about asking the right questions. In lab, at dinner, or in daily rituals, researcher's mindset shapes how we see the world.

#research is everywhere #dailyresearcher

Rethinking Research Impact: Beyond Metrics

Written by Janice Leong
PhD Candidate - Chemical Engineering

Impactful research is more than just publishing in high-ranking journals; it is the driving force behind groundbreaking discoveries, technological advancements, and transformative changes in industry, policy, and society. True research impact shapes scientific knowledge, drives innovation, and addresses real-world challenges, leaving a lasting imprint beyond academia. Effective research addresses pressing challenges, introduces novel methodologies, and, although perhaps less common today, still importantly seeks to uncover the fundamental principles of natural systems that govern the universe and to generalize them.

Today, research impact is commonly assessed through various quantitative metrics. Among these, the Impact Factor (IF) is one of the most widely used indicators of journal quality. It measures the average number of citations received by articles published in a journal over a specific period, typically two years. While metrics like IF provide a measure of research influence, they fall short in capturing the broader significance of research.

An example is the work of mathematician Zhang Yitang, who made a groundbreaking breakthrough in 2013 by proving that there are infinitely many pairs of prime numbers with a bounded gap, an achievement that had eluded mathematicians for centuries[1]. His work had profound implications across multiple areas of mathematics and computational science. Yet, despite its significance, Zhang's research was published in a journal with a modest IF, highlighting the limitations of IF-based evaluation.

In today's academic landscape, publishing in high-ranking journals is strongly encouraged and often rewarded. While the pressure to pursue prestigious metrics is undeniable, we must not lose sight of what truly matters. Impactful research is not defined by numbers alone; it is measured by the knowledge it uncovers, the innovations it inspires, and the lasting changes it brings to the world. After all, the most transformative discoveries are not always the ones with the highest citation counts or those published in journals with the highest IF, but the ones that redefine how we understand and shape the future.

(1) Vermillion, J. (2022) The Fast Food Working Genius, Medium. Available at: https://medium.com/illumination/the-fast-food-working-genius-8dc0f156c5bb

In a Pact for Impact: A Budding Researcher's Perspective

Written by Darren Low
Final Year PhD Candidate - Chemical Engineering

Transitioning from undergraduate to postgraduate studies presents its own set of challenges and hurdles. As undergraduates, we were primarily exposed to knowledge and skills within our chosen discipline, rarely venturing beyond it. Graduate research, however, introduces an entirely new dimension filled with unknowns, surprises, independence, camaraderie, and steep learning curves. Yet, these additional years provide valuable opportunities to develop transferable skills such as critical thinking, discipline, management, teamwork, and, most importantly, effective communication.

Effective communication is one of the most sought-after workplace skills and should be developed early. Research provides a relatively safe space to practice articulating ideas, discoveries, and challenges to diverse audiences. Strong communication also opens the door to collaboration—an essential aspect of impactful research.

Collaboration in research can be transformative. It enriches projects, broadens knowledge, and often leads to future opportunities like new initiatives, supervisory roles, or job placements. Working in teams brings together multidisciplinary perspectives that enhance understanding and problem-solving. These diverse viewpoints strengthen both the justification and impact of a project. Research outcomes are significantly improved when expertise is shared across teams with aligned goals.

Collaborations occur at various scales, from interdisciplinary and interdepartmental to institutional, industrial, and international. But international isn't inherently superior. Effectiveness depends on the project's goals and needed expertise. No researcher works in isolation; teamwork remains the foundation of impactful research. Communication and teamwork naturally flourish through collaboration, encouraging meaningful professional relationships and better outcomes.

In my journey, I have had the privilege of contributing to complementary projects alongside my doctoral research in rubber and polymeric composites. Through communication and networking, I connected with key industry players who supported my work with essential resources. My side projects have also involved close collaboration with experts across mechanical engineering, biology, pharmaceutical sciences, and even aerospace, leading to real innovation and discovery.

Monash University actively fosters collaborative research. As early-career researchers, it's our responsibility to initiate and leverage these opportunities, contributing to a collective vision for society's betterment. We can do better.

~ Ancora Imparo, e dovresti farlo anche tu ~
(~ I'm still learning, and you should too~)

Should the fool persist in his folly, he would … run out of time?

Written by Hanin Izzeldin
PhD Candidate - Electrical Engineering

At what point do you think it best to move on from a method you're trying? Maybe when you're bleary-eyed, caffeinated up to your gills, and pulling your 10th all-nighter in a row (please do not do this), and you find that your 16th trial gave you no significant results? No? Well, how about when you relay that to your supervisor and get the impression they're looking at Sisyphus? You might want to let that rock go.

Ok, so what about its core? There's no need to nix the whole thing. Let's find a new method, yeah? It took Tesla seven years before he could test and prove AC-powered motors. Gaitsgory funnelled thirty into the Langlands program, so surely you should keep going, right?

Now, Tesla and Gaitsgory had the systematic knowledge to back them up. Floundering about when your basic theory is, at best, a C average is draining your finances and your days. Of course, you could eventually get the results you need through sheer will, supplementing with whatever paper or background knowledge on a need-to-know basis. "He would become wise," you tell yourself after another day's work amounts to what's basically half a high-schooler's overnight physics paper. But before you gear up for round 17, how sure are you that your tenacity shows resilience rather than futility?

There's more to research than perseverance, and knocking on the door of the same topic that's been done to death back in 2003 might not be the right play here. Could there possibly be more to what's currently known? Of course! 'Revivals' of well-established areas happen for a reason. They can lead to interesting finds, but are you presently positioned for that? If needed, can you pour seven or thirty years of your life into preparation for that, or are you racing against deadlines? Are you willing to drop them all for the chance? Maybe this ground-breaking find can help you 'start up' your way to success, or a company can pluck you from where you're standing. But if you don't, having to scrape together every shred of data you've got to date and slap on a heuristic just to show something doesn't feel good.

A touch of realism is needed to make sure you're on track to some semblance of beneficial results rather than just wandering blind. Do not fully douse any ambition—if you've got a clear picture in your head and you're determined, then by all means, keep at it! But keep in mind the risks, and make sure you realise exactly what you stand to lose alongside anything you can gain.

Funny enough (not really), they're almost always financial.

Introducing the

INDUSTRY DOCTORAL PROGRAMME

with Joshua Liew

Can you briefly explain how your programme works and what your research/project is about?

The Industry Doctoral Programme fosters collaboration between academia and industry. These types of collaboration often stem from an industry partner seeking a particular solution for a problem, thereby engaging researchers, such as PhD students, to develop solutions for their use cases. In my case, the project focuses on developing a waste monitoring solution using AI and drones to modernise and enhance waste management, making it more efficient. The solution includes a smart waste monitoring module, a website with data analytics and heatmap visualisation, and a mobile app to manage the system.

How does your research contribute to solving real-world problems in the industry?

Waste monitoring in cities is often manual and labour-intensive. Using AI and drones to automate waste monitoring, my research aims to create cleaner streets and improve operational efficiency. Beyond the AI model developed for waste monitoring, another aim is to develop end-to-end solutions for the authorities to easily manage detected waste with tools such as a website with data analytics, mobile app control of the waste monitoring module, and alert systems on messaging applications.

What motivated you to pursue this programme, as opposed to a traditional academic PhD programme?

I was drawn to this programme for the opportunity to apply research in the real world. The chance to collaborate with industry partners and learn how the industry operates also excited me. I wanted to see my research lead to tangible solutions, similar to how influential companies like OpenAI turned their research ideas into practical applications in the industry.

How closely do you work with industry professionals on your research, and what role do they play in your project?

I have realised that the industry often prioritises speed and feasibility of applying research solutions, while academic research focuses on novelty and advancing knowledge. Industrial applications also tend to require a different set of criteria, such as reliability and ease of implementation. Nevertheless, there is an overlap in academic and industrial research, where

both areas require constant curiosity, a strong emphasis on problem-solving with cutting-edge solutions, and critical thinking to tackle challenging problems.

Do you feel that your industry-based research is different from traditional academic research in terms of objectives or outcomes?

I have realised that the industry often prioritises speed and feasibility of applying research solutions, while academic research focuses on novelty and advancing knowledge. Industrial applications also tend to require a different set of criteria, such as reliability and ease of implementation. Nevertheless, there is an overlap in academic and industrial research, where both areas require constant curiosity, a strong emphasis on problem-solving with cutting-edge solutions, and critical thinking to tackle challenging problems.

What skills have you gained so far that you think are unique to the Industrial PhD pathway?

Project management has become a key skill, as I assist my supervisor in planning and managing the project, such as its budget and timeline, to meet both academic and industry expectations. This experience has taught me how to balance resources, set realistic milestones, and adapt to unforeseen challenges. Additionally, I've learned a lot about how to engage with the industry and build relationships with stakeholders, along with developing the ability to communicate complex ideas to non-expert audiences, which is essential for bridging the gap between research and real-world applications.

What are some challenges you have faced that you think students in traditional PhD programmes might not encounter?

I feel that greater attention must be paid to the feasibility of a research idea. From personal experience, real-world constraints such as computational power and energy usage must be considered. Additionally, balancing academic research with the expectations of the industry partner is a challenge, as every industry partner has different requirements and deliverables. Nevertheless, I have enjoyed my journey thus far and look forward to continuing my research journey.

what's next?

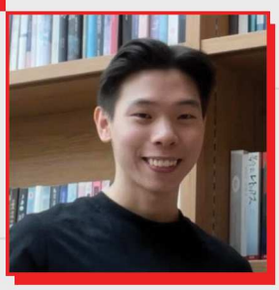
GRS Feature

Zakia Hussain (Robotics & Mechatronics Engineering)

The final year of a PhD is a constant juggling act, managing thesis deadlines, drafting manuscripts, and preparing for the next career step, which often feels like starting a new chapter in life. I aspire to become an academic and continue my research in rehabilitation technology, with the aim of restoring mobility and improving lives. As I near the end of my PhD journey, I am focusing on securing a postdoctoral or lecturer position, strengthening my publication record, expanding my professional network, and refining my research vision for the next stage of my career.

Crystal Thew (Chemical Engineering)

My PhD journey has been dedicated to exploring how enzymes can break down plastics, turning a major environmental challenge into a sustainable solution. Seeing the potential of enzymatic biodegradation firsthand has strengthened my passion for tackling plastic pollution with biotechnology. As I complete my PhD, I look forward to applying my expertise to real-world challenges - whether through postdoctoral research or industrial collaborations. I look forward to contributing to practical and meaningful solutions in sustainability.



Michael Ho (Mechanical Engineering)

As a final-year PhD student in mechanical engineering, I'm excited to use what I've learned to tackle real-world challenges in industry. Instead of staying within the confines of research, my goal is to work closely with industries to solve practical problems and push technology forward. I'm driven by the idea of turning complex engineering concepts into meaningful advancements that make a real difference in the world and help shape the future of various industries.

Ervin Tiu (Civil Engineering)

My research journey has been a transformative experience, shaping my aspirations and future direction. With a strong passion for both academia and entrepreneurship, I have outlined a long-term vision beyond my PhD. I plan to gain experience bridging the gap between research and real-world applications, while also exploring entrepreneurship in areas that align with my research interests, such as waste materials. Over time, I hope to grow the business, establish a strong presence in the industry, and drive sustainable innovations that create a lasting impact. While plans may evolve - "things don't always go as planned" - I believe in the importance of having a clear direction, because, as the saying goes, "If you fail to plan, you're planning to fail".

Min Khant (Mechanical Engineering)

I can't believe I'm almost at the finish line of my PhD and it's honestly been quite a journey! There've been ups and downs, but I've learned so much—about research, working with others, and myself. I've been lucky to work with great peers and mentors who've really helped shape this experience. I'm excited (and a little nervous!) about the next chapter, but one thing's for sure—I'd love to stay in academia, where I can combine research with teaching—two things I've really come to love. Fingers crossed for the next adventure!

Hamza Zubair (Civil Engineering)

My PhD research explores how flexible working arrangements can be leveraged to reduce urban traffic congestion. The shift in work culture, accelerated by the COVID-19 pandemic, has presented a unique opportunity to examine the long-term transport and urban planning implications of flexible work practices. This research addresses a real-world challenge while contributing to the promotion of sustainable and resilient urban mobility.

As I approach the completion of my PhD, I am preparing for the next phase of my career. I am keen to pursue a postdoctoral or lecturer position where I can continue to work at the intersection of policy, research, and planning, contributing to the development of future-ready and adaptable transport systems.

GRS ACHIEVEMENTS

Abdulwaheed Tella
Best Student Paper Award, IWGRS2024

I am honored to receive the Best Student Paper Award at the *IEEE Workshop on Geoscience and Remote Sensing (2024)*, held at Universiti Teknologi MARA, Malaysia. The conference brought together researchers and innovators to discuss advancements in geospatial technology and its societal impact.

Our paper, *"Delineating Historical Flood Extents in Kuala Lumpur Using Google Earth Engine: A GeoAI-Based Investigation of Contributing Factors,"* demonstrated how GeoAI and Google Earth Engine can enhance flood analysis, climate resilience, and disaster risk reduction. Presenting my research and engaging with experts from around the world was truly rewarding.

The event fostered meaningful collaborations and reinforced the power of geospatial research in tackling global challenges. This milestone strengthens my dedication to geospatial analysis and flood risk management innovation. I am deeply grateful to my mentors, collaborators, and the scientific community for their support, guidance, and inspiration along this journey.

Zakia Hussain
Best Paper Award, IECBES 2024

Receiving the Best Paper Award at the *8th IEEE-EMBS Conference on Biomedical Engineering and Sciences (IECBES 2024)* was an incredibly rewarding experience. This year's theme, Healthcare Evolution through Technology and Artificial Intelligence," fostered insightful discussions. My presentation, *"Muscle Power Adaptations in Healthy Males Across the Lifespan During Sit-to-Walk Motion,"* explored how aging affects muscle groups unevenly, offering biomechanical insights to improve mobility and reduce injury risks. Being part of the working committee was an enriching experience, offering a glimpse into how collaboration shapes impactful scientific exchange. Listening to the presentations from around the globe underscored the power of research in advancing healthcare, enhancing quality of life, and driving innovation through collaboration.

Jun Cheng Kho, Absam Moosa Ali, Assoc. Prof. M. E. Raghunandan

Gold Medal Win, MRC-IIE 2024

Our team - Assoc. Prof. M. E. Raghunandan, Jun Cheng Kho, and Absam Moosa Ali—won the Gold Medal award during the *4th Malaysia Road Conference - Invention and Innovation Exhibition (MRC-IIE 2024)*, held as part of the 12th Malaysian Road Conference.

At the exhibition, we showcased the *Smart Soil Moisture Management System*, an innovative solution designed to regulate subsurface temperature by managing soil moisture — ultimately mitigating the effects of the Subsurface Urban Heat Island (SUHI) on infrastructure.

The system utilises a network of temperature sensors strategically placed within the soil to monitor heat flow. Based on the data captured, water is distributed through an existing wicked drain system to maintain optimal moisture levels. This achievement highlights the growing potential to minimise heat-related damage to infrastructure, thereby extending structural lifespan while preserving the soil's mechanical integrity.

We thank the conference organisers (https://12thmrc.com/about) and Monash University Malaysia for providing a platform to develop and showcase this work, contributing to climate-resilient infrastructure development.

Afnan Ahmad

3rd Place Award, AAC2024

I recently had the pleasure of attending the *13th Asian Aerosol Conference (AAC)* in Sarawak, held from November 3rd to 7th at the Borneo Convention Centre Kuching (BCCK). It was an incredible experience, and I was thrilled to present my research titled "The Assessment of Aerosols Originated from Construction Activities: A Case Study in Kuala Lumpur." Being part of such a prestigious event was truly rewarding, and it was an honor to compete among 58 exceptional researchers from 13 countries. I was delighted to secure 3rd place, which is a significant milestone in my research journey. The conference offered a great chance to interact with top experts, share ideas, and build stronger research connections. Meeting peers and mentors in person significantly enriched my professional network. Overall, AAC 2024 was an unforgettable journey that deepened my passion for environmental sustainability research and left me excited for the future.

Global Mobility

MONASH AIRLINES

FROM **KUL** KUALA LUMPUR

TO **GBR** UNITED KINGDOM

PASSENGER
SIA CHIN SIEW

DEPARTMENT
CHEMICAL ENGINEERING

COUNTRY
UNITED KINGDOM

UNIVERSITY
IMPERIAL COLLEGE LONDON

As a PhD researcher in chemical engineering, I had the incredible opportunity to participate in a global mobility program at Imperial College London, working under the esteemed Professor Rongjun Chen in the Department of Chemical Engineering. This experience was a transformative chapter in my academic journey, allowing me to collaborate with world-class researchers, and broaden my scientific perspective.

At Imperial, I was able to expand my work by integrating advanced biomaterials and nanomedicine approaches, leveraging the department's expertise in controlled drug delivery and bioengineering. The interdisciplinary environment fostered intellectual exchange and hands-on experimentation, allowing me to refine my techniques, explore new possibilities, and even develop a collaborative project which we are actively working on now, merging our expertise for innovative drug delivery solutions.

Beyond research, this experience allowed me to immerse myself in an international academic culture, where I engaged in discussions with leading experts, postdoctoral fellows, and fellow PhD students from diverse backgrounds. During the team building activities, I was able to really get to know the group not only academically but also personally fostering lifelong friendships.

This mobility program was not just about academic growth—it was a journey of professional and personal development. Navigating a new research environment, adapting to different methodologies, and networking with experts provided invaluable insights that will shape my future career. I return with a fresh perspective, new collaborations, and a deeper appreciation for global scientific cooperation.

Spending time at the University of Warwick through the GRS Global Mobility Programme was an incredibly rewarding experience that allowed me to step into a new academic environment, engage with world-class researchers, and explore different perspectives on my work. Being immersed in a setting that fosters innovation and collaboration pushed me to think beyond conventional approaches in sustainable concrete materials. I had the opportunity to discuss cutting-edge research with experts, refining my understanding of fibre-reinforced concrete while also exchanging ideas that could shape future advancements in the field.

Beyond the academic experience, living in the UK offered countless memorable moments. One of the highlights was attending a Premier League match at the Etihad Stadium, an experience that brought an entirely different kind of excitement. The roar of the crowd, the intensity of the game, and the energy in the stadium were exhilarating. Watching some of the world's best footballers play live was surreal, and it was a moment that truly captured the passion and culture surrounding the sport in England.

Looking back, this mobility programme was more than just a professional milestone. It was a journey that broadened my outlook, strengthened my global network, and gave me experiences that I will always cherish. The friendships I built and the perspectives I gained have left a lasting impact, and I am confident that this experience will continue to shape my academic and professional path in meaningful ways.

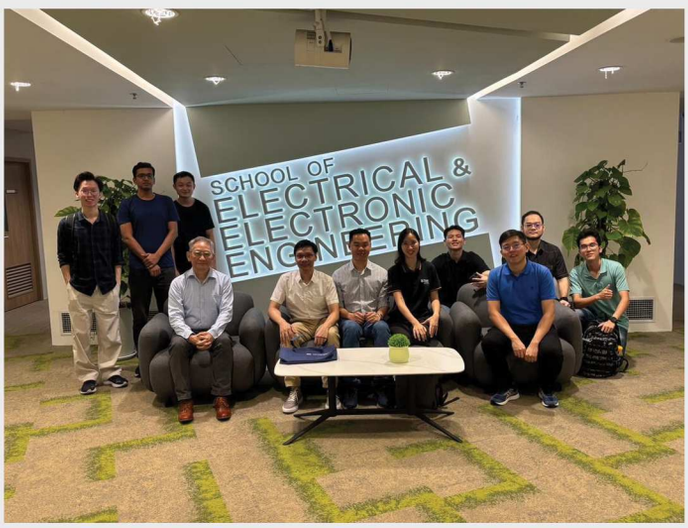
EVENT HIGHLIGHTS

a lookback on the latest events around campus!

IEEE-PELS NUS-Monash University SBCs Joint Workshop

The School of Engineering team, led by Dr Oon Cheen Sean, Dr Chan Ping Yi, and Dr Andrew Xavier Raj Irudayaraj, recently completed a fruitful and enlightening three-day experience in Singapore.

On 28th November 2024, the team participated in the IEEE-PELS NUS-Monash University SBCs Joint Workshop on Power & Energy Systems, held at the National University of Singapore and featuring Associate Professor Sanjib Kumar Panda. The workshop facilitated insightful discussions on power electronics, renewable energy integration, and smart grid technologies, bringing together researchers and students from both institutions. Appreciation is extended to the organising team for hosting such a collaborative and inspiring event.



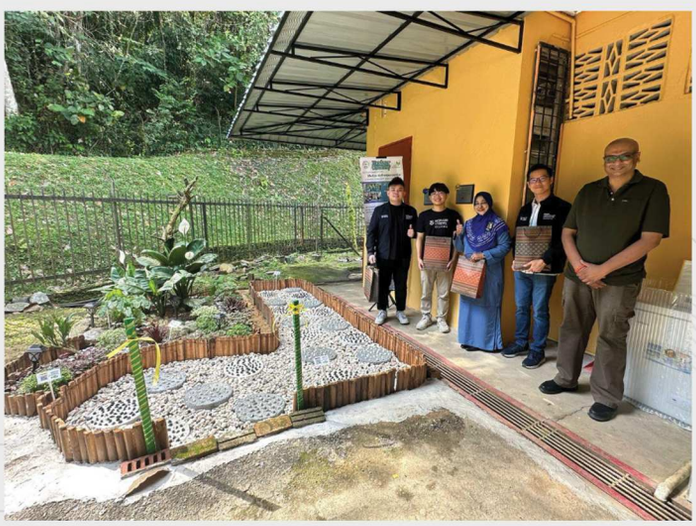
The learning journey continued on 29th November with two significant site visits. At the Electric Power Grid Competency Centre (EPGC) on Jurong Island, participants explored advanced testing facilities and engaged with cutting-edge developments in power grid innovation. Gratitude is expressed to Dr. Veerapandiyan Veerasamy (Research Fellow, NTU) for facilitating this insightful visit.

Later, a visit to the NTU Clean Energy Research Laboratory provided valuable exposure to leading clean energy research initiatives, hosted by Professor Hung Nguyen D. The experience offered an exceptional opportunity to deepen understanding and foster future research collaborations in sustainable energy technologies.

Eco-Reflexology Garden Community Project

The Eco-Reflexology Garden at Rumah Pandu Puteri Selangor, in Bukit Gasing, Petaling Jaya, Selangor, Malaysia, is a University-Social-Responsibility innovation project, aimed at promoting sustainability and environmental stewardship through creative landscaping and youth participation. The project was initiated through an invitation from the Selangor State Commissioner of the Girl Guides Association of Malaysia – Selangor Branch, Pn Aisah Ibrahim, to the Monash Climate-Resilient Infrastructure Research Hub (M-CRInfra). Undertaken under the guidance of A/Prof Sudharshan N. Raman, the Director of the Research Hub, the project reflects Monash's commitment to impactful community engagement.

The Project was spearheaded by Davies Kok Yaw Chung (PhD Candidate, Civil Engineering) as the Project Leader, and Ervin Shan Khai Tiu (PhD Candidate, Civil Engineering) as the Deputy Project Leader, and the team included fellow researchers from the Monash Climate-Resilient Infrastructure Research Hub (M-CRInfra), Syed Roshan Zamir Hashmi (PhD Candidate, Civil Engineering), Wong Shi Hong (MEngSc Candidate, Civil Engineering), and Myat Min (Civil Engineering undergraduate student). Over the course of three months (December 2024 – March 2025), the Team supported and mentored a group of Girl Guides aged between 14 and 16, in the development of reflexology blocks for the eco-reflexology garden at the Girl Guides House in Petaling Jaya, Selangor. The eco-reflexology blocks system was developed using novel green cement variations (known as Monash-sCem©), which were synthesised using high-volumes of industrial by-products (between 50-90%), developed through the PhD research of Davies Chung and Ervin Tiu at Monash, and a porous aggregate system designed by Syed Roshan Zamir Hashmi.



To mark the culmination of the project, a virtual sharing session (Webinar) was organised on 27th February 2025, where Davies Chung and Ervin Tiu delivered keynote presentations on "Sustainable Innovation in Community Projects" and "Climate Resilience through Industrial Innovation". The Webinar attracted more than 140 participants, which included Girl Guides from all over Malaysia.

The ECO Reflexology Garden stands as a testament to collaborative action, merging technical expertise and youth enthusiasm to create a meaningful and lasting impact on the community.

Engineering Research Opportunities for High School Students (EROHSS)

The closing ceremony for the Engineering Research Opportunities for High School Students (EROHSS) 2024 programme on March 15th, 2025, marked the conclusion of the eight-month-long programme, held from July 2024 to February 2025. EROHSS 2024 saw the participation of over 50 students from six high schools across the Klang Valley, where they were exposed to university research under the guidance of Monash academics and GRS, who enthusiastically mentored the students to achieve a fulfilling experience. On the day, the students participated in poster and oral presentations to present their research findings, which were evaluated by both Monash academics and GRS to provide the students with insightful feedback. These presentations exhibited a myriad of research areas, such as the Internet-of-Things (IoT), biomedical engineering applications such as drug delivery, photocatalysis for sustainable energy generation, and sustainable solutions for green building applications, to name a few.

Sustainability Educators Training MUM 2024 – Unlock Your Inner Child!

The Sustainability Educators Academic Workshop held on 29th October 2024 at Monash University Malaysia offered a refreshing approach to reimagining classroom experiences for both students and educators. Led by MUM Education Academy Fellow, Dr. Poovarasi Balan alongside a vibrant team of academic and student partners across various backgrounds, the event was a testament to the core principle of UN SDG 17, Partnership for Common Goals. Through creative and mind-stimulating activities, such as LEGO city-building, clay modelling, escape room challenges, and concept mind-mapping about sustainability in education, participants explored various sustainability concepts while rediscovering their inner child. These activities allowed participants to explore youthful approaches to empower the next generation of students. Furthermore, the activities were reinforced with in-house case studies, knowledge sharing, and inspiring talks that successfully fostered a collaborative spirit amongst the diverse participants in an interactive way. The event also engaged external participation from universities and partnering industries, making it a resoundingly successful occasion.

Monash Symposium on Climate-Resilient Infrastructure (M-CRInfra2024)

In recent decades, global warming and climate change have become significant issues, with rising temperatures, changing weather patterns, and climate-related disasters. The construction and infrastructure industry is vital for the economy and job creation, making the development of climate-resilient infrastructure essential to protect against these threats. The 1st Monash Symposium on Climate-Resilient Infrastructure (M-CRInfra2024) addressed these challenges, featuring about 27 distinguished speakers who shared ideas and innovations. The event brought together 123 participants from nine countries over three days to discuss climate change impacts on infrastructure in Southeast Asia and beyond. The symposium also launched the Monash Climate-Resilient Infrastructure Research Hub (M-CRInfra), dedicated to innovative solutions for climate-resilient infrastructure. This initiative was officiated by Professor Emeritus Dato' Dr Adeeba Kamarulzaman, President and Pro Vice-Chancellor of Monash University Malaysia, Her Excellency Danielle Heinecke, Australian High Commissioner to Malaysia, and Professor Anthony Guo, Head of School of Engineering, Monash University Malaysia.

Associate Professor Sudharshan Raman
Head of the Department of Civil Engineering
Director of the Monash Climate-Resilient Infrastructure Research Hub (M-CRInfra)

Associate Professor Mavinakere Eshwaraiah Raghunandan
Deputy Director of the Monash Climate-Resilient Infrastructure Research Hub (M-CRInfra)
Organizing Chair of the 1st Monash Symposium on Climate-Resilient Infrastructure (M-CRInfra2024)

INTRODUCING OUR

NEW ACADEMICS

Dr Wail Gourich (Joined on 2 April 2025)
Lecturer
School of Engineering

Dr Wail Gourich obtained his PhD and Bachelor's Degree (Hons) in Chemical Engineering from Monash University Malaysia. His research interests include the processing of oils and fats for food and fuel applications, as well as life cycle assessment. Additionally, Dr Wail has extensive experience in managing and supporting industry-funded projects focused on pilot-scale process configuration, operation and optimization. Dr Wail now joins the School of Engineering as a Lecturer, where he will contribute to teaching within the Department of Chemical Engineering and be actively involved in research through the Monash-Industry Plant Oils Research Laboratory (MIPO).

Dr. Karim Sherif Mostafa Hassan Ibrahim (Joined on 3 February 2025)
Lecturer (Practice)
School of Engineering

Dr Karim Sherif Mostafa Hassan Ibrahim holds a PhD in Civil Engineering from Universiti Tunku Abdul Rahman (UTAR) and a Bachelor's degree (First-Class Honours) from Universiti Tenaga Nasional (UNITEN), Malaysia. He previously served as a research assistant in UNITEN, teaching foundation and geotechnical engineering subjects, and later as a researcher in UTAR focusing on artificial intelligence and machine leaming applications in water resources and hydrology engineering. He has accumulated several years of experience in engineering consultancy practice, specializing in civil and geotechnical engineering, with renowned engineering consultants, HACENT Consultant San Bhd and Minconsult San Bhd. Dr Karim was actively involved in the design and supervision of foundation and geotechnical engineering works for ECO World Development Group Berhad and Sime Darby Property, during his tenure with HACENT Consultant Sdn Bhd. He also contributed to deep excavation and pipe jacking projects for Indah Water Konsortium (IWK) and Tenaga Nasional Berhad (TNB) during his tenure at Minconsult Sdn Bhd.

Dr Tze Che Van, Catherine (Joined on 16 December 2024)
Lecturer
School of Engineering

Dr Tze Che Van (Catherine) obtained her PhD in Structural Engineering (Earthquake Engineering), MSc in Earthquake Engineering, and Bachelor's degree (Hons) in Civil Engineering from Universiti Sains Malaysia. During her MSc and PhD studies, she worked as a Research Assistant and Research Officer on several research and consultancy projects.

She then transitioned to academia in early 2024, when she joined the Civil Engineering Department of Universiti Kebangsaan Malaysia (UKM) as a Senior Lecturer in Structural Engineering. Dr Tze Che Van (Catherine) will lead teaching and research in advanced structural engineering, seismology, and earthquake engineering within the Department of Civil Engineering here at the School of Engineering, Monash University Malaysia.

Dr. Julian Tan (Joined on 2 September 2024)
Senior Lecturer (Practice)
School of Engineering

Dr Julian Tan joins the School of Engineering at Monash University Malaysia as a Senior Lecturer (Practice) in the Electrical & Robotics Department. With over two decades of experience in Unmanned Aerial Vehicles (UAV) research and development, Dr Julian Tan has collaborated extensively with government agencies, industry partners, and international stakeholders. His expertise spans policy research in the national space and aviation sectors, and he has a strong background in mentoring students and developing innovative engineering courses. His main research interests include Unmanned Aerial Systems (UAS), Advanced Air Mobility, Aircraft Design, CubeSat, and Robotics.

Dr Howgen Pratama Kesuma (Joined on 2 January 2025)
Lecturer
School of Engineering

Dr. Howgen Pratama Kesuma holds a Ph.D. in Electrical and Computer Systems Engineering from Monash University, with expertise in surface acoustic wave (SAW) resonator sensors. His research focuses on innovative sensors (biosensor, gas, environmental sensor, etc.) and semiconductor fabrication techniques, with findings published in leading journals. He previously served as a Research Fellow at Monash University Malaysia, contributing to cleanroom operations, photolithography, and impactful MEMS technology projects. Currently, he is a Lecturer in the Electrical and Computer Systems Engineering (ECSE) department at Monash University Malaysia. His vision is to continue bridging academic research with practical applications in advanced engineering fields and industry.

breakzone

Click on the texts below to visit their respective pages!

1. The top 10 material innovations of 2024
2. 1981 Racing Car Incident Shows Why Invisible Methanol Fires Are So Dangerous
3. How a chemistry professor at MIT accidentally made a Nobel Prize-winning breakthrough
4. How a PhD student's lab size affects their chance of future academic success
5. You're only human: a six-step strategy to surviving your PhD
6. The world keeps running out of helium. There is now a race to prepare for the next shortage
7. Building the world's second tallest skyscraper
8. Inside the extreme life of repairing underwater cables
9. Inside the high tech quest to decode the lost scrolls of Herculaneum