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SYNC

Say Yes N' Collaborate

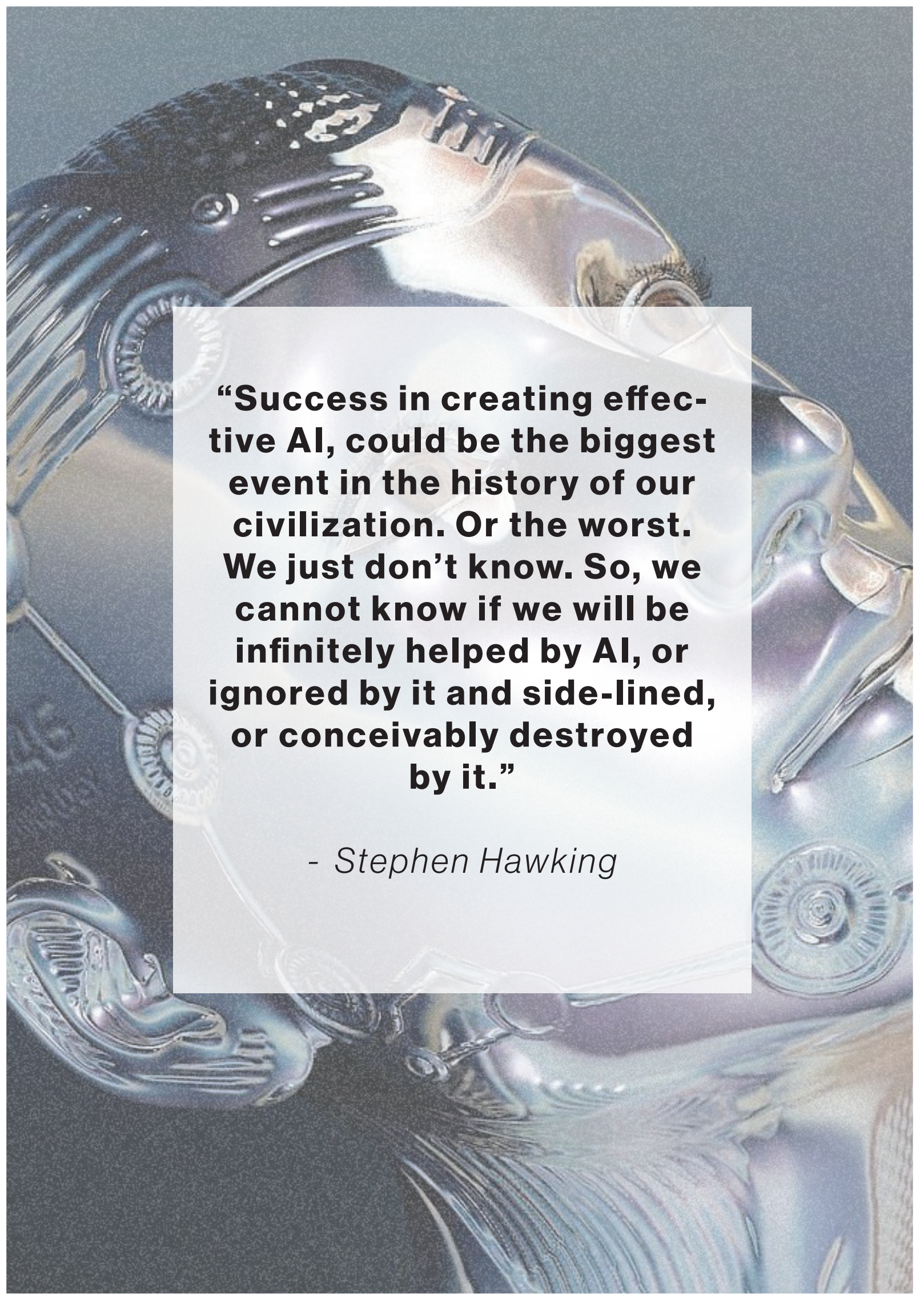
ChatGPT and Artificial Intelligence

AI in education: Friend or foe?

Life outside research: the reality

Will AI replace pilots in aircrafts?

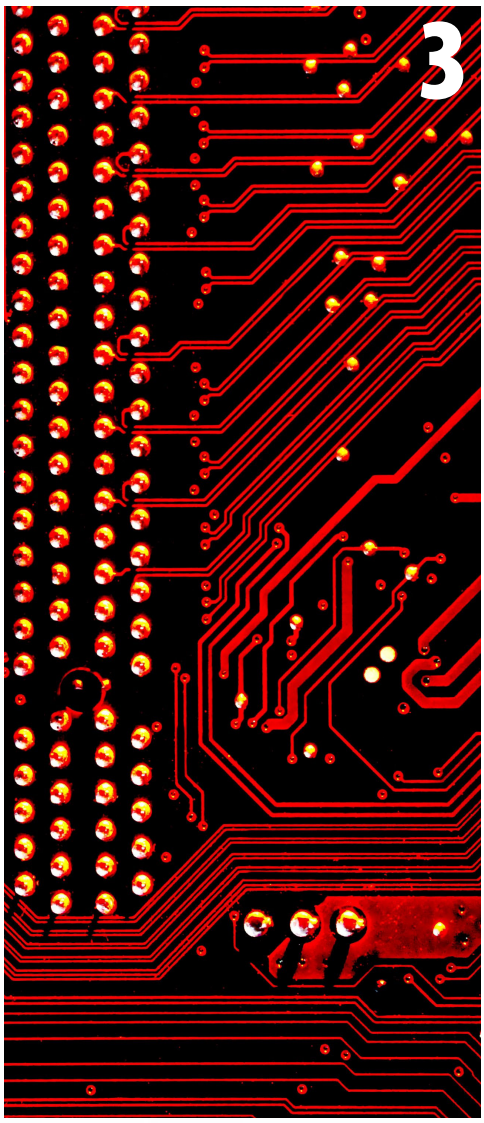
ISSUE 11 | AUGUST 2023

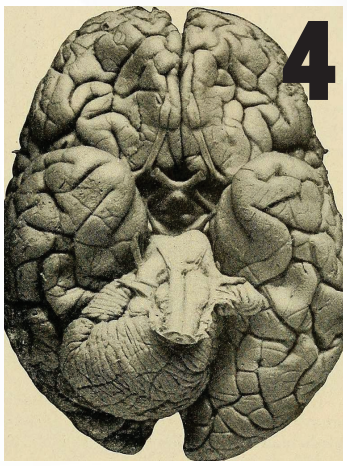


“Success in creating effective AI, could be the biggest event in the history of our civilization. Or the worst. We just don’t know. So, we cannot know if we will be infinitely helped by AI, or ignored by it and side-lined, or conceivably destroyed by it.”

- Stephen Hawking

IN THIS ISSUE





TOP ROW (FROM LEFT TO RIGHT)

Dr Tan Wen Shan | *Advisor*
Dr Mohammed Ayoub Juman | *Advisor*
Dakshina Fernando | *Journalist*
Freddy Phan | *Journalist*
Israq Mohd Ali | *Designer*

BOTTOM ROW (FROM LEFT TO RIGHT)

Emmanuella Widjaja | *Journalist*
Janice Leong | *Editor/Journalist*
Yanru Wang | *Co-editor/Journalist*

Editor's note

Hello, and welcome readers to SYNC, the engineering research newsletter of the School of Engineering (SOE)! We are delighted to introduce our 11th issue with the theme "ChatGPT and Artificial Intelligence (AI)", which we believe is a very timely topic. Let's be honest, we are all blown away by the impressive new conversing bot — ChatGPT.

In this issue, we have a special opinion section featuring a lineup of four academics sharing their thoughts on using ChatGPT for research and academia. Some exciting research works from our researchers at SOE from different engineering disciplines are also highlighted, showcasing how AI is used across diverse applications. For our fellow graduate research students (GRS), here we included some valuable tips from several GRS on time management, and we hope that their insights would offer some help in better managing our time. We also asked GRS about their hobbies and activities outside of research for fun and relaxation!

Lastly, while I've had the pleasure to be the editor for this issue, I will be signing off from SYNC. It was nothing but fun working with SYNC the past three issues and I've learned a lot. I believe that the new team will continue to bring fresh ideas to the magazine, providing an avenue for our engineering community to remain "sync"-ed.

Well, that's all from me. If you're wondering whether I've used ChatGPT to write this article... maybe? ;)

The editorial team would like to sincerely thank all contributors who made this issue possible. We welcome any feedback and/or suggestions through the Google form for our continuous improvement.

Janice Leong
Editor
mum.sync.soe@monash.edu

We want to hear from you!
Submit your thoughts or feedback on SYNC here:

Insights from

The Course Director (Robotics and Mechatronics Engineering), School of Engineering

Dr Alpha Agape Gopalai

It is a great honor for me to be sharing my insights to the SYNC newsletter on the theme "ChatGPT and Artificial Intelligence". This is a timely theme as ChatGPT has generated headlines in many leading news portals months after its initial launch. With the buzz and vast possibilities surrounding ChatGPT, a renewed interest and curiosity in artificial intelligence (AI) has been injected into the lives of people. With AI impacting all facets of our lives - it is impossible to stop the penetration and use of AI in the classrooms, especially ChatGPT.

As an educator, I was taken aback at the thought of a technology that will now help students to complete assessments without having learnt anything from it. But, I realized that AI has already been in our everyday lives. When calculators were first introduced, a heated debate was sparked about teaching and learning math. Today, we are very dependent on calculators and yet it has not reduced our ability to understand and solve complex mathematical concepts — if anything it has helped us do more, given the same amount of time. Hence, I am of the opinion that we should view AI and its very trending "offspring" ChatGPT as a very powerful assistant that could assist us in our productivity.

ChatGPT will definitely change the way we create assessments. It's time we move towards assessments that focus on the higher end of Bloom's taxonomy. This means that assessments should no longer focus on memorizing and providing definitions, instead it should now focus on synthesis, analysis, internalization, and even creation. How would this look like in class you may ask? We could, for example, ask students to use ChatGPT to generate an argument for a certain topic and then get the class to annotate/comment on how effective they thought the argument was. Students can then submit the assignment based on the critique they provided.

What is clear is that ChatGPT and its many forms in the future will continue to be a part of our lives. However, we must not forget the purpose of why we do what we do, be it in research or teaching. We are here to learn and to train/raise a new generation of thinkers/learners - only then will there be progress and new developments. Failing this, we will all just be consumers - with or without AI and ChatGPT.

In this SYNC issue, applications of AI across various engineering disciplines are covered. I hope readers will gain insights into how AI drives advancements in engineering and continues to serve as a powerful tool for scientific and engineering pursuits.

Research Focus

Unraveling the Mysteries of the Human Brain: Advancements in Diagnosing Neurological Disorders

By : Freddy Phan

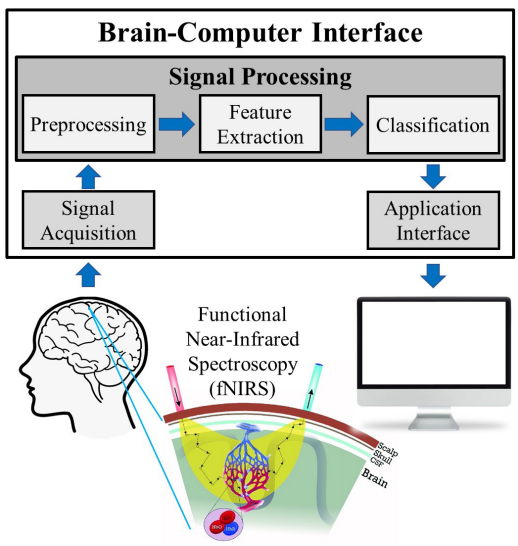
Dr Lim Lam Ghai

(Robotics and Mechatronics Engineering)

The human brain, despite remarkable technological advancements, remains a mysterious realm of scientific exploration, housing the core elements of cognition, emotion, and identity. However, the increasing prevalence of neurological disorders, such as Alzheimer's and Parkinson's diseases, presents a global health crisis. Currently, an estimated 50 million people worldwide live with dementia, with nearly 10 million new cases each year. As life expectancy rises and the global population ages, this trend is projected to surge, causing huge burdens to individuals, families, and healthcare systems.

Diagnosing neurological disorders has traditionally been challenging, relying on subjective observations, limited cognitive tests, and imaging techniques that offer constrained insights into the underlying neurological mechanisms. This approach leads to delayed diagnoses, misdiagnoses, and inadequate treatment plans, negatively impacting the quality of life for those affected and impeding the development of targeted therapies.

Dr Lim Lam Ghai utilizes brain-computer interfaces (BCIs) to identify abnormal functions in the brain. In particular, he investigates the activation and connectivity of the brain during cognitive performance using functional near-infrared spectroscopy (fNIRS). In brief, fNIRS is a non-invasive optical imaging technique that indirectly measures neural activity in the brain via hemodynamic changes. To accomplish this, he uses BCIs to record and analyze brain signals.



Dr Lim's research goal is to translate this technology into clinical use, enabling early diagnosis of neurological disorders. If individuals exhibit signs of cognitive impairment, they can then be referred for further monitoring and treatment. This approach has the potential to save a significant number of human resources. However, the major challenge of this research lies in the signal quality, which often contains a considerable amount of noise and variability. To address this issue, he is exploring machine learning and deep learning algorithms.

Assoc Prof Wang Xin
(Mechanical Engineering)

Research Focus

Advancing AI to Solve Complex Engineering Challenges

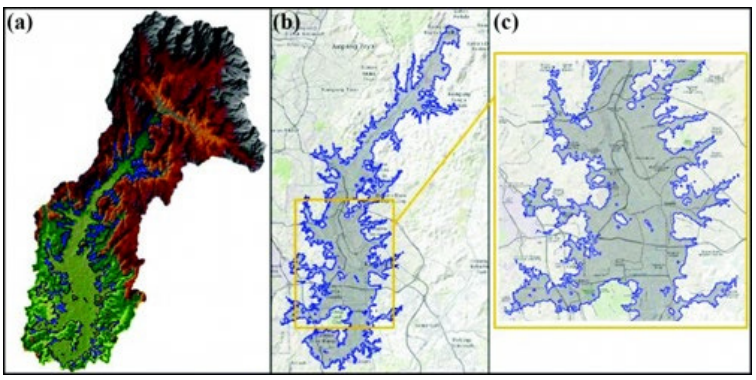
By : Yanru Wang

Artificial intelligence (AI) is developing rapidly due to the rise in the availability of computing power and massive datasets, with a contribution of up to $15.7 trillion to the global economy by 2030 [1]. These capabilities work well only in controlled test environments, while the engineering problem often occurs in unpredictable and chaotic environments. Thus, the need for developing and deploying AI to adapt to real-world applications is urgent. AI engineering is an interdisciplinary field where AI systems are created in accordance with human needs by combining system engineering, software engineering, computer science, etc.

A/P Wang Xin and her research team specialize in developing AI algorithms to address various engineering problems, including non-destructive detection, image reconstruction, and remote sensing. "AI models can be applied in these environments where the traditional methods cannot solve the problem," A/P Wang Xin said. For example, manual detection of cracks in road pavement is a highly non-trivial task. This can be improved by ~20-30% when AI tools are employed with their increased robustness and noise handling. However, one of the challenges is the availability of datasets when using AI models to solve these problems. Extensive efforts need to be made in data collection and labeling. Additionally, high-performance hardware is required for conducting the training process.

A/P Wang Xin is excited to apply their findings to solve specific problems in the industry. She highlighted the potential of AI-controlled systems to reduce costs, improve efficiency and minimize manpower requirements. Since their research involves multidisciplinary study, she actively encourages her students to foster communication and mutual learning. Furthermore, she closely collaborates with researchers from Australia, United States and China. When asked about the future of AI in engineering, A/P Wang Xin believes that machine learning will continue to address problems that traditional methods cannot effectively solve. Nevertheless, she acknowledges that conventional approaches will still benefit certain engineering challenges.

[1] PricewaterhouseCoopers. "Sizing the prize: What's the real value of AI for your business and how can you capitalise?" Accessed June 26, 2022. Available at: https://www.pwc.com/gx/en/issues/analytics/assets/pwc-ai-analysis-sizing-the-prize-report.pdf



Climate change, coupled with growing urban population and economic development, have led to great uncertainty on the necessary adaptation of the urban environment to flood risk. Flood forecasting systems are urgently needed to provide accurate real-time flood warnings to agencies and the public. This calls for response strategies that manage flood risk in a flexible and holistic way, which requires a portfolio of mitigation and adaptation measures.

A/P Chow Ming Fai's primary research focus is on urban stormwater management. His goal is to develop a sustainable urban drainage system that minimizes flood risks and improves the urban runoff quality by creating a naturally-oriented water cycle while enhancing the amenity of the city. According to A/P Chow, fast and reliable forecasting of flood events is key to saving lives and reducing the risks and damages caused by floods. To achieve this, machine learning has shown great promise to simulate the river flow discharge and water quality. Input data, such as rainfall, river stage and flow data, are required to train the AI model.

Currently, A/P Chow's research team is developing a machine learning-based flood forecasting system to obtain real-time data from different sources to forecast future river stages and high-resolution flood inundation at locations along the river network. Some AI models that are used include artificial neural network, random forest, and random tree, to name a few. More interestingly, the integration of machine learning with Geographic Information System (GIS) and remote sensing can be used to explore the correlation between the change in land-use/cover and flash-flood potential.

Besides, the Malaysian government has initiated the "River of Life" project to transform Kuala Lumpur into one of the most liveable cities in the world. However, the city is still facing challenges in terms of urban river pollution and flooding. Thus, A/P Chow's goal is to develop a guideline on sustainable urban environment for Malaysia in line with the project, which aims to protect the hydrological and ecological values of the urban landscape while providing resilient and adaptive measures for flood management.

Assoc Prof Chow Ming Fai
(Civil Engineering)

Research Focus

Machine Learning for Flood Risk Management

By : Emmanuella Widjaja

Research Focus

Optimizing Palm Oil Mill Effluent Treatment via Physics-informed Neural Network

By : Janice Leong

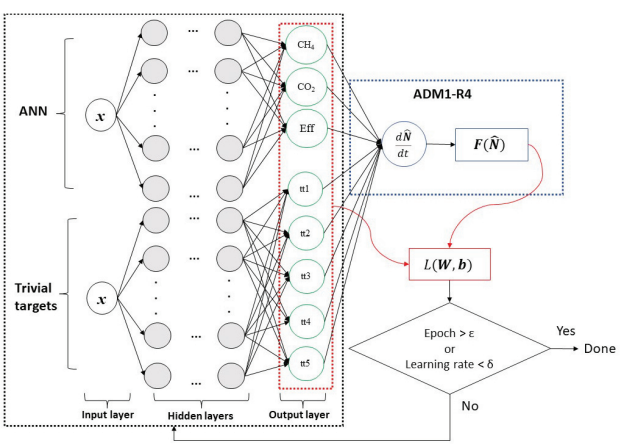
Dr Irene Chew
(Chemical Engineering)

Palm oil, which is derived from fruits of oil palm trees, is primarily used as cooking oil and is used in various food products, cosmetics, and so on. The extraction of these golden oil, however, generates a huge amount of wastewater termed as palm oil mill effluent (POME). While POME is non-toxic, it is an environmental threat when discharged to aquatic systems due to its high oxygen depleting ability. Fortunately, POME can be effectively treated by feeding them to microorganisms for anaerobic digestion, which not only reduces the waste effluent concentration but also yields valuable by-products such as biogas (methane and carbon dioxide) for electricity generation.

As the world strives for a greener future, biogas produced from anaerobic digestion of POME offers a great alternative to fossil fuels. However, large-scale production of biogas from POME is currently infeasible due to its low yields, which is mainly attributed to the lack of comprehensive knowledge of the process hindering an effective optimization. Furthermore, conducting experiments with various factors in search for the optimum conditions is costly and laborious.

With the advent of machine learning tools, Dr Irene Chew employs physics-informed neural networks to predict the yield of biogas and effluent concentration during anaerobic digestion of POME. Her research team scrutinizes the limitations of current physical models, such as the Anaerobic Digestion Model No.1 (ADM1-R4), which exhibits high prediction errors, as well as machine learning models that utilize artificial neural networks (ANN), which can be time-consuming to train.

Thus, Dr Irene's research team employs a hybrid model, termed the ADM1-R4 embedded physics-informed neural network (ADM1-R4-NN), that outperforms the current physical and machine learning models in terms of accuracy and higher efficiency in training. The development of this physics-informed neural network holds great promise and can serve as a significant milestone for modeling the anaerobic digestion of POME.



[1] Statista Research Department and 25, J. (2023) Malaysia: Palm oil share of GDP, Statista. Available at: https://www.statista.com/statistics/952996/malaysia-palm-oil-share-of-gdp/.

SyncGPT

https://opinions.syncai.com

ChatGPT, a generative AI launched in late 2022, has been a hot topic ever since owing to its impressive capabilities. Here, we interviewed four academics: on their take on the use of ChatGPT in the academic and research field.

Dr Tridib Saha
Electrical and Computer Systems Engineering

Dr Joseph Ho
Chemical Engineering

Dr Ayoub
Robotics and Mechatronics Engineering

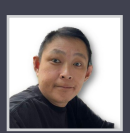
A/P Ooi Ean Hin
Mechanical Engineering

S What's your opinion on using ChatGPT in the academic and research field?

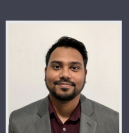
It can be a valuable learning resource if it's used to seek clarifications and explanations. But, if students use it as a tool to generate solutions to their assignments, then the students are denying themselves the opportunity to learn. However, getting ChatGPT to "complete your assignments" constitutes plagiarism and a serious violation to the rules of the university. Misuse of ChatGPT is not limited to students. I believe that raising awareness among students on the benefits of ChatGPT as a learning resource is important.

Generative AI is a fast-evolving field, so my current feelings about it are optimism and caution. Tools like ChatGPT will only get better with time, with newer and more accurate information. Science has always relied on new technologies and tools to make new discoveries; generative AI should not be treated any differently. If it can help improve the quality of scientific research (while maintaining research integrity), I am all for using tools like ChatGPT.

S How does ChatGPT help conduct research or study among researchers and students?



1) Brainstorming ideas, for example, propose a research idea combining two different keywords like "machine learning" AND "rambutan". 2) Write a template or scaffold by referring to the style of high impact factor journals, and it would generate an outline that one could follow during their writing. 3) A more "advanced" search engine, like asking it to explain in simple words (the results may surprise you). 4) Spot grammatical errors or simplify a written passage for a specific target audience, like industry partners.



1) Obtain concise information via proper prompts, saving significant amounts of time. 2) Improve written work by paraphrasing or compressing a written piece of work. 3) Generating and troubleshooting code, so you can quickly get a basic piece of code to be generated for a given task, rather than write it from scratch, making only edits and customization necessary.

SyncGPT

https://opinions.syncai.com

Are there any limitations or disadvantages of using ChatGPT, such as plagiarism detection, ethical issues or over-reliance on it?

We have all read about ChatGPT creating bogus references and making up garbage facts. The bigger problem is that we cannot detect that unless we fact-check everything churned out by ChatGPT. The other issue concerns ethics — claiming a paper written by AI as your own. Things may get more complicated in the future when AI starts exhibiting human emotions. But the bottom line on such breaches is: cheating existed in the past, exists now, and will exist in the future. People will always find innovative ways to do it. So we will have to do better in increasing awareness about the ethical usage of AI, just as we should for other breaches of academic and research conduct.

Since the information is taken from multiple sources, for concepts that are more abstract and need a deeper level of thinking, the information output might not be very correct. As for ethics, most assessments or publications have guidelines that you need to adhere to and declare what Gen AI tools or how you have used them in your work. As far as I'm aware, no current tool can accurately detect if the work done has been generated via AI or self-written, giving a high amount of false positives, making it unusable as a dependable source at the moment.

What are the potential benefits of using ChatGPT in the academic and research field in the future?

AI is already in use in both the academic and research fields whether or not we are aware of it. The corrected suggestions prompted by Microsoft Word and Grammarly are some examples. While these technologies may help to improve the quality of the output, we should be conscious of whether there is an over-reliance that puts less thought on the human mind and takes away our learning opportunities. In this case, does the use of Grammarly help to improve our writing skills or are we just passing that responsibility to the AI algorithm? The same thing can be said of ChatGPT. Students/researchers should be educated on the correct/ethical way of using ChatGPT. If not, the day may come when it is ChatGPT that says "*Ancora Imparo*", instead of us.

I expect newer versions of ChatGPT to be more reliable, and might be able to provide validated citations and references with the results. This might be helpful for literature review, where ChatGPT can serve as a much more efficient search engine. Mainly, I see ChatGPT not as a substitute for the brain, but more like a good substitute for an extra pair of eyes or hands to do the manual labor for us. I've seen videos on ChatGPT being able to effectively summarize the gaps from a paper and suggest future extensions of the work, but I've not been able to test it out yet.

Send a message

Can AI FLY my plane?

By: Dakshina Fernando

I barely trust the pilot to fly me safe. Will I trust an emotionless intelligence to fly me through the skies? This will be the first question that comes with introducing AI to aviation. Historically, aviation has been one of the safest transportation mediums in the world. This means the magnificence of an aircraft does not stand on its flight but its safety. As the saying goes, "numbers don't lie," supports the statement as the statistics show 1.21 accidents per million departures in air transport and 1.3 million deaths per year in land transport. However, 80 percent of the 1.21 is due to human errors. Does that mean AI will do better? "Maybe, maybe not!" Humans were always about breaking barriers. Since we started flying, we have flown past time and the moon, which says something. So why are we scared to let AI take the throttle?

The simple answer is that the situational decision will be logical. In layman's terms, it will not think like a human to save everyone but statistically take the best cause of action it is supervised with. But will it make a good co-pilot? Let's ask an AI; "Flying with AI as your co-pilot is like having a wingman who always got your back, except this wingman doesn't need bathroom breaks!" was what GPT4 had to say about piloting an aircraft, showing that the supervised build of an AI brings the supportive nature from its core. When an AI is the brainchild of a human being, the ideology it carries reduces from being creative to being a suitable support mechanism. Now this, we are comfortable with! Hence comes the autopilot system. Rather than giving full control to an AI, frequent fliers have always been satisfied being flown around by AI while the pilot keeps one eye open. But in critical junctures, even the pilots didn't trust an AI.

Are we ready for AI to take over? This can be answered with Spock's famous words in Star Trek: "Needs of the many outweigh the needs of the few," then the logical answer would be yes, provided that logically AI will save the majority by sacrificing the minority to bring the best outcome in otherwise a catastrophic situation. But by ethical means the answer would be no, where human nature is to do anything and everything in its power to save everyone. As a human pilot would do: use one's heart, alongside the brain!

Is ChatGPT affecting our critical thinking?

By: Dakshina Fernando

Where does innovation begin and where should it take a step back? After introducing $E=mc^2$, Albert Einstein stated that "I do not consider myself the father of the release of atomic energy", but the unstoppable urge of humankind pushed it until the invention of the atomic bomb by Robert Oppenheimer which successfully destroyed Hiroshima and Nagasaki. Hence, the unequivocal control in lengths of innovation is demanded by the mistakes of our history. In the present day, humans have resorted to tasks as simple as switching off lights using 'Alexa' to writing complete system codes using ChatGPT. Day by day AI has gone from a support system to a complete work takeover. How does this affect the thinking and creativity of a human being? Rests a huge question mark in years to come. The only limiting factor of AI has become its self-learning capability. However, today's generative AI has become the nemesis of critical thinkers and the prime of freebees.

The famous quote by tech billionaire Bill Gates states, "I choose a lazy person to do a hard job. Because a lazy person will find an easy way to do it." has been given new meaning through the uprising of AI. In the context of AI, it would be "Choosing the best AI to do the hardest job will find the best solution in no time". When humans resort to finding solutions through AI rather than their own critical thinking, should they be replaced by AI? What is the downside?

The extent of the thinking capability of humans is what has supported it to thrive and to evolve into becoming the apex of nature. This has been the by-product of all challenges thrown towards man, since the stone ages. The critical thinking and engagement towards any problem have brought up people to arm themselves to survive. As the saying goes, "Hard times create strong men, strong men create good times, good times create weak men, and weak men create hard times." The invention of AI can be identified as the best creation of strong men to make lives easier. But how we use AI defines the effect it's going to have on critical thinking.

So how can we thrive with AI? Let the support structure be simply the support structure not the base way of solving a problem. Since, learning from standing without falling to running to using an AI, humans are capable of great things. Why should a species with universe conquering capability defy itself under their own creation? Take the support of AI and create better, think further!

MANAGING TIME AS A GRS

Wail Gourich
2nd Year Chemical Engineering

Wail Gourich is a 2nd year PhD student in Chemical Engineering. His research focuses on palm oil and oleochemical processing. Aside from his PhD studies, Wail assists in tutoring undergraduate students and in emceeing several events within the university. He is also currently an official student ambassador of Monash University Malaysia and has also served as a former MUPA committee member.

In terms of general time management strategies, Wail uses Google Calendar to plan and organize his commitments (both work-related and personal). He also syncs his calendar to his phone so that he can clearly visualize his available time and schedule on the go. This helps him ensure that he doesn't overlook any crucial tasks or accidentally "double-book" his schedule. Additionally, he highlights the effectiveness of preparing a plan for the following day the night before, enabling him to start each day with a clear roadmap in mind. On the actual day, he utilizes WhatsApp to send himself reminders of the tasks he needs to complete.

When unexpected events disrupt his schedule, Wail emphasizes the need to acknowledge that factors beyond our control can and will occur. Instead of dwelling on setbacks, he advises individuals to regroup, reorganize and reprioritize to help them proactively get back on track. Furthermore, he recognizes that experiencing burnout is a common occurrence and suggests taking breaks when needed, allowing oneself to return to work with renewed energy and focus.

Lastly, when reflecting on his own experiences starting his PhD, Wail would offer advice to prioritize "me time" and not compromise on it. He stresses the significance of allocating personal time to engage in activities that bring joy and satisfaction. Moreover, he underscores the importance of prioritizing mental and physical well-being, emphasizing their utmost significance.

Peter Ling
3rd Year Robotics and Mechatronics Engineering

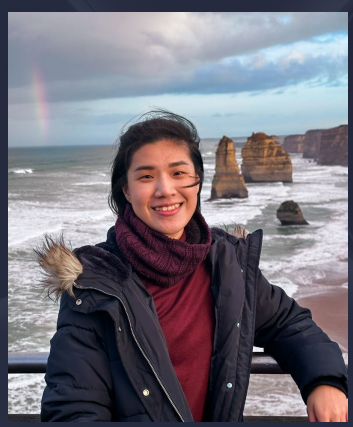
Peter Ling, who hailed from Sarawak, is a final year PhD student in Robotics and Mechatronics Engineering, specializing in vision-based indirect sensing for soft robotic applications. Being passionate about enhancing campus experience for GRS, Peter contributes to the Monash University Postgraduate Association (MUPA) as the School of Engineering Representative. Peter also holds the position of Chairperson in the Institution of Engineering and Technology (IET) Malaysia Network Young Professionals Section.

To manage his schedule efficiently, Peter firstly employs a prioritization system based on urgency and importance, ensuring that sufficient time is allocated to each task. Secondly, he schedules specific time blocks for different activities, guaranteeing that all responsibilities receive proper attention. Digital calendars are handy for Peter to track essential deadlines and events. He also maintains open communication with his supervisors, MUPA committee members, and fellow students. In the face of interruptions, Peter assesses the urgency of the new task, adjusts his schedule accordingly, and proactively communicates with relevant stakeholders to minimize potential impacts on deliverables. Importantly, Peter encourages setting realistic goals. "By setting achievable targets, I can make progress incrementally and maintain a sense of accomplishment," Peter shared. Further, he emphasizes the importance of minimizing distractions, staying organized, and seeking support when needed.

"Time management is a personal journey. It requires trial and error to find the strategies that work best for you. Stay persistent, adapt as needed, and be open to refining your approach along the way," Peter said. He added that taking care of our well-being by incorporating breaks, exercise, and relaxation time into our schedule is important to recharge and maintain a healthy work-life balance. "Celebrate achievements along the way! This will help sustain motivation and enthusiasm throughout your research journey," Peter added.

Dora Lawrencia is a 3rd year PhD student in Chemical Engineering with a strong interest in environmental sustainability. Her research focuses on the biodegradation of water filtration membranes for decentralized water treatment in rural communities to access clean water. Apart from her PhD, Dora interns at the Research Excellence Unit (REU) in the university. There are several sub-units in REU — Grants and Opportunities, Commercialization and The Generator, Strategic projects and Research Insights and Research Skills Development. Dora is part of the Strategic projects team.

"The internship at REU has been great. I wanted to expand my experience beyond academic teaching and learn more about project and research management," she shared. At REU, Dora assisted in the recent Monash Cardiovascular Summit, revamped the Monash research website, and proposed ideas for the GRS induction program. "It was eye opening to see the work and various initiatives that go into shaping Monash's research as it is today," she added. On the time commitment at REU, Dora said that it is roughly the same as tutoring duties. Thus, she strongly encourages GRS interested in research management to take up the internship opportunity at REU.

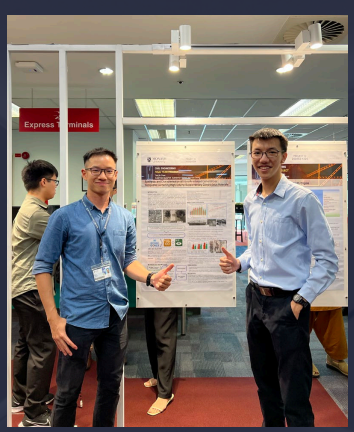


Dora admits that it can be challenging to switch from one task to another and maintain productivity. To organize her tasks, Dora uses an Excel sheet she adapted from "The 7 Habits of Highly Effective People" book. She lists her daily tasks in detail and further breaks them into manageable bits. "It has become a daily habit to check this sheet before I start work in the morning," Dora said. She also uses Asana software, a project management tool, which she picked up during her internship.

3rd Year Chemical Engineering Dora Lawrencia

GRS FEATURE

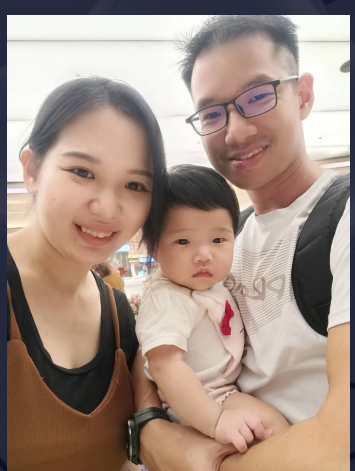
Davies Chung *2nd Year Civil Engineering*



Davies Chung, a father in his 2nd year of PhD in Civil Engineering who spent six years working in the industry, specializes in cementless concrete material reinforced by steel fiber. On top of his PhD studies, Davies has a number of commitments on his plate — teaching, family obligations, inter-university competitions, and more. Here, Davies shared some tips on how he navigated his packed schedule while keeping his PhD study afloat.

Davies believes in using a traditional approach to time management, relying on a journal to record tasks and plan his schedule in advance. By mapping out his days ahead of time, he frees up mental space and ensures that he can focus on accomplishing his predetermined tasks. He sets a target of completing three major tasks each day, which becomes the foundation of his to-do list.

When it comes to categorizing tasks, Davies adopts a method that considers both urgency and importance. He divides his tasks into four categories, ranging from very urgent and very important to not urgent and unimportant. This classification system serves as the basis for forming his daily to-do list. Additionally, Davies schedules his most critical tasks and meetings in the morning, capitalizing on his belief that individuals are most productive during this time. To enhance his focus and performance, he enjoys a morning exercise to invigorate and energize himself for the day ahead.



Based on his own experiences, Davies offers valuable advice to students embarking on PhD or master's programs. He suggests that gaining industry experience before committing to higher studies can be tremendously beneficial. By understanding how their research aligns with the broader industry context, students can produce research that is more focused, relevant, and impactful. Davies highlights the importance of aiming to improve the industry through research rather than merely conducting research for its own sake.

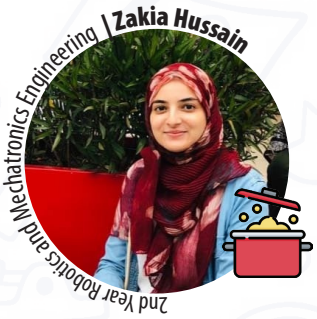
In conclusion, Davies's insights into time management offer a valuable perspective rooted in his experience both in the industry and academia. And by implementing Davies's practical methods and advice, individuals can enhance their own time management skills and increase their overall effectiveness in their chosen fields.

GRS FEATURE

A PhD isn't a sprint or competition. Ups and downs are inherent in the research journey, so it's essential to maintain a work-life balance. Besides research, I love socializing and making new friends. Exploring new places is a weekly task, and going to the gym 4-5 days a week boosts my endurance. Lastly, remember that nature is the ultimate healer.

As a GRS, life can be stressful so I greatly rely on my hobbies to unwind after a long day or sometimes even a week. In my downtime I am an avid PC gamer with a preference towards fantasy and adventure role playing games. My two most favored games would be The Witcher 3: Wild Hunt and Elder Scrolls V: Skyrim. I also enjoy doodling or doing ink drawings, and listening to 80s and 90s music, with a preference for rock and artists such as AC/D, Bon Jovi or Rod Stewart. It's also important to get some exercise and walking helps clear my mind, air my thoughts, and prepare for the research ahead.

Outside of my PhD, I prioritize maintaining a healthy body through activities like running and occasional gym sessions. I am an active member of Weekends Athletics, a running club where we motivate and challenge each other to improve. Engaging in running helps me achieve mental clarity and make better decisions, enhancing my overall productivity and well-being. Moreover, running provides me with increased energy levels throughout the day, enabling me to excel in both academic and personal pursuits.



I believe it is crucial to take breaks from research and engage in leisure activities to rejuvenate your mind and prevent burnout. Although it can be difficult to carve out this time, maintaining a healthy work-life balance is essential. While I don't have any intense hobbies, I prioritize taking time almost every week to play badminton, visit new eateries/places with friends, and cook Kashmiri meals. This can provide relaxation and a break from the monotony of academic routine. Additionally, I like to read self-improvement books for motivation to maintain a disciplined research routine.

When I'm not caught up in my research, I prioritize personal time to keep a good work-life balance. I love to jam out to some music, dive into a good book, and catch up on the latest drama. These activities provide me with relaxation and enjoyment to unwind and recharge. And of course, I enjoy spending time with my family as they bring me immense joy and sense of belonging.

Outside of research, I like to do sports activities but recently got into running because my friends in church invited me to run a 10k (which was my first-ever race). Post-race, I had a really bad case of Runner's knee. However, I found myself agreeing to my church friends into signing up for a half-marathon this August. I try to run three times a week with slow runs to improve my endurance. I usually run in the early mornings when it is more comfortable to run. Running helps me clear my mind and acts as a long term investment towards my health.

LIFE OUTSIDE RESEARCH: THE REALITY

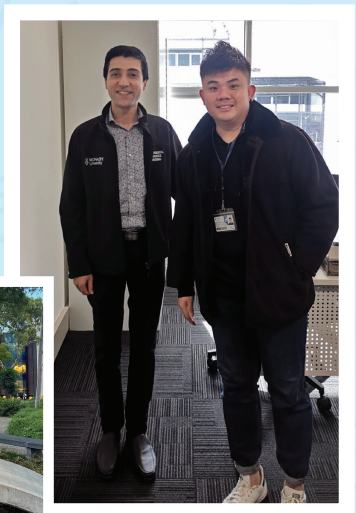
Apart from my research work, I hangout with friends. But as an introverted extrovert, I usually spend time alone at home to self-recharge. It can range from aimless pastimes like scrolling my device and daydreaming (sometimes with self-reflection) to hobbies like swimming, cooking, and drawing. Lately, I find myself loving to watch movies and TV series, specifically kdrama. Currently expanding my activity list to food hunting, outdoor activities (such as bouldering), and hopefully backpacking in the future.

Apart from research, I enjoy reading self-help and non-fiction books. I find it interesting to observe the perspectives of others on life philosophy. Occasionally, I would stumble upon useful advice that I would easily miss out in the midst of a busy life. Additionally, it helps me to take a break from writing and publishing, simply enjoying the collective wisdom of authors from different walks of life. Time is limited for everyone, but with literature, may the wisdom be passed down for generations to come.

Outside of work, I enjoy two main things: reading novels and playing badminton. Reading is a favorite pastime of mine. I love getting lost in different stories and exploring new worlds through books. When I'm not engrossed in a novel, I like to hit the badminton court. It's a fun and active way for me to unwind and stay fit.

Other than my work in research, I do find myself constantly trying to gain new knowledge in order to prepare myself to achieve financial stability. From side hustles to stocks, property and cryptocurrency investment, I indulge myself in the technical know-how of analyzing the market trends, market demands and other methods of semi-passive to fully passive income. I do strongly believe that we can achieve so far from savings and fixed deposits. Hence, it is vital for us to know how to get a financial advantage especially in these struggling economies.

Vice Chancellor's International Inter-Campus PhD Travel Grant



Ervin Tiu, a 2nd year PhD student in Civil Engineering, was awarded the Vice Chancellor's International Inter-Campus PhD Travel Grant early this year. He visited Monash University Australia (Clayton) for three weeks in May 2023.

"During my visit, I had the pleasure to meet my host, A/P Mehrdad. Interacting with him was an enlightening experience as his expertise and guidance enriched my understanding of my research area. It's my pleasure to interact with his fellow PhD candidates as well. The knowledge-sharing among the faculty and students fostered a collaborative atmosphere, enabling me to forge meaningful connections and expand my professional network. I also had the opportunity to visit my PhD external supervisor at the University of Melbourne. Grateful for this experience, I look forward to applying the insights and experiences gained from this journey to advance my research and contribute to the academic community." - Ervin

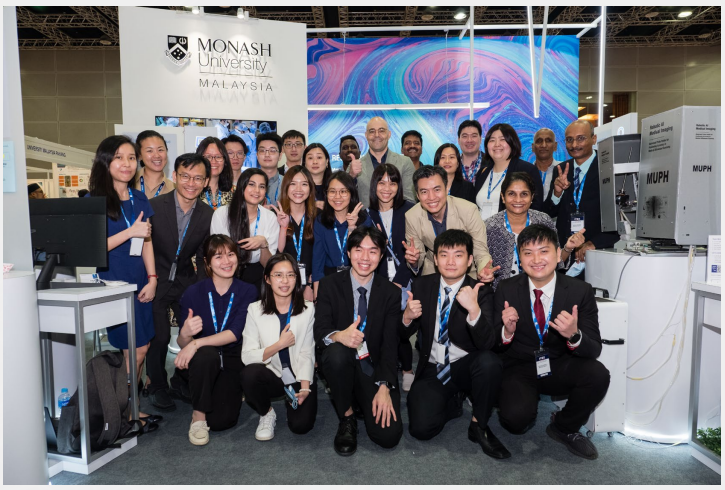
SoE Highlights

Congratulations to our researchers for their outstanding inventions at the 34th International Invention, Innovation & Technology Exhibition (ITEX) 2023 held on 11-12 May! Here are our researchers from SoE who received awards (Silver):

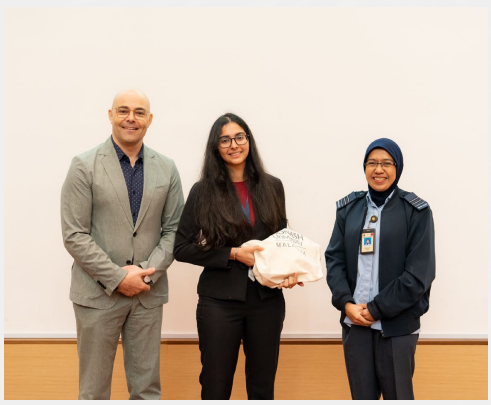
Dr Patrick Ho Wan Chuan, Lo Zhi En
Invention: "Indoor Navigation Mobile Application"

Ir Ts Dr Joanne Lim Mun Yee, Dr Lim Jun Yi, Liew Chan Yue, Lim Yun Mun, Dr Ricky Sutopo, Ku Nurul Fatiah Binti Ku Mamat
Invention: "DroneHub, DHub"

Dr Tan Wen Shan, Wong Zheng Hao, Mohammad Rafaquat Alam
Invention: "Teniaga - Peer-to-peer energy trading with blockchain"



The 3MT competition kickstarted at the school level (SOE & SoIT) on 23 May, in which Janak Kaur emerged as the winner, followed by Wail Gourich the 1st runner-up and the recipient of the People's Choice award. Janak then competed at the MUM 3MT final on 14 June and triumphed as the winner! She will be competing at the Monash University Final 3MT with participants from other Monash campuses on 23 August. Congratulations and we wish Janak all the best!



MUM 3MT 2023 Final
Winner: Janak Kaur
Giving carbon dioxide new life with nanostructures and the power of light

3MT 2023 (School Level)
Winner: Janak Kaur
1st Runner-up: Wail Gourich
People's Choice Award: Wail Gourich

On 13 May, the Staff Wellbeing Committee organized a nature excursion to Taman Botani Negara, consisting of both staff and engineering GRS. The event was a fun-filled day with games and nature exploration at the serene park.

New Academics

Position & Department:

Lecturer, Electrical and Computer Systems Engineering Discipline, School of Engineering

Expertise:

Industrial AI, Deep Learning, Data-Driven Modeling, Process Monitoring

Ongoing Projects:

Monitoring and Control of Industrial Processes using Deep Learning

Fault Diagnosis and Predictive Maintenance

Knowledge Discovery for Explainable AI in Industrial Systems

Reinforcement Learning for Process Optimization

Contact: ding.zeyang@monash.edu

Dr Ding Ze Yang

Dr Yaser Mohammed Rageh Gamil

Position & Department:

Lecturer, Civil Engineering Discipline, School of Engineering

Expertise:

Construction management and informatics

On-going Projects:

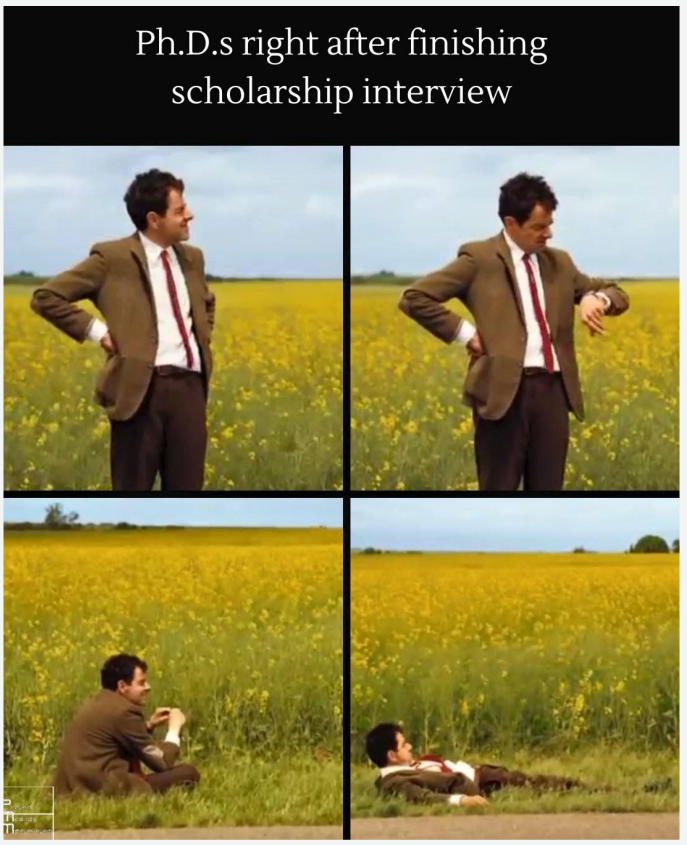
Building Information Modeling (BIM) for time management and its role on the completion of construction projects

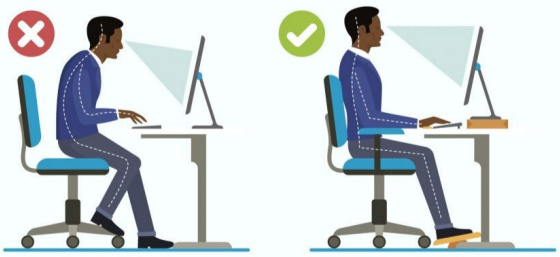
Clash detection in complex projects using BIM-VR (virtual reality) technology

Construction projects clash and conflict detection using artificial intelligence techniques

Risk analysis and management in construction projects using BIM

Contact: yaser.g@monash.edu





How to read literature properly

How I read my literature

BREAK ZONE