

SYNC

**RESEARCH
FOCUS** *Page 4*

**JOURNEY IN THE
INDUSTRY** *Page 11*

**HACKING EXCITING
RESEARCH** *Page 13*

GRS ACHIEVEMENTS
Page 18

Celebrating Women In Engineering



Letter from the Editor

Welcome to the fourth issue of SYNC newsletter with our theme on “**Celebrating Women in Engineering**” in conjunction with Women’s day, where we highlight the achievements of women academics, professional engineers and alumni in the School of Engineering (SOE), Monash University Malaysia.

We are proud to have Dr Susilawati (Chair, Monash Women in Engineering and Information Technology Committee (MWEIC)) to share her insights on diversity and update us on activities organised by MWEIC. In “**Research Focus**”, we have featurettes on the female SOE academic staff. The “**Feature**” section presents female alumni from SOE in various careers that can be explored by future engineers. Under “**Spotlights**” section, we invited Ir Dr Lim Jen Nee to share her industrial experience while Ir Dr Joanne Lim Mun Yee talks about the recent IoT lab on campus. We have also interviewed Prof Chai Siang Piao, who was recently awarded the Highly Cited Researcher in 2019, to share his experience and tips on performing exciting research.

In this issue, we introduce the “**GRS Achievements**” section, to celebrate the global achievements of graduate research students (GRS) in SOE. You are welcome anytime to let us know about your achievements so that we can feature them in upcoming issues. We are also more than excited to receive your feedback for continuous improvement. So feel free to suggest or share any content, ideas or even food for thought. We would also like to recruit new members to join our editorial team (fingers crossed). We are grateful to the academic staff and GRS for their contribution to this issue. Many thanks for your continuous support for the newsletter and hope you enjoy this issue.

Let us **SYNC - Say Yes 'N' Collaborate**

Talha Shahid
Editor
(GRS)

Editorial Team

Journalist: Arshia Fathima (GRS)

Reporters : Lee Li Yong (GRS), Yasmin Mohd Zaifullizan (GRS)

Advisors : A/P Poh Phaik Eong, Ir. Dr. Mohd Zulhilmi Paiz

Feedback and Suggestions



OR

mum.soe.sync@monash.edu

Contents

Insights- Women In Engineering.....	3
Spotlights	
Research Focus.....	4
Journey In The Industry.....	11
Challenging the Road Traffic	
With IoT.....	12
Introducing	
New Academic Staff.....	14
Award Winners.....	15

Insights

Women in Engineering



Workplaces with gender equity tend to be better work environment because gender equality is associated with improved productivity and economic growth, increased organisational performance, ability to attract talent and retain employees and enhanced organisational reputation which leads to profitability. However, women remain underrepresented at every level in the corporate world, particularly in the engineering field, despite the fact that women make up 20% of engineering graduates. One of the prevailing factors contributing to this is the lack of women's presence in senior leadership positions, resulting in a lack of women role models in engineering. The role model which adopts the concept of seeing is believing is essential in career development and is an extremely powerful way to challenge gender stereotypes. Because oftentimes, young women engineers experience self-doubt, hence they need to continuously validate their career choices. Having someone to look up to would help other women to imagine themselves in those roles too.

School of Engineering (SOE) Monash University Malaysia has paved ways to reduce the gender gaps by building a culture of opportunity and fairness where women have an equal opportunity to grow and advance. This includes efforts to hire and promote more diverse candidates and create a gender-balanced culture. In May 2019, SOE inaugurated the first Women in Engineering and IT Committee (MWEIC) for an avenue to promote effective career development and to support women staff to achieve work-life balance. The Monash Women Engineers Club was established in August 2018 to promote engineering among female students and to break the gender stereotypes. Although these initiatives have been in place since last year, pressing needs to do more as individuals and organizations are inevitable. Therefore, let's start now. Be a role model! Inspire others!

- Dr Susilawati, Chair, MWEIC



Feature

Careers for Women Engineers **8**

Event Highlights

The Women Empowering Symposium 2019 **16**

Congratulations to Our Research Graduates!..... **16**

Thriving In A Competitive World..... **17**

Advanced Engineering

Colloquium 2019 **17**

Career Booster

Hacking Exciting Research..... **13**

GRS Achievements

Research Output - Journal Publications **18**

Vice Chancellor's Intercampus

PhD Mobility Scheme Award Winners..... **19**

Chemical Engineering International

Research Mobility Grant Awardees..... **19**

Notable Achievements..... **19**

VC Commendations for Thesis Excellence..... **19**

Going Places - Global Conferences..... **20**

Research Focus

- Lee Li Yong and Talha Shahid

The academic staff at the School of Engineering engage in exciting research to advance technological developments impacting communities and economy. This featurette shares a few of our female academic staff research profiles.

ASSOC. PROF. POH PHAIK EONG

CHEMICAL ENGINEERING

AREA OF EXPERTISE

Fresh water conservation, Industrial wastewater treatment, Decentralised greywater treatment system, Biogas from wastewater as renewable energy source



SOURCE OF INSPIRATION/MOTIVATION

I believe it is crucial for us to sustain the water availability for future generations and also to provide greater access to some in developing countries for drinking and sanitation. I find excitement seeing translucent effluent flowing out of the treatment system as it indicates one step nearer to a solution that can benefit all mankind.

HOW TO OVERCOME CHALLENGES

Switching between tasks enables me to take some time away from the problem, which sometimes enables me to figure out a solution to a challenge while I am preoccupied with something else.

HOW DO YOU DESTRESS

Playing badminton, watch dramas and shopping!

SKILLS DEVELOPED

Being resourceful

ADVICE TO YOUNGER SELF

Maybe I could have spent more time on extra-curricular activities that enables me to broaden my horizon and develop additional skills.



DR MAXINE TAN

ELECTRICAL AND COMPUTER SCIENCE
ENGINEERING

AREA OF EXPERTISE

Medical imaging, Quantitative imaging (QI) feature based clinical markers to phenotype disease risk, development and prognosis, Deep learning and Medical image processing

SOURCE OF INSPIRATION/MOTIVATION

My source of inspiration/motivation in research is to develop or do something that is beneficial to society.

HOW TO OVERCOME CHALLENGES

Doing work consistently and not leaving things to the last minute.

HOW DO YOU DESTRESS

Listening to music
Reading

SKILLS DEVELOPED

Developing good presentation skills is important to present your point of view well and is required in every stage of your career.

ADVICE TO YOUNGER SELF

Amidst facing challenges, persevere and do not give up. This is because hope always remains amid failure, and there is always a light at the end of the tunnel.

DR TAN JULLY

CHEMICAL ENGINEERING

AREA OF EXPERTISE

Chemical engineering education research, Chemical/manufacturing production, Process selection analysis, Life cycle assessment and optimisation



SOURCE OF INSPIRATION/MOTIVATION

Learn to enjoy what I have chosen and what I am doing. Our working life will be more wonderful if we always remind ourselves why we are here. Always refresh my enthusiasm, passion and enjoyment as academician.

HOW TO OVERCOME CHALLENGES

Practice gratitude and pray. Always count our blessings instead of counting the troubles.

HOW DO YOU DESTRESS

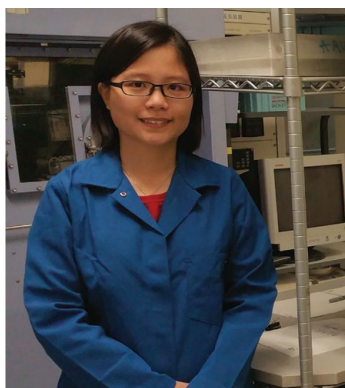
Meditate and pray
Visit a BFF and speak and express out all the feeling or emotion
Sleep to combat stress
Get away from the screen and have family fun time

SKILLS DEVELOPED

Interpersonal ability. "No man is an island", we all have to work with others to complete our task.

ADVICE TO YOUNGER SELF

Do not feel regret on what you have chosen to study and what you want to be. Education is not everything, but the positive characters that you build over the years matters a lot, they will lead you to success! Ninety nine percent of the things you worry will not happen. So, dare to dream, enjoy every moment. Remember, it is so good to be YOUNG!



DR CHANG WEI SEA

MECHANICAL ENGINEERING

AREA OF EXPERTISE

Energy materials - functional oxide materials, polarisable semiconductors with enhanced photoactivity for electromechanical application, LED epitaxial technology (National project - "GaN on GaN")

SOURCE OF INSPIRATION/MOTIVATION

Do things that I enjoy. That's how I keep the excitement alive at work. I think the easiest way to get motivated/inspired is through reading. I read books like "Who Moved My Cheese?", "The Monk Who Sold His Ferrari", books by Mitch Albom and etc., for inspiration/motivation.

HOW TO OVERCOME CHALLENGES

Be proactive

HOW DO YOU DESTRESS

Take a break and go for long walk
Have a good coffee time
Enjoy chit-chatting with my good buddies

SKILLS DEVELOPED

Adaptability

ADVICE TO YOUNGER SELF

Love what you do and keep focus firmly on your goals. There will always be hiccups along the way and that's okay. Be persistent and just stretch a little bit of the mind to think of other ways to solve the problems.

DR VIVI ANGGRAINI

CIVIL ENGINEERING

AREA OF EXPERTISE

Ground Improvement, environmental geotechnics, gas CO₂ sequestration in liners, geosynthetic in landfills, compacted clay liners, geo-materials and earth reinforced structures; Technical member - Construction Research Institute of Malaysia (CREAM)



SOURCE OF INSPIRATION/MOTIVATION

My philosophy in life is being useful to others. The ultimate satisfaction I achieve is when I can share my expertise and knowledge with others or community. Being surrounded by civil engineers in my family motivated me to be even a better woman engineer.

HOW TO OVERCOME CHALLENGES

Always be a collected person. Stay calm and analyse problems from different perspectives.

HOW DO YOU DESTRESS

Spend time with my family
Enjoy the process of nurturing students and research
If you do what you love, it's the best way to relax - this really describes the way I cope with pressures.

SKILLS DEVELOPED

Analytical skills

ADVICE TO YOUNGER SELF

Never stop learning about everything although it does not seem related to what you are studying now (engineering). Open your mind and eyes to new things. There are many sources around us to learn, even from a simple thing. Be brave, be ready and be adventurous to see changes.



ASSOC. PROF. WANG XIN

MECHANICAL ENGINEERING

AREA OF EXPERTISE

Optical metrology, remote sensing, 3D imaging, novel optical testing and other non-destructive testing techniques in different fields, such as freeform surface measurement, underwater detection, defect inspection, and defense applications.

SOURCE OF INSPIRATION/MOTIVATION

I am driven by curiosity. Exploring new things gives me immense motivation.

HOW TO OVERCOME CHALLENGES

Put first things first.

HOW DO YOU DESTRESS

Watch movies
Exercise

SKILLS DEVELOPED

Determination and perseverance

ADVICE TO YOUNGER SELF

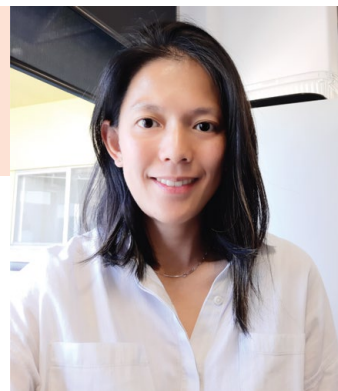
Believe in yourself.
Failure is a state of mind.

IR DR LAU EE VON

MECHANICAL ENGINEERING

AREA OF EXPERTISE

Flotation technology for environmental remediation including graphene oxide coated microbubbles for oil-in-water separations, crude oil removal from oil-contaminated sand, pollutant (PAHs) removal from water and oil-in-water emulsions; Study of bubble-particle attachment phenomenon



SOURCE OF INSPIRATION/MOTIVATION

Achievements, regardless of how small they are, for instance, an accepted journal publication, a new citation or a successful grant application, keeps me motivated to do what I do. With these small achievements, I know that my research is worth moving forward, and thus inspires me to do more.

HOW TO OVERCOME CHALLENGES

Perseverance. We have to keep trying even after we fail. The number of rejected journal articles and grant applications will be countless, but we have to keep trying and not give up. Be upset for a day, then move on and persevere.

SKILLS DEVELOPED

Writing - I have learnt to write better grant proposals from Prof. Jussi Parkkinen, and this really helped in my research.

ADVICE TO YOUNGER SELF

Take the opportunities when it comes. If it was bad, at least you would have tried, rather than still wondering "what if" until today.

HOW DO YOU DESTRESS

Eat or exercise, more of the latter



DR IZNI ZAHIDI

CIVIL ENGINEERING

AREA OF EXPERTISE

Interactions between hydrological system and human responses, Hydrodynamic modelling to develop an integrated framework for flood impacts assessment for improved decision-making in flood mitigation measures and building more flood resilient development

SOURCE OF INSPIRATION/MOTIVATION

The possibility to create impacts in improving the quality of environment, society and economy in relation to water.

HOW DO YOU DESTRESS

Spending time with family
Having my favourite iced tea whilst reading or watching a movie

ADVICE TO YOUNGER SELF

Never give up chasing your goals, make the best of the journey and the people you meet and if things get tough, find support because they are available if you look for them.

HOW TO OVERCOME CHALLENGES

Writing things down to formulate an action plan.

SKILLS DEVELOPED

Geospatial modelling - it is still a niche skill in the region.

Careers for Women Engineers

- Yasmin M.Z and Arshia Fathima

As engineers, women take up many roles in academia and industry. Here, our alumni tell us about their career experiences, share their habits that they use to face challenges and express their thoughts on promoting diversity in the field.



Dr Sheeba Jenifer Sujit
Mechatronics Engineering, PhD

CAREER ROLE

My role as a researcher in AI and Medical Imaging Big data involves frequent interaction with an interdisciplinary team of health care professionals such as MR Imaging physicists, radiologists, biomedical engineers, data scientists and MD physicians, for the development of AI algorithms and to efficiently translate the AI tools to widespread clinical practice.

CAREER SKILLS

Programming skills. Knowledge of MATLAB, Python, and R really helps.

DIVERSITY IN ENGINEERING

Living and working in universities in 3 different countries has taught me the value of diversity and inclusion in Engineering. Regarding gender disparity, in a JAMA article, the author wrote, "Women are hesitant to promote themselves and quick to doubt themselves. They underestimate their abilities". As I build my own career, I try to constantly update myself with latest techniques and methods, find engaged mentors, forge professional relationships and seize opportunities, even though they arise outside my comfort zone.

HELPFUL HABITS

Breaking large tasks down into smaller ones, makes it more manageable and doable.

Dr Katrina Shak Pui Yee

Chemical Engineering, PhD

CAREER ROLE

I am a lecturer in Chemical Engineering at Universiti Tunku Abdul Rahman, teaching at the undergraduate and graduate level. I teach and also perform research related to the field of chemical/environmental/material engineering.

CAREER SKILLS

Adaptability has helped me cope with the ever changing circumstances in everyday life. It helped me to pick up new opportunities which could be helpful in my career and interpersonal development.

DIVERSITY IN ENGINEERING

I think it is important to promote diversity in engineering - it is an absolute necessity, especially in workforce. People should be concerned about its current status in the Malaysian engineering industry. With the lack of diversity, we are limiting the quality of engineering to a point where creativity and input that's put to good use is limited. I believe we can start by sharing our experiences to change the traditional mind-set, and be an example of why diversity is essential to engineering.

HELPFUL HABITS

Living mindfully has prepared me to deal with stresses by overcoming the fear of failure/discomfort.

Hong Shuen Wen

Mechanical Engineering, BEng.

CAREER ROLE

Process Mechanical Engineer - To coordinate and manage production flow and ensure products are of top quality for an American company.

CAREER SKILLS

Good time management

CAREER ROLE

As a lecturer at Curtin University Malaysia, I conduct lectures, tutorials and lab sessions for undergraduate students. Additionally, I serve as an academic mentor to monitor and help conditional students attain a good standing status. Besides engagement in the academic aspects, I also collaborate and work with industry partners in core engineering units such as final year and design project.

CAREER SKILLS

Be brave to take up new challenges and step out of one's comfort zone to explore new opportunities and gain new experiences.

HELPFUL HABITS

Be persistent and always believe that no progress is too small as long as advancement is taking place.

DIVERSITY IN ENGINEERING

Engineering is simply a term to solve difficult problems in the simplest manner. Having good social and communication skills is a good leverage to encourage your work partners to work together with as little conflict possible.

HELPFUL HABITS

Confidence

DIVERSITY IN ENGINEERING

Engineering is a profession that thrives upon the collective inputs from a diversified team to propose the best solutions. By engaging industry partners to work with schools and institutions, STEM can be introduced to students at an early stage to instil curiosity and inspire them to embark on engineering careers. Additionally, initiatives such as dedicated scholarships for females and minorities to recognise their academic excellence would help them achieve their dreams. Support system such as mentoring, practical training and internships are essential elements that would promote inclusion in engineering.



Dr Choy Sook Yan

Chemical Engineering, PhD

Dr Hia lee Lee

Mechanical Engineering, PhD

CAREER ROLE

As an industrial postdoc, my career still revolves around scientific research similar to PhD. The main difference is that you are considered an expert or an experienced researcher. So, instead of starting from scratch, I apply what I have learned and acquire new research skills simultaneously. Besides, I work on several projects and each of them involves different people from the research team and industry. Often, the research work done will have to be documented into industrial reports and scientific publications as well.

CAREER SKILLS

Communication - you are not a lone ranger, you work in a team. It is important to communicate well with everyone in the team.

DIVERSITY IN ENGINEERING

I think a lot of efforts has been done to achieve diversity in engineering in Malaysia. For instance, Malaysia is having 50% proportion of women engineers as compared to Japan and Korea which only makes up 5% and 10% according to The Star Online. However, I think people are still not fully aware that engineering encompasses a broad range of fields, from the engineers working in institutions that mainly focus on research and teaching, to practising, professional and consulting engineers. It is our duty to empower and support the younger generations.

HELPFUL HABITS

I try my best to calm down because that is when you can think better for solutions.

Feature

Dr Christina Ng

Civil Engineering, PhD

CAREER ROLE

Coordinating traffic survey study, delivering lab demo, lectures, tutorials, markings, develop new traffic models and run simulations.

CAREER SKILLS

Self-learning

HELPFUL HABITS

Perseverance

DIVERSITY IN ENGINEERING

Diversity in engineering is very important for better problem solving, expanding talent pool, creativity and innovation. Diversity is needed for long term economic growth. Only employers with the right mindset and the right working attitude among employees can lead to an overall better job quality life.



Atiqah binti Abdulatif

Mechanical Engineering, BEng.

CAREER ROLE

As a project engineer, my daily job scope includes inspecting worker's work progress on site and reporting directly to my superior. As I am involved with general workers at site, I need to inspect their work and make sure all procedures done are following standard operating procedures (SOP). I also write daily reports and deal with suppliers and consultants.

CAREER SKILLS

Good time management is crucial and will let us be one step ahead in planning.

DIVERSITY IN ENGINEERING

I strongly agree with diversity in engineering. Though females seem to be less competent when it comes to work involving machinery and hardware tools, they are good with detailed works and that is what completes the team. To progress, females who choose to get into engineering must first always remind yourselves that it's your choice. Keep competing and gain experiences. Skills are a life process that cannot be obtained in a day. So, keep improving and learning. This is what I tell to myself to keep surviving in the industry.

HELPFUL HABITS

Tolerance as I am involved with many people from various backgrounds.

CAREER ROLE

Drive Lean 6 Sigma projects related to process improvement and efficiency, oversee operations flow, suggest corrective and preventive actions

DIVERSITY IN ENGINEERING

Learning relevant skills expected at work such as knowledge in technical drawing or coding when working in a manufacturing line involving database is important. Another suggestion is to have courses/electives on lean manufacturing principles/industrial engineering.

CAREER SKILLS

Leadership skills

HELPFUL HABITS

Persistence



Lee Yee Mei

Chemical Engineering, BEng.

Journey in The Industry

- Ir Dr Lim Jen Nee Jones

Ever since I was doing my undergraduate studies, I have always had my mind set on working in the industry as most engineering graduates would. When I was given the opportunity to do some tutoring work in my final year with Assoc. Prof. Lan Boon Leong, I started to consider a lecturing career. I never regretted that decision as I flourished in my education career with the option to have a good work-life balance while raising my young family. After years spent completing my part-time PhD, I explored the possibility of stepping into industry attachments. My supervisor, A/Prof. Kenny Tan was very encouraging and supported my intention to gain industry experience so that we enrich our courses through industry projects with an emphasis on industry practices.

Since November 2014, I have been spending my 3 months of semester breaks every year on industrial attachments. My first attachment was with MyBig Sdn. Bhd. that develops hybrid renewable energy solutions from industrial design to commercial applications. I was involved in designing an automated rubber tapping machine, which was also extended as final year student projects. The design experience was also in line with the machine element design based units that I taught in 2015.



A prototype of an automated rubber tapping machine

My second attachment was with Dynamic Pile Testing Sdn. Bhd, a pile testing company. I learnt about their new technology in using fibre optics for strain measurements and was exposed to geotechnical engineering. I had the opportunity to witness how pile testing was carried out beneath 4 tonnes of static load using hydraulics and a beam deflection test (see photos below) using the same technique.



Static load test in Sentul area (photo on the left) and Beam deflection test at Eastern Pretech (photo on the right)

Some of the instrumentation techniques gave me insights to develop metrology lab activities in 2016. I was back with the same company in 2018 to work on developing a data handling software and a graphical user interface (GUI) for their fibre optics sensors.

My longest attachment was spent with Sunway Engineering as I was involved in the upgrading works for the Gas District Cooling (GDC) Plant 1 in Putrajaya. When I joined in 2016, the project was in the early stages of submitting a tender for bid involving project costing and design calculations for Thermal Energy Storage tanks. By the second round of attachment in the GDC project, construction was on-going and I had my hands-on learning basic computational fluid dynamics (CFD) skills along with structural design work on steel tanks. The team I worked with had a mix of those who specialized in HVAC systems, geotechnical, structural and electrical engineering. It was a rewarding experience to be able to see through this project until its completion in 2018.



GDC team in Putrajaya on last day of my industry attachment

With the given opportunities, I learnt about project management and current industry practices which I could share and inculcate in my students. With these industry experiences under my belt, my registration as a Chartered Engineer with IMechE and Professional Engineer with Board of Engineers Malaysia (BEM) became feasible. The timing couldn't be more perfect when my discipline critically needed more professional engineers for the course accreditation. The journey does not end here as I am excited to learn more through a new project from another round of industry attachment with Sunway Engineering this year.

Challenging the Road Traffic with IoT

- Yasmin M.Z.

The Internet-of-Things (IoT) lab was started 2 years ago at the School of Engineering (SOE), Monash University Malaysia to address the challenges faced by urban mobility. Here, the founder of the IoT Lab, Ir Dr Joanne Lim Mun Yee (Lecturer, SOE) shares her current research work and experience as a female Professional Engineer (P.Eng) on ushering the era of IoT on our campus.

Q. What are the challenges that your research is solving?

My research focuses on solving the challenges of transportation to improve urban mobility, thereby adding to the quality of life by saving time and fuel on the road. We have secured 3 grants – one FRGS grant and two industry grants. The FRGS grant focuses on alleviating the traffic system with route optimisation and urban planning. By managing the traffic flow efficiently, commuters would save time and cost. The industry grants deal with the application of IoT as a solution to enhance urban mobility and city planning. This research includes looking into the communication system between Unmanned Aerial Vehicles (UAV), popularly known as drones, for observation of traffic congestion. We are also competing in the Innovate Malaysia Design Competition (IMDC) this year with our project on the use of IoT to improve quality of life.

Q. How do collaborations impact your research?

A good collaboration project is one that gives impact to both the educational institution and the industry. It is essential to balance between academic and industrial expectations by finding common ground where both parties agree with the objectives and outcomes of the research. For PhD students, an industry-related project will give them the exposure to both worlds preparing them for careers after graduation, whether they choose to go into industry or continue with academia.

Q. What is the vision of the IoT lab on campus?

IoT is a system of interconnected machines, objects, animals or people communicating via data transfer without requiring human-to-human or human-to-computer interaction. The IoT lab on campus is focusing on research areas in transportation and smart grids with plans to move into healthcare later. There is also a new course on IoT, with support and feedback from Intel, to build students' skill set for industry careers.

Q. How does your experience as P.Eng help you as an academic and researcher?

As a Professional Engineer, my experiences as a control and design engineer has helped me to direct and structure my research projects to come up with solutions capable of implementation in the next 5 years. It enables me to have a clearer mindset to deal with real-life research challenges. As a fundamental researcher, we work in niche areas that have yet to be solved and developed. However, for translational or application-based research, we must have an impactful problem statement by engaging with the industry as they are the first point of contact with the customers in the real world.

Q. Do you have any advice for future engineers and researchers?

Passion and time management skills are crucial to go far in your career and balance your life. Gender doesn't matter when it comes to opportunities; only passion and hard work will get you through. Dive with confidence into your field and build relevant skills set. For example, the IoT industry is looking for engineers with strong skills in data analytics and machine learning. You must develop a keen interest and passion in what you are doing. Keep moving forward, even when you face challenges along the way. Learn from your "mistakes" as it builds your experience.

For more information on her research, you may contact Dr Joanne Lim Mun Yee at joanne.lim@monash.edu.

"Passion and time management skills are crucial to go far in your life"



Ir Dr Joanne Lim Mun Yee, Electrical and Computer Systems Engineering Discipline

Hacking Exciting Research

- Yasmin M.Z.

In 2019, Prof Chai Siang Piao, Deputy Head of School (Research) School of Engineering, was recognised as a Highly Cited Researcher by Web of Science. In this interview, Prof Chai shares his thoughts on identifying and conducting novel research.

Q. How do you get people excited about your research?

The most important thing is to have high-quality research work. Attention will naturally follow something that has never been done before in the field. The “wow factor” of research comes from being extra-ordinary, novel, outstanding and differentiated. To come up with innovative research, read a lot, identify significant gaps and take riskier and crazier approaches to bridge that gap. Unusual questions with no answers make for interesting research rather than playing safe, which will not get you far.

Q. How do you plan for your research?

We apply for research grants by looking at the bigger picture and matching our expertise to address critical issues that entities such as government or industry want to solve. One of the National Key Priority Areas, Energy and Environment, is where my research team works to find solutions. We develop photocatalysts that get activated by sunlight and perform “artificial photosynthesis” to reduce carbon dioxide to fuels. Although these novel photocatalysts are still in fundamental research, they are the basis for future technology and hence garners interest from researchers. When planning for your project, ensure each research objective is different and can produce novel work.

Q. How do you deal with competition in research around the world?

Working in hot research topics, we need to work fast and publish fast. Publish short communication paper, which has short review and publishing timeline, to claim your novel ideas and show that you are the pioneer in your research area. Researching with a local context can also give you an edge over competitors.



Prof Chai Siang Piao, Chemical Engineering Discipline

Q. Do you plan for citations?

Citation is an outcome of publishing high-quality work in top-tier journals. The top journals have high readership with researchers having confidence in the work published in them. Publishing innovative work in such journals attracts citations.

Q. How to improve scientific writing and deal with paper rejections?

Be creative with your presentation of results and discussion. Use a catchy title with well-designed figures and schematic diagrams to communicate your findings. Choose your keywords wisely as these will be used by readers to search for your paper. Generate reliable data with advanced characterisation to bring out new information that has not been seen before. Concise and compelling language with an in-depth discussion of your results will convince your audience. An excellent way to get started would be to consult model papers from journals like Nature and Science. On a different note, paper rejections are typical for a researcher. Learn to improve from failures and rejections. Address any constructive criticism given to you to enhance your research. Submit to good journals with scopes that align with your work.

Q. Does being on the Highly Cited Researcher list impact your career or research?

To me, becoming a Highly Cited Researcher is only a global recognition in the scientific community. This recognition is an outcome of the research contributions to the community.

Q. Do you have any advice for the Graduate Research Students (GRS)?

Cultivate a consistent research attitude – read, experiment/ simulate, write and repeat. Right now is your platform to pursue your dream, so work hard, be passionate and stay focused to achieve your goals within these 3-4 years. Focus on a niche area that is a hot topic or worth to invest your time and then be a champion in the field.

Tips To Get Ideas

- Read a lot
- Think out of the box by exploring other disciplines
- Talk to people
- Attend conferences
- Brainstorm in a team
- Share, discuss and exchange information as a scholarly researcher

Introducing New Academic Staff



Name: Dr Alireza Daman Pak

Department: Lecturer, Mechanical Engineering

Expertise: Multi-functional and smart materials/structures, Thermomechanical constitutive modelling, Computational mechanics, Micromechanics and multiscale modelling, Additive manufacturing and 3D and 4D printing

Ongoing/Completed Projects:

- Developing multi-functional materials with 3D printing and simulating smart devices for 4D printing
- Additive manufacturing, multiscale, thermo-mechanical modeling and simulating of smart 4D printed structures

Contact: a.damanpak@monash.edu

For more information, please visit: <https://bit.ly/37o9Kvu>

Name: Dr. Nur Hazliza Ariffin

Department: Lecturer, Common Engineering

Expertise: MEMS, IoT, Embedded systems, Control systems, Robotic design and Digital signal processing

Ongoing/Completed Projects:

- Develop a measurable device for Edible Bird Nest (EBN) grading of nutritional composition and amino acid parameter profile using classification framework based on micro-spectrometer using data mining technology

Contact: nur.hazliza@monash.edu

For more information, please visit: <https://bit.ly/2Gha57m>



Name: Dr Mohammed Ayoub Juman

Department: Lecturer, Mechatronics Engineering

Expertise: Machine vision, Machine learning, Mobile robot control, Neural Networks

Ongoing/Completed Projects:

- Automation in palm oil plantations with machine vision and machine learning techniques including identification of oil palm fresh fruit bunches and determination of their ripeness
- Control of outdoor mobile robots to create autonomous motion control systems for multi-terrain use

Contact: mohammedayoub.juman@monash.edu

For more information, please visit: <https://bit.ly/2TNVnN2>

Name: Dr Chua Yie Sue

Department: Lecturer, Civil Engineering

Expertise: Robustness of high-rise modular construction, Design of connection, Design of protective material against impact

Ongoing/Completed Projects:

- Development of lightweight and efficient modular construction system for construction (Sembcorp-NUS Corporate Laboratory, National University of Singapore)
- Explore modular construction in Malaysia to implement Industrialised Building System

Contact: chua.yiesue@monash.edu

For more information, please visit: <https://bit.ly/37fLxAc>





Name: Dr Tan Lling-Lling (Carynn)
Department: Senior Lecturer, Chemical Engineering
Expertise: Environmental remediation and energy generation, Heterogeneous photocatalysis systems, Micromechanics and multiscale modelling, Hybrid photocatalyst for solar fuel generation

Ongoing/Completed Projects:

- Rational design and development of advanced photo(electro)catalytic nanomaterials for environmental remediation and energy generation
- Development of platinum-doped graphene/TiO₂ ternary nanostructures for photoreduction of CO₂ to CH₄

Contact: tan.lingling@monash.edu

For more information, please visit: <https://bit.ly/38AyD7x>

Name: Dr Chan Ping Yi

Department: Lecturer, Mechatronics Engineering

Expertise: Biomechanics, Parkinson's disease tremor measurement, Data analysis, Inertial sensing

Ongoing/Completed Projects:

- Tremor measurement system to quantify hand- arm tremors for Parkinson's disease - developed the system and tested in lab using own developed tremor simulator and in clinics for characterising pathological and physiological tremors
- Tremor compensation system to counteract severe tremors suffered by patients using actuators including soft robots and control moment gyroscopes
- Electromagnetic energy harvesting - expand the frequency range of electromagnetic wave convertible to electricity through improving the response and efficiency of the harvester in system level spectrum; combine rectenna and photovoltaic system

Contact: chan.pingyi@monash.edu

For more information, please visit: <https://bit.ly/3bggM7N>



Award Winners

PECIPTA Awards

International Conference and Exposition on Inventions by Institutions of Higher Learning (PECIPTA) is a biannual programme organised by Ministry of Education Malaysia. This event showcases innovations from the local and international institution of higher education as well as government agencies and research institutes. We congratulate members from the School of Engineering who bagged the gold and bronze awards in PECIPTA held on 22-23 September, 2019.

- **Gold Medal** - Assoc. Prof. Narayanan Ramakrishnan, Dr Lee Neam Heng & Howgen Kesuma Pratama
- **Bronze Medal** - Dr Yong Siek Ting (Estee), Assoc. Prof. Ooi Chien Wei, Wong Lai Ling, Prof. Chai Siang Piao, Abdul Wahab Bin Mohammad & Ang Wei Lun

2019 PVC Awards Winners and Commendations

Congratulations to the academic staff for being awarded the Pro Vice-Chancellor's (PVC) Award winners for their exceptional performance in the areas of research and education.

- **Awards for Excellence in Education, Innovations in Teaching - Team-** Dr Lim Jen Nee Jones, Dr Mohd Zulhilmi Paiz Bin Ismadi and Dr Chiew Yeong Shiong
- **Awards for Excellence in Research, Early Career-** Dr Saman Ilankoon
- **Awards for Excellence in Research, Open Category** - Assoc. Prof. Narayanan Ramakrishnan

For more information on the PVC Awards, please visit - <https://bit.ly/20Elt01>

The Women Empowering Symposium 2019

Established in April 2019, the Monash Women in Engineering and IT Committee (MWEIC) aims to provide a platform for female staff members from the School of Engineering (SoE) and School of Information Technology (SIT) to get-together, network and share common interests. On 19 July 2019, 60 women from both schools were gathered together on campus for the Women Empowering Symposium 2019. This one-day symposium is a valuable platform for women academics, professional staffs, technical officers and early career researchers to exchange ideas, discuss common issues, overcome barriers, drive progress as well as network with their peers.

Alongside the Chair of MWEIC, Dr Susilawati, the presence of Prof. Anthony Guo (*Head of SOE and SIT*), management members including Prof. Rajendran Parthiban (*Deputy Head of School, Education, Engineering*) and Mr. Pratheeban Krishnan (*Senior School Manager*) gave support to the women colleagues. The event started with Professional Development Talks from invited keynote speakers.

-Dr Tan Jully and Ms Wong Weng Yan

Professor Xinhua Wu (*Director of the Monash Centre for Additive Manufacturing and Director of the ARC Centre of Excellence for Design in Light Metals*), Puan Azimah Abdul Kadir (*Head of Cognitive Science Lab, MIMOS Berhad*) and Ms See Wai Hun (*CEO and Founder of Juris Technology*) shared their experiences to lead the symposium attendees by their example.

The next highlight was the Panel Session, moderated by Dr Adriana Ortega, with the theme "Work-Life Balance". The panellists included Dr Lau Ee Von (*Senior Lecturer, SOE*), Dr Tang Wai Mun (*Education Manager, SOE*), Ms Vijayamalar Sivasegaran (*Education and Research, School of Business*) and Ms Janice Wong Yoke Chen (*Director of Human Resources*). They shared a variety of issues in achieving work life balance throughout their career, overcoming the challenges and succeeding. Each step in the career advancement may not be significant at the moment, but the hard work done and the triumph gained through perseverance are the elements that built the story of who we are and what we can offer.



Congratulations to Our Research Graduates!

Doctor of Philosophy

- Dr Joseph Chan Chang Lun
- Dr Chang Tak Kwin
- Dr Mohammed Shahnawaz Chowdhury
- Dr Jayasree Kanathasan
- Dr Kong Xin Ying
- Dr Jayesree Nagarajan
- Dr Boon Junn Ng
- Dr Christina Ng
- Dr Ivan Pradipta
- Dr Tan Kok Hong

Master of Engineering Science Research

- Ian Daryl Sta Maria



Graduation Ceremony on 16 November 2019

Thriving In A Competitive World

The Monash Women Engineers Club organised an inspirational talk by Ir Dr Christina Phang on 17 October 2019 on our campus. Ir Dr Christina Phang shared her life story from being a female JPA Engineering scholar in the UK to the challenges doing her PhD in safety and loss prevention to the current position she holds as the Commercial Director at ERM Safety and Technical Risk, Asia Pacific to her being a cancer survivor. Giving examples from her experiences, she gave us tips to not just survive but “thrive” in this competitive world, which include:

- Treasure the time now to polish your communication skills. Learn how to write and put your thoughts in words first to be able to communicate verbally.
- The first thing you learn in management course – how to take care of yourself.
- It is ok to ask for help as it will help you grow, pick up skills and move ahead.

- Expect to face giants. Build a positive outlook to face your giants.
- It is ok to get knocked down, but don't stay there. It's your choice to get up or not.

Dr Christina also shared her 3 thoughts on success:

1. Be inspirational – live to impact and effect positive change
2. Be positive – build your community to keep positivity around you
3. Have real conviction in what you do – discover what motivates you



Advanced Engineering Colloquium 2019

Advanced Engineering Colloquium (AEC) is a flagship conference organised by the School of Engineering, Monash University Malaysia. The second series of the biennial event, AEC 2019 was held on our campus on Thursday, 1 August 2019 with the tagline “Share. Synergize. Solve” to propel innovation and transform lives in the region. Prof. Ir. Dr. Abdulrahman Mohamed (*FASc, J.M.N., B.C.N.*), the Deputy Vice-Chancellor of Research and Innovation-Universiti Sains Malaysia, delivered the keynote address on “Cultivating Impactful Research” with USM as the case study. This was followed by 36 student research presentations in 4 tracks namely Advanced Computational Engineering, Energy Sustainability and Environment, Smart Industry and Health and Advanced Materials and Mechanics.

Also on the event program was the interactive forum on “Nurturing Connections: Academia and Industry” moderated by Mr Adam Ramsky (*Cradle Sdn Bhd*) with panelists including Prof Chan Eng Seng (*Director MIPO, Monash University Malaysia*), Prof Ir Dr Aduwati Sali (*Deputy Director, Research Management Centre, Universiti Putra Malaysia*), Ir Khor Bee Chin (*Senior Manager Technology and Innovation, Indah Water Konsortium Sdn Bhd*) and Ybrs Ir Dr Sanjayan Velautham (*CEO, SEDA Malaysia*). The event ended with an award ceremony for best abstract and best participant in the 4 tracks which also included sponsored prizes from IChemE Malaysia, ACS Malaysia and IEEE-EMBS Malaysia. The organising committee also thanks its sponsors - Sky Kencana, IT Tech, Fave and TA Instruments - for their support to AEC 2019. For more event information, visit AEC 2019 website at www.monash.edu.my/engineering-aec2019



Research Output

Journal Publications

The culmination of the research efforts by Graduate Research Students (GRS) through journal publications is a commendable contribution to the scientific community. Here, we share with you some of the recent journal publications by the GRS (highlighted in bold).

- **Chang, Jang Sen**, et al. "Multi-Dimensional Zinc Oxide (ZnO) Nanoarchitectures as Efficient Photocatalysts: What Is the Fundamental Factor That Determines Photoactivity in ZnO?" *Journal of Hazardous Materials* 381 (January 5, 2020): 120958. <https://doi.org/10.1016/j.jhazmat.2019.120958>
- **Chang, Jang Sen** et al. "Exploration of a Novel Type II 1D-ZnO Nanorods/BiVO₄ Heterojunction Photocatalyst for Water Depollution." *Journal of Industrial and Engineering Chemistry* 83 (March 25, 2020): 303–14. <https://doi.org/10.1016/j.jiec.2019.12.002>.
- **Dassanayake, Sandun M.**, and Ahmad Mousa. "Hydraulic Response of an Internally Stable Gap-Graded Soil Under Variable Hydraulic Loading: A Coupled DEM-Monte Carlo Approach." In *Innovative Solutions for Soil Structure Interaction, Sustainable Civil Infrastructures*. Springer International Publishing, 2020. https://doi.org/10.1007/978-3-030-34252-4_3.
- **Dassanayake, Sandun. M.**, et al "A Statistical Inference of Hydraulic Shear and Clogging in Internally Unstable Soils." *Géotechnique Letters* 10, no. 1 (December 9, 2019): 1–6. <https://doi.org/10.1680/jgele.19.00082>.
- **Emmanuel, E.**, and V. Anggraini. "Effects of Desiccation-Induced Cracking and Leachate Infiltration on the Hydraulic Conductivity of Natural and Olivine-Treated Marine Clay." *International Journal of Environmental Science and Technology*, December 23, 2019. <https://doi.org/10.1007/s13762-019-02606-x>.
- **Emmanuel, E.**, et al "Interaction of Landfill Leachate with Olivine-Treated Marine Clay: Suitability for Bottom Liner Application." *Environmental Technology & Innovation* 17 (February 1, 2020): 100574. <https://doi.org/10.1016/j.eti.2019.100574>.
- Abendong, Akoanung A., **Emmanuel, E.**, et al. "Assessment of Groundwater Quality in Bamenda–Cameroon for Suitable Applications." *SN Applied Sciences* 1, no. 11 (October 12, 2019): 1389. <https://doi.org/10.1007/s42452-019-1351-1>.
- **Emmanuel, E.**, et al. "Improving the Engineering Properties of a Soft Marine Clay with Forsteritic Olivine." *European Journal of Environmental and Civil Engineering* (September 18, 2019): 1–28. <https://doi.org/10.1080/19648189.2019.1665593>.
- Low, Liang Ee, **See Kiat Wong**, et al "Production of Highly Uniform Pickering Emulsions by Novel High-Intensity Ultrasonic Tubular Reactor (HUTR)." *Ultrasonics Sonochemistry* 54 (June 1, 2019): 121–28. <https://doi.org/10.1016/j.ultsonch.2019.02.008>.
- **Yaw, Chong Siang**, et al "Synergistic Effects of Dual-Electrocatalyst FeOOH/NiOOH Thin Films as Effective Surface Photogenerated Hole Extractors on a Novel Hierarchical Heterojunction Photoanode Structure for Solar-Driven Photoelectrochemical Water Splitting." *Chemical Engineering Journal* 380 (January 15, 2020): 122501. <https://doi.org/10.1016/j.cej.2019.122501>.
- **Yaw, Chong Siang**, et al. "Tuning of Reduced Graphene Oxide Thin Film as an Efficient Electron Conductive Interlayer in a Proven Heterojunction Photoanode for Solar-Driven Photoelectrochemical Water Splitting." *Journal of Alloys and Compounds* 817 (March 15, 2020): 152721. <https://doi.org/10.1016/j.jallcom.2019.152721>.
- **Yong, Lee Li**, et al "Stabilization of a Residual Soil Using Calcium and Magnesium Hydroxide Nanoparticles: A Quick Precipitation Method." *Applied Sciences* 9, no. 20 (January 2019): 4325. <https://doi.org/10.3390/app9204325>.

Vice Chancellor's Intercampus PhD Mobility Scheme Award Winners

Congratulations to the following GRS for being awarded the AUD\$ 3000 grant in September 2019. The 2020 applications are now open with the first closing date on 11 March 2020. For information, visit <https://bit.ly/20EYnbo>



Firnaaz Ahamed



Kulandai Arockia Rajesh Packiam



Endene Che Emmanuel

Chemical Engineering International Research Mobility Grant Awardees

The 9th Annual Chemical Engineering Postgraduate Association Conference was held in Monash University Clayton on 31 October 2019. For the first time, CEPA conference was open to participation from different universities. From our campus, 5 GRS were awarded the Department of Chemical Engineering International Research Mobility Grants to participate in CEPA. Kudos to the GRS!



GRS Awardees from left to right- Ms. Jia Min Lee (3rd), Mr Hoe Boon Chin (4th), Kulandai Arockia Rajesh Packiam (6th), Ng Wen Cai (8th), Vidya Sundaram (9th)

Notable Achievements

Here, we highlighted GRS who have taken up visiting researcher and fellowship opportunities during their PhD Candidature.

- Sandun M. Dassanayake – Civil Engineering - Visiting Researcher at the University of Warwick, UK as part of the Monash-Warwick alliance project
- Endene Che Emmanuel – Civil Engineering -
 - (1) 2020 World Bank Group - Africa Fellow - Jan - June 2020, The World Bank Group, Washington DC
 - (2) Short Mediterranean Ph.D. School Fellow - Universita Degli Studi di Napoli Federico II, Napoli, Italy.

Vice Chancellor's Commendations for Thesis Excellence

Congratulations to Dr. Arvind Rajan, the recipient of the 2018 Monash University Vice-Chancellor's Commendations for Thesis Excellence. Arvind is our Electrical and Computer Systems Engineering (ECSE) alumnus, who now works as a data scientist at Brookfield Asset Management in Melbourne, Australia. His Thesis title: "Moment-based uncertainty propagation using multivariate polynomials: Advances in probabilistic engineering design" was completed under the supervision of Dr. Ye Chow Kuang, Dr Melanie Ooi and Dr Vineetha K Menon.



Going Places Global Conferences

Sharing their research with the global scientific community at conferences is another notable effort by the GRS.



- Janarthanan Supramaniam - 26th Regional Symposium on Chemical Engineering (RSCE 2019), 30 - 31 October 2019, Kuala Lumpur, Malaysia
- Wong See Kiat - The 4th International Conference on Materials Technology and Applications (ICMTA 2019), 11-14 October 2019, Kyoto, Japan
- Sandun M. Dassanayake - 4th International Conference on Civil Engineering and Material Science 2019 (ICCEMS 2019), May 2019, Bangkok, Thailand
- Loo Junn Yong - IEEE Conference on Control Technology and Applications (CCTA), August 2019, Hong Kong, China
- Shalini Darmaraju - 21st IFAC Symposium on Automatic Control in Aerospace, August 2019, Cranfield University, UK

GRS Thoughts on The Achievement Experience

The Experience



The Lesson Learnt

Perseverance

Never give up and lose hope

Use the opportunity to prepare yourself and experience a greater learning

Learn to accept, process and learn from failure along the journey

Stay humble and hungry for learning

Ability to learn ANYTHING faster and more efficient, as long as some dosage of hardwork has been applied

The importance of putting yourself out there and learn new things from different people

Be willing to explore uncharted territory!

Proper time planning and management are the keys to success