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CENTRE OF EXCELLENCE IN RESEARCH, VALUE INNOVATION AND ENTREPRENEURSHIP

OFFICE OF POSTGRADUATE STUDIES



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STAFF ACHIEVEMENTS



Emeritus Professor Dr Phang Siew Moi, FASc, FMSA, FMBA (UK) Deputy Vice-Chancellor (Research and Postgraduate Studies), UCSI University

Congratulations to Emeritus Professor Dr Phang Siew Moi for being re-elected as council member of the Academy of Sciences Malaysia (ASM), 2021-2022.

Emeritus Professor Dr Phang Siew Moi was elected into the Academy of Sciences Malaysia (ASM), under the Discipline Group of Biological, Agricultural and Environmental Sciences in 2009. She also received the ASM Top Research Scientist Malaysia award in 2012. Professor Phang represents the ASM in the Science Council of Asia. She is the Chairperson of the ASM Special Interest Group on Oceanography and a Fellow of the Malaysian Scientific Association and the Marine Biological Association, UK.

Professor Phang Siew Moi has been an exemplary figure in the scientific community. As a passionate research scientist, she has published over 297 ISI-indexed articles and filed over 20 national and international patents with an H-index of 32. Her remarkable leadership skills have been acknowledged with her relentless efforts to propel UCSI University to achieve the greatest heights in research and innovation.

Under her focused and strategic planning, UCSI University have achieved an increase in University research grant approval (123%), national research grant application (167%), funding quantum received from Fundamental Research Grant Scheme (FRGS) in 2020 (129%), consultancy project (85%), SCOPUS publications (15%), journal article publications (35%), high impact factor publications (44.8%), journal citations (55.2%), national and international Memorandum of Understanding (MoU) and Memorandum of Agreement (MoA) (220% and 33%, respectively), copyrights (300%) and trademarks (100%)

We celebrate her achievement and together let us move towards research excellence at UCSI University.

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Congratulations to Senior Professor Ts Dr Ooi Keng Boon for being elected as Fellow of Academy of Sciences Malaysia (ASM)

UCSI's Graduate Business School (GBS) Dean, Senior Professor Ts Dr Ooi Keng Boon has been elected as one of the Fellows of the Academy of Sciences Malaysia (ASM) in 2021. This election is a prestigious recognition of individuals with outstanding achievements and contributions.

For Senior Professor Ts Dr Ooi, the appointment is significant as it brings honour to the University regarding its visibility at the national level. It also signifies that UCSI University is a university that emphasises teaching and impactful research. On a personal level, Senior Professor Ooi has authored and co-authored over 100 papers in international refereed journals indexed to Clarivate Analytics-Web of Science with close to 60 percent in A/A* journals ranked by the Australian Business Deans' Council (ABDC) in the 2019 Journal Quality List.



Senior Professor Ts Dr Ooi Keng Boon, FASc Dean, UCSI Graduate Business School

His current Google Scholar Citation H-index is 64 (Scopus H-index = 49; Clarivate Analytics-Web of Science H-Index = 43), with over 13,000 citations based on Google Scholar received from diverse authors and journals across the fields of information technology and industrial management.

"I am constantly motivated by the quest for knowledge, which empowers me to produce quality research work. I hope that my work can contribute by providing knowledge to practitioners to overcome many social and economic barriers faced by our nation, and that gives me satisfaction," He said. "I want to attribute this achievement to the University which has supported me immensely throughout my research. It would not be possible without the necessary encouragement and the appropriate strategic direction given by the top management. In addition, I am thankful and forever indebted to Emeritus Professor Dr Phang Siew Moi, Professor Dato' Dr Ahmad Ibrahim, Professor Dr Kurunathan, and Professor Dr Ong Seng Huat for all of their support during my application process for the ASM. The application would not be successful without their mentoring and encouragement," He added.

A few of Senior Professor Ts Dr Ooi's other international awards include being acknowledged as one of the Top World Authors and High Impact Researchers (ranked #6) in the topic "Technology Acceptance Model; Mobile Payment; UTAUT" by Elsevier. He has produced 22 papers in this topic between 2015 and 2020 whereby his papers have been cited over seven times in the world average levels based on Elsevier's Scopus and SciVal. He was ranked as the World's Top two percent Scientists (in the field of Business and Management and under the subfields of Information Systems) by the 2019 Stanford University List. He was also acknowledged as the World's Most Productive Author in the field of 'Mobile Commerce' from 2007-2018 (Du and Li, 2019) based on the Web of Science database in an article entitled "The Knowledge Mapping of Mobile Commerce Research: A Visual Analysis based on I-Model" published in Sustainability 2019, 11(6), 1580; https://doi.org/10.3390/su11061580

As for the impact of Senior Professor Ooi's recent achievement on GBS, he had this to say: "The achievement will broaden my international network for future research collaboration and knowledge sharing with scholars worldwide. With this, I hope the Graduate Business School can play a more prominent role in this scientific community and lead more research and consultancy projects. At the same time, I hope that the appointment can inspire all of my colleagues at the university to follow through." He said.



ESTABLISHMENT OF TAN SRI OMAR CENTRE FOR SCIENCE, TECHNOLOGY, AND INNOVATION POLICY STUDIES

The centre for Science, Technology, and Innovation (STI) Policy Studies will be named after a personality who has been championing Science, Technology, and Innovation for years, as a major enabler for national socio-economic transformation, and has injected relentless efforts in putting in place the necessary processes and institutions to drive the nation's STI agenda. He is none other than Professor Emeritus Tan Sri Dr Omar Abdul Rahman, Malaysia's first Science Advisor to the Prime Minister and currently a member of UCSI University Council. During his tenure as the Science Advisor, he was instrumental in the enhancement of the national R&D Budget, the development of the first national Science and Technology policy, and the establishment of MIMOS, Technology Park Malaysia (TPM), Malaysian Technology Development Corporation (MTDC), Malaysian Industry-Government Group for High Technology (MIGHT), Academy of Sciences Malaysia (ASM) and other institutions. This centre is created in line with the university's aspiration to be a leader in thought leadership. In this regard, it is in an area which is inadequately represented in the national context, that is associated with the role of, and relationship between, STI and economic competitiveness, social wellbeing and environmental sustainability. The mission of the Centre of STI Policy Studies are to contribute to national STI policy review and formulation through independent research and engagements with all national and global stakeholders. The vision is to be one of the leading STI policy centres for inter-institutional, national and international, public and private sectors.

This center is created with the university's aspiration to be a leader in thought leadership. It is in an area inadequately represented in the national context, namely that of the role of and the relationship between, STI and economic competitiveness, social wellbeing and environmental sustainability. As a centre of knowledge, policy thinking is one area that can effectively impact the interests of society, government and community. The Tan Sri Omar STI Policy Center will provide another platform for the university to further enhance its research and publications, making it more visible in the government and public discourse.

Through regular comments on STI policy and related matters, the public perception of the university can be strengthened, positively positioning the university to attract student enrolments. This will be the first policy study center attached to the university. However, few other research centers in other universities include policy assessment on their work but do not focus on STI Policy. The aforementioned research centers include the Asian Strategy and Leadership Institute (ASLI), The Centre for Policy Research and International Studies (ICMAS-UKM), Institute of China Studies (ICS – UM), and Social Wellbeing Research Center (UM).

Consequently, the establishment of the STI Policy Centre will enable UCSI to contribute to the development and research of science, innovation and technology which is also a part of the socio-economic aspect. This is also aligned with the the recently launched National Policy on Science, Technology and Innovation (2021-2030) (NPSTI) by the Minister of MOSTI.

This centre is chaired by Professor Emeritus Tan Sri Dr Omar Abdul Rahman. The research team comprised Dato' Professor Dr Ahmad Ibrahim and Professor Dr Razman Salim as the principal investigators, The head of programmes including Professor Dr Mohd Tajuddin Rasdi (STI on Social Policy and National Integration), Associate Professor Dr Lionel In Lian Aun (STI on Environment and Sustainability), Associate Professor Dr Pek Chuen Khee (STI on Economics, Trade and Regional Integration), and Muhammad Ikhram Ridzuan (STI on Foreign Policy and Security Studies).



FUNDAMENTAL RESEARCH GRANT SCHEME (FRGS) 2020: IDENTIFYING THE SIGNATURE BIOMARKER(S) OF EARLY METASTASIS EVENT IN NASOPHARYNGEAL CARCINOMA USING HETEROTYPIC MULTICELLULAR TUMOUR SPHEROID



Associate Professor Dr Cheah Shiau Chuen

Nasopharyngeal carcinoma (NPC) is one of the most aggressive head and neck cancer and frequently metastasize to distant lymph nodes and organs. It is a type of malignancy that have a remarkable ethnic and geographical distribution. it is one of the major public health problems in some countries, especially Southern China and Southeast Asia countries. NPC is the fifth most common cancer in Malaysia (MNCR 2012-2016). The incidence rate of this cancer in Malaysia is amongst the highest in the world, especially in certain ethnic groups in Malaysia (Bidayuh, Chinese, other indigenous people of Sabah and Sarawak). However, owing to its very low prevalence in western countries, it has often been considered as an 'orphan disease'.

A significant percentage of NPC patients will develop distant metastases. NPC and its complex tumour microenvironment are essential for various aspects of macroscopic tumour growth, maintenance, invasion, metastasis, and angiogenesis. Since early NPC is relatively asymptomatic, over 80% of the patients with NPC present with locally advanced disease or distant metastasis at diagnosis. When metastases are diagnosed, the prognosis is poor with a median survival less than 4 months. Metastasis accounts for approximately 90% of overall mortality among solid tumour patients. Hence, understanding the fundamental mechanism of NPC metastasis is imperative for developing a reliable model to predict metastasis in NPC.

Owing to the abovementioned rationale, Associate Professor Dr Cheah has decided to venture into this research area which resulted in the award of Ministry of Higher Education (MOHE) Fundamental Research Grant Scheme (FRGS) in 2020 with the research project entitled "Identifying the Signature Biomarker(s) of Early Metastasis Event in Nasopharyngeal Carcinoma using Heterotypic Multicellular Tumour Spheroid". As a cancer biologist, Dr Cheah hopes she would able to make contributions to the science through her uncovering the targeted cancer therapy and translated into the bedsides practice eventually.

FUNDAMENTAL RESEARCH GRANT SCHEME (FRGS) 2020: PRENATAL EXPOSURE TO HEAVY METALS AND ITS ASSOCIATION WITH FETAL GROWTH, TELOMERE LENGTH AND DNA DAMAGE IN NEWBORNS



Assistant Professor Dr Normina Bustami

Heavy metals are present naturally and had been used in many industries for thousands of years; making them to be present in the environment. Following the rise in industrialisation and urbanisation in the past decade, chances of being exposed to toxic heavy metals have increased; either from food, water, or occupational exposure. Pregnant mothers are vulnerable to adverse effects from occupational and non-occupational exposure of HMs while fetus received them through cord blood. Exposure to higher concentration of heavy metals such as cadmium (Cd) and lead (Pb) during pregnancy may increase the risk of miscarriages, premature deliveries, low birth weight, and impaired cognition in growing children while maternal blood lead (Pb) levels of approximately 100 μ g/L could increase the risks of pregnancy hypertension and spontaneous abortion as well as disrupting neurobehavioral development in offspring.

Researchers had also linked heavy metals with telomere length and DNA damage. Cadmium has been shown to be associated with signs of aging like mitochondrial dysfunction, genomic instability, and cell senescence. Previous research has shown that the uterine environment may influence leucocyte telomere length at birth, which is essential for cellular function, aging, and disease susceptibility such as obesity, diabetes, and cancer over the lifespan. The newborn setting of telomere length is a major determinant of telomere length in later life and can be considered a potential marker for future disease and lifelong health. This study aims to investigate relationship between prenatal exposure to heavy metals with fetal growth and development, telomere length and DNA damage among newborns. The results from this study are expected to assist in establishing the link between maternal and fetal heavy metals transfer, heavy metals, telomere length, and DNA damage.



FUNDAMENTAL RESEARCH GRANT SCHEME (FRGS) 2020: PSYCHOMETRIC PROPERTIES OF SALT@HOME AND SALT@SHOPPING APPROACHES FOR INVESTIGATING DIETARY SALT CONSUMPTION AND SOURCES IN THE DIETS OF URBAN-POOR MALAYSIAN POPULATION



In 2010, the Ministry of Health Malaysia started a salt reduction initiative as one third of the population were affected with high blood pressure. Statistics continuously show that sodium intake in Malaysia generally exceeded the WHO recommendation which is related with salt intake. However, the gold standard to evaluate dietary salt intake which is the 24-hour urine collection is not able to distinguish the various sources of salt. It is costly and resource consuming. Furthermore, dietary surveys have been proven to be prone to bias. The current study aims to investigate a practical approach to estimate dietary salt intake, sodium and identify the sources of salt intake in household compared to a 24-hour urine collection. These approaches are named as Salt@Shopping and Salt@Home which estimate salt intake based on items shopped or weighing cooking salt based on major salt-containing food at home in a typical one week adjusted for number of family members.

Psychometric properties of the approaches will be determined together with sensitivity, specificity, cost analysis, and feasibility test. Salt@Shopping or Salt@Home could serve as a simple, sensitive, and cost-effective practical approach to evaluate the total consumption of salt at population level. These methods may ease monitoring population salt and the effectively of national reduction programs. These methods are easier for public to implement and more likely to provide useful information that highlights the excessively high intake of salt and its sources, and in turn is helpful in guiding dietary salt reduction and further reduce the prevalence of hypertension.

FUNDAMENTAL RESEARCH GRANT SCHEME (FRGS) 2020: EVALUATION OF ELECTRIC FIELDS INCORPORATED AQUEOUS TWO-PHASE SYSTEM FOR KERATINASE SEPARATION AND BIOCONVERSION

First and Foremost, the research team of Associate Professor Dr Grrace Ng Hui Suan, together with co-PI, Associate Professor Dr Yim Hip Seng, Assistant Professor Dr Stephenie Wong Yoke Wei and the external collaborators: Professor Dr Akihiko Kondo from RIKEN Institute/Kobe University, Japan and Professor Dr John Chi-Wei Lan from Yuan Ze University, Taiwan would like to thank the Ministry of Higher Education, Malaysia for awarding the Fundamental Research Grant Scheme Funding for the two years research project. There were a total of 8.5 million tons of feather wastes containing the highly rigid polypeptide non-degradable keratin produced per annum which ended up in landfill. Microbial keratinase can degrade the keratincontaining feather wastes with relatively cheaper and simple operation. The enzymatic reaction of keratinase converts the keratin waste into useful feeds and biofertilizers. Keratinase is also widely applied in energy generation, green synthesis of nanoparticles, cosmetic, textile, biomedical, and detergent industries.



Associate Professor Dr Grrace Ng Hui Suan

The vast biotechnological applications of keratinase have urged the search to enhance the keratinase production with high yields and purity for commercialization purposes. There are limited studies demonstrated on the efficient recovery and separation of keratinase from microbial sources. The recovery of high purity and yields of microbial keratinase poses a great challenge due to the high processing cost and long processing time. Aqueous two-phase system (ATPS) was proven to be an effective separation tool for protein purification, however there is no literatures available reported on the integration of the electric field in the ABS for protein separation and enzymatic bioconversion process to-date. The application of electric field can direct the charged protein to migrate to a specific phase of the ATPS and thereby, enhance the separation efficiency of keratinase from fermentation broth.

UCSI University

ESTABLISHMENT OF UCSI-CHERAS LOW CARBON INNOVATION HUB RESEARCH CONSORTIUM: AN INITIATIVE TOWARDS LOW CARBON CITIES

UCSI University has in recent years made impressive progress in research with increased numbers of publications in high-impact journals. The steady increase in the number of external grants secured by UCSI researchers indicates UCSI University is ready to contribute significantly in the national and international arena. Along with this, the University Council has approved the establishment of Research Consortium (RC) targeted to address the thrust areas which aligned with the goal of National Prosperity Vision 2030. It is the main aim of each RC to further strengthen the research output of UCSI researchers in thrust areas through the generation of theories, new ideas, innovations and foremost creations for the development of knowledge boundaries. In this regard, Dr Alex Teng Kah Hou, Assistant Professor Dr Yeap Swee Pin (Faculty of Engineering, UCSI University) and our team from UCSI University have taken initiative to collaborate with Professor Andy Shaw (Built Environment and Sustainable Technology Research Institute, Liverpool John Moores University), Professor Ir Chong Wen Tong (Center of Energy Sciences University of Malaya) and Professor Ir Dr Suzana Yusup (Center for Biodiesel and Biochemical Research, University Teknologi Petronas) for the establishment of the UCSI-Cheras Low Carbon Innovation Hub RC as part of the initiative to accelerate Low Carbon Cities development in Malaysia (Figure 1).

According to BP Statistic Review of World Energy 2020, carbon dioxide (CO2) emission in Malaysia has amounted to 244.5 million tons in 2019, a rise from 243.5 million tons in 2018.

The statistic shows Malaysia, as one of the contributing countries for carbon emission yearly in Asia Pacific, has been increasing from past ten years until now. In particular, our energy resource still depends heavily on crude oil, coal, and natural gas, which accounted to large amount of CO2 emission. The Malaysian government, via Green Tech Technology Corporation, has been contributing a lot of continuous efforts to reduce the carbon footprint by promoting the Low Carbon Cities Framework (LCCF). The goal is to reduce CO2 emission by 45% by 2030. Owing to this, many cities in Malaysia have already set a low-carbon vision as a response to the global climate emergency, and to answer the EU net zero carbon target by the year 2050. However, thus far, there is no one-stop center available to provide expertise solution, consultation on challenges, and identify opportunities for the Cheras area to achieve low carbon development. UCSI group, as part of the Cheras community, would take initiative support to reduce carbon footprint strategy via the establishment of the UCSI-Cheras Low Carbon Innovation Hub RC.

This RC, which is currently formed by a team of renowned researchers in Malaysia and UK, aims to further work with industrial partners from a variety of sectors and industries in Cheras, governmental bodies, non-governmental organization (NGO), as well academicians, researchers from leading local and international universities in attaining knowledge transfer, community care, embracing sustainable goals (SDGs) and green economics on issues related to low carbon strategies.







Also, it is the mission of this RC to contribute towards "A greener and better Kuala Lumpur", as mentioned in the KL Low Carbon Society Blueprint 2030 along with support on the carbon footprint reduction in the global agenda. Here, the RC will take initiative to delivering programs with the potential to bring millions of ringgits to benefit to the economy, increase the productivity of businesses in a variety of sectors, and reducing carbon emission by thousands of tonnes.

As part of the method to achieve the goals, this RC have categorised their expertises into Five (5) main pillars, which provide offer towards low carbon initiative in (i) IR 4.0, (ii) Renewable Energy, (iii) Environmental Science, (iv) Chemicals, and (v) Electronics. Figure 2 further shown the specific areas grouped under each pillar.



Every project proposed by this RC is part of the strategies to answer the FIVE (5) core offers delineated in Figure 1; Accordingly, all the projects are connectable and are designed in such a way to achieve the vision and mission of this consortium. It is worth noting that the output from this consortium may impact the nation and global in the following ways.

On society and industry – This study may bring impact in terms of making low carbon initiatives a public knowledge. Society will be benefited by receiving a safer and greener living environment for their healthy lifestyle. It is hoped that the development of this consortium will promote more business models and job opportunities in the industries. In particular, this RC targets to offer consultation to SMEs in achieving their low carbon goal.

On the economy - The projects/initiatives conduct by this RC may impact Malaysia's vision of a "green economy" which aims to see it moving beyond its status as a manufacturing hub, and establish low carbon emissions, highly efficient use of resources, and a healthy well-educated populace. In fact, the economics of climate change has demonstrated that the benefits of strong action to reduce greenhouse gas emissions far outweigh the economic costs of not acting.

On the environment - The projects/initiatives conduct by this RC may serve to conserve and minimize the impact of greenhouse gases on the environment. In a long run, the efforts may address climate change, reduce climate-related risk, and propel the implementation of measures to adapt to climate change.

On National Policy - The projects/initiatives conduct by this RC is relevant to the National Green Technology Policy. Also, the FIVE core offers proposed by this consortium are aligned with the Malaysia's Key Economic Growth Activities (KEGA). The mentioned KEGA activities are KEGA 3, KEGA 11, and KEGA 12, which refer to Fourth Industrial Revolution, Renewable Energy, and Green Economy, respectively.

UCSI University as the coordinator of the research consortium, we are working with an open arms to extend the networking to more international bodies via the joint forming of a low carbon research group. The RC is open for other passionate, talented, dynamic, and responsive people/bodies who are committed to making a positive and significant impact on climate change to join the team! Please approach us by contacting the Coordinator of this RC (Dr Alex Teng: TengKH@ucsiuniversity.edu.my) for more details.



INTRODUCING THE ARTIST-IN-RESIDENCE, NG CHONG LIM

Ng Chong Lim is a well-established Malaysian pianist, composer and a celebrated educator. Chong Lim was the winner of the Malaysian National Piano Competition 1993, prize winner of the Royal Overseas League Competition and The Anthony Saltmarsh Junior Fellowship (RCM).

As a performer, he was featured as a soloist as well as a chamber musician in many major venues in countries such as the UK, USA, Holland, Austria, Germany, Denmark, Spain, Ukraine, Brazil and Japan. His most recent appearances were in Singapore, where he initiated the "Beethoven Complete Piano Sonatas Project."

Ng Chong Lim has also performed at The 3rd Asian Grand Piano Concert in Seoul, Korea, "Beethoven Complete Piano Sonatas Project' in Singapore, and many international venues.



Ng Chong Lim, Artist-in-Residence

Previous performances include those at "Evmelia" International Music Festival in Greece, the "Opusfest" Antipolo 2013-International Piano and Chamber Music Festival in Philippines and the 2014 "21st New Music Festival" held in Almaty, Kazakhstan. As a keen composer, Ng has had his works commissioned by various organisations such as the Malaysian Philharmonic Orchestra, the International Festival of Classical Music, the "Stream" New Music Festival in Brauweiler, and John Donal Robb Composer's Symposium. His work has been premiered in various countries such as Malaysia, Germany and United States.



Brahms Piano Concerto No 1 Op 15 with the University of Santo Tomas Symphony Orchestra (USTSO) at the main theatre in the Cultural Center of the Philippines.



As a piano teacher, Ng has taught many outstanding students who have won top prizes in prestigious international competitions. He is also a much sought-after adjudicator for many piano competitions around the world. Despite his international profile, as a Malaysian artist, he truly believes in improving society through the arts. His tireless efforts to transform the Malaysian music scene was noted and recognised by the Yamtuan Besar of Negeri Sembilan who conferred him the STM (Pingat Setiawan Tuanku Mukhriz—Associate-Order of Loyalty to Tuanku Mukhriz) in 2011. It is without doubt that he is among the top few piano luminaries in the classical scene of Malaysia.

With his appointment as UCSI University's Institute of Music (IMus) Artist-In-Residence, it will help IMus' mission to elevate piano artistry to higher level of professionalism. Ng Chong Lim's appointment will bring greater visibility of local talent in UCSI University to the public and higher education sectors. Furthermore, it will provide a much-desired source of inspiration that facilitates the formation of a creative environment benefitting IMus staff, students and the community at large.

As the Artist-In-Residence in IMus, Ng's expertise and experience will not only add tremendous value to the UCSI University student body but also to the community at large. Ng's outstanding credentials as an international artist and composer will serve as vital cultural knowledge for IMus students that ultimately aim to set them on par with international artistic standards. His interest and experience in promoting the musical arts will set him apart as an exemplary leader that pushes for new and innovative trends in community engagement. His community outreach effort will not only enrich the musical experience of public stakeholders, it will also help to cultivate a deep sense of appreciation for local talent and their special contributions to Malaysia's thriving music industry.



Rehearsal at Dewan Filharmonik concert hall with the Malaysian Philharmonic Youth Orchestra.



A Night For The Children in Aid of PA Nepal and Other Humanitarian Funds



Who is our Artist-In-Residence – Dr Kody Kato?

Dr Kody Kato is a Japanese-American designer and founding member of the Office for Design Evolution. He received the Doctor of Architecture degree in Performance-Oriented Design from the University of Hawaii at Manoa. While completing his dissertation, he studied and worked under the direction of Dr Ken Yeang in Kuala Lumpur and Byoung Soo Cho in Seoul, where he applied his integrated research in architecture, engineering, material, mathematical biology, and digital fabrication to international projects of various scales. His work is focused on streamlining the building design process and utilising principles inspired from nature to create a more direct relationship between people, materials, and the natural environment. This results in unique spatial experiences that encompass a wide spectrum of these disciplines, all of which have an immense respect to a project's natural surroundings and the lives connected to them. Kato received a London Design Award for 'Beyond Surface', a gravity-defying paper installation. Kato was also selected as One of the Top 10 Most Dynamic Entrepreneurs in Malaysia 2021 by APAC Entrepreneur.



Dr Kody Kato, Founder / Director of ODE Office for Design Evolution

Kato was recently selected as the Young CAADRIA (The Association for Computer Aided Architectural Design Research in Asia) and won the Best Paper Award for his dissertation in the 17th International Conference for CAADRIA. His work has also been published in Space Magazine and has received numerous awards including the Best Prize for the 28th Space Competition for International Students, Award of Merit for the 2010 Shinkenchiku Residential Design Competition, AIA Student Award of Excellence, AIA Student Award of Merit, and Energy Pioneer Award. His work has been exhibited in Space Gallery (Seoul) and at the Gwangju Design Biennale in 2009.

What is Performance-Oriented Architecture?

Originally proposed by Michael Hensel, this is based on the term 'performativity' in which all elements in both the built and natural environment are heterogeneous and in constant response to one another as well as external stimuli. He places an important emphasis on design research in architecture and the value of an interdisciplinary approach to create unique spatial experiences that enhance the lives of his clients and the public.

What has been done by our A-I-R?

'Beyond Surface' is a gravity-defying installation designed by architect Kody Kato, featuring 5,500 pieces of origami Takeo Tela, showcased during London Craft Week from 9-12 May 2018. The folding and assembly method became an extension of the original Sonobe technique. Rather than sliding individual units and glueing them to form tetrahedra, they are folded into one another, creating a new interlocking system. This new system meant that the 5500 interlocking papers, could only be done in series by adding a single unit of paper at a time and in a particular direction. The result of this new folding and assembly method also creates variations in light and shadow that are experienced from inside the installation. There are anywhere between 2 and 12 layers of paper overlapping one another at any given time. The varying thicknesses allow light to transmit at different intensities, which in turn result in different lighting conditions that can be seen from below the installation.

What is Dr Kody Kato challenging this time?

We, ODE and Web Structures are in the process of creating a bio-inspired reciprocal frame (a reciprocal frame is a class of self-supporting structure made of three or more beams and which requires no centre support to create roofs, bridges or similar structures). We are aiming at creating it entirely out of recycled paper with no rigid joints that would be able to take on the load of one walking on it.





Figure 1.

We are now looking into the actual structural analysis and sizing of the members. After confirming the structural analysis, the next step would be to implement natural or irregular organisational. (i.e. voronoi, etc). Bio-inspired tessellations make up the structural layout of dragon fly wings, leaves, patterns on a giraffe and even human skin. The organisation of these systems in nature have been found to be highly efficient. In this project, we will study how the combination of nature based systems and reciprocal frames can reduce the amount of paper beams needed while meeting the structural requirements for supporting the weight of a person.

How are we going to integrate the university community?

The workshop is going to be a six-month long research and engagement with the School of Architecture and Built Environment students, who would be taught the application of Grasshopper Scripts in the workshop. The students will be able to take this script, explore various options and design their own structure. This true integration of exploration would be integrated into our elective course. 10 students from the elective course will be selected into the Master Class at the end of the year to fine tune the design with the building of installation that is to be displayed to the public coupled with workshops opening to public.

How is this related to to the UN Sustainable Development Goals?

The ultimate aim for this workshop is to study the possibility of self-supporting structures utilising the most common waste in any university community – paper. The A-I-R is working with local paper manufacturers to transform the University's recycled paper into industrial grades rectangular and circular tubes for the construction elements. The SDGs we are looking at include: Goal 4: Quality Education – Integrating forefront technology and research activities within the syllabus to culture the future generation; Goal 9: Industry, Innovation and Infrastructure - Investigating the transformation of everyday waste into structural elements that may serve as a temporary structure for shelter; Goal 12: Responsible Consumption and Production - Turning waste into structural elements or building temporary structure with recyclable materials and system; Goal 17: Partnership For The Goals – Working with industrial research experts and industrial players in manufacturing to develop self-supporting structures with the university community.

What do we envision this structure to become in the future?

As the structure is self-supporting without any rigid joinery, it will be of such flexibility and recyclability for the structure to be used and reused in many different occasions, taking different forms and scale. The possibilities is unlimited. For example, with the recent spike in Covid-19 cases and a shortage of space for hospital beds, the structure would be able to provide large unencumbered areas as a fast, temporary solution.



Figure 2



RESEARCH GRANT CALLS, EXHIBITIONS SYMPOSIUMS AND WEBINARS

No.	Funding Scheme	Endorsement by CERVIE	Submission Closing Date
	Malaysia Grand Challenge, MOSTI		
1	Applied Innovation Fund (AIF)		
	 Technology Development 1 Fund (TeD 1) 	Open, no closing date as	Open, no closing date as
	Bridging Fund (BGF)	for now	for now
	MOSTI combatting COVID-19 Fund		
	URL link: https://edana.mosti.gov.my/		
2	Public-Private Research Network (PPRN) 2.0 - Phase 2	11 June 2021	18 June 2021
	URL link: https://www.mohe.gov.my/perkhidmatan/penyelidikan/pprn		
	Malaysia Social Innovation (MySI) 2021	20 June 2021	30 June 2021
3	URL link: https://mysi.innomap.my/about/overview		
No.	Exhibition(s)	Submission Closing Date	
1	12th International Greentech & Eco-Products Exhibition & Conference Malaysia	30 June 2021	
	(IGEM) 2021		
	URL link: www.igem.my	20 June 2021	
2	KINOVASI ZUZI	50 Julie 2021	
2	The 8th Korea Creative Invention Contect (CiC) 2021	20 June 2021	
_	The 7 th World Invention Innovation Contest (WiC) 2021	20 July 2021	
	IRI link: www.kinews.org	2030	, 2021
No.	Symposium(s)	Abstract Submission Closing Date	
	6th Green & Sustainable Chemistry Conference		
1	URL link: https://elsevierfoundation.org/partnerships/research-in-developing-	1 August 2021	
-	countries/greenchem/?utm_campaign=STMJ_139984_SC&utm_medium=email&utm_acid		
	=101345782&SIS_ID&dgcid=STMJ_139984_SC&CMX_ID&		
No.	Webinar(s)	Webinar Date	
1	Green Energy Transition in Asia	29 June 2021	
	URL link: https://zoom.us/webinar/register/WN_93xD4G4PSA-HP71L6OL9SA		
2	Researching Ethically and Responsibly with Marginalised Communities (Refugees &	13 July 2021	
	Migrants)		
	UKL IINK: http://jorms.gle/VqZjar5bWSGUKTIP6	I	

Please refer to your respective Head of Research for more information.

Advisor

Emeritus Professor Dr Phang Siew Moi

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