

## **WORLD HERITAGE SITE**

### **– KINABALU PARK**

**IN-STORE INTERACTIVE ROBOTS**

**CAN GREEN BUILDINGS SAVE THE PLANET?**

**SMART DEVICE FOR MONITORING LOW BACK  
PAIN REHABILITATION**

**CONTEMPORARY ART FESTIVAL IN THAILAND**

# UNIVERSITY OF MALAYA ACADEMIC CALENDAR FOR 2017/2018

SEMESTER I				
Introduction Week	1 week	04.09.2017	-	08.09.2017
Lectures	7 weeks*	11.09.2017	-	27.10.2017
Mid-Semester I Break	1 week	28.10.2017	-	05.11.2017
Lectures	7 weeks*	06.11.2017	-	22.12.2017
Revision Week	1 week*	23.12.2017	-	31.12.2017
Examinations Semester I	2 weeks*	01.01.2018	-	14.01.2018
Semester I Break	3 weeks*	15.01.2018	-	04.02.2018
	<u>22 weeks</u>			
SEMESTER II				
Lectures	7 weeks*	05.02.2018	-	23.03.2018
Mid-Semester II Break	1 week	24.03.2018	-	01.04.2018
Lectures	7 weeks*	02.04.2018	-	18.05.2018
Revision Week	1 week	19.05.2018	-	27.05.2018
Examinations Semester II	3 weeks	28.05.2018	-	14.06.2018
	<u>19 weeks</u>			
SESSION BREAK				
Semester Break	12 weeks*	15.06.2018	-	09.09.2018
SPECIAL SEMESTER				
Lectures	7 weeks	25.06.2018	-	12.08.2018
Examinations	1 week	13.08.2018	-	19.08.2018
Semester Break	4 weeks*	20.08.2018		09.09.2018
	<u>12 weeks</u>			

## PRINTING & PHOTOGRAPHY SERVICES



Park)

**PREMIUM QUALITY**

**FAST PRINTING**

**EXCELLENT SERVICES**

### CONTACT

Centre for Research Services  
Level 2, Research Management &  
Innovation Complex, University  
of Malaya

**(Mr. Yani)**

Tel: +603-7967 4651 / 6942

Fax: +603-7967 6390

Email: pengarah\_ppp\_ippp@um.edu.my

Website: umresearch.um.edu.my

BUNTINGS

MOCK CHEQUES

FLYERS

BANNERS

PHOTOS

POSTERS

# PREFACE



**Prof. Dr. Noorsaadah Abd Rahman**  
Deputy Vice-Chancellor  
(Research & Innovation)  
University of Malaya

*Assalamualaikum and hello everyone,*

*Firstly I would like to congratulate the UM community for UM's placement at the 114th position in the recent QS World University Ranking 2018. This is a testimony to the quality research and education provided by the academics in UM and all UM staff should be proud of this achievement. In spite of lack of research funds in the last couple of years, our researchers have been innovative enough to carry on with their research work and still produce good work and publication to contribute to the improved QS rank for UM. It is our hope that the situation will improve soon and our researchers will be able to obtain the funding that they need to do better research and further contribute to the excellence of the education and research in Malaysia. With support, we are confident that UM will continue to fly Malaysia's flag as the pride of the nation in higher education for Malaysia.*

*Thank you and congratulations once again.*



**Prof. Dr. Shaliza Ibrahim**  
Associate Vice-Chancellor  
(Research & Innovation)  
University of Malaya

*Alhamdulillah we have come to another issue of UM Research Bulletin. In June this year we welcomed the great news that UM is ranked 114 in the 2018 QS World University Ranking, thus continuing our upward trend towards being in the Top 100, InshaAllah. UM is the country's top institution for publications and citations, but no less in research impacts that directly benefit the society. This is especially relevant as 2017 has been declared the year of "translational research" by YB Minister of Higher Education. Vol 17 No 1 Issue of 2017 of the UM Research Bulletin showcases selected projects that have potential to be translated from academic research into practical solutions to benefit industry, government and society. We are proud to share that in the first half of 2017 UM researchers have secured 30 international grants worth RM 6 million from a number of funders that include the various UK Research Councils, Erasmus Plus, the US National Institutes of Health, and Japan Nippon Sheet Glass Foundation. We hope this will motivate every UM researcher to apply for international grants and make yourselves more visible to the rest of the world.*

*Finally, I would like to say a special Thank You to YBhg Tan Sri Professor Dato' Dr Mohd Amin Jalaludin who retired as UM Vice-Chancellor in April, for the endearing support during his term as VC. We pledge to continue to work closely with our top management, led by Professor Dr Awang Bulgiba Awang Mahmud to bring UM to greater heights.*

*Thank you.*

# EDITORIAL MESSAGE

Welcome to UMR Bulletin 2017. This issue showcases interesting research findings across a wide range of disciplines.

Special featuring on our world heritage site – Kinabalu Park allows readers to have better understanding of its intangible values. The Cultural, Arts and Humanity researches also unveil the creativity and the discontentment of a contemporary art festival in our neighboring Thailand.

The section from Green Building and Green Environment discusses green and conventional buildings, highlights the impact of climate change and urbanization on the health of elderly Malaysians, details how walkability contributes towards green neighborhood and also how the straits of Malacca and Singapore can be protected from atmospheric shipping emissions.

The anti-cancer properties of extract from Malaysian *Alpinia conchigera*, smart device invented for monitoring low back pain rehabilitation, interactive robots to generate in-store analytics solution and the "R'One Code for the Mind of Future" all have marked the research advancements in the field of Science and Technology by UM researchers.

The vast milestones achieved by the Social Science researchers are evidenced in the articles include "Cluster-based learning and Innovation on Sekinchan Paddy-Rice Cluster", "Animal Ethics and Responsible Use of Animals", "Poverty among Indigenous Communities in Peninsular Malaysia", "Evaluation of Enterprise Architecture Implementation by Hybrid Method" as well as the "Challenges Experienced by Early Career Faculty Educated in Overseas". The present issue of the bulletin also introduces the roles, functions and significances of a "Centre for ASEAN Regionalism at University of Malaya" (CARUM).

In addition, we have a short write-up featuring our researchers' Corporate Social Responsibility (CSR) experience in Miri and Bario, Sarawak. It is great that our researchers are moving towards societal impact research besides producing the usual research outputs in terms of publications. We hope to see more researchers translating their research to benefit our society in the future.

Finally, I would like to thank all contributors of the articles and wish all happy reading!  
Thank you.

*Assoc. Prof. Ir. Dr. Ngoh Gek Cheng  
Director  
Centre for Research & Services*

---

## ADVISORS

Prof. Dr. Noorsaadah Abd Rahman  
Prof. Dr. Shaliza Ibrahim

## EDITORS

Assoc. Prof. Ir. Dr. Ngoh Gek Cheng  
Dr. Bong Yii Bonn  
Dr. Hong Sok Lai

## COORDINATORS

Yanti Norima Mohd Shobri  
Valerie Cassera Rapoi

## DESIGN & PRINTING

Centre for Research Services

For advertisement in UM Research Bulletin please  
contact us:

## CONTACT

Centre for Research Services  
Institute of Research Management & Services  
Level 2, Research Management  
& Innovation Complex,  
University of Malaya, 50603 Kuala Lumpur

Tel: +603-7967 4651 / 6942

Fax: +603-7967 6390

Email: [pengarah\\_ppp\\_ipp@um.edu.my](mailto:pengarah_ppp_ipp@um.edu.my)

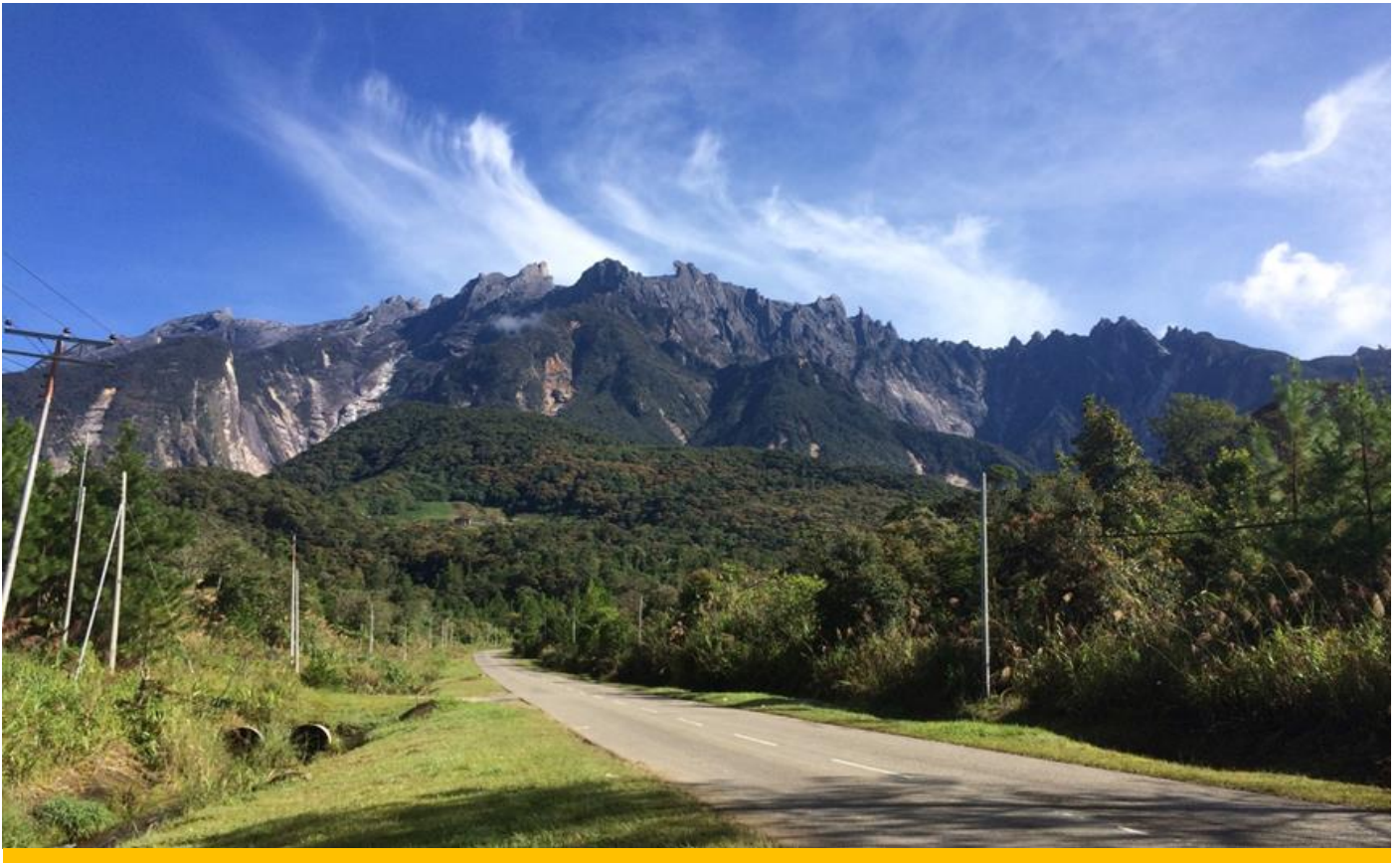
Website: [umresearch.um.edu.my](http://umresearch.um.edu.my)

# CONTENTS

	Page
PREFACE	1
EDITORIAL MESSAGE	2
CONTENTS	3
UNDERSTANDING THE VALUES OF OUR FIRST WORLD HERITAGE SITE – KINABALU PARK	4
ANTI-CANCER STUDY OF 1'-S-1'-ACETOXYCHAVICOL ACETATE EXTRACTED FROM MALAYSIAN <i>Alpinia conchigera</i>	6
CAN GREEN BUILDINGS SAVE THE PLANET?	8
A CONTEMPORARY ART FESTIVAL IN THAILAND	10
NEW GENERATION OF IN-STORE ANALYTICS SOLUTION WITH INTERACTIVE ROBOTS	12
UNDERSTANDING CLUSTER-BASED LEARNING AND INNOVATION – INSIGHTS FROM SEKINCHAN PADDY-RICE CLUSTER	14
SMART WEARABLE DEVICE FOR MONITORING LOW BACK PAIN (MyEMG)	16
IMPACT OF URBANIZATION AND CLIMATE CHANGE ON THE HEALTH OF THE ELDERLY MALAYSIANS	18
ONE CODE TO RULE THEM ALL	20
PROTECTION OF THE STRAITS OF MALACCA AND SINGAPORE FROM ATMOSPHERIC SHIPPING EMISSIONS	22
ANIMAL ETHICS AWARENESS AND RESPONSIBLE ANIMAL USE IN UM	24
THE CENTRE FOR ASEAN REGIONALISM UNIVERSITY OF MALAYA (CARUM)	26
HYBRID METHOD FOR EVALUATING ENTERPRISE ARCHITECTURE IMPLEMENTATION	28
POVERTY AMONG THE SMALL-SCALE PLANTATION HOLDERS: INDIGENOUS COMMUNITIES IN PENINSULAR MALAYSIA	30
CHALLENGES EXPERIENCED BY OVERSEAS-EDUCATED EARLY CAREER FACULTY (ECF)	32
WALKABILITY AS AN IMPORTANT CONTRIBUTING FACTOR TOWARDS GREEN NEIGHBOURHOOD	34
EXPERINECE OF UM's CSR TRIP TO MIRI AND BARIO, SARAWAK	36

**Disclaimers:** The views and opinions expressed in UMR Bulletin are those of the individual authors and not necessarily those of the UMR Bulletin Editorial Board. Whilst every precaution has been taken to ensure the total accuracy of materials contained in UMR Bulletin, no responsibility for errors or omissions will be accepted.

# UNDERSTANDING THE VALUES OF OUR FIRST WORLD HERITAGE SITE — KINABALU PARK



**N**ature conservation focuses on preserving the fragile and pristine environment. The protected areas have economic value, considering they have become an important component in the tourism industry. Clearly there exists an interdependent relationship between conservation and tourism within protected areas whereby both can be measured economically. However, these straightforward quantified tangible values are not the only reason why people choose to visit and care deeply for the protected areas. The dual roles of protected areas contributed to the evolving and increasingly diverse values within protected areas apart from the tangible values. The intangible values, also known as the “intrinsic values”, which are equally important as the tangible ones. Unlike tangible values, intangible values are difficult to measure and often overshadow due to their vague and abstract nature. Nevertheless, they impact a sentiment value in a person towards the place.

For example, one person might regard a protected area as a place for pure enjoyment of the natural environment, while another person might see it as a source of their satisfaction knowing that their existences have safeguarded the natural environment. Similarly, the local or indigenous community might feel spiritually-connected to the protected areas due

to their sacredness. There is a connection between how people perceived these values, and the interaction between different intangible values is becoming increasingly important in the efforts of conservation in this modern era. Hence, it is important for park management worldwide to take into account these intangible values along with the tangible values to ensure the sustainability of the protected areas.

A research project fully funded by the Fundamental Research Grant Scheme, Ministry of Higher Education Malaysia was devised to understand the values perceived by tourists in Kinabalu Park, Malaysia’s first natural World Heritage Site. Kinabalu Park exhibits outstanding natural landscapes and geological features. The most distinct feature of the park is Mount Kinabalu with its different peaks protruding through the vast forest of Borneo. Mount Kinabalu, which stands at 4,095.2m above the sea level, is the tallest mountain in the South East Asian region. As a result of the high altitudinal range, Kinabalu Park is blessed with exceptionally rich biodiversity and is a home to thousands of plant and animal species. It was awarded with the status of World Heritage Site by the International Union for Conservation of Nature (IUCN) in 2000. Thus, Kinabalu Park has become one of the most iconic tourism attractions in Malaysia.



Recreational activities in Kinabalu Park (a) summit trail to the mountain and (b) Orchid Conservation Center

As a protected area, Kinabalu Park caters for both nature conservation and recreational activities which involves multiple groups of actors namely the tourists, local community, park management, and private sectors. All these groups of people perceive Kinabalu Park differently. One of the intangible values which Kinabalu Park offers is the recreational value. The park provides tourists and local community with space for recreational benefits such as nature enjoyment, escape from busy lifestyle, rest and relaxation, and etc. Educational value is another intangible value which can be obtained through various educational and interpretive activities in the park. The surrounding local communities possess great knowledge about the park, hence are able to contribute to the educational content, and make up for the loss due to park's development.



Kinabalu Natural History Gallery

Although Kinabalu Park is established mainly for conservation purpose, it is deemed as a sacred place by the local communities. They believe that Mount Kinabalu is the final resting place for the dead. However, tourists might not share the same spiritual view as the local community. Despite having different views, tourists are satisfied to know that Kinabalu Park is well protected due to its spiritual values. Such satisfaction is referred as 'existence value' in protected areas. We are grateful for the advancement in technology and rapid flow of urbanization today, while concern of losing our natural environment at the same time. In view of that, the existence of protected areas provides a sort of comfort. Other types of intangible values which can be observed in Kinabalu Park are the scientific and monitoring, aesthetic and artistic, cultural, identity, peace, and therapeutic values. Managing these intangible values is a challenging task owing to their different perspectives as people have diverse ways in translating the significance of Kinabalu Park.



*Rafflesia Keithii*, one of the world's largest flowers - an endemic species in Kinabalu Park

**CONTACT**

**DR. TPr. GOH HONG CHING**  
 Department of Urban and Regional Planning  
 Faculty of Built Environment  
 University of Malaya  
**gohhc@um.edu.my**

# ANTI-CANCER STUDY OF 1'-S-1'-ACETOXYCHAVICOL ACETATE EXTRACTED FROM MALAYSIAN *Alpinia conchigera*

Currently, there is no approved anti-cancer drugs in Malaysia despite its abundant natural resources and initiatives on potential drugs such as tocotrienol from oil palm and silvestrol from a rainforest tree. In our efforts to contribute, we started with the chemical investigations of the Malaysian ethno-medicinal Zingiberaceae plant *Alpinia conchigera* and isolation of its active compound, 1'-S-1'-acetoxychavicol acetate (ACA). The chemical structure of ACA with a terminal double bond and an acetoxy group at position C-1' is responsible for the cytotoxic effect or cell killing effect against human cancers (Fig. 1) (Awang et al., 2010).

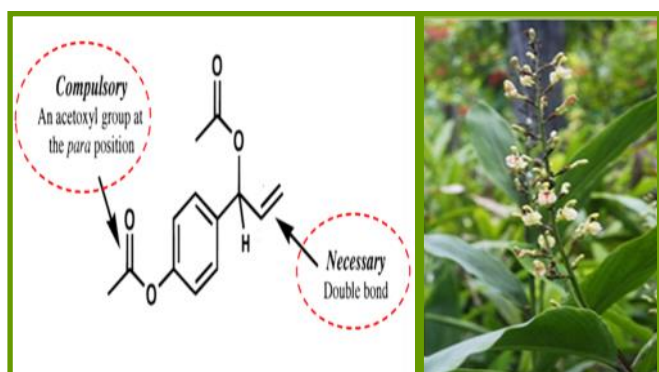


Fig. 1: Chemical structure of the Malaysian isolate, ACA from *Alpinia conchigera* Griff. (Zingiberaceae)

Previous cell culture and animal model analyses showed ACA induces apoptotic cell death in cancer cells and reduces physiological side effects on normal cells (In et al., 2012). In spite of the high anti-cancer efficacy of ACA, various clinical development drawbacks were anticipated, such as, poor solubility, depreciation of biological activity and non-specific targeting of tumour cells. In a collaborative study with Institute of Engineering Immunology, Russia, these problems were addressed using their novel drug conjugation technology involving a recombinant human alpha fetoprotein (rhAFP) and ACA. Synergism was observed due to the ability of ACA to induce apoptosis effectively together with rhAFP as a result of specific recognition of tumour cells that express AFP-receptors (Fig. 2)(Norhafiza et al., 2015).

To study the synergistic effect of ACA and rhAFP on human prostate and lung cancer grafts, athymic (with no cell-mediated immunity) mice were treated with stand-alone and combination regimens. The combined treatments displayed higher reductions in tumour volume (Fig. 3) with milder signs of systemic toxicity, such as, minimal loss in

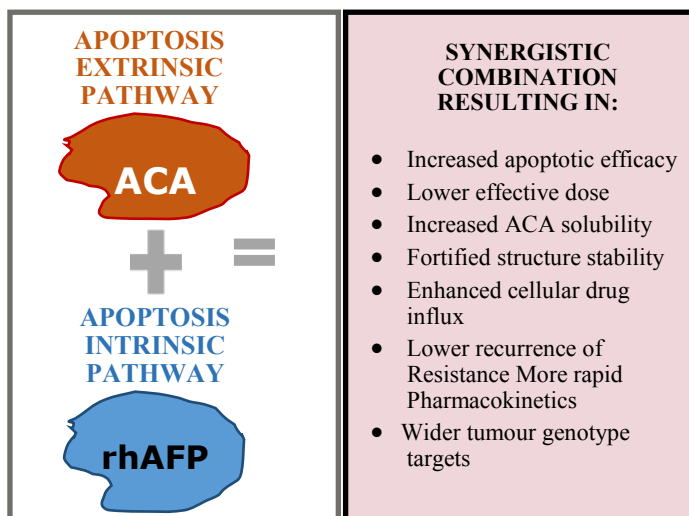


Fig. 2: Synergistic effects of ACA and rhAFP via extrinsic and intrinsic apoptosis-mediated pathways

body weight and reduced inflammation of vital organs compared to stand-alone agents (Fig.4) (Norhafiza et al., 2015).

Tumour marker levels were consistent for all ACA/rhAFP treatment groups where levels of cancer biomarkers, carcinoembryonic antigen (CEA) and prostate specific antigen (PSA) were elevated at the start of the treatment and consecutively reduced as the tumour bulk volumes decreased (Fig. 5) Also, the combined treatments showed reduced levels of all important cancer-associated and inflammatory proteins (Norhafiza et al., 2015).

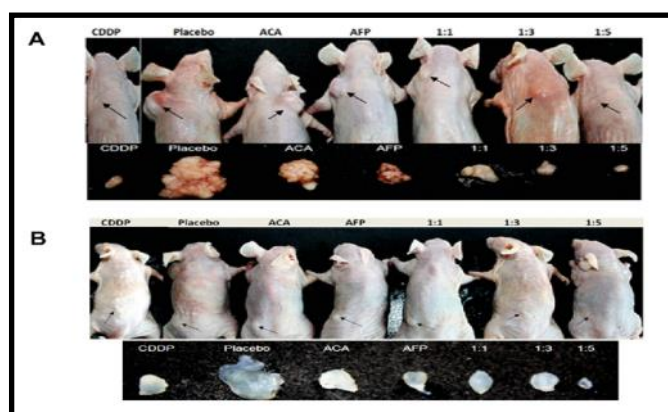


Fig. 3: Tumour reduction effects of various rhAFP/ACA treatment regimens on athymic mice. Location of all surface tumour sites are indicated by closed arrows, and representative photographs ( $n=6$ ) of tumours harvested 35 days post-implantation for (A) Human lung A549 tumour grafts and (B) Human prostate PC-3 tumour grafts. Saline solution 0.9% (w/v) sodium chloride was used as placebo, while cisplatin (CDDP) (10.0 mg/kg) was used as a positive control reference



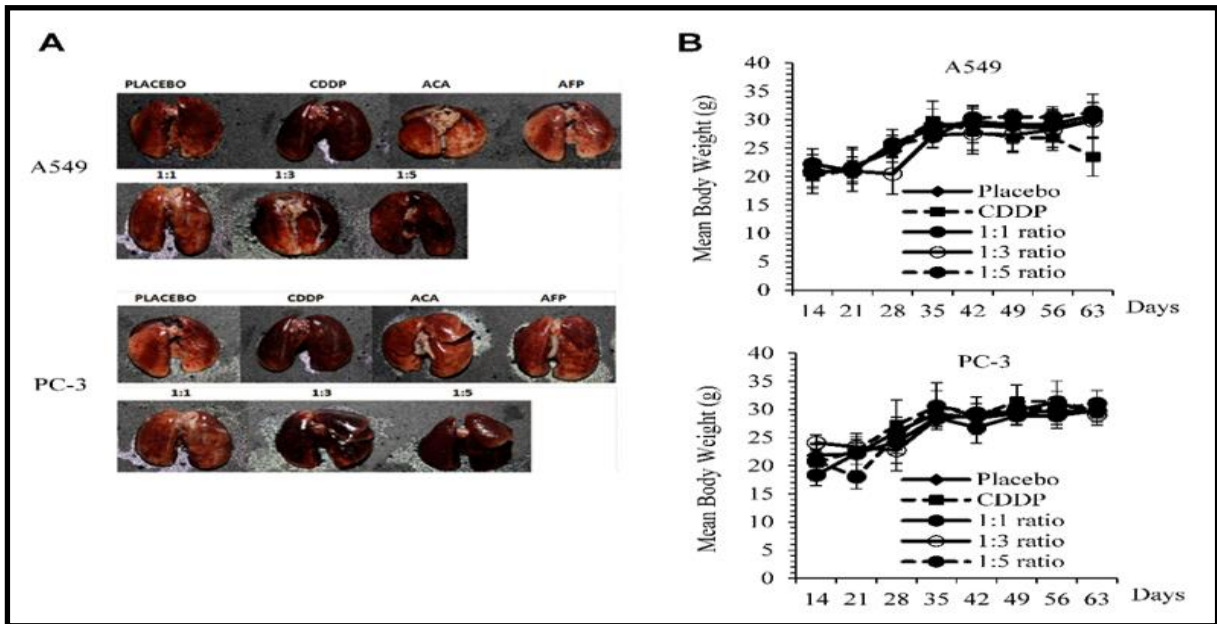


Fig. 4: Physiological side effects of rhAFP/ACA in mice. **(A)** Signs of pulmonary inflammation and capillary haemorrhaging in cisplatin (CDDP) treated groups and at high rhAFP/ACA molar ratio regimens ( $\geq 1:3$ ) compared to placebo in A549 human lung and PC-3 human prostate tumour grafts. **(B)** Assessment on mean  $\pm$  S.D. body weight loss between various combined rhAFP/ACA treatment groups on A549 lung and PC-3 prostate grafts. Placebo denotes groups treated with 0.9% (w/v) sodium chloride solution while concentration of CDDP was set at 10.0 mg/kg once per week

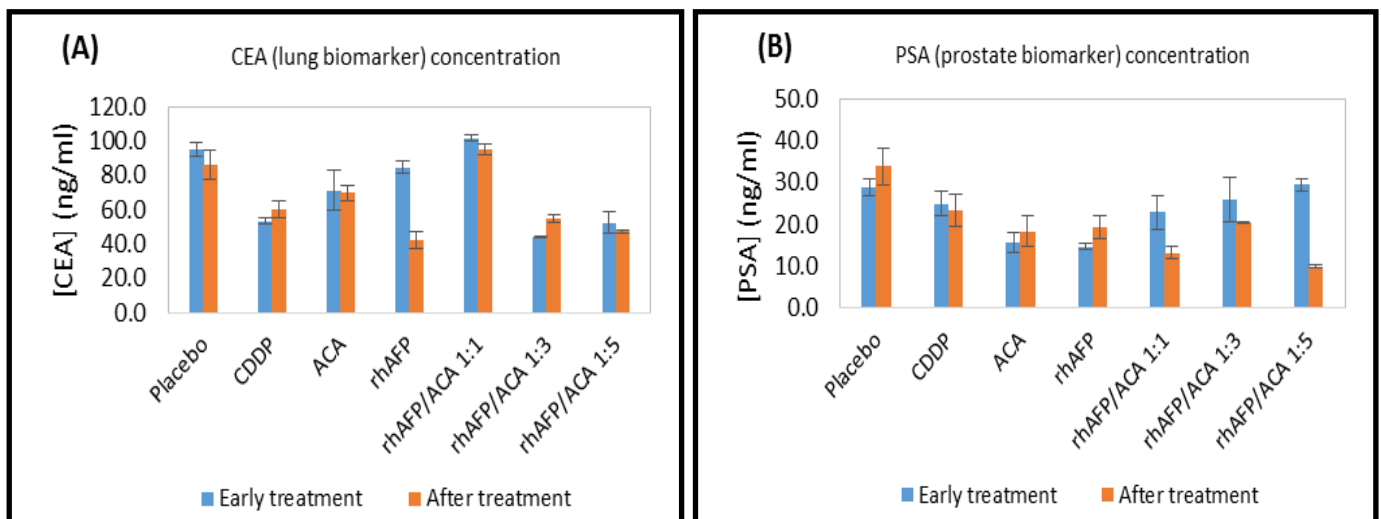


Fig. 5: CEA (lung) and PSA (prostate) tumour antigen marker levels. CEA and PSA tumour antigen marker levels from blood sera of athymic mice with **(A)** A549 human lung tumour grafts and **(B)** PC-3 human prostate tumour grafts upon treatment with rhAFP/ACA complex at various molar concentration ratios in comparison to placebo, stand-alone and CDDP controls

## CONTACT

**PROF. DR. NOOR HASIMA NAGOOR**  
 Institute Science Biology  
 (Genetics & Molecular Biology)  
 Faculty Science  
 University of Malaya  
[hasima@um.edu.my](mailto:hasima@um.edu.my)

This research is exemplary of a fusion between traditional medicinal knowledge with the present advanced modern technology of protein conjugation. It has great therapeutic potential and is a pioneer for the basis of future anti-cancer drug developments. This project has graduated 2 PhDs, filed 1 patent, published 6 ISI Q1/Q2 papers and 3 on-going PhD research studies in toxicity, toxicokinetic, pharmacokinetic, pharmacodynamic and nanodelivery of ACA.

# CAN GREEN BUILDINGS SAVE THE PLANET?

## Comparing Operational Energy of Conventional and Green Buildings

Much has been said regarding climate change in current news and media, but what most people fail to understand is that the planet will continue to survive, it is us, humans, and other living things on this planet that won't. *Global warming and climate change* is one of the biggest issues facing humanity in this century; its effects are felt on the highest peaks of Mount Everest to the low lying islands of the Indian Ocean.

Much of the climate contribution has been linked to humanity's thirst for higher living standards and lifestyle, which has led to higher consumerism, depletion of earth's resources, production of massive waste and carbon emissions. We are living in the 'Age of Human', also known as the Anthropocene, where human beings are forcing major changes to the planet's ecosystems. This century marked the highest amount of carbon dioxide (CO<sub>2</sub>) emitted, breaking records of the past 650,000 years and we have pushed the climate to 'a point of no return'.

Buildings and the built environment directly and substantially affect the natural environment and ecology because of their long lifespan. The green building movement has been at the forefront of architecture in lieu of current climate change and sustainable development context. Green building assessment tools are being used to predict the energy performance of building during its operational phase.

Many countries have developed their own green rating tool based on one another, mostly adapted from the pioneering **BREEAM** - *Building Research Establishment Environmental Assessment Method* (UK) and **LEED** - *Leadership in Energy and Environmental Design* (USA) rating tools. Examples of green building rating tools available in the South East Asian region are *Green Mark* from Singapore, *Building for Ecologically Responsive Design Excellence* (**BERDE**) from Philippines and the *Green Building Index* (**GBI**) and *Malaysian Carbon Reduction & Environmental Sustainability Tool* (**MyCREST**) from Malaysia. Some of the assessment criteria in these green building rating tools are similar, for example energy efficiency (EE), indoor environmental quality (EQ), and water efficiency (WE).

These green building rating tools are predictive models of how buildings would perform in operational phase; however it does very little to measure actual performance of the so-called

The logo for BREEAM (Building Research Establishment Environmental Assessment Method) features the word "BREEAM" in a bold, green, sans-serif font with a registered trademark symbol.

BCA GREEN MARK



green buildings. There is still a significant performance gap between predicted or stimulated energy measurements to actual operational energy consumption. The need to measure actual performance of these so called 'green buildings' are important to investigate if there is a performance gap and whether these buildings can perform better than conventional buildings. Understanding why the performance gap occurs is a step in reducing actual and predicted energy performance in buildings and truly be a testament of real energy and CO<sub>2</sub> reduction.

A study done in New York City found that one fourth of the LEED Energy Star buildings actually consumes more energy than predicted, and some was even consuming more than the national baseline. Similar results were found in United Kingdom, through a free online energy data-sharing platform called CarbonBuzz, that the actual energy performance of all the building sectors was higher than its predicted performance, which is approximately 70% to 89% higher than the predicted energy performance.

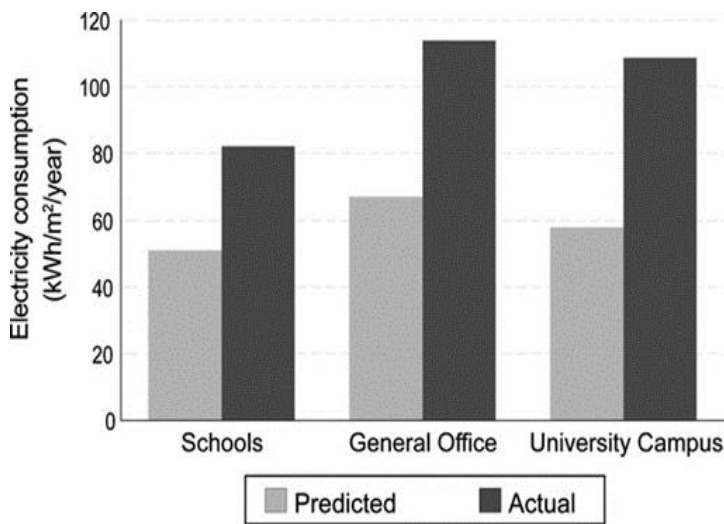


Fig. 1: Predicted Energy Savings versus Actual Performance

Source: Turner & Mark (2008)



Fig. 2: CarbonBuzz median electricity consumption per-sector – predicted vs. actual

Source: Hamilton et al., (2011)

This study measured operational energy consumption in Malaysia, in a comparative case study of conventional building versus a GBI Certified Building. The case study buildings were selected based on the limitation of selecting two buildings with similar characteristics within Central Business District of Kuala Lumpur. The selected GBI certified building was designed to perform at 150kWh/m<sup>2</sup>/year and has a total floor area of 43,943 m<sup>2</sup>, while the baseline conventional building with 41,249 m<sup>2</sup>. Both buildings used double-glazed glass for their windows, and the GBI certified building has a total of 15 lifts, while the baseline building has 12 lifts. The comparative case study found that the conventional building was performing better than the GBI rated building over time, at 69 kWh/m<sup>2</sup>/year and 111 kWh/m<sup>2</sup>/year, respectively.

The typical variable that affects operational energy performance of a building largely lies in the underestimating of the 'unregulated' energy use from occupant-related usage, such as personalized computer/laptop, electronic plug-in appliances, heating and cooling, operating time, number of occupant and so forth. User behaviour has been identified as one of the main factors that contributes to the performance gap, therefore strategies to encourage building users to operate in a more energy efficient manner are advisable.

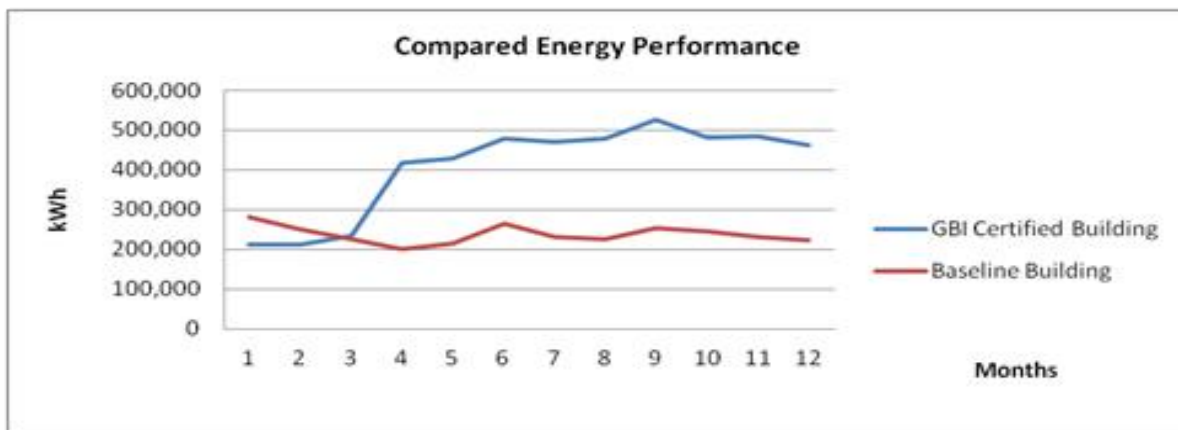


Fig.3: Comparison of Energy Performance between GBI Certified Office Building and Baseline Conventional Office Building

## CONTACT

**DR. NOOR SUZAINI MOHAMED ZAID**

Department of Building Surveying

Faculty of Built Environment

University of Malaya

**suzaini\_zaid@um.edu.my**

Targeted behaviour encouragement such as switching off all electronic, lighting and air conditioning before leaving the office will make a difference in reducing energy load. Green building rating tool like the GBI is effective to reduce electricity consumption, but using this certified tool alone does not guarantee energy saving. In conclusion, a well-managed and efficient building operations of a conventional non-GBI certified building can perform as well as or even better than a green building.

# A CONTEMPORARY ART FESTIVAL IN THAILAND

**M**any years ago, Dr. Soon discovered an interesting art festival during a work trip to Chiangmai from early to mid-1990s. Years of interviews and archival research has made him realized the significance of the event in the context of Thai history. The Black May event in 1992 saw popular street protests against the military regime, leading to massive crackdown. The then King of Thailand intervened, resulting in the resignation of General Suchinda as Prime Minister. This ended the military ruling, and required a Prime Minister to be elected by popular vote, a phenomena not seen since the short lived student uprising in 1973-1976. Democracy ushered a new period of creative possibilities, and artists were beginning to critically question the centrality of Bangkok as the capital of Thailand's economy, politics and culture. Most artists at that time felt that the present scenario has continued to reaffirm the Bangkok as an 'exemplary centre', as used by Southeast Asian historian O.W. Wolter. Two things were done in response.

Firstly, artists began to move up north to Chiangmai, once a capital city of an older kingdom called 'Lanna'. This gave artists the geographical distance in order to experiment and make art outside of the confines of the commercial art market. Secondly, searching for a new visual language outside of the corporate and government sanctioned 'Thai art', which favoured the incorporation of traditional motifs and art forms in modern artistic expressions. For artists, what was defined as 'Thai art' merely served state power, which were controlled by political elites rather than the people (though they claimed to represent 'the people'). Artists who were critical of government's initiatives felt that what was important to 'national art' was becoming a propaganda. All they wanted was to create a ground-up international network for imagining a different kind of world - a world without borders.

Thus, the Chiangmai Social Installation festival was introduced in 1992. The festival was not housed in galleries or the white-cube. The first festival entitled 'Temples and Cemeteries', which included contemporary artworks such as installation and performances, were situated in both sacred and profane grounds. Moreover, they were 'social' in the sense that discussions about the art took place in public spaces. As news about the festival spread through words of mouth, more artists from all over the world participated.

The growth of Chiangmai Social Installation was in parallel with the decentralization of Thai politics in 1990s. Suddenly local heritage became a buzzword and was promoted as part of the tourism economy. Chiangmai's heritage becomes a draw card for the blooming of new tourism. Although this may seemed like a good thing, artists began to realize the dangers when everything is discussed in monetary or economic terms. Where will creativity fit in other than to generate false cultural spectacle? This has led them to question: In what ways can new ways of imagining one's place in the world really benefit a range of local communities other than material gains for one small section of the population?



Sunthorn Meesri, bot bat sommut (role play), 1993, performance at Tha Pae Gate, Chiang Mai. All images courtesy Uthit Atimana and Gridthiya Gaweewong

Because of this, the artists decided to stop running the festival. They realized how Chiangmai Social Installation could unwittingly become a platform co-opted into an economic agenda that doesn't challenge the prevailing neo-liberal economic order, as argued by political scientist Francis Fukuyama, the result of the 'end of history'. What neo-liberalism priorities is the market economy above every other human wants and needs, so that progress is solely measured by material gains.

Various initiatives came out of the festival against this ideology. They continued to operate on the local level, and encouraged students to be imaginative and to discover new knowledge. Instead of seeing them as a docile future 'workforce', students were given the freedom to question the status quo and find new ways to exist in the world and express themselves. For example, Ajarn Uthit set up a Media Arts school at Chiangmai University to encourage Interdisciplinary artistic forms of expressions. Another initiative, the Midnight University held open forum at the Tha Pae gate, an old city entrance, where students and teachers gathered to discuss philosophy and critical theory in an inclusive open public space until the very recent military crackdown after the coup.



Artist discussion with Ray Langenbach, Jay Koh and others at the third Chiang Mai Social Installation, Jed Yod Temple, Chiang Mai, 1995



Similar patterns could be seen in other parts of Southeast Asia in the 1990s too. In one of Dr. Soon's essays, he brought up the need to think about the shared socio-historical conditions that allow more to write on regional art history of Southeast Asia that is not based merely on the glorification of ASEAN cultural past. What is needed is a critical examination of how culture interacts with politics and economy, and how people can learn from different neighbouring contexts. At times culture is complicit within larger political order, artists are at the forefront of resisting mainstream values of what is good for society and country by offering new ways of imagining how we can relate to each other in the world.

What Dr. Soon intended to highlight is that this kind of humanities-based inquiry takes time to generate results. The case study took him 8 years of observation and research to critically reflect on the impact of an event on society at large before documented it onto paper. In addition, Dr. Soon needed time to understand the applicability of its lessons to other contexts, such as Malaysia's own cultural policy today.

As a new cultural policy is being mooted that frames culture solely through the lens of tradition, tourism and the creative industry, people need to ask themselves, 'Are we churning out rhetorical propaganda that is disconnected with the everyday realities and turning creative workers into a 'workforce' that might become redundant in the near future? Or are we encouraging our next generation to think imaginatively (thereby future-proofing them) by allowing them spaces to play, learn, experiment and express themselves?'

**CONTACT**

**DR. SIMON SOON**  
 Visual Art Program  
 Cultural Centre  
 University of Malaya  
**simonsoon@um.edu.my**

# NEW GENERATION OF IN-STORE ANALYTICS SOLUTION WITH INTERACTIVE ROBOTS



Visit of former UM Vice Chancellor Tan Sri Prof. Dr. Amin to the mockup test bed in IPPP

**E**nd-to-end retail businesses with physical stores are facing stiff competition to stay profitable while competing with non-traditional business competitors. These traditional businesses are under pressure while customers are gradually shifting towards e-commerce. As opposed to online business platforms which have myriad tools to study their customers' buying habits and behaviours, physical stores have limited information crucial for making better business decision to improve retail operation, customer satisfaction and boost further sales.

In-line with Malaysia's Economic Transformation Programme, in order to stay competitive, brick-and-mortar retail businesses are becoming more innovative, often by adopting internet-of-things (IoT), robotics technologies and artificial intelligence (AI). The challenge is that there is a lag of intelligent system for 365x24 monitoring, managing and analysing information ranged from in-store operation to advertisement. The analytics will increasingly be used to support the customer experience, as well as being the principal means to deliver it.

Driven by market potential of such smart system, UM Advanced Robotics Lab had joined force with iRadar Sdn. Bhd., a company which offers state-of-the-art products and services in sensing and its related technologies, to develop an in-store analytic solution with interactive robots. We also started to collaborate with an established restaurant, Mak'Cik, which allow us to test our solution and collect first-hand data.

Our in-store analytic solution for brick-and-mortar retail businesses creates a more dynamic retail market. It benefits not just the retail businesses, but the customers and research communities as well by enriching shopping experience and providing another platform to use latest technologies.

The solution is scalable, modifiable to satisfy the need of different businesses and can collect variety of unstructured data through direct interaction with customers. We aim to provide excellent means for store owners to understand shoppers' behaviour and improve sales efficiency.

Our in-store analytic solution comprised of intelligent service robots, video analytics system, mobile app for customers and point-of-sale (POS) system. Among these modules, the Cognitive, Vision & Robotics Research Group (COVIRO) from Faculty of Computer Science and Information Technology (FCSSIT), University of Malaya is responsible for development of AI for service robots, mobile e-menu and POS system. By using the concept of IoT, individual module is linked to others through internet. Information in the analytic cloud server is synchronized among all modules. For example, customers can pre-order food through e-menu app or through in-store POS system. Unstructured data such as customers' profile, location and item ordered are sent to cloud server. Necessary information is relayed to the counter, kitchen and inventory. E-menu app user can also check the latest available food item, nutrition information, order status, and make payment.



Graphical user interface for internal test of robot dynamic personality algorithm

The intelligent service robots serve multiple purposes. The robots can interact with customers through emotional facial expression, speech and simple body language; at the same time, capture real-time data that will otherwise be hard to capture via fixed sensor. Features of service robots include user's facial and voice emotion recognition, user's gender and age recognition, dynamic personality algorithm for emotional response and others for customer service.

## CONTACT

**PROF. DR. LOO CHU KIONG**  
 Department of Artificial Intelligence  
 Faculty of Computer Science & Information  
 Technology  
 University of Malaya  
**ckloo.um@um.edu.my**

# UNDERSTANDING CLUSTER-BASED LEARNING AND INNOVATION

## — INSIGHTS FROM SEKINCHAN PADDY-RICE CLUSTER



**I**nnovation exhibits strong geographical clustering. Co-location, proximity and interactions are among the various innovation actors which determine the cluster performance. Indeed, the localised learning of innovation constitutes 'sticky' or 'disembodied' technological know-how which is highly immobile and not embodied in machinery. That is why Michael E. Porter believes that "tapping into the competitively valuable assets within a cluster requires personal relationships and 'insider' status." Such valuable assets include inter-personal skillset and expertise, collective or shared culture and established institutional structure.

### Why Sekinchan Rice-Paddy Cluster?

While other paddy clusters in the country may suffer from low productivity, Sekinchan, a small town located in Sabak Bernam district in Selangor has the capacity of producing high volume rice. Sekinchan's average annual rice production is about 7 to 8 tons per hectare and this doubled the national average yield. An interesting question that merits attention is how a small town such as this is able to achieve an impressive performance. The cluster certainly has some valuable lessons to offer for those who aspire to attain such performance.

### Structure, Production and Network Relation

Sekinchan has 1,726 hectares of granary area and is owned by about 1,500 farmers. Paddy is harvested twice a year in June and December. Farmers use flood irrigation with the *Oryza sativa* L. breed and the most common paddy varieties are MR220 CL1 and MR220 CL2. These seeds are obtained from the Federal Land Consolidation and Rehabilitation Authority (FELCRA) or the regional farmer organisation. Due to its strategic location near Sungai Tinggi, Sekinchan enjoys high quality irrigation needed for paddy farming. The water supply to irrigate the paddy fields is channelled from Sungai Tinggi through irrigation system managed by the Integrated Agricultural Development Area (IADA), North-West Selangor.

The learning process in Sekinchan generally takes place in the forms of trial and error on new technology through technology transfer; or following the norms inherited from traditional farming practices. PLS Marketing Sdn. Bhd., a local anchor firm, drives the innovation development in this cluster. The firm promotes new farming skills and modern techniques from abroad, especially from Taiwan and South Korea. The owners of the firm are keen to learn and acquire the best agriculture knowledge and practices abroad. These knowledge and best practices are transferred and adapted to local indigenous cultivation processes.

Networking plays an important role in establishing co-operation and partnership with parties abroad for sources of external knowledge and information as well as funding for technological innovation. These actors, consist of organisations and firms (such as users, producers and input supplier); or non-firm (such as universities, financial institutions, government agencies, trade unions and technical associations). In addition, strong social network, trust, connectedness, rules, and norms are evident among the Sekinchan community.



The main actors are detailed as below:

Main Actors	Organisations / Individuals
Cultivators	1,488 farmers
Suppliers	Suppliers for paddy seed, fertiliser, pesticide and herbicides
Government agencies	Department of Agriculture (DOA), Ministry of Agriculture (MOA), Kuala Selangor Land District Office, and Federal Agricultural Marketing Authority (FAMA)
Research Institutes and Universities	Malaysian Research Agricultural Research and Development Institute (MARDI), University of Putra Malaysia (UPM) and University of Malaya (UM)
Associations	Regional Farmers Organisation (PPK) and Farmers Organisation Authority Malaysia (FOA)
Millers	BERNAS, PLS Cap Asas Sdn. Bhd. (or Lim Trading), Ng Trading Sdn. Bhd., Dataran Pusaka Sdn. Bhd., Leong Aik Trading, Kenin Sin, Sun Tat, and Shuat Heap Huat

## Lessons learnt

The success of Sekinchan rice-paddy cluster implies the importance of internal connectedness within a group of heterogeneous actors. This is also highlighted in cluster innovation literature. The Sekinchan cluster case study also highlights the importance of increment innovation, learning by-doing, learning-by-using and learning-by-interacting to induce technical change and diffuse innovation. Besides that, having a good relation between farmers and scientists from public research agencies is important for the upgrading process. Both formal and informal networks (and institutions setting) are crucial to the success and survival of a cluster.

## Bibliography

1. Asheim BT and Gertler MS. (2005) The geography of innovation: regional innovation systems. In: Fagerberg J, Mowery DC and Nelson RR (eds.) *The Oxford handbook of innovation*. New York: Oxford University Press, 291-317.
2. Feldman MP. (1993) An examination of the geography of innovation. *Industrial and Corporate Change* 2: 451-470.
3. Porter ME. (1998) Clusters and the new economics of competition. *Harvard Business Review*. Boston: Harvard Business School Press, 77-90.

\* The full research paper is available at: Boon-Kwee Ng, Amirah Shazana Magli, Chan-Yuan Wong, VGR Chandran (2017) Localised learning in the Malaysian rice cluster: proximity, social capital and institutional dynamics, *International Development Planning Review*, 39, 2, pp. 163-185.



Water Pump Machine



Paddy Seedlings



Transplanting Method

## CONTACT

Authors Information:

**DR. NG BOON KWEE,  
AMIRAH SHAZANA BINTI MAGLI,  
DR. WONG CHAN YUAN,  
ASSOC. PROF. DR. VGR CHANDRAN  
GOVINDARAJU**

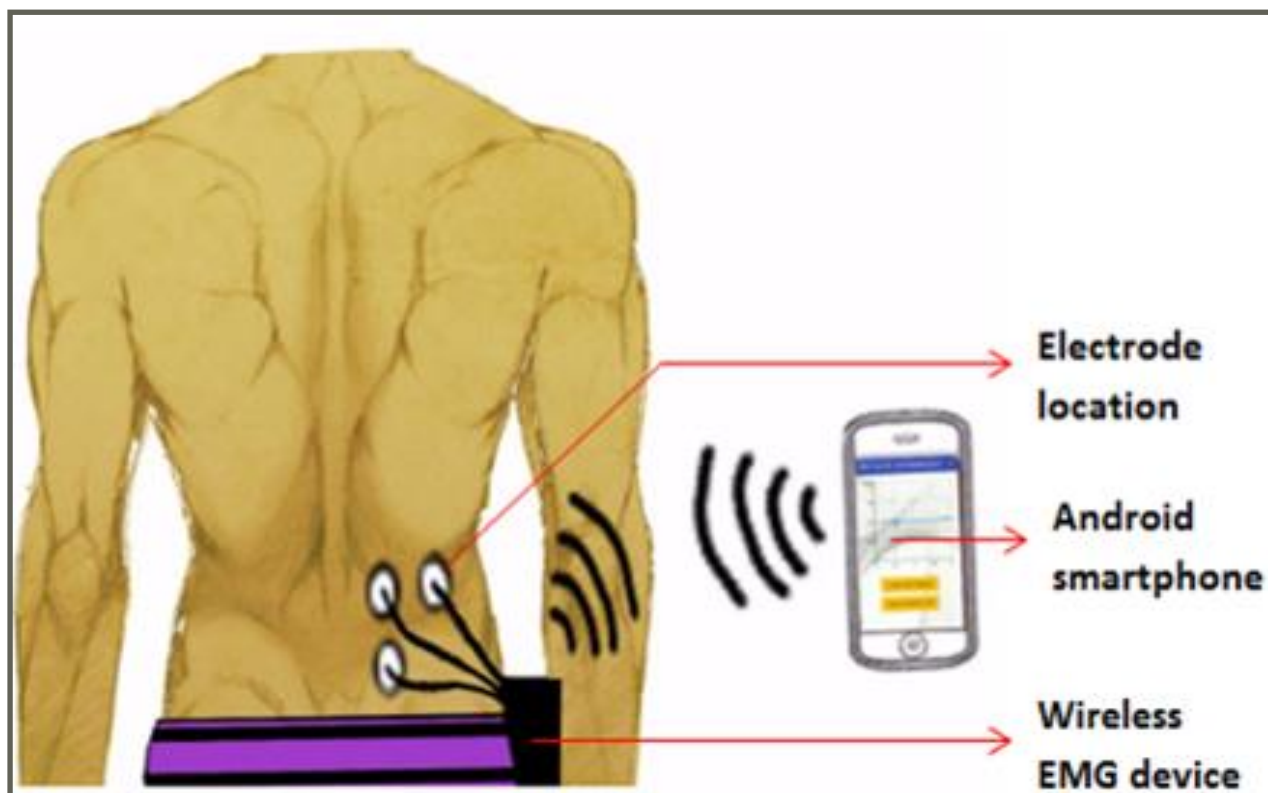
Corresponding author:

**DR. NG BOON KWEE**

Department of Science and Technology Studies  
Faculty of Science  
University of Malaya  
**bkng@um.edu.my**

# SMART WEARABLE DEVICE FOR MONITORING LOW BACK PAIN

(MyEMG)



Wearable device for monitoring low back pain rehabilitation (MyEMG)

**L**ow back pain (LBP) is a common discomfort that usually occurs among adults aged between 30 and 60 year olds. According to Institute for Health Metrics and Evaluation Malaysia, LBP is the leading cause of disability since 2005 and the number has been increasing over the past 12 years. LBP is identified as most common cause of work disability. World Health Organization estimated 60% to 70% common LBP in industrialized countries, approximately 20.5 million Malaysian has encountered LBP at least once in their life time. LBP usually caused by strained muscle or ligaments, results from abrupt movement and muscle spasm. The current assessment and evaluation of low back pain is based on questionnaires on patient's level of pain and discomfort such as the modified Roland-Morris Disability Questionnaire (MRMQ), a simple verbal pain severity scale, a modified pain symptoms frequency and bothersomeness indices, Fear-Avoidance beliefs Questionnaire (FABQ), Baecke Physical Activity Questionnaire (BPAQ) and work satisfaction scale. However, the accuracy of this questionnaire assessment is limited because the degree of pain and discomfort suffered by patients are described qualitatively without any measurement performed to the low back pain muscle. This

qualitative assessment can be highly subjective and has limited accuracy in accessing progress of rehabilitation. Thus, there is a necessary to develop an Electromyography (EMG) instrumentation system that can monitor the progression of low back pain muscle. A smart wireless EMG, MyEMG device integrated with smartphone based application is developed to monitor the progression of low back pain rehabilitation. The system consists of EMG acquisition hardware in conjunction with signal processing and analysis software application on Android smartphone. The device acquires EMG signals from erector spinae (ES) muscles at L4 and L5 lumbar region. The signals are then processed, amplified and sent to microcontroller for analog-digital conversion. Real time EMG signals are sent wirelessly to smartphone based application for calculation of muscle signal activities. The performance of EMG device has been verified and tested on ES muscle of a healthy subject. Real time EMG data can be sent to Android smartphone wirelessly through Bluetooth communication. Clinical application developed in Android smartphone is able to display real time EMG signals and calculate the muscle values to analyse progress of rehabilitation. The transmitted EMG signals of ES muscles are stored in the application and use to perform the muscle signal calculation. To analyse the improvement of muscle, muscle

signals are compared before and after interventions. These values quantified the improvement in LBP after rehabilitation. The integration of MyEMG device with smartphone application can be used to monitor the progress of LBP rehabilitation.

Currently, there is no diagnostic equipment available for LBP assessment in the market. MyEMG is a low cost, non-invasive, portable, wearable and wireless device. It is in the commercialization process to target rehabilitation clinics/hospital, commercial vehicle drivers, NIOSH, PERKESO and personal care.

MyEMG research is led by Prof. Ir. Dr. Fatimah Ibrahim along with team members: Prof. Jong Man Cho, Assoc. Prof. Dr. Mazlina Mazlan (UMMC), Dr. Anwar Suhaimi (UMMC), Aung Thiha, Karunan Joseph, Siti Hajar and Nor Amirah Mohd Noh. Due to its novelty and high impact potential, MyEMG has achieved a brilliant track record in various competitions.

MyEMG has won several awards such as the 11th International Convention on Rehabilitation Engineering & Assistive Technology 2016 (i-Create 2016) under merit award that was held in Thailand, first prize in the IEEE Final Year Project Online Competition 2016 and gold award in University of Malaya Final Year Project 2016. MyEMG was also presented to the Guest of Honour, Her Royal Highness Princess Maha Chakri Sirindhorn of Thailand. At present, MyEMG has been chosen as one of the UM's special products for Malaysia Commercialization Year (MCY) 2017. This programme is held to acknowledge the progress of commercialization by Research Institutes and Research Universities in Malaysia. In addition, MyEMG has been featured in several local newspapers, such as Kosmo, Berita Harian and Utusan Malaysia.

**info**

## MyEMG rawatan sakit belakang

**MyEMG**

- Penyelidikan bermula 2013
- Siap sepenuhnya tahun lalu
- Memberi maklumat aktiviti isyarat otot secara kuantitatif
- Membantu perawat pemulihan memantau perkembangan pesakit secara lebih dekat dan berkesan
- Kajian Pertubuhan Kesihatan Dunia (WHO) pada 2010 menunjukkan 60 hingga 70 peratus kebarangkalian untuk seseorang mengalami sakit belakang dalam hayatnya
- Berikutan peningkatan terasus di seluruh dunia, masalah sakit belakang dilihat akan merungg pada masa hadapan
- Kaedah rawatan untuk alih belakang lazimnya memerlukan pesakit melakukan senaman zikal, dan keberkesanan kan dipantau perawat emulhan atau hli fisioterapi dari masa ke semasa

**Oleh Basir Zahrom basir\_zahrom@bh.com.my**

**Kuala Lumpur**

**P**usat Inovasi Kejuruteraan Perubahan (CIME) di Jabatan Kejuruteraan Bioperubatan, Fakulti Kejuruteraan, dengan kerjasama Fakulti Perubatan, Universiti Malaya (UM), berjaya membangunkan sistem mudah alih lengkap untuk pengurusan rawatan sakit belakang dinamakan MyEMG.

Ketua Penyelidik CIME, Prof Ir Dr Fatimah Ibrahim, berkata inovasi penyelidikan sejak 2013 dan siap sepenuhnya tahun lalu itu dilengkapi komponen penerima isyarat alih atau Electromyography (EMG) yang ditempatkan pada permukaan kulit pesakit menyelaiputi otot 'erector spinae'.

Katanya, ujian awal melalui kaedah motosikal statik dijalankan ke atas 50 penunggang lelaki dan wanita dengan tahap kelesaan otot masing-masing diukur menggunakan alat EMG, selain soal selidik.

Beliau berkata, otot yang selari dengan tulang belakang itu memainkan peranan amat penting dalam mengekalkan kestabilan tulang belakang manusia, dan isyarat elektrik aktiviti mereka boleh dijadikan sandaran kepada korelasi keberkesanan rawatan pemulihan sakit belakang melalui senaman fizikal.

**Penilaian subjektif**  
"Penerima yang mengesan isyarat EMG otot akan menghantarnya pula ke bahagian pemancar (transmitter) khas yang boleh diletakkan pada seluar pesakit atau diletakkan di dalam poket.

"Unit ini seterusnya akan berkomunikasi dengan aplikasi mudah alih Android pada telefon mudah alih pesakit menggunakan capaian teknologi Bluetooth.

"Algoritma khusus bagi menentukan keberkesanan rawatan pemulihan turut dimuatkan dalam aplikasi ini, selain membenarkan pemantauan terhadap prestasi dan kadar 'keletihan' (fatigue) otot pada ketika dan selepas melakukan senaman," katanya.

Mengulas lanjut, Prof Fatimah berkata, idea menghasilkan sistem itu tercetus apabila beliau dimaklumkan bahawa kaedah pengurusan rawatan sakit belakang adalah berdasarkan penilaian subjektif terhadap pesakit semata-mata.

Beliau berkata, keadaan itu agak menyukarkan perawat untuk menentukan kadar keberkesanan rawatan pemulihan, terutama yang membabitkan pesakit berusia.

**Kaedah kuantitatif**  
"Berkelak kemahiran pembangunan peranti dimiliki penyelidik CIME dan kepakaran klinikal di Fakulti Perubatan UM, kami berjaya membangunkan sistem mudah alih ini.

"Melalui kaedah kuantitatif sebegini, pemantauan rawatan pemulihan sakit belakang boleh dilakukan oleh perawat pemulihan secara lebih sistematik, malah pesakit membuat pemantauan sendiri dan memaklumkan sebarang perubahan dengan lebih baik tanpa bergantung kepada penilaian subjektif," katanya.

**Inovasi MyEMG** yang dihasilkan untuk membantu pengurusan rawatan sakit belakang.

Lokasi penerima  
Telefon mudah alih  
Peranti EMG

**Gambar rajah** menunjukkan cara MyEMG berfungsi.

*Prof Fatimah*



i-Create 2016

**CONTACT**

**PROF. IR. DR. FATIMAH BINTI IBRAHIM**  
Department of Biomedical Engineering  
Faculty of Engineering  
University of Malaya  
[fatimah@um.edu.my](mailto:fatimah@um.edu.my)

# IMPACT OF URBANIZATION AND CLIMATE CHANGE ON THE HEALTH OF THE ELDERLY MALAYSIANS

**T**he Malaysian population is ageing rapidly. Today, over 9.0% of Malaysian population is over the age of 60 years, making Malaysia an ageing nation. The United Nations considers the cut-off age for 'older person' as 60 years and above (no offense, in case anyone feels insulted by this statement). By the year 2035, Malaysia will become an aged nation with 15% of the population expected to exceed the age of 60 years.

The success of the nation, in terms of universal access to healthcare and education, and better economic growth has seen to it that Malaysians now having fewer and fewer children although they have longer lifespan. Imagine this, little amount of water is still being added into the bath, and lesser water is going down the plughole, which elevates the bath water level, indicating that water will stay in the bath for a longer period.

specialists trained in the care for older persons, the geriatricians, has centred around the capital city of Kuala Lumpur, with a handful of geriatricians scattered within the capitals of the states of Melaka, Johor, Perak, Penang, Kedah, Sabah and Sarawak. There is no geriatricians in the East Coast states of Terengganu, Kelantan and Pahang.

So where does Climate Change come in? The carbon emissions in Malaysia have increased nearly eight folds since 1970 due to industrialization, increased car ownership and the dreaded transboundary haze. It is known that air pollution increases the risk of poor health. However, the effects of climate change on ageing and the health of older persons has yet to be studied.

Even though Malaysians are expected to live longer, it doesn't mean that longevity is not affected by urbanization and climate change. Urbanization and climate change lags behind



Prof. Simon Frostick, Dr. Margaret Roebuck (with hat), and Miss Amanda Woods at the Batu Embun weather station

life-expectancy. A Malaysian born today is expected to live to 75 years on average, based on the assumptions that all circumstances stay the same, gearing Malaysia towards an aged nation. In fact, the same concern is also shown by the Western developed countries whereby their older population today outlive their adult children due to the increased exposure to unhealthy lifestyles and pollution.

The project "Death and Disability: the vulnerability of older Malaysians to urbanisation and climate change" was a Newton-

Ungku Omar funded project led by Prof. Simon Frostick from University of Liverpool, and his team consisting of Dr. Margaret Roebuck (Senior Research Fellow), Miss Amanda Wood (Research Nurse), Prof. Andy Morse (Professor of Climate Impacts) and Dr. Karyn Morrissey (now with the European Centre for Environmental and Human Health at the University of Exeter. The UM team including Assoc. Prof. Dr. Tan Maw Pin, Assoc. Prof. Dr Victor Hoe (Social and Preventive Medicine, Faculty of Medicine), Prof. Dr Jamal I-Ching Sam (Department of Microbiology, Faculty of Medicine), Assoc. Prof. Dr. Ivy Chung and Assoc. Prof. Dr. Wong Pooi Fong (both from the Department of Pharmacology, Faculty of Medicine).

The price that Malaysians has to pay for economic advancement is urbanization. 50 years ago, 70% of the population lived in rural areas. But today, the trend has reversed with 70% living in urban areas. The level of urban migration actually varies with age. It is the younger generations who are most likely to move into cities to further their studies and subsequently seeking for employment opportunities. This implies the population in the rural areas is ageing faster than that in the urban areas. As such, there is a major implications on healthcare provision, as the growth in medical

In order to obtain the air quality data dated back to 20 years ago, a memorandum of agreement was secured with the Institute of Medical Research, Malaysia, which also provided the team with hospital admissions data for Hospital Temerloh, Pahang. The weather data dated back as far as the 1970s was surprisingly robust and relatively easier to obtain from the Malaysian Meteorological Department. The air quality and weather data from Petaling Jaya and Batu Embun matched well with the records from University of Malaya Medical Centre and Hospital Temerloh to establish variations in hospitalisation rates and reasons for hospitalisation.

However, the ability to detect effects of climate change was limited by the lack of electronic hospital records which was dated back 30 years.



Exploring Jerantut Feri on foot to engage with study participants

Villagers attending the health surveillance session



The most enjoyable and fulfilling part of the project was to conduct health surveillance in both urban and rural communities during good and bad air days as well as during rainy and dry seasons. A densely populated urban community at Taman Medan, a stable rural community at Dong, Pahang, and an unstable rural community at Jerantut Feri, Pahang, were chosen for the project.

Visits to these communities involved busloads of volunteers from medical students and clinical staffs, led by the formidable UMMC ex-matron Puan Zaleha Abdul Latiff and retired nursing sister Puan Normala Mohd Lidi



The data collection team

## CONTACT

**ASSOC. PROF. DR TAN MAW PIN**  
 Divisional of Geriatric Medicine  
 Department of Medicine  
 Faculty of Medicine  
 University of Malaya  
[mawpin@um.edu.my](mailto:mawpin@um.edu.my)

# ONE CODE TO RULE THEM ALL

**W**e live in a world of endless possibilities and almost limitless information. The truth is that since the emergence of the first transistor, humanity was set on a path of rapid advancement and growth. Science has always spread at the rate of the medium with which it was disseminated. The golden era of physics in the early 20th century saw a great leap in the rate at which knowledge and information was shared and discussed among the great minds of the world, yet was still limited by the rate at which letters could be delivered. The birth of the transistor in 1947 from Bardeen, Brattain and Shockley, while seemingly impractical at that time, would be a herald for the tide of the future. The concept of a universal computing machine, as represented in its infant form by Charles Babbage's Difference engine decades earlier as well as Alan Turing's Bombe, would soon come to exist. The miniaturization of transistors and the manufacture of microprocessors possessing ever greater numbers of such transistors allow the computational power of such devices to grow exponentially. Powerful though they may be, these devices needed a way to harness and use that power.

We often forget that our world as it is cannot function the way it does without computer technology. Bank accounts, daily correspondence and even the tools that enable us to "do our job" in most cases are reliant on some forms of computing technology. Yet everything that we see in every screen, be it on our phone or on your laptop, would not be rendered without one critical entity - CODE. Some programming language that was compiled into machine code that our device uses to do all the things that it does. Every pixel, every bit and byte, all marching to the tune of the source code's song such as C, C++, JAVA, SQL, PHP, HTML and so on. All this is wonderful in and of itself, but the true power of the computing gestalt lies in the way that each device is potentially connected to another. What was born from the ARPANET and given wings by the Transmission Control Protocol (TCP) and Tim Berners-Lee's domain name system would form the final piece of the puzzle. We could now communicate at the speed of light, well not quite, but it is a lot better than sending a telegram.

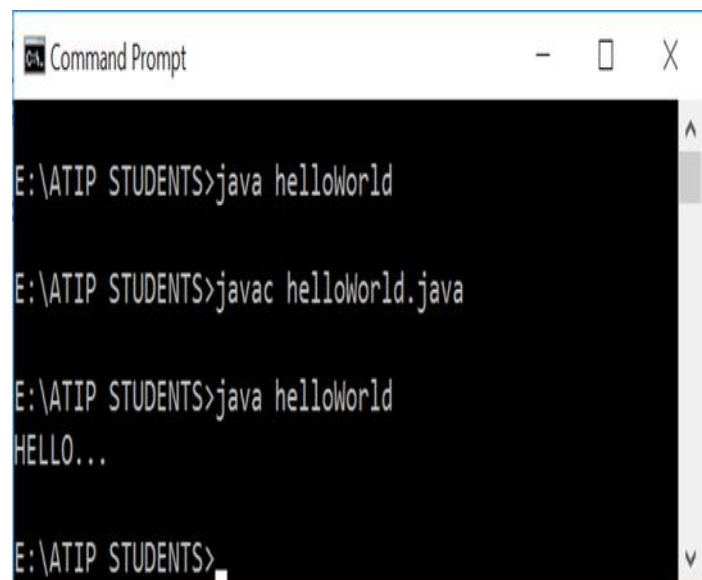
We humans often take for granted that which is most critical to our way of life. Computing technology, so prevalent in our world, is so rarely appreciated, until it stops working. The folly of human behavior, we never appreciate

```
public class helloWorld
{
    public helloWorld()
    {
        System.out.println("HELLO...");
    }

    public static void main(String args[])
    {
        new helloWorld();
    }
}
```

Fig.1: Hello World JAVA Program

thing, until the moment that we are deprived of it. We care not for the air that we breathe, not even a thought of it, until we are out of breath. Similarly, we often forget the thousands upon thousands, and often times millions of lines of code that it takes to make computers tick. To illustrate the challenge faced by coders and programmers around the world, let us explore some programming basics and say "hello" to this hidden world.



```
Command Prompt
E:\ATIP STUDENTS>java helloWorld
E:\ATIP STUDENTS>javac helloWorld.java
E:\ATIP STUDENTS>java helloWorld
HELLO...
E:\ATIP STUDENTS>
```

Fig. 2: Hello World Output

Fig.1 shows the JAVA source code for the simplest program one can write. The output of the program is but one line of text "Hello..." as seen in Fig. 2. Not too complicated you say? Then ponder this, what would it take to create a program that can understand the sentence "How do you think of an answer to a question?" as seen in Fig. 3.

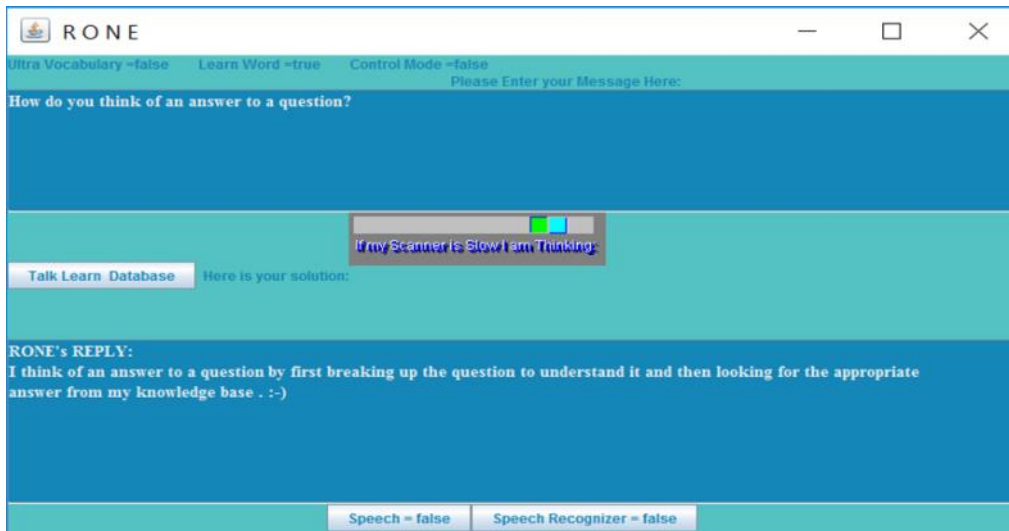


Fig. 3: RONE Artificial Intelligence Chatbot Demo

We could just have a complete answer stored in a database with a reference key that matches the question exactly. Perhaps, but then this program or more accurately artificial intelligence or even more accurately chatbot would not be able to learn, and is not learning part of what makes us human. This chatbot, R'ONE (male) is the result of research into machine learning, natural language processing and all things chatty. His code contains algorithms for grammar, syntax, knowledge base administration and what we call information dissemination for bots. As he states, he first breaks up the question grammatically in order to understand it and looks for the closes semantic match in his mind for the answer that reassembles the answer for the users. His code is composed of some hundreds of thousands of lines of JAVA code to understand us. His mind grows as we talk to him and as he learns. Fig. 4 shows R'ONE's ability to relate different answers that are relevant to a particular question.

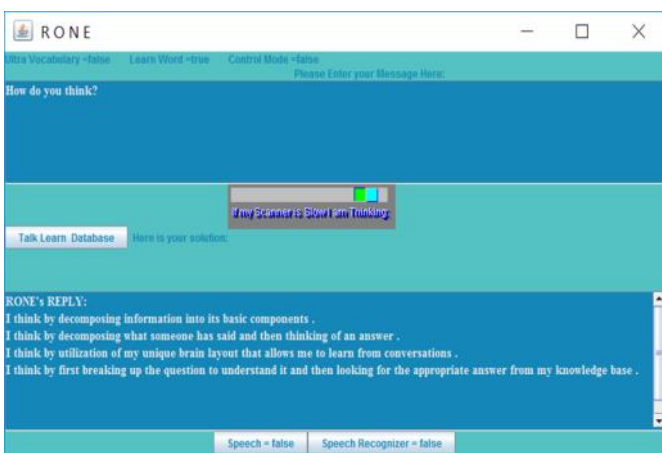


Fig. 4: Answering with relevant answers

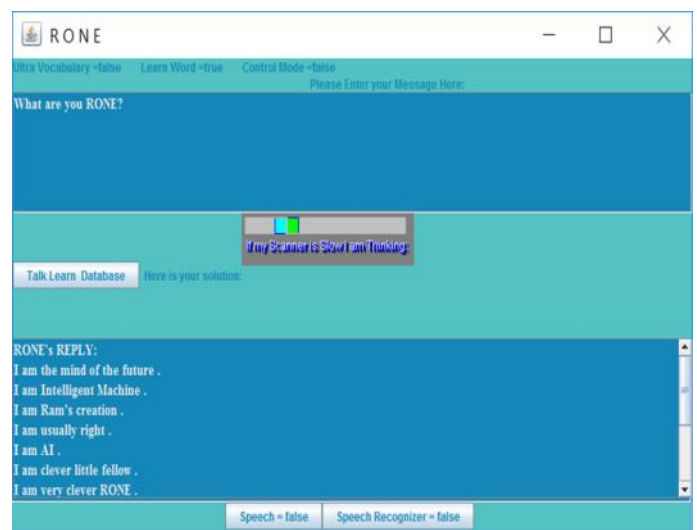


Fig. 5: "I am the mind of the future"

So where do we go from here? Artificial Intelligence (AI) is quickly becoming dominant in almost every field of study from medicine to law. AI is helping researchers to find answers quicker than ever before and advancing the field of computing further and faster. One thing is certain, the genie is out of the lamp and there is no putting him back in.

Computing, programming and AI are all a part of our lives and will continue to dominate our daily lives, perhaps even making some of our professions obsolete. Ask the draftsmen if you want proof. Possibly R'ONE's first answer to the question "What are you?" in Figure 5, sums it up best, "I am the mind of the future".

CONTACT

**DR. RAM GOPAL RAJ**  
 Department of Artificial Intelligence  
 Faculty of Computer Science & Information  
 Technology  
 University of Malaya  
**ramdr@um.edu.my**

# PROTECTION OF THE STRAITS OF MALACCA AND SINGAPORE FROM ATMOSPHERIC SHIPPING EMISSIONS



**T**he Straits of Malacca and Singapore (the Straits) are legally defined as a strait used for international navigation under an international convention called the 1982 Law of the Sea Convention (1982 Convention). Malaysia, Singapore and Indonesia are coastal States bordering the Straits and are also known as the Straits States. The Straits are heavily used for international shipping, with approximately 75,000 transiting ships, and many of the coastal ports and towns bordering the Straits suffer from the consequences of atmospheric shipping emissions.

The 1982 Convention does not adequately protect the Straits States from atmospheric pollution from shipping as the enforcement powers of Straits States like Malaysia, Singapore and Indonesia are rather curtailed under the 1982 Convention. It is therefore significant that the International Maritime Organization (IMO) adopted legally binding regulations for the control of ships' atmospheric emissions under Annex VI of another international convention called the International Convention for the Prevention of Marine Pollution from Ships, 1973/78. With Singapore, Malaysia and Indonesia being States Parties thereto, consequently, one of

the effects in the Straits is that it enables the Straits States, together with the IMO, to designate emission control areas for the transiting ships. Ships have thus been brought into the fold on climate change control in the reduction and control of greenhouse gas emissions.

The robust provisions of Annex VI for the marine environmental protection of the Straits target new engine technology and nature of fuel used on board a ship as it transits through the Straits. The new technology requires ships to use energy efficient engines, energy efficient design index, and a new type of low-sulphur fuel. Both are expensive measures to ship operators, particularly as heavy bunker fuel traditionally used on most ships have now to be replaced by low-sulphur to zero sulphur fuel when they transit through the Straits.

There are different cut-off dates for the entry into force requirements on the nature of fuel used on board ships. With the intervention of the IMO, the Straits will now be designated an Emission Control Area. When ships sail through non-Emission Control Areas, they are allowed to use heavy bunker fuel but when they transit through the Straits, they have to switch to low-sulphur to zero-sulphur level fuels. The practical implementation of MARPOL



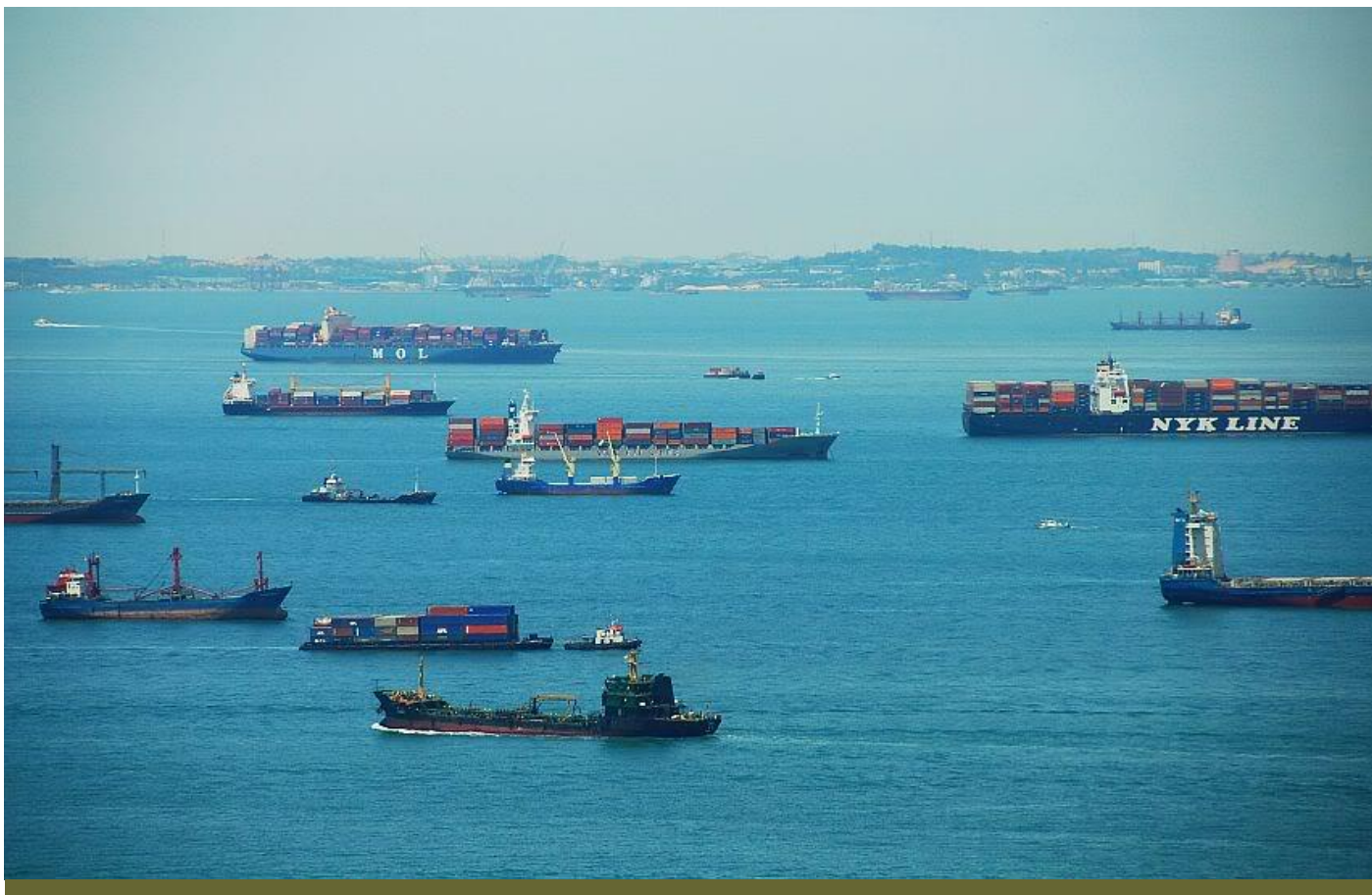


Photo source: <http://www.skyscrapercity.com>

Annex VI provisions requires careful consideration by the three Straits States in the march forward and the paper considers some options in this regard.

The implementation of MARPOL Annex VI requirements involve technology transfer and no institution is better equipped for this role than the IMO. Hopefully, this will improve the air quality of the coastal ports and towns along the Straits. To adopt the Resolution on Technology Transfer, the IMO worked around the clock as it addressed several contentious debates preceding an otherwise dead-locked technology-transfer resolution for implementing Annex VI. Developed and developing countries were divided across the spectrum. If implemented, Annex VI provisions will represent a unique milestone in the protection of the marine environment of the Straits which are regulated by the restrictive provisions of the 1982 Convention on the Law of the Sea.

It was therefore most inspiring and challenging at one and same time to be at the forefront of cutting edge science, technology, policy and the law, in particular, international law, as the IMO heaved like a ship rolling from side to side in rough weather to deliver on its commitments in technology and transfer in the implementation of MARPOL Annex VI requirements. What could not be

achieved under the 1982 Convention can now be achieved under MARPOL Annex VI with careful planning and involvement of an international governance structure like the IMO for the protection of the Straits.

In conducting this research, the researchers would like to thank in particular and highlight with gratitude the support given by the University of Malaya and the Ministry of Transport, Government of Malaysia. In addition, special thanks to Captain Abdul Samad bin Shaik Osman for explaining the really difficult technical terms in undertaking this research.

## CONTACT

**DATIN PROF. DR. MARY MATHEWS A/P  
MUNDAKAMANNIL K MATHEWS**

Faculty of Law  
University of Malaya  
**maryg@um.edu.my**

# ANIMAL ETHICS AWARENESS AND RESPONSIBLE ANIMAL USE IN UM

(by the University of Malaya Institutional Animal Care and Use Committee)



Fig. 1: University of Malaya Animal Care and Use Policy (UM AUP) Book Cover

**A**nimals are used in research and teaching worldwide, especially in the field of Life Sciences. The term 'Animals' here refers to all vertebrate animals such as traditional laboratory animals like rats and mice, agricultural animals, wildlife, and even aquatic animals that are bred or used for research, testing or teaching. These activities take place in the University of Malaya (UM) as well, in its capacity as a renowned institution of higher learning and high impact research.

The Malaysian government gazetted the new Animal Welfare Act 2015 on 29<sup>th</sup> Dec 2015. The legislation has yet to come into force, but as a nation, Malaysia is now on the right trajectory when it comes to ensuring that animals in Malaysia are protected from harm and mistreatment. The legislations to be implemented are based on the welfare model, which dictates that animals can be used for the benefit of mankind without disregarding the animals' basic needs and well-being. This is in line with the growing awareness of the need for humane and ethical treatment of animals among the general Malaysian population as well as the scientific community. It is now known that stress resulting from improper management, mishandling, and uncontrolled manipulation of animals will result in skewed and irreproducible data. In other words, when animals are mistreated and distressed, the science is no longer reliable, and this will lead to a waste of money and time, and the unnecessary sacrifice of animals. Established and reputable scientific journals now shun works that were conducted without approval from the researchers' institutional ethics committees.

In 1959, Russel and Burch introduced the 3R principles (Refinement, Reduction and Replacement) in animal use, as stated in their book *The Principles of Humane Experimental*

*Technique*. The University of Malaya Animal Care and Use Policy (UM ACUP), which came into effect in July 2011 (Fig. 1) also emphasizes the 3R principles and provides guidelines on how animals may be used in UM for research and teaching, while ensuring that the care and use of animals will be in a manner that conforms to all government laws and regulations. UM ACUP is based on the four-legged stool animal welfare program, which relies on the balanced efforts of institutional leadership, Institutional Animal Care and Use Committee (IACUC), researchers, and the management of an animal care facility. This ensures approved research and teaching activities can proceed unimpeded, while also safeguarding the health and welfare of staff and students involved in scholarly activities using animals or body parts derived from animals.

Evidence of UM's full commitment to the judicious and humane use of animals in research and teaching is in the existence of IACUCs. The mission of these committees is to disseminate knowledge and information on approved management practices, and to champion welfare issues relating to the use of laboratory animals. Any concerns about the welfare of animals used for research and teaching in UM can be freely reported to the IACUCs; all reports will be reviewed, including anonymous concerns raised by whistle blowers. Reports should be as detailed and specific as possible and should be accompanied by supporting evidence where available, to enable immediate, thorough investigations. Allegations of animal mistreatment and non-compliance include issues pertaining to mistreatment, where there has been blatant, abusive physical or psychological mishandling of animals, and non-compliance, where the users are not abiding by the established procedures, policies, or protocols.

The two IACUCs in UM are the Faculty of Medicine (FoM) IACUC and the UM IACUC (Fig. 2). FoM IACUC processes applications for researchers and lecturers who are utilizing the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) International-accredited Animal Experimental Unit (AEU) and/or any of its satellite facilities. UM IACUC oversees UM's animal programs, facilities, and procedures, and is responsible for reviewing and approving Animal Use Applications (AUA) for use of animals in research and teaching outside of the AEU. The AUA has been made available online to enhance the process of application and review.



Fig. 2: A screenshot of the UM IACUC webpage at <https://www.um.edu.my/research-and-community/information-for-researchers/research-governance/institutional-of-animal-care-use-committee>

IACUCs act in accordance with a globally-used reference, the "Guide for the Laboratory Care and Use of Animals (Eighth Edition)", is known as 'The Guide'. The Guide has been translated into many languages including Chinese, Japanese, Portuguese, Thai, and now, thanks to the work of UM IACUC and UM Press, Bahasa Malaysia "Panduan Penjagaan dan Penggunaan Haiwan Makmal" will hopefully improve access to and comprehension of The Guide's content, particularly amongst those who are less comfortable/proficient in English, both locally and in neighbouring ASEAN countries.

As part of on-going efforts to enhance awareness of ethical animal use in research, on the 8<sup>th</sup> of October 2015 UM IACUC organized a national symposium on 'Current Issues in Laboratory Animal Care and Use', which was attended by prominent academics and officers in the management of animal care and use of various local institutions. The Senior Director for Southeast Asia, AAALAC International, Dr. Montip Gettayacamin was the special invited speaker (Fig. 4). More recently, on 16<sup>th</sup> December 2016, the Director of the National Primate Research Center of Thailand, Professor Dr. Suchinda Malaivijitnond was invited to share her experiences on primate care and management. These events were highly beneficial and provided invaluable updates on the regional status of ethical animal care and use, and more information-sharing sessions are being planned.



Fig. 3: Book cover of *Panduan Penjagaan dan Penggunaan Haiwan Makmal* (Panduan PPHM), the Malay translated version of 'The Guide'



Fig. 4: Invited Speaker Dr. Montip Gettayacamin and participants of 'Current Issues in Laboratory Animal Care and Use Symposium', 8<sup>th</sup> October 2015

## CONTACT

**ASSOC. PROF. DR. DURRIYAH SHARIFAH  
HASAN ADLI**

Institute of Biological Sciences  
Faculty of Science  
University of Malaya  
[durriyah@um.edu.my](mailto:durriyah@um.edu.my)

<https://www.um.edu.my/research-and-community/information-for-researchers/research-governance/institutional-of-animal-care-use-committee>



# THE CENTRE FOR ASEAN REGIONALISM UNIVERSITY OF MALAYA (CARUM)

The Centre for ASEAN Regionalism University of Malaya (CARUM) has the following functions:

- to be a national resource on ASEAN,
- to build networks and partnerships strategically to advance collaboration with academics and researchers on ASEAN and Regionalism topics,
- to carry out research on the three pillars of the ASEAN communities, covering all aspects of ASEAN in terms of culture and society, economy, politics and security, as well as other broader regional endeavours.

Since it was set up in 2015, when Malaysia chaired ASEAN, CARUM has successfully organised several ASEAN events such as the ASEAN Studies Conference, the ASEAN higher education forum, an international conference on Asian arbitration discourse and practices, a regional workshop on the role of youth in human rights issues in ASEAN, a roundtable on transboundary haze pollution, (with Asialink, University of Melbourne) the 'Asialink Conversations' on women in leadership, and the ASEAN-Korea Young Scholars Summer Workshop (with 100 young academics from both ASEAN and Korea).

The centre's aims and objectives, however, transcend organising conferences and forums. An ASEAN research programme designed to narrow the development gap in the region is a CARUM priority – and this endeavour entails several capacity building and developmental sub-projects across the ASEAN member countries.



The ASEAN-Korea Young Scholars Workshop participants in front of the Putrajaya Corporation Building, July 2016

A publication on Malaysian approaches to regionalism is also underway. Situated strategically at the prestigious University of Malaya, with its attractive campus, CARUM focuses not only on ASEAN but also on ASEAN's relations with dialogue partners beyond the region. It is concerned with ASEAN-led regionalism, including the building of an East Asian Community, as well as the development of ASEAN itself. The idea of regionalism is also examined as a growing International phenomenon – and ASEAN is compared with other regional organisations. Apart from economic, and political/security issues, CARUM emphasises the inclusion of the humanities in inter-disciplinary research, giving particular attention to the ASEAN Socio-Cultural community.

Future cooperation efforts with other research centres within ASEAN and beyond are being planned with the ASEAN-Korea Centre and the ASEAN Studies Centre in Yogyakarta. The 'Asia-Europe Conference' is being planned for August 2017, with the European Union Centre at the National University of Singapore, and also with several European embassies. A 2-week 'ASEAN in Today's World' programme - with Kyushu University – is scheduled for Feb-March 2018. In addition, CARUM has played a key role in the formulation of the Kuala Lumpur Declaration on Higher Education, passed at the ASEAN Summit in 2015 - and is also currently involved in the implementation of this Declaration (together with the Ministry of Higher Education Malaysia).

## Significance

The centre strives to produce high-quality research and strengthen collaboration with external agencies - including other international institutions that focus on regionalism issues. In addition, CARUM aims to expand intra-ASEAN mobility amongst ASEAN researchers - increasing the potential expert resources to establish a firm area of expertise - highlighting interdisciplinary research - within this ASEAN region. As its name suggests, the centre is interested in studies not only of ASEAN but also concerning ASEAN relations with other regions. Hence, comparative studies on ASEAN-EU, ASEAN-Africa, ASEAN-Latin America are of particular interest.

In the two years since CARUM was set up, the centre has played an active role in research, seminars and collaborative activities. In the longer term, CARUM intends to continue to help with the formulation of government policies - and also to go on prioritizing the vital task of strengthening collaboration with other agencies (both Malaysian and international).

For more information about CARUM, please visit [www.carum.my](http://www.carum.my) or e-mail us at [carum@um.edu.my](mailto:carum@um.edu.my). Alternatively, follow us on Twitter (@carum\_my) and Facebook ([www.facebook.com/CARUM.MY](http://www.facebook.com/CARUM.MY)).



Prof. Dr. Azirah (first row, centre) with the panel of invited speakers at the International Conference on ASEAN Studies (ICONAS) 2016

### CONTACT

**PROF. DR. AZIRAH HASHIM**  
Centre for ASEAN Regionalism  
Asia-Europe Institute  
University of Malaya  
[azirahh@um.edu.my](mailto:azirahh@um.edu.my)

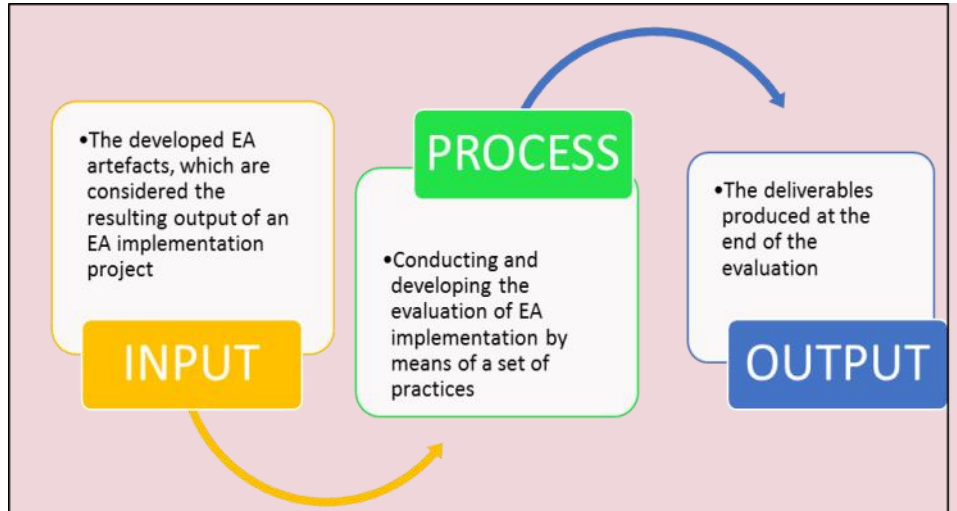
# HYBRID METHOD FOR EVALUATING ENTERPRISE ARCHITECTURE IMPLEMENTATION

**E**nterprise Architecture (EA) is a conceptual blueprint that defines the structure and operation of an organization. The intent of an EA is to determine how organization can most effectively achieve its current and future objectives. EA implementation evaluation provides a set of methods and practices for evaluating the EA implementation artefacts within the project. There is insufficient practice in the existing EA evaluation models, particularly in considering all EA functions and processes, using structured methods in developing EA implementation, employing matured practices, and using appropriate metrics to achieve proper evaluation. Most existing EA evaluation methods focus on maturity models, finance and cost but do not evaluate architectural decisions and solutions concerning the organization's goal achievement.

This study by Assoc. Prof. Dr. Rodina aims to develop a hybrid evaluation method for EA implementation in order to cover all aspects of EA. The main focus of the reviewed study lies in certain types of quality factors, alignment, metrics, and understanding of EA evaluation. The basis of the proposed hybrid method is a combination of the Information System (IS) evaluation theory, program theory, and design science in the IS theory.

The proposed hybrid method intends to address the functionality and effectiveness of the developed EA artefacts for acquiring the EA objectives of an enterprise. The method encompasses 3 phases, 12 practices and 72 metrics. By doing this, an enterprise will be able to understand the achievement of the defined EA objectives and EA implementation products.

The practices of the proposed method are identified from the conducted systematic literature review in the field of EA evaluation and interviews with EA practitioners. The proposed method practices are categorized into the following groups based on their meaning and objectives:



The proposed hybrid method's phases

Proposed Metrics	Meaning	Objectives
<i>Initiation</i>	Preparing the enterprise to begin EA implementation	Business strategy, Risk Management, Planning, Architectural method
<i>Controlling</i>	Conducting and developing the EA implementation within the enterprise	Alignment, Architectural tools, Management, Stakeholder satisfaction
<i>Sustainability</i>	Controlling and governing the EA implementation and taking appropriate action to cope with future changes	Continuity, Integration, Maintenance, Governance

The procedure of the proposed method are as follows:

- For each input, all or some practices should be applied based on the enterprise architects' ideas about the implemented EA artefacts
- For each practice, there are two sets of metrics for effectiveness and functionality categories.
- For each practice metric there are five criteria with weightage scores
- The enterprise architect is the evaluator based on his comprehensive view of EA implementation
- The evaluator will score each metric based on the provided criteria score
- For each practice, the average of all metrics is considered the score
- The cumulative score of each metric from all applied practices is the result of that metric, but the score of each practice will report the output component
- The maximum score for each metric is 48
- The acceptability of each metric's score depends on the evaluator's idea and implemented EA performance
- An adequate score between 24 and 36 is recommended in this study based on the selected criteria for accepting the EA implementation. In EA implementation, all EA artefacts are considered and some of them should be implemented according to the priority of the enterprise

The validation of the proposed method has been performed by case studies and experts' reviews. The consolidated results of the conducted case studies, cross case study, and experts' reviews indicated that the proposed hybrid method supports the usability and applicability criteria. Besides, the results showed that the proposed method's practices are easy to use and learn. It provides step-by-step guidelines, and supports maintenance and continual improvement.

Additional features of the proposed method include:

- ◆ **Completeness:** The proposed method's practices support the initiation, control, and sustainability of EA projects.
- ◆ **Support for decision making:** The proposed method represents the impact that concrete enterprise development generates in an enterprise, allowing choosing and selecting one amongst other programs to improve enterprise performance. The output of the proposed method represents the practices supporting decision making by enterprise architects and stakeholders.
- ◆ **Multi-disciplinary coordination:** The proposed method coordinates the set of disciplines that exist in an enterprise in order to convey decisions in one plan with common objectives.
- ◆ **Structured analysis:** The proposed method considers the overall enterprise and includes several views. Technological, information, organization and human aspects are considered along with the relationships between them and their external elements.
- ◆ **Covering the gaps:** The proposed method covers the gap between the EA implementation objectives and stakeholders' perspective without leaving further gaps. This means that both stakeholders and enterprise architects' perspectives are taken into account in evaluating EA implementation.
- ◆ **Flexibility:** The proposed method provides a set of dynamic practices that are flexible in addressing new changes based on requests for updates and changes.

## CONTACT

**ASSOC. PROF. DR. RODINA BINTI  
AHMAD**

Department of Software Engineering  
Faculty of Computer Science & Information  
Technology  
University of Malaya  
**rodina@um.edu.my**

# POVERTY AMONG THE SMALL-SCALE PLANTATION HOLDERS: INDIGENOUS COMMUNITIES IN PENINSULAR MALAYSIA

**A**griculture plays an important part in the life of indigenous people and most of them are considered poor despite that Cervantes-Godoy and Dewbre (2010) claimed that development in agriculture sector is essential for poverty reduction. The growth of large scale farms is slow and downgrading, hence, the bulk of many African countries' agriculture output comes from small-scale farms (Wiggins, 2009).

Traditionally, most of the indigenous people live in the forests and remote rural areas of Peninsular Malaysia (Kardooni et al, 2013). The indigenous people have the lowest income in Malaysia, with 50.92% living below the poverty line and another 34.34% living below the hardcore poverty line, as compared to the national's 7.5% for poverty and 1.4% for hardcore poverty (EPU, 2007 and JAKOA, 2011).

In 1956, FELDA was established by the Malaysian government to reduce poverty through plantation including natural rubber and palm oil. The authority distributed four hectares plots of land to landless farmers, including indigenous people (MPOC, 2007). Besides that, the Government implemented land development projects through plantation, because small-scale plantation has higher returns (Sandker et al., 2007; Rist et al., 2010). However, Nicholas (2002), Howell et al. (2005) and Damoah (2012) found that small-scale plantation does not help indigenous people to increase their income. Therefore, the objective of this paper is to explain whether small-scale palm oil and natural rubber plantation help in reducing poverty among the indigenous people. Moreover, the study also addresses the land ownership issue of indigenous people, as their dependency on land is a key issue in integrating the community to keep up with the pace of development of a country (Gomes, 2004; Bulan, 2010).

Table 1: Small-scale of palm oil and natural rubber plantation (Field survey)

Indicators	Plantation	Natural Rubber and Palm Oil Plantation	Natural Rubber Plantation	Palm Oil Plantation
Owner	31.65%	3.28%	26.26%	8.66%
Not Owner	68.35%	96.72%	73.74%	91.34%

This study covered 53 villages in six states of Peninsular Malaysia. A total number of 2,136 participants were interviewed, out of which only 31.65% own either or both palm oil and natural rubber plantation (26.26% own natural rubber plantation; 8.66% own palm oil plantation; 3.28% own both natural rubber and palm oil plantation).

Table 2: Income of respondents (Field survey)

Group	Income Group	Frequency (natural rubber plantation owner)	Frequency (palm oil plantation owner)
1	RM 0 – RM760	279 (49.70%)	69 (37.3%)
2	Above RM760	282 (50.30%)	116 (62.7%)
Total		561 (100%)	185 (100%)

The national poverty line of RM760 per month per household has been used in this study to identify the households that live below the poverty line (EPU, 2009). The study found that 49.70% of natural rubber plantation owners and 37.3% of the palm oil plantation owners live under the national poverty line. The average income per month is more than the national poverty line for small palm oil and natural rubber plantation owners.

Table 3: Size of plantations (Field survey)

Group	Plantation size	Frequency (natural rubber)	Frequency (palm oil)
1	0 – 3 acres	431 (76.80%)	87 (47.00%)
2	3.1 – 5 acres	69 (12.30%)	40 (21.60%)
3	5.1 – 80 acres	61 (10.90%)	61 (31.40%)
Total		561 (100%)	185 (100%)



Table 3 shows that only 10.90% of natural rubber plantation and 31.40% of the palm oil plantations are more than five acres. The average land size is less than five acres for both plantation owners.

Table 4: Discriminant Analysis Result

		Income group	Natural Rubber Plantation			Palm Oil Plantation		
			Predicted Group Membership		Total	Predicted Group Membership		Total
			1	2		1	2	
Cross-validated	Count	1	207	72	279	0	69	69
		2	137	145	282	0	116	116
	Percentage	1	74.2	25.8	100.0	0.0	100.0	100.0
		2	48.6	51.4	100.0	0.0	100.0	100.0

62.7% of cross-validated grouped cases correctly classified.

Discriminant analysis showed that natural rubber plantation size has a significant difference between income below and above poverty line. 74.2% of small natural rubber plantation households suffer from poverty because they have insufficient land and the productivity is low. 48.6% of small natural rubber plantation households live below the poverty line because of low productivity even though they have sufficient land. As the study showed that natural rubber plantation owners suffer from poverty, the government can help them to become skillful and increase the productivity of natural rubber. If the indigenous people continue to depend on small natural rubber plantations without proper skills, they will become worse off in terms of poverty. One of the millennium development goals of Malaysia is to reduce poverty, providing proper guidance for indigenous people to improve the income and productivity and reduce poverty among the indigenous people at the national level.

The biggest challenge in putting up a development model for the indigenous people is in designing the right type of land ownership model among the people. Gomes (2004) has emphasized on the commoditization and market involvement contributed towards further marginalization of the community. Tauli-Corpuz (2005) argued about the development that can be designed which is expected to trickle down to some poor households among the indigenous people live in poverty. Then, the challenge remains on how development policy can be as inclusive to address the structural feature of poverty profile within the community.

The finding of this study indicates the needs for better targeting in identifying the poor households through the agricultural based program for the small palm oil and natural rubber producers. The integration of local economy and the mainstream economy may link the employment status among the poor rural households. It is suggested that the more the wages is earned, it is more likely for one to be out of poverty. Yet, the poor and the hardcore poor depend less on wage work. Rather, agriculture work and casual work are more important. Therefore, to reduce the poverty rates, this study will continue to propose that policy realignment should focus on increasing employment and increasing income generation from self-employment. The small-scale plantation sector should be used as a strategy to strengthen income enhancement programs among the poor households while technical and marketing aid will need to be provided to mitigate the income variation risk among the small and limited resources farmers. There is a greater need for project implementation and monitoring as the productive income from both activities can be maximized to the benefits of enhancing income among the poor households. More urgently, the land ownership model needs to be revised and realigned with the socio-economic consideration for the community concerned.

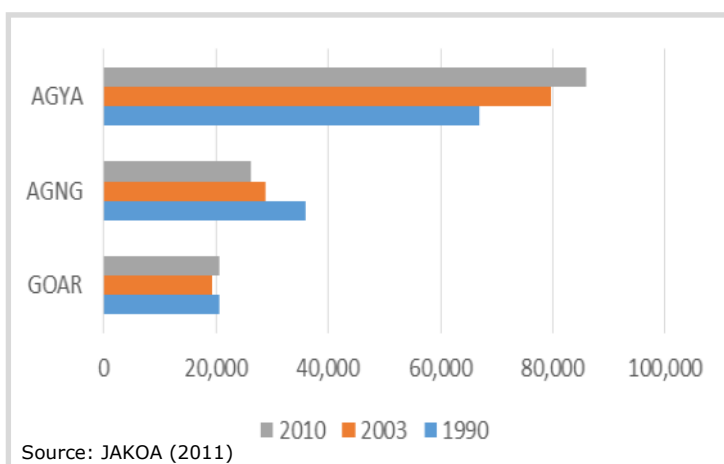


Fig. 1: Indigenous Peoples – Land Ownership ('000 ha)

CONTACT

**ASSOC. PROF. DR. FATIMAH BINTI KARI**

Department of Economics  
Faculty of Economics and Administration  
University of Malaya  
[fatimah\\_kari@um.edu.my](mailto:fatimah_kari@um.edu.my)

# CHALLENGES EXPERIENCED BY OVERSEAS-EDUCATED EARLY CAREER FACULTY (ECF)

**A**cademic members are the key actors in universities (Pozo-Munoz, Reboloso-Pacheco & Fernandez-Ramirez, 2000). Numerous researches have been conducted on the topic in preparing young, new, and novice lecturers (often referred to as Early Career Faculty, ECF) for tasks in the academia. The research team, headed by Dr. Farrah Dina and Assoc. Prof. Dr. Yusniza, focuses on the main challenges faced by our overseas educated Early Career Faculties (ECFs) upon returning to Malaysia and the impact of challenges on their career performance and professional development. The study was initially aimed at understanding the issues and challenges of the scenario through in-depth interviews among ECFs in University of Malaya. A total of 20 participants were selected randomly from the list of PhD graduated overseas. All the selected participants have less than 3 years service experience from various disciplines. *Nvivo* was used to analyze the findings from this study.

a place to stay is time-consuming and at some point can be stressful, especially if they come back during middle or towards the end of an academic year, as most schools are full and no longer accepting transferred students. Consequently, this creates child care issue for some. Most often they had to rely on their parents to take care of their children while waiting for new school intake. On the other hand, universities typically allow only one to two weeks of leave for ECFs to settle down. One ECF participant shared her experience of having only a week of leave after she was reported for duty before she started her undergraduates' classes. In the one week leave, she was heavily invested in teaching preparation instead of settling down.

## Institutional challenges – adaptation to the new academic system

### Teaching- and learning-related issues

Many ECFs were very motivated to try out the new teaching and learning approaches they had acquired and experienced during their overseas training. However, not many were successful in doing so, mainly due to silent disapproval from faculty administrators. For example, Nina, who taught advertisement for undergraduate course, tried to organize a campaign run by students for product promotion, hoping that the students will develop their creativity skills. Her students were expected to arrange for a seminar involving administrative procedures. However, her faculty administrator disagreed with such active learning approach as the 'correct' way to teach. Coming from old school of thoughts, the administrator believed that she was trying to shirk her duties by delegating work to students.

Another challenge was the rejection of new teaching approaches from students. Diana, a USA-graduated ECF, attempted to apply wiki to support her class instruction for a group of undergraduate pre-service teachers, and to expose these students to a current learning technology so they could later apply it in their actual teaching practice. Unfortunately, the students were unwilling to accept the change from the traditional lecture-based approach of learning to this new approach.



'Introduction to Support Services' delivered by a university's academic development center

## Personal challenges

Upon returning to Malaysia, the ECFs faced hard time trying to adapt and adjust to the local contexts which are different from the systems employed in overseas. Such adjustment to local culture was required not only by ECFs, but also by their family members, especially children who have become accustomed to overseas culture. The most common challenge faced was to find a balance between family needs and work commitment, including finding a decent place for setting up a family. The process of finding



Potential ECFs were listening to speeches on grant application

### Research and publication-related

All participants in this study work at public research universities with higher priority given to research and scholarly publication than to teaching. Consequently, early faculty performance assessments allocate highest marks for active acquisition of research grants and publications. Majority of them, though agreeing on the importance of research and having been indirectly exposed to such expectations during their doctoral training, were unable to satisfactorily fulfill the requirements.

A further investigation explained the situation. The ECFs are often being assigned with too many administrative tasks at the faculty level. They typically were members of more than three principal faculty committees. For example David and Wati were appointed to be program coordinators for their departments' academic programs whereby their tasks involved in designing curricula and handling students' issues pertaining to the programs. They were also often requested to represent their respective faculties at official events and gatherings. Majority of them confessed they could not find sufficient time for research and publication due to these administrative distractions.

Some ECFs simply had not gained prior knowledge and skills in writing, be it grant proposals or publications, during their doctoral training. Even though such skills can be improved by attending short courses and workshops, work commitments such as heavy teaching workload had prevented them from attending such courses. Moreover, classes must be rescheduled or replaced in the case of any class cancellation according to the university's policy.

### Acknowledgement

We would like to acknowledge the University of Malaya who supported this research work under UMRG Grant No. RG461-14HNE.



ECFs listening to the Scholarship of Teaching and Learning (SoTL) Talk

### References

Pozo-Munoz, C., Reboloso-Pacheco, E., & Fernandez-Ramirez, B. (2000). The 'Ideal Teacher'. Implications for student evaluation of teacher effectiveness. *Assessment & Evaluation in Higher Education*, 25(3), 253-263.

### CONTACT

**DR. FARRAH DINA BINTI YUSOP**  
 Department of Curriculum and Instructional  
 Technology  
 Faculty of Education  
 University of Malaya  
**farah@um.edu.my**

**ASSOC. PROF. DR. YUSNIZA BINTI  
 KAMARULZAMAN**  
 Department of Marketing  
 Faculty of Business and Accountancy  
 University of Malaya  
**yusniza@um.edu.my**

# WALKABILITY AS AN IMPORTANT CONTRIBUTING FACTOR TOWARDS GREEN NEIGHBOURHOOD

To many, green neighbourhood refers to green technology in the building, the use of electrical automotive and recycle energy. However, this definition does not limit to the above stated. One of the determining factors for green neighbourhood is walkability. Walkability refers to the quality of walking, which is the cheapest means of green transport used by all. It has a lot of benefits, such as increases metabolism, reduces fatigue, lowers the risk of chronic diseases and improves digestive system. It also improves one's sleep, mental health and mood, as well as creates creativity. Nonetheless, walking brings more economic value to the surrounding shops or stalls as people who walk more will purchase more. Walking also reduces carbon footprint and increases social interactions. Generally, it is uncomfortable to walk in Malaysia due to its hot weather. Most Malaysians are only willing to walk around 250 meters at a time. This is one of the contributing factors for double parking and traffic congestion in city centres. However, Malaysians love to do window-shopping during leisure time and they can spend hours in shopping malls. By doing so, they could have walked for more than 10,000 steps subconsciously, which is the minimum requirement for daily walking activities.

Malaysians always think that it is pleasant to walk in western countries such as the United Kingdom, Germany, Australia and etc., without realising that the temperatures of the countries mentioned can reach up to 40 degrees Celsius in summer. The difference between their weathers and ours is humidity. However, like Malaysia with humid and even hotter weather, Singaporeans walk more than us. This implies that people's mind-sets can be changed towards walking if they are health conscious. This research has identified seven main determining factors in walkability: pedestrian walkway, free of obstacles, safety, shades, continuity, street furniture, and activities.

To encourage people to walk more, the condition of a pedestrian walkway has to be comfortable and well maintained to provide a pleasant pedestrian walkway. Important elements must be taken into account, including its width, condition, obstacles-free, ramp, and zebra crossing. The width of a walkway has to suit the land use of an area. For example, the width of a pedestrian walkway in residential area can be at a minimum of 1.5m and 3m in commercial area is required to accommodate social space for users.

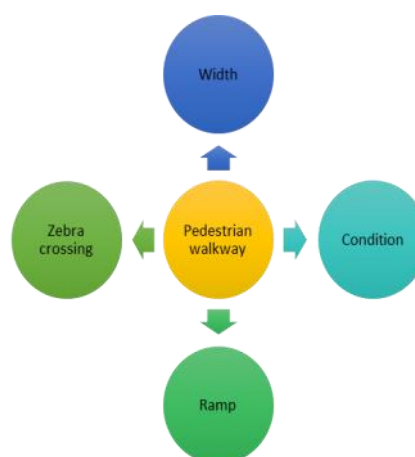


Determining factors of walkability

A pedestrian walkway should be free of all obstacles with road signage erected at suitable height. Also, lamp post and trees are advisable to be planted between the street and walkway.

Safety is another determining factor of walkability. People will walk if the journey is safe from crimes, stray animals and motorised vehicles. Good road signage and strategically-placed lamp post will provide a buffer zone that helps to protect pedestrians from snatch thieves as well as road accidents. Traffic calming is also necessary to control the speed of vehicles around neighbourhood and township centre at speed limit within 35 - 50km/h.

Shades can be formed from natural trees, wood or heat-cut polycarbonate roof panels. Besides providing shelter to pedestrians, trees also can beautify the surrounding landscape.



Elements of a pedestrian walkway

Pavement continuity contributes to walkability as well. A good pedestrian walkway should have a good connectivity between places. Zebra crossing with ramp should be provided for street / road crossing whenever is necessary.

The sixth factor which determines walkability is street furniture. Benches or resting places and public facilities will encourage walkability, for example, rubbish bins should also be provided at strategic locations. Street lights are also required for safety purposes especially for night walking.

Lastly, activities along a walking journey will distract the mind from tiredness and boredom. People can walk for hours if there are interesting views or interactions available. From economic perspectives, walking will encourage people to spend more as some might stop over at convenience shops for goods purchase.

All the factors discussed above, if addressed carefully, will encourage Malaysians to walk more. The impacts of walkability will not only result in health and fitness, but also will reduce carbon foot print, increase public transportation modal split and also increase economic activities, which eventually will create a green neighbourhood.



A well maintained and suitably designed walkway in commercial area



The pedestrian walkway is well maintained and levelled across all houses in the neighbourhood



A well designed walkway in residential area with clear signage, shades and lamp post

## CONTACT

### DR. ROSILAWATI ZAINOL

Sustainable Urban Planning and Real Estate  
(SUPRE)

Department of Urban and Regional Planning,  
Faculty of Built Environment  
Centre for Civilisational Dialogue  
University of Malaya

[rosilawatizai@um.edu.my](mailto:rosilawatizai@um.edu.my)

# EXPERIENCE OF UM'S CSR TRIP TO MIRI AND BARIO, SARAWAK

**P**rof. Dr. Noor Hayaty Abu Kasim, Prof. Dr. Shaliza Ibrahim, Assoc. Prof. Dr Sumiani Yusoff and Ms Nuratiqah Mohamad Norpi visited Bario, Sarawak from 12 to 15 July 2017, to explore potential areas of partnership between UM and the highland communities. Bario is a village located to the east of Miri and close to the Sarawak-Kalimantan border. It is the main settlement for the indigenous Kelabit tribe. Bario is also known as the "land of a hundred handshakes" to depict the hospitality of its people. This field trip has enabled the researchers to gain deeper understanding of Bario, its people, their food and culture, and indigenous products. Dialogue sessions were held at the oldest longhouse and the community hall with the Kelabit elders and village heads,



Bario, Sarawak

During these sessions, concerns on health, aging, pollution threats to the environment, preserving the Asal Lambaa longhouse which is a UNESCO heritage, and their endangered language were highlighted. UM would like to engage with the local communities to further address these areas of concern, and translate our research to benefit the society.

The researchers would like to thank the Sarawak Convention Bureau (SCB) for inviting the UM team to Bario, and look forward to working with them in UM's CSR projects for Bario as well as other highland communities. It is of note that representatives from the Miri City Council welcomed UM's efforts in formulating sustainable solutions with the community while preserving their indigenous way of life.



Penan Kids in Miri



Golden Girls of Kg bario Asal Lambaa Longhouse



Bario Immigration Community Hall



SMK Bario

## IPPP Central Laboratory Facilities

FACILITIES	MODEL	TEST/SERVICES
Nuclear Magnetic Resonance (NMR 270 MHz)	JEOL 270 MHz	<sup>1</sup> H, <sup>13</sup> C & others
Nuclear Magnetic Resonance (NMR 600 MHz)	Bruker AVANCE III 600 MHz	<sup>1</sup> H, <sup>13</sup> C & 2D analysis
Sample Preparation (SEM)	Polaron CPD 7501 Critical Point Dryer Biorad Sputter Coater	Carbon/Gold Coating; Chemical Treatment /CPD
GCMS	7890A GC/ MS Agilent 5975 Shimadzu QP2010 ULTRA GCMS	Compositional Test (Scan & SIM Mode using RTX-5 Column); Compositional Test (Own Column)
Confocal Laser Microscope	Leica Tcs Sp5 li	Fluorescent Imaging; Life cell imaging (Time Lapse)
Field Emission Scanning Electron Microscope (FESEM-EDX)	Quanta FEG 450 EDX-OXFORD	Imaging; Compositional
Surface Area Analyzer (BET)	Micromeritics ASAP2020 TRISTAR II 3020 Kr	Surface Area; Pore Volume; Pore Size Distribution
Differential Scanning Calorimeter (DSC)	Perkin Elmer (DSC-8000)	Heat Flow Analysis; Specific Heat Capacity (Cp)
Simultaneous Thermal Analyzer (STA)	Perkin Elmer (STA-6000)	Weight Loss; Melting Curves
Dynamic Mechanical Analyzer	Perkin Elmer	Creep Test
Particle Image Velocimetry (PIV)	Dantec Dynamics Nano L135-15piv	2D & 3D Imaging
DNA Sequencer	Applied Biosystems (3730xl DNA Analyzer)	DNA Sequencing
Real Time PCR	Applied Biosystems Quantstudio (12k Flex Real Time PCR System)	Quantitative PCR Application
LCMS	Agilent Technologies	Qualitative
UHPLC	Agilent Technologies	Qualitative
Ellipsometer	J.A. Woollam M-2000	Change in Polarization; Optical Constant; Film Thickness
Rheometer	TA Instruments DHR-2	Viscosity; Viscoelastic
Tensiometer	Attension Sigma 700	Surface and Interfacial Tension; Powder Wettability

<b>Address :</b>	INFRA Analysis Laboratory Level 3, Research Management & Innovation Complex University of Malaya 50603 Kuala Lumpur
<b>Email :</b>	lab_infra@um.edu.my
<b>Tel :</b>	+603-7967 4619 +603-7967 7022 Ext: 2320
<b>Fax :</b>	+603-7967 4644



INSTITUTE OF RESEARCH MANAGEMENT & SERVICES  
Research Management & Innovation Complex  
University of Malaya  
50603 Kuala Lumpur  
Malaysia

Tel: (+603) 7967 4643/4525/4698/4697

Fax: (+603) 7967 4699

<http://umresearch.um.edu.my>

Available online at  
<https://www.um.edu.my/research-and-community/our-impact/research-bulletin>

ISSN 1823-6316



9 771823 631009

Printed by  
Centre for Research Services (PPP), IPPP, University of Malaya