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BULLETIN @ RICE UTeM

Research, Innovation, Commercialisation and Entrepreneurship

BUILDING EXCELLENT R&D CULTURE THROUGH PURPOSE-BASED INITIATIVES

IS3 Research Seminar 2016

IRID'16

A Research Visit to **NIPPON**

ISSN 2289-991X

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INTEGRATED OCEAN OBSERVING SYSTEM (IOOS) BUOY FOR TSUNAMI ALERT

Welcome to the 4th edition of **RICE** bulletin!

This edition focuses on the overall research and innovation achievements of UTeM in 2016. In this edition, we highlight the research outputs by our researchers throughout the second half of 2016. For this, we would like to congratulate all researchers who have received awards since the last edition of the bulletin.

On behalf of the editorial board, I would also like to thank all researchers and UTeM's staff members who have contributed to the success of this edition. A special thanks also to all readers who spare their time to read and support this RICE bulletin.

Best regards and easy reading,

Chief Editor
Associate professor Dr. Massila Kamalrudin

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BUILDING EXCELLENT R&D CULTURE

THROUGH PURPOSE-BASED INITIATIVES

We are now reaching the year-end of 2016 and it is timely to assess our accomplishments in research, innovation and commercialisation this year for the purpose of continuous improvement. Firstly, I would like to congratulate researchers at UTeM who have contributed to our research achievements this year. However, we should not be complacent; instead, we have to find ways to continuously improve our performance in research and innovation. Hence, the best way for us to move forward is to build a culture of Research and Development (R&D). An excellent R&D culture will naturally change the daily practices of academicians at UTeM: They become active researchers and their conversations are mainly about exchanging research information. However, this cannot be accomplished easily and quickly. We need a systemic approach with concerted efforts as well as commitment from everyone!

I believe that we can grow an excellent R&D culture by practising purpose-based initiatives: There should be a purpose for whatever research initiatives that we intend to embark and it has to be systemically implemented. It is also doing things with a grand purpose. Here are the four steps to do things with a grand purpose. First, focus on your most important goal. We normally have many goals, but we cannot achieve all of them within a limited time. As such, we have to identify our most important goal and focus on striving to achieve it. This will sustain our motivation to achieve the goal. Second, identify the indicators that measure your performance to achieve your goal. In measuring your performance, you should identify your lead measures and lag measures, and then act on achieving your ultimate goal. A lag measure measures the ultimate goal you are trying to achieve, while lead measures are short-term measures in achieving your intermediate targets, and they have to work in tandem with one another. The third step is to measure your performance in achieving your goal by keeping a compelling scoreboard. Similar to managing a project, this is where you can monitor your performance and make any changes that drive you towards achieving your goal. Finally, everyone has to play his / her roles and take ownership and responsibility on the grand agenda.

… This is my wild ideas as a closure for 2016 and a warming up for the coming 2017.

Prof. Datuk Ir. Dr. Mohd Jailani Mohd Nor

DVC Research and Innovation UTeM

INNOVATIVE RESEARCH & INDUSTRIAL DIALOGUE 2016 IRID'16

Innovative Research & Industrial Dialogue IRID'16 is an inaugural research day hosted by the Advanced Manufacturing Centre (AMC) of the Faculty of Manufacturing Engineering, UTeM. IRID'16 aims to offer post-graduate students as well researchers and engineers from the industry, especially in the fields of engineering and technology, a unique platform to present their research findings, establish a mutual knowledge transfer and build networking. Through IRID'16, ideas and solutions to the problems and needs of the local industry can be shared, thus bridging the gap between the university and industry in Malaysia.

The opening ceremony was officiated by Prof. Dr. Mohammad Ishak Desa, the Director of the Centre for Research and Innovation (CRIM) on the 20th December 2016 at the PPS Auditorium, UTeM main campus. The CRIM Director was accompanied by the IRID'16 Chairman, Prof. Dr. Radzali Othman.

Three major programs have been held successfully, namely:

1. Industrial Forum:

   Title: "Career Prospects in Manufacturing Engineering"
   Moderator: Prof. Ir. Dr. Sivarao A/l Subramonian
   Panelists:
   i. Mr. Lee Chee Cheong (CEO, Infineon Technologies (Malaysia) Sdn. Bhd.)
   ii. Tuan Haji Mohamad Zamri Md. Zin (Manager/Staff Engineer, Manufacturing Planning, Production Engineering, PROTON (MALAYSIA) SDN. BHD.)
   iii. Mr. Amirul Herman Razali, (Head of Department, Manufacturing Engineering Department, CTRM (Malaysia) SDN. BHD.)

2. Poster Exhibition/ Research Showcase

   - 102 participants from various fields.
   - The judges were from academia and industry.
   - 10 best posters were selected.

3. UTeM-Materials Lecture Competition

   - 15 participations from various fields.
   - The judges were from academia and industry.
   - Champion, first runner-up, and second runner-up were selected.

The award presentation and closing ceremony were performed by Assoc. Prof. Dr. Mohd Rizal Salleh, the Dean of the Faculty of Manufacturing Engineering, UTeM, accompanied by the IRID'16 Chairman.

IS3

RESEARCH SEMINAR 2016

On the 4th-6th December 2016, the Innovative Software System & Services (IS3) research group conducted a research seminar at the Lexis Suite, Penang. The seminar, participated by 25 researchers from multi-disciplinary background in UTeM was officiated by our Deputy Vice Chancelor, Prof. Datuk Dr. Ir. Mohd Jailani Mohd Noor. The aim of this seminar was to provide a space for researchers to brainstorm the research and innovation projects and activities for 2017 as well as to present their research output of 2016. This seminar was also a platform to encourage motivation among group members in research and innovation. The highlight of the seminar was a special session, 'Racun Minda', delivered by Prof. Datuk Dr. Ir. Mohd Jailani Mohd Noor, in which participants were taught to be positive and open up their sub-conscious mind to accept positive vibes, especially in upgrading their research and innovation. Members were also given an opportunity to experience NLP Coaching session, led by Mr. Aziz Yahya. Focusing on identifying one's own personality, the session allowed the team members to get to know and understand each other's personality, leading to a better group work. Finally, the seminar ended with a presentation from each group on the innovation and research project that will be carried out in 2017.

TECHNICAL VISIT (UTeM-PROTON)

to Aluminium Alloys Industries (AAI) Sdn. Bhd.

An industrial visit to Aluminium Alloys Industries Sdn. Bhd. was carried out on the 26 th October 2016. Participated by three members from UTeM and six members from PROTON, this visit involved visiting three places namely, the aluminium die-casting process, the machine and equipments and the heat treatment process.

Aluminium Alloys Industries (AAI)

Aluminium Alloy Industries Sdn Bhd (AAI) is a manufacturer of aluminium alloy casting parts specialising in gravity and low pressure casting, machining and painting. This company was founded in 1993 and located at Nilai Industrial Estate. The company's line of business includes the manufacturing of steel castings including alloy, bushings and rolling mill rolls.

During the visit, the AAI representative, Mr. Sashendran presented the company's background and the machining facilities that they have in the factory. After that, a technical discussion with the AAI team was carried out, in which Dr. Mohd Shukor Salleh, the UTeM representative, presented a design proposal of a low control arm fabrication. During the discussion, the AAI team also proposed a suitable material for the low control arm fabrication as well as the casting process in order to achieve the target strength that fulfills the PROTON's requirement.

Plant tour

The AAI plant tour took place after the two-hour discussion on the low control arm fabrication with the AAI team. The tour started from the casting process equipment with a brief introduction of the AAI facilities and business report in the recent years. The visitors first entered the factory at the melting furnace equipment. The most priority of this equipment is to melt the aluminium alloys. After that, the molten alloys were poured into the die.

Next, the assembly production line where workers assemble some of the cast components was introduced. This production line includes many working stations and it is a moving line that facilitates a worker to travel within a short distance between the assembling parts to finish his work.

Some of the components undergoT6 heat treatment that consists of solute solutioning, quenching and ageing which can improve the mechanical properties of the parts. Throughout this industrial visit, we experienced the real atmosphere of aluminium alloy industry. We also learned how workers perform their work during the factory tour. Finally, this event is very effective in increasing communication between our research group and the industry.

A RESEARCH Visit to Nippon

By: Pn. Nuridawati Mustafa

The journey to the Land of Rising Sun on the autumn season was an amazing and unforgettable experience. The purpose of this visit was to attend an international conference, the 3rd Asia-Pacific Requirements Engineering Symposium, APRES 2016, that was held in Nanzan University, Nagoya, Japan as well as to honour an invitation from Nanzan University for a research visit and sharing session.

The APRES 2016 was held from 10th-12th November 2016, focusing on sharing the state of the art and practice in requirements engineering and to explore emerging challenges in requirements engineering innovation. In brief, the symposium that was held annually, consists of talks from the keynotes, paper presentation sessions, and discussions on the future of Requirement Engineering (RE) as well as an industry practice talk.

The keynote speeches were given by among RE experts in the world, such as Prof. Carl K, Chang, from IOWA State University, USA, Chairman of the Board TOYOTA, Yuji Inoue, and Michael A. Cusumano, Distinguished Professor of Management from MIT, USA. Complementary to this, industry talks were also given by established industries, such as TOYOTA, TOSHIBA and FUJITSU to share their technologies and new current research interest related to Requirements Engineering. As the sole presenters from Malaysia, we were proud to share our research findings in this area with other researchers from other countries, such as Ajou University, South Korea, IOWA State University, USA, Nihon University, Nanzan University and others. We enjoyed all the sessions and have taken this valuable opportunity to have a close research discussion with the Requirement Engineering experts from all over the world. The symposium ended with a dinner at Tokugawaen Japanese Garden Restaurant, which Tokugawaen is known as a Japanese garden, with numerous highlights around a pond in its center. The dinner is also fulfilled with Kabuki, a traditional dance drama.

Further, on the13th November, we were invited by Prof. Mikio Aoyama to visit NISE Lab in Nanzan University. Mikio is a professor of Software Engineering Department in Nanzan University, Japan as well as a leader of NISE Lab. His lab consists of more than 20 undergraduate and postgraduate students who conduct research in Web services/SOA/cloud computing, requirements engineering, software architectures, and embedded software engineering. Here, Assoc. Prof. Dr. Massila was invited to give a talk on "Automated Support of Requirements Validation". The session went well and we gained valuable inputs from Prof. Mikio Aoyama and his researchers.

The time spent in Nihon was so much to be shared with and we are looking forward for the next APRES 2017 that will be organized in Malaysia.

SHORT COURSE TRAINING:

Theory & Application of Li-Ion Battery for Engineers' Samsung SDI Energy Malaysia Sdn Bhd

Date of training: 28th Nov – 2nd Dec 2016

Organiser: Faculty of Engineering Technology and Faculty of Manufacturing Engineering, Universiti Teknikal Malaysia Melaka.

Participant: 30 engineers from Samsung SDI Energy Malaysia Sdn. Bhd. Senawang, Seremban, Negeri Sembilan.

Venue: Faculty of Engineering Technology and Faculty of Manufacturing Engineering.

Session of training:

1. Introduction to Li-Ion battery (LIB) materials
2. Processing and fabrication of LIB
3. Test performance of LIB
4. Battery management system
5. Manufacturing Jig & Fixtures & Highly Automated Robotic System

List of trainers from UTeM:

Dr. Umar Al-Amani bin Azlan (FTK) – Project Leader
Assoc. Prof. Dr. Jariah binti Mohamad Juoi (FKP)
Assoc. Prof. Dr. Zulkifli bin Mohd Rosli (FKP)
Assoc. Prof. Dr. Mohd Warikh bin Abd Rashid (FKP)
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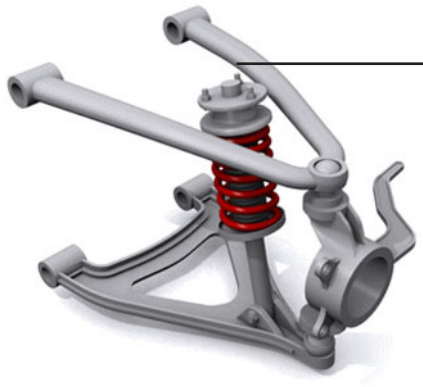
Dr. Noraiham binti Mohamad (FKP)
Prof. Dr. Qumrul Ahsan (FKP)
Dr. Intan Sharhida binti Othman (FKP)
Dr. Rose Farahiyan binti Munawar (FKP)
Dr. Zikri Abadi bin Baharudin (FTK)
Mr. Adlan bin Ali (FTK)
Mr. Abd Khahar bin Nordin (FTK)
Mr. Arman Hadi bin Azahar (FTK)
Mr. Farees Ezwan bin Mohd Sani @ Ariffin (FTK)



DESIGN & FABRICATION of Lightweight Aluminium Cast Lower Control Arm

(UTeM-PROTON Research Collaboration)

By: Dr. Mohd Shukor Salleh & Prof. Dato' Dr. Abu Abdullah

A control arm set connects knuckle assembly and suspension module to the main frame support underneath a vehicle. In McPherson setup, control arm consists of only lower portion, which is symmetrical to the left and the right wheel. Depending on the vehicle body structure crash, torsion and rigidity strategy, the Lower Control Arm could be shaped to A or L geometry. Due to its function which needs to path and absorb some lateral and longitudinal road loading, the lower arm is stiff; and thus, it is heavy. Stiffness by means of additional reinforced material increases the number of child parts assemblies. Therefore, there is a need to design a lower control arm that is excellent in rigidity stiffness, lighter weight and less number of child parts.

Designing work involves using CATIA V5 by considering Quasi-static loading and fatigue loading. The geometry is then optimised and analysed through SOLID THINKING by ALTAIR. The optimised geometry is then shaped and finalised before proceeding to the bi-directional fatigue durability loading analysis. The outcome is expected to reduce weight as much as 1kg and fasten the time to assemble due to less complexity. Improvement in the components weight contributes to fuel efficiency and improvement in the vehicle ride criteria.

In suspension design, there are two major concepts mainly used in vehicle. The first is the McPherson strut suspension setup (Figure 1) which is simpler and less cost. In McPherson, only a single control arm is used at the bottom, anchoring bottom kingpin point to sub frame. Almost all vehicles use McPherson type due to its involvement of minimal number of child part. With the reduced number of components, suspension tuning becomes easier to achieve vehicle character, but the drawback is the limitation to less degree of freedom, such as the camber change that could affect a lot of tire wear.

The second setup is the double-wishbone (Figure 2), where we could see a higher range of vehicles that use such application. A higher range refers to a bigger engine displacement, bigger car segment as well as performance vehicle. In double-wishbone, there are two A-shape control arms: the upper and lower. It uses more linkages and bigger space area for packaging all sorts of joints and bushes. However, on the positive side, it gains a lot of wheel motion optimisation to easily tune the suspension setup to achieve intended vehicle character.

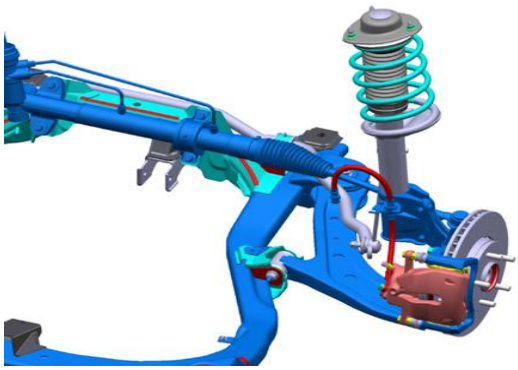


Figure 1: McPherson Suspension

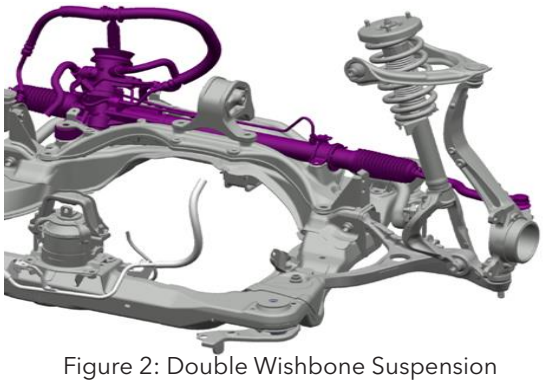


Figure 2: Double Wishbone Suspension

In putting the design work effectively, a step-by-step approach consisting of a proper planning is loaded upfront or topmost in order to achieve a meaningful result. It is like carving a proper path so that the result is more focused. Starting with an establishing target setting, six main criteria that need to be understood are the component approximation cost, target weight, components design guidelines, planning of material and process, performance target such as the NVH or stiffness, and FMEA. The approximation cost is determined to be as a guideline so that the design does not leap over too much over the top from the current cost. In weight optimisation, the material change might increase rather than reduce the cost. The second item in the target setting is the target weight. The percentage of weight reduction will drive most of the design shape (refer to Figure 3). Weight target comes with different perspective for every car maker subjected to their goal post, normal practice and a percentage figure that are given based on benchmarking data from a specific car segment. Every car maker has their actual percentage of weight segregation to every design department. From here, benchmarking data are laid against and set a limit to weight for each design department.

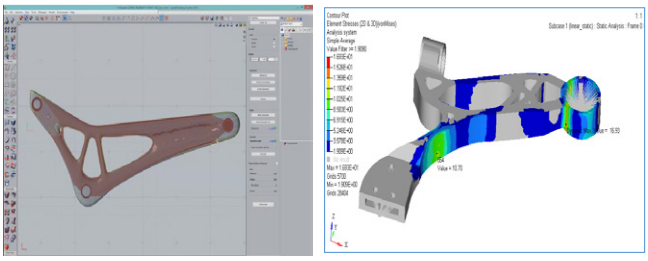


Figure 3 : Design optimization

The third item is the automotive designing work relative to the constraints to SAE, JIS, ISO, DIN, BS and several other automotive regulation bodies. Designers need to comply with these regulations and will only receive accreditation after passing various vigorous tests for the sake of safety or reducing environmental effects. All of these regulations inclusive with after sales improvement history are added into design guidelines for the specific components, sub-systems and up to system level. The know-how knowledge is the most significant content in design guidelines.

Due to the complexity of surface topography, the familiar approaches for lower control arm fabrications are using the stamping and casting process. The materials mostly used for both processes are steel and aluminum. These selections of materials and processes are widely used by OEM as they have the ability to be mass produced. For an extrusion process with a choice of aluminum material, it is commonly fabricated in race cars or as an aftermarket options. The limitation of such process is the complex shapes of the components: That is why it is normally used at the rear multilink and as lower control arm. For current trend of hybrid cars that strive for lower weight, a hybrid design is used. It is a combination of injection molding, normally Nylon to a steel stamping part. The Nylon functions as an insert to lower the arm in order to increase the level of stiffness level. In terms of performance input, such as NVH (Noise, Vibration, Harshness) or stiffness target, most of the best drivability criteria is to achieve the comfort of driving as it translates to less road vibration transfer into cabin. Normally in Macpherson suspension design, there are two rubber bushes, aligning into lateral and longitudinal direction. Both serve the main intention of isolating as much as possible vibration level from road while driving. There is as well natural frequency target so that the road frequency does not magnify with the frequency of knuckle assembly. This phenomenon happens at certain vehicle speed and will result in discomfort and less confidence while driving.

The last item in target setting is Failure Mode and Effect Analysis: It is a step-by-step approach of defining the probability of failure in design criteria and manufacturing criteria and the effect towards the system and user at the end. Severity, Occurrence and Detection were numbered to categorise the impact, being number 10 as the highest number to the system. The target is to reduce any high impact criteria to a level of acceptance that does not deteriorate the next system process or user. The major contributions in implementing FMEA are to ensure safe and reliable products to customers as well as reduce the cost of defects due to manufacturing defects or design that is not robust.

INTEGRATED OCEAN OBSERVING SYSTEM (IOOS) Buoy for TSUNAMI ALERT

By: Dr. Mohd Shahrieel Mohd Aras

Today, Integrated Ocean Observing System (IOOS) Buoy is used for many purposes, such as navigation, scientific or engineering investigations, gathering synoptic data, and supporting ocean operations. IOOS Buoy can increase the capability to satisfy the challenges associated to predict the change of weather condition, such as Tsunami, and its effects on coastal communities, marine operations, marine ecosystems, and sustained use of marine resources. This IOOS Buoy is very important because it works as a platform for the weather forecasting station. This platform and ground station connect each other through wireless. IOOS Buoy will generate electricity power from solar panel and batteries. Since the tsunami alert, this IOOS Buoy has depth sensor that gives information about the changes of depth based on the change of tidal wave.

Table 1: List of Sensor on Integrated Ocean Observation (IOOS) Buoy

Sensor	Parameter
Anemometer	Wind speed and direction
Temperature sensor	Air temperature
Humidity sensor	Air humidity
Rain gauge	Rainfall
Depth Sensor	depth

Table 1 shows the various types of sensors installed on the IOOS buoy. These sensors are required to measure oceanographic and meteorological parameters. In addition, this buoy also will be equipped with a hydrophone, an underwater camera, and an omnidirectional surface camera to capture audio and visual information from the marine environment. This hydrophone and camera can be configured to automatically respond to certain trigger to initiate the recording and capturing.

The data have been collected using IOOS Buoy

THE EFFECT of Cu Content on Microstructure & Mechanical Properties of Thixoformed Al-Si-Cu-Mg Alloys

By: Dr. Mohd Shukor Salleh
& Dr. Saifudin Hafiz Yahaya

In recent years, the need to produce near net-shape products that have superior properties to those produced by the conventional casting process has drawn attention towards a new processing technique, known as thixoforming processing. This type of processing offers a solution to the problems associated with die casting due to its capability of using a lower temperature than that required die casting. It also uses low forming forces during the shaping process. Moreover, this process also ameliorates the usage of feedstock materials and contributes to the diminution of the cost of processing manufactured parts. The main purpose of this research is to investigate the effects of Cu on the microstructure and mechanical properties of thixoformed Al-6Si-*x*Cu-0.3Mg (*x*= 3, 4, 5 and 6 wt%) alloys. The samples were thixoformed at a 50% liquid content and some of the samples were treated with the T6 treatment. The samples were then examined by optical microscopy, scanning electron microscopy, energy dispersive X-ray spectroscopy and X-ray diffraction analysis, as well as hardness and tensile tests. The results showed that the thixoforming process promote the formation of very fine and well distributed intermetallic compounds (Figure 1a) in the aluminium matrix and the mechanical properties of the alloys have been increased considerably in comparison to the conventional casting (Figure 1b). The results also revealed that as the Cu content in the alloy increases, the hardness and tensile strength of the thixoformed alloys increases. The mechanical properties of the thixoformed alloys improved significantly after the T6 treatment (Figure 2). The ultimate tensile strength, yield strength and elongation to fracture of the thixoformed heat-treated Al-6Si-3Cu-0.3Mg were 298 MPa, 201 MPa and 4.5% (Figure 3), respectively, whereas the values of the thixoformed heat-treated alloy in high Cu content (6 wt%) were 361 MPa, 274 MPa and 1.1%, respectively. The fracture of the thixoformed Al-6Si-3Cu-0.3Mg showed a dimple rupture, whereas the alloy that contained the highest Cu content (6.0 wt%), a combination of dimple and cleavage fractures was observed.

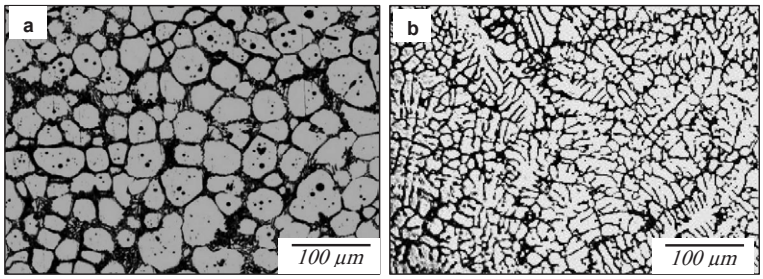


Figure 1: Microstructures (a) thixoforming (b) conventional casting

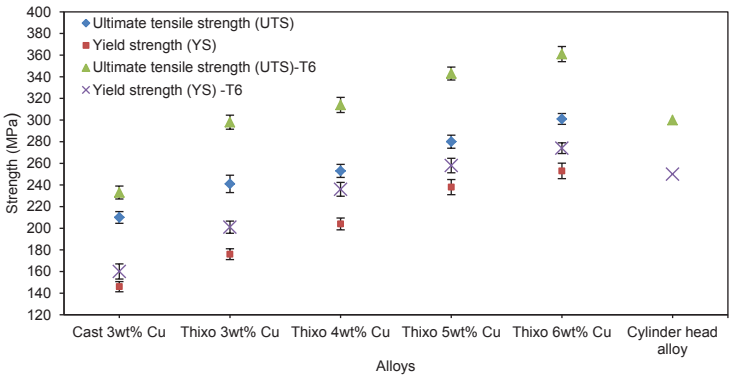


Figure 2: Comparison of ultimate tensile strength and yield strength of thixoformed alloys in T6 condition

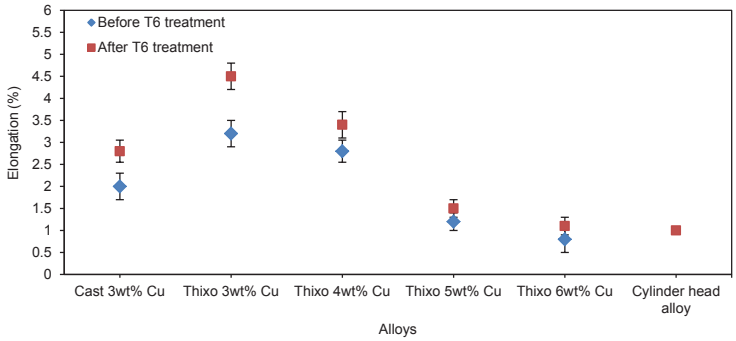


Figure 3: Comparison of the elongation of various alloys (before and after T6 treatment) produced via permanent mould casting and thixoforming

Robo-therapy for mental healthcare in Malaysia:

CAN ROBOTS LEND A HAND?

What is mental health? Do you know that depression is a common illness now?

By: Dr. Syamimi Shamsuddin

Mental health refers the state of our emotional well-being. It affects how we feel, make decisions and behave. Good mental health is vital to the nation's productivity. Vision 2020 envisions Malaysia as a fully developed country along all dimensions- economically, politically, socially, spiritually, psychologically, and culturally- by the year 2020. One of the six strategic thrusts of the Eleventh Malaysia Plan is improving the wellbeing for all, covering physical, psychological, social, and spiritual sense.

Depression is the fourth most disabling illness in Malaysia and in the world. Symptoms of depression, include low mood, low self-confidence or self-esteem, loss of pleasure and feeling restless and agitated. By the year 2020, major depression is projected to be the second largest contributor to the global burden of disease, after heart disease. World Health Organization (WHO) has classified depression as a common illness worldwide, with an estimated 350 million people affected. In Malaysia, the prevalence is estimated between 8-10% of the population.

Robotics technology has been applied in a variety of ways in mental healthcare scenarios. Such applications include interventions for conditions ranging from depression, autism, other cognitive impairments and provide companionship to individuals living alone. Though the number of studies in this area is increasing, the methodology behind the studies is still lacking. More work is needed on the human-robot interaction aspect. Other issues to be sorted out include the durability of such robots, the ability of the robot to sustain the patient's interest for long period of time and the best shape of robot to suit specific health problems.

Animal-assisted therapy (AAT) is a treatment using trained animals for therapeutic purposes. AAT is capable to increase the patient's mood and motivate them if they are about to feel depressed. It is also proven to stabilize patient's blood pressure and build self-confidence to interact with other people. However, the use of animals for therapy is not practical due to the fact that it is not suitable for certain patients who are afraid of animals or have allergies. Other than that, the maintenance care for the animals will be costly and the animals have the potential to give zoonotic infection, bites and scratches.

Combination treatments provide the best results for depression. This is why robotic therapy is suitable as is can be integrated as a tool in the current therapy program. Animal robots are suggested to replace real animals in AAT programs because they can prevent the case of scratches, bite, and allergy. However, they still remain effective and give positive impact, just like using real animals.

To date, there is a noticeable progress of robot therapy to help people with depression. In Malaysia, it is a breakthrough to introduce the use of animal robots to replace real animals as adjunct therapy in treating patients with depression.

Robo-therapy will reduce the need for antipsychotic drugs during therapy. Recent years have recorded noticeable progress of robot therapy, but there is still a lack of methodology behind the studies. More work is needed on patient-robot protocol. Also, psychologists require systems that can be used without high technical skills (like programming).

Cost wise, the use of robotic therapy integrated into existing rehab program is expected to lower the cost of medication, therapy and care for the affected. Since the robot can be used in situations where pets are not allowed, the need for robot therapy is ideal. The companionship of an animal robot could likely never fully replace that of another human being, but it can be one of the best artificial cures for depression, with the immensely positive effects similar to the effects of a real therapy animal.

The algorithm in therapy model will involve real patients with depression and psychologists at a rehabilitation center. The main outcome is a therapy protocol that suits the needs of affected people with depression in Malaysia and worldwide. This research is carried out in collaboration with SOCSO Rehabilitation Center in Melaka.

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POTENTIAL PRODUCTS TO BE COMMERCIALISED

TestMEReq 2.0: A Total Package Tool to Capture and Validate Quality Requirements

By: Assoc. Prof. Dr Massila Kamalrudin, Nor Aiza Moketar

TestMEReq 2.0 is a total package tool for requirements engineering to capture and validate users' requirements. This innovative tool helps you to effectively validate and confirm the client-stakeholders' requirements in a timely manner.

TestMEReq2.0 provides a systematic approach to validate the captured requirements by automatically generate a combination of abstract test cases and mock-up user interface (UI) prototypes from semi-formalised requirements model: Essential Use Cases (EUCs) and Essential User Interface (EUI) (See Figure 1). It is also augmented with real time collaborative platform to allow multiple stakeholders to validate the same set of requirements at the same time with different geographical locations (Figure 2). This feature helps to improve and promote effective communication and collaboration between requirements engineer and client-stakeholders, leading to fast confirmation and agreements on the requirements. With TestMEReq, you can perform an early acceptance testing of the requirements and eliminate requirements defect and unnecessary rework at the later stage.

You also can learn to write good test requirements and test cases with TestMEReq's test-authoring template (Figure 3), especially for the novice requirements engineers.

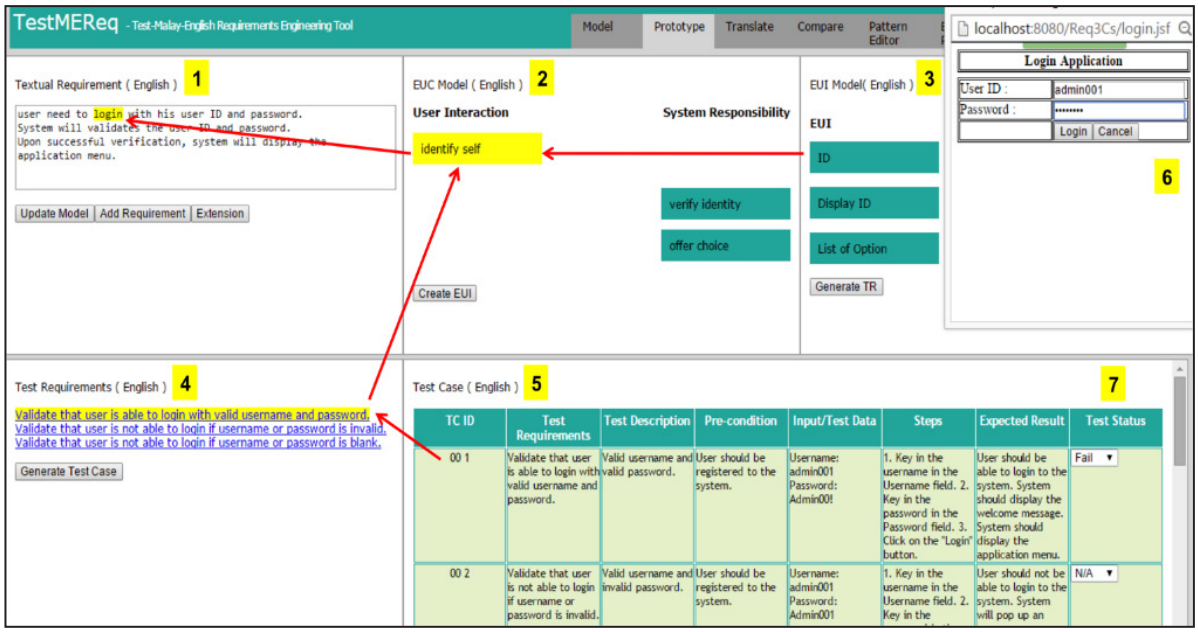


Figure 1: Automatic Extraction of EUC and EUI model, Abstract Tests and Mock-Up UI from Textual Requirements

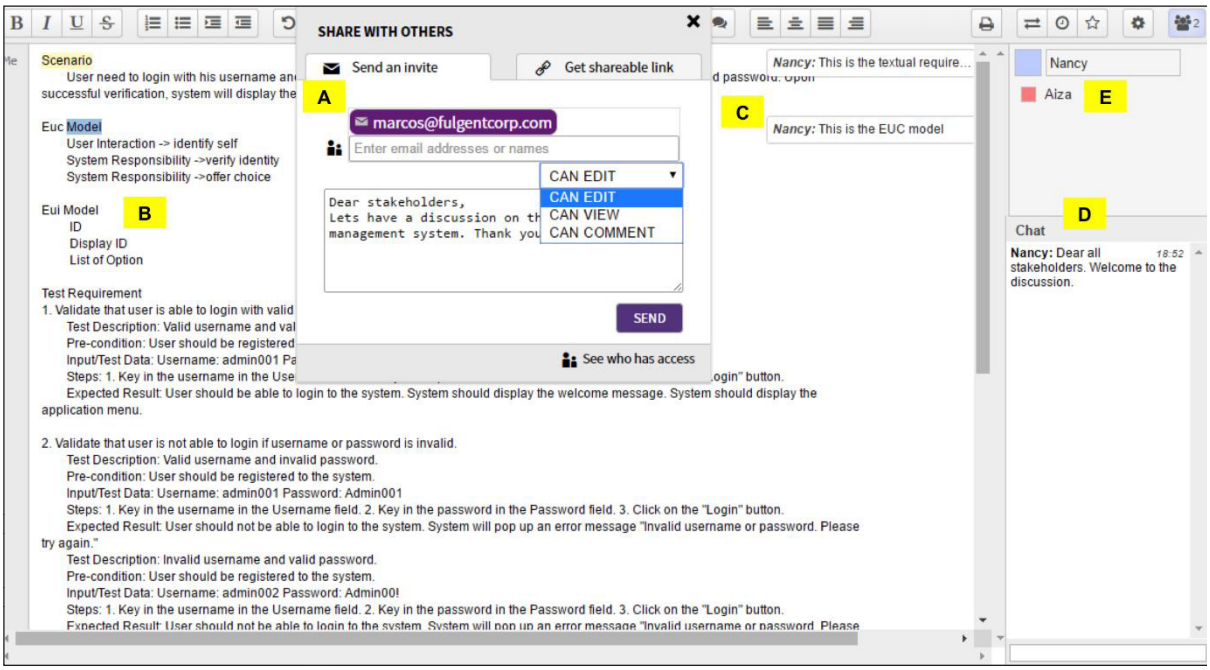


Figure 2: The Collaborative Platform Augmented with TestMEReq

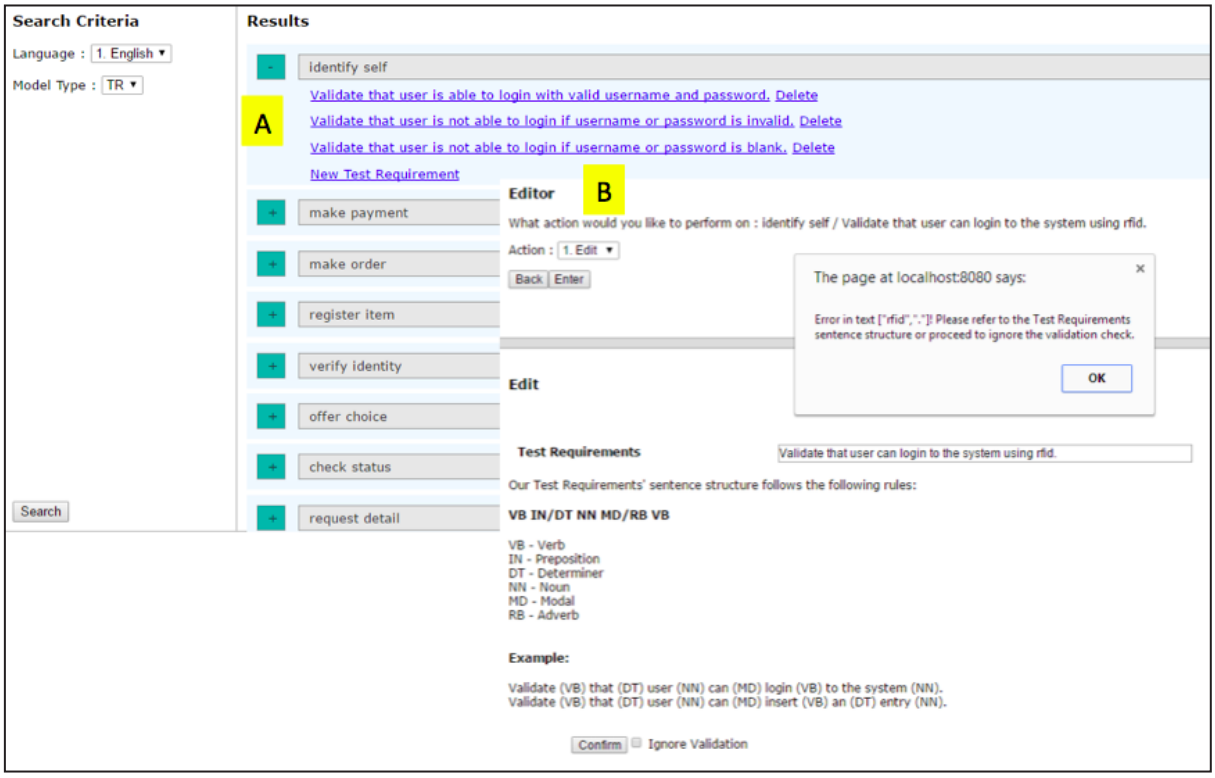


Figure 3: The Authoring Template to Help Novice RE to Write Quality Tests

INTERNATIONAL INVENTION, INNOVATION & TECHNOLOGY EXHIBITION (ITEX)

12th-14th May 2016

UTeM has participated in the 27th International Invention, Innovation And Technology Exhibition (ITEX) 2016 organised by the Malaysian Invention and Design Society (MINDS) on the 12th- 14th May 2016 at the Convention Centre KLCC. In this event, UTeM has won Four Golds and Four Silvers with 100% success rate from the participation. The list of winners are as below:

GOLD
Product:
PANIC BUTTON: A PERSONAL SECURITY SOLUTION FOR CRISIS SITUATION CALL FOR ASSISTANCE

Principal Researcher (PI): PROF. DR. AHMAD ZAKI BIN A BAKAR

GOLD
Product:
A NEW CLASS OF RECTIFYING CIRCUIT WITH IMPROVED EFFICIENCY FOR RF/ MICROWAVE ENERGY HARVESTING

PI: ASSOC. PROF. DR. ZAHRILADHA BIN ZAKARIA

GOLD
Product:
PERSONAL REMOTE SENSING SYSTEM (PRSS)
PI: DR. ASMALA BIN AHMAD

GOLD
Product:
HEXI-CIENCY DRIVE
PI: DR. AUZANI BIN JIDIN

SILVER
Product:
MY IOT-POWERED PLUGS
PI: ASSOC. PROF. DR. GAN CHIN KIM

SILVER
Product:
SIW BANDSTOP FILTER FOR INTERFERENCE SUPPRESSION IN X BAND APPLICATION
PI: ASSOC. PROF. DR. BADRUL HISHAM BIN AHMAD

SILVER
Product:
SUNGAI MELAKA DIGITAL TOUR USING INTERACTIVE MEDIA
PI: SHAHRUL BADARIAH BINTI MAT SAH

SILVER
Product:
BATTERY-LESS INTERACTIVE FLOOR
PI: ASSOC. PROF. DR. KOK SWEE LEONG

SEOUL INTERNATIONAL INVENTION FAIR (SIIF)

ORGANISED BY KOREA INVENTION PROMOTION ASSOCIATION (KIPA)

1st-4th December 2016

Seoul International Invention Fair (SIIF) 2016 organised by 'Korea Invention Promotion Association (KIPA) was held on the 1st December- 4th December 2016 in COEX, Seoul, Korea. For this event, eight out of nine participations have won ONE Special award, FOUR golds, THREE silvers and ONE bronze with the success rate of 88%. The list of winners are as per below:

1. **TARMIZI BIN AHMAD IZZUDIN**
   MIND X GYRO WHEELCHAIR SYSTEM (MIND CONTROLLED GYRO ASSISTED WHEELCHAIR SYSTEM)
   SPECIAL AWARD & GOLD

2. **ASSOC. PROF. DR. ZAHRILADHA BIN ZAKARIA**
   A NEW CLASS OF RECTIFYING CIRCUIT WITH IMPROVED EFFICIENCY FOR RF/ MICROWAVE ENERGY HARVESTING
   GOLD

3. **DR. RAJA NOR FIRDAUS KASHFI BIN RAJA OTHMAN**
   HIGH TORQUE-POWER DENSITY PERMANENT MAGNET MACHINE
   GOLD

4. **JOHAR AKHBAR BIN MOHAMAT GANI**
   I-SAJADAH : PRAYER RUG WITH SMART RAKA'AH NOTIFICATION DEVICE
   GOLD

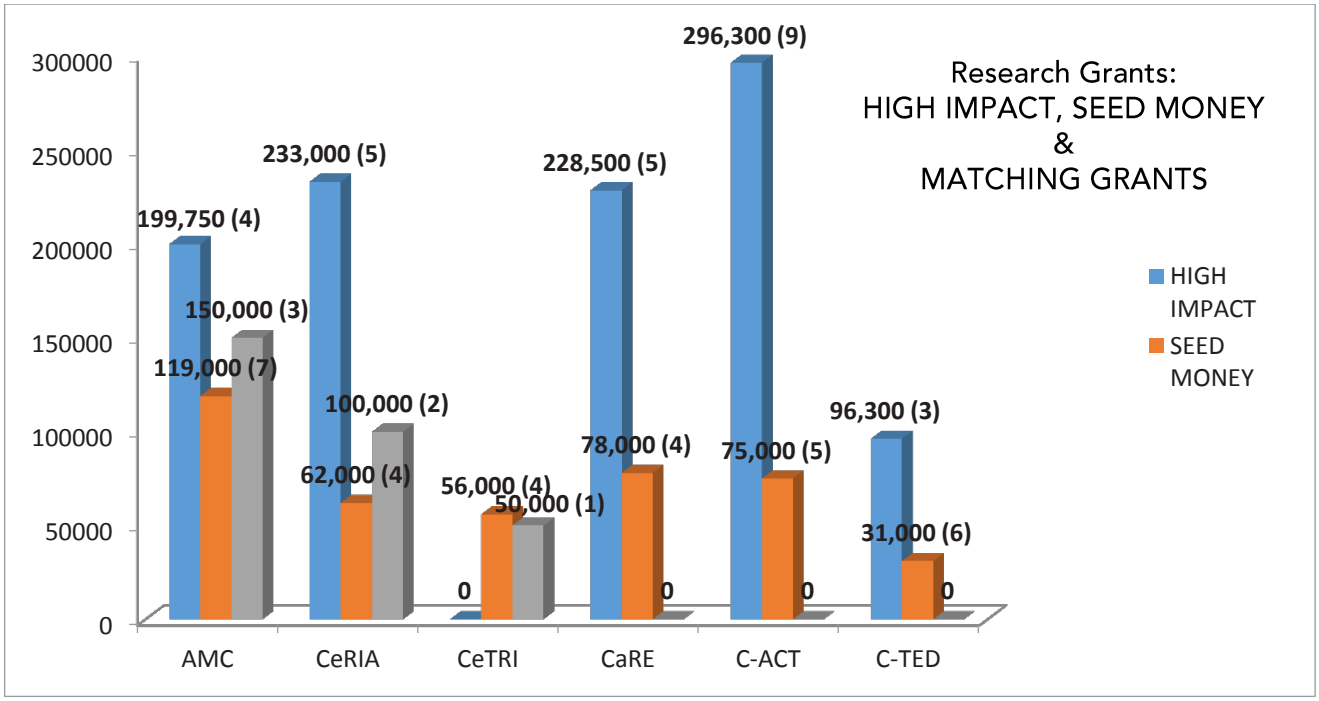
5. **ASSOC. PROF. DR. AZIZAH BINTI SHAABAN**
   BIO-U FERTILIZER
   SILVER

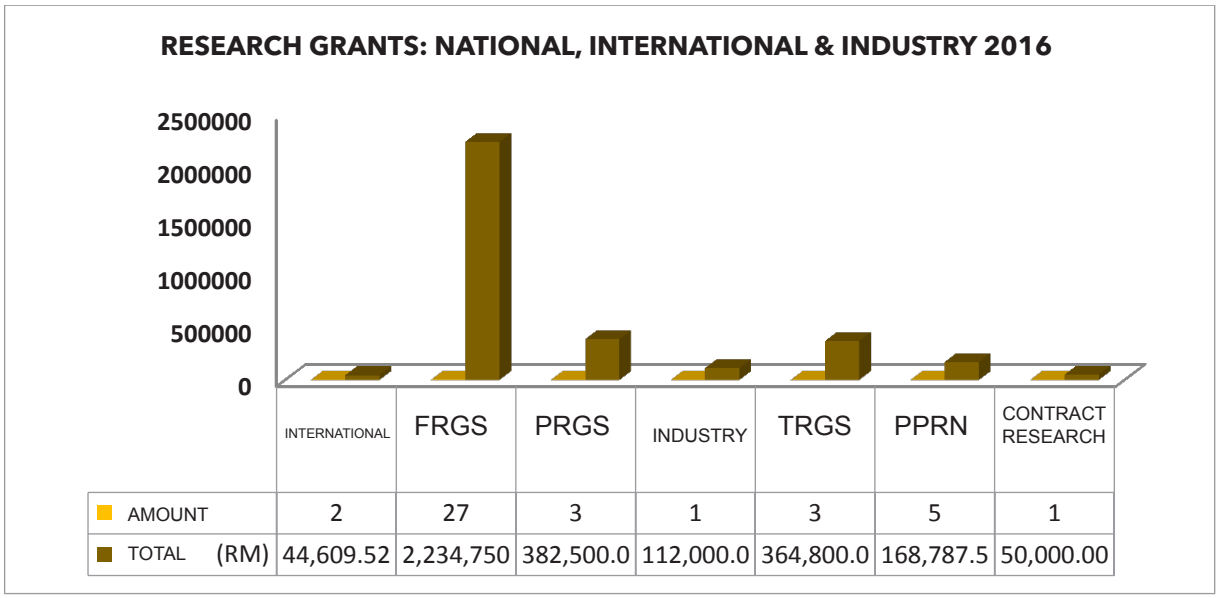
6. **ASSOC. PROF. DR. MOHD ASYADI' AZAM BIN MOHD ABID**
   ADVANCED PROTOTYPE OF GRAPHENE SUPERCAPACITOR
   SILVER

7. **DR. ASMALA BIN AHMAD**
   PERSONAL REMOTE SENSING SYSTEM (PRSS)
   SILVER

8. **ZUL HASRIZAL BIN BOHARI**
   BIOELECTRICITY: MICROBIAL FUEL CELL AT SEWAGE TREATMENT PLANT (STP)
   BRONZE

RESEARCH GRANTS
RECEIVED IN 2016





	INTERNATIONAL	FRGS	PRGS	INDUSTRY	TRGS	PPRN	CONTRACT RESEARCH
AMOUNT	2	27	3	1	3	5	1
TOTAL (RM)	44,609.52	2,234,750	382,500.0	112,000.0	364,800.0	168,787.5	50,000.00



International Symposium on Research in Innovation and Sustainability 2017

ISoRIS'17

July 17-19, 2017, Melaka, Malaysia

"Innovative and Sustainable Technologies for Societal Wellbeing"

Call For Papers!

International Symposium on Research in Innovation and Sustainability 2017 (ISoRIS 2017) scheduled on July 17-19, 2017 in Malacca (a UNESCO World Heritage City), Malaysia is an academic based symposium themed "Innovative and Sustainable Technologies for Societal Wellbeing".

In this symposium, people are invited to submit articles discussing 7 tracks of research area with the following topics of interest.

TRACKS

Sustainable Manufacturing
Responsive Manufacturing
Innovative Software System
Software Engineering and other ICT applications
Social Impact on Innovation and ICT
Industrial Case Studies
Engineering and IT education for Sustainability

TOPICS OF INTEREST

- Decision support systems for sustainability
- Managing knowledge for sustainability
- Sustainable manufacturing system
- Manufacturing agility
- Sustainability assessment and optimization
- Strategies and business models for sustainability
- Resources utilization and waste reduction
- Sustainability trends in engineering
- Product design for sustainability
- Green supply chain and logistics
- Entrepreneurial initiative for sustainability
- Managing innovation and sustainability
- Industry papers / case studies
- Software engineering and innovation
- Software innovative solutions towards sustainable manufacturing
- Human technology interaction for sustainability
- Sustainable and innovative research for Societal Wellbeing
- Socio-technical based research for Societal Wellbeing
- Current trend and future direction of research for Societal Wellbeing
- Internet of things for sustainability
- Intelligent system for sustainability
- Engineering / Technical / ICT Education for sustainability

The submitted paper will be double blind peer reviewed. Selected papers presented in this symposium will be published in indexed by Scopus or ISI Journals such as International Journal of Automotive and Mechanical Engineering, Far East Journal of Electronics and Communications, Journal of Mechanical Engineering and Sciences, Asian Journal of Information Technology, International Business Management and International Journal of Science, Lahore (ISI-Thomson Reuters indexing).

ORGANIZERS:

Innovative Software System and Services Group (IS3)
Sustainable and Responsive Manufacturing Group (SUSREM)
Center for Graduate Studies (PPS), UTeM

IMPORTANT DATES

- Deadline of Full Paper Submission, **March 30, 2017**
- Notification of Acceptance, **April 30, 2017**
- Deadline for Camera Ready and Registration , **June 15, 2017**
- Symposium Dates, **July 17-19, 2017**

ISoRIS'17 July 17-19, Melaka, Malaysia

More Information: http://isoris17.utem.edu.my | Contact: massila@utem.edu.my

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