The 2nd MULTIDISCIPLINARY CONFERENCE ON MECHANICAL ENGINEERING 2017

16 October 2017
Johor Bahru, Malaysia

BOOK OF PROGRAM

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MESSAGE FROM
THE DEAN, FACULTY OF MECHANICAL ENGINEERING
UNIVERSITI TECHNOLOGI MALAYSIA

Faculty of Mechanical Engineering (FME) in collaboration with the Institute for Vehicle Systems and Engineering (IVeSE) are organizing the Second Multidisciplinary Conference on Mechanical Engineering (McME 2017). This multidisciplinary conference is the continuity from the first McME which was held in 2016. The program encompasses the Mechanical Engineering field including specialization in Materials, Manufacturing, Automotive, Aeronautical and Industrial Engineering as well as Naval Architecture and Offshore Engineering.

McME provides a platform for the researchers including postgraduate students and academician to present their research finding as well as providing an avenue for them to develop their writing skills. This conference allows the knowledge and research findings to be shared, thus creating enthusiasm among the readers in the broad areas of Mechanical Engineering. With the experience publishing with this conference, the academic writing culture will be nurtured and become one of our DNAs.

I wish to take this opportunity to thank all McME 2017 Organizing Committee members for their effort to ensure the success of the conference. Thanks also go to all participants of McME 2017 for their contributions. I hope that this conference would be an annual event and encourages more researchers in the Mechanical Engineering field to participate in the future.

Prof. Dr. Mohd Hasbullah Hj. Idris
Dean
Faculty of Mechanical Engineering
Universiti Teknologi Malaysia

PREFACE FROM
CONFERENCE CHAIRMAN 2017

As the Chairman of the organizing committee of The Second Multidisciplinary Conference on Mechanical Engineering, McME 2017, I would like to welcome all participants and presenters to our conference. The conference topics cover a broad research area including solid mechanics, fluid mechanics, thermodynamics and heat transfer, aeronautical engineering, automotive engineering, material science, marine and ocean engineering, manufacturing engineering, industrial and systems engineering and also mechanical design as well as other related topics. Originally, this conference is intended to boost the publication of Faculty of Mechanical Engineering staff as well as becoming a platform for newcomers to learn some experience in presenting technical papers at conference. However, this conference was open to all postgraduate students, staff and researchers throughout Malaysia to share their research findings. This will actually allow us to share more research experiences amongst us. It will be a good research findings forum and is expected to be an annual event in the future. The conference is on the 16th October 2017 at Universiti Teknologi Malaysia, Skudai, Johor. I hope you all will have a good deliberation during the conference and wish you all success in your research. Looking forward to your participation in McME2017.

Prof. Dr. Mohammad Nazri Mohd Jaafar

Conference Chairman 2nd McME2017
Multidisciplinary Conference on Mechanical Engineering

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PLENARY SPEAKER

Professor Ir. Dr. Azhar bin Dato' Abdul Aziz, PhD,

P. Eng., MIEM, C. Eng

Title: Innovating the Spark-Ignition Engine to Become Efficient Powertrain for Future Automobiles

Abstract:

The Spark ignition (SI) engines have been around to power automobiles for more than 100 years and the innovations to improve its overall performance is constantly on-going by the parties concern around the globe. Currently the number of cars in the world has exceeded 1.015 billion in 2010. According to OECD's forecast, the car population will reach 2.5 billion by 2050. There will be more than 100 million vehicles expected by 2020 – 70% will be powered by SI engines. The engine production industry is expected to hit USD 500 billion as of 2020. In just over a century after its inception, the symbiotic relationship between gasoline and cars that transform society is beginning to fray. Recent announcements by the UK, Sweden and France of plans to ban internal combustion engine vehicles (ICEVs) by 2040 have amplified two critical questions for the petroleum industry: will battery electric vehicles (BEVs) cause oil demand to decline and, if so, when will it be? Executives at the world's biggest oil companies have offered some answers — sceptics would call them guesses. Many players in the oil industry think the transition will take longer but is inevitable.

BEVs are closely monitored by market analysts as to when it will surpass ICEVs sales. Many predict the 'tipping of the scale' to be somewhere around 2040. Currently BEV sales are barely breaking 1% in most markets, but many experts believe there will be an evitable shift in the future that will change everything unless something is done to revolutionize the current state-of-the art ICEVs. Once all of the electric powertrains, due to the falling cost of batteries, reach cost parity with ICEVs (before accounting for cost of operation), there will be absolutely no reason for consumers to want ICEV over BEVs. The threat from BEV and other propulsion developments on ICEs may be imminent in western European countries, however things may not be looking good for BEVs to make inroads in developing and third world countries. This is largely due to lack in BEV infrastructure development as well as human sceptics and anxiety. Thus, the world has seen the rapid rise of EVs, but the major short-comings still remain – largely the questions of EV infrastructure, the advancement and robustness of electric motors & energy storage, and susceptibility to climatic changes. In many instances consumers are very conservative and sceptical, making changing from one mode of practise to the other, rather difficult. Currently there are many R&D programs conducted worldwide addressing the co-optimization of fuel and techniques for maximum performance with minimum greenhouse gas emissions, removing the constraint that current fuels impose on this type of engine design. This oral presentation on the subject will showcase the various approaches towards a more sustainable and efficient SI engine. Among others, it will focus on the new technologies, engineers and scientists are working to infuse into the traditional reciprocating (and non-reciprocating) designs, in facing the much anticipated 'disruptive'

BEV technologies. It will also highlight the new area of applications for the SI derivatives. This will transform the SI engines as the prime mover of choice for future cars. A powertrain that is more efficient, low carbon footprint, more robust and reliable than the existing SI engines of today.

Biography

Ir. Dr. Azhar Abdul Aziz is a mechanical engineer graduated from Brighton Polytechnic, (B.Sc (Hons) UK, 1984). He received his MSc in Mechanical Engineering (UTM, 1990) majoring in alternative fuels. He then obtained his PhD (from UMIST, 1998) for his work on temporal and spatial distribution of gas species in compression-ignition engine. He is now a member of IEM (since 1997) and holds a chartered engineer UK, and is a member of the International Association of Engineers (IAENG). He is the Alumni of Harvard Business School (Malaysian Chapter), since July 2012.

As an academician (from 1984 to 2017), he has taught subjects such as Thermodynamics, Fluid Mechanics, Mechanical Design, Internal Combustion engines, Powerplant Engineering and Engineers in Society at undergraduate and post-graduate levels. His R&D activities were in the area of biodiesel and alcohol-based fuels, densification of biomass, thermal energy system, small engines and engine fueling systems. He was the Dean of Faculty of Mechanical Engineering, Director of Innovation & Commercialisation Centre, Director of Automotive Development Centre (ADC) in UTM from 2001 to 2014. As to date, he has undertaken many consultancy work (since 1990) mostly in the area of component testing and evaluations, thermal systems design & development and has acquired more than RM 11 million of research grant since 1986, mostly in his capacity as principal researcher. He has led 18 R&D projects and has published more than 200 scientific publications (journals and conference papers) in his subjects of interest i.e. alternative fuels internal combustion engines, engine fueling system and biomass for thermal energy generation. He now holds 5 intellectual properties from his R&D ventures in UTM and with private sectors. In his capacity as mechanical engineering professor, he was appointed as visiting professor to Brawijaya University (Indonesia), Shariff University (Iran) as well as the Sudan Technical University (Sudan).

He was also the external examiners to five local universities (UMP, UTHM, UTEM, MMU, and UniKL) for automotive engineering and technology programs, till his retirement from service in June 2017.

He is now practicing mechanical engineering as consultant and is a technical director for a local company called Portland Arena Sdn Bhd, specializing in thermal system development, agriculture/food dryers, modular craft (reappraisal of containers for buildings), industrial/factory automation, biomass pelletization and energy auditing services. He is currently a member of the board of directors for Synergy Tech Consult Sdn Bhd, a multi-disciplinary consultant company of UTM.

PROGRAM OVERVIEW

Monday, October 16, 2017			
08:00 - 09:00	Registration opens		
Opening and Plenary Speech Time: 09:00 - 10:00 , Venue: Lecture Hall 1, Block E07			
09:00-09:15	**Opening Remark by Prof. Dr. Mohd Hasbullah Bin Hj. Idris**		
09:15-10:00	**Plenary Speech by Prof. Ir. Dr. Azhar bin Dato' Abd Aziz Title: Innovating the Spark-Ignition Engine to Become Efficient Powertrain for Future Automobiles**		
10:00-10:30	Morning Break		
Technical Sessions Time: 10:30 - 5:00, Venue: Level 3, Block E07			
10:30 - 12:30	**Session 1**		
	Session 1A Venue: Lecture Room 1 Topic: Applied Mechanics and Design	**Session 1B** Venue: Lecture Room 4 Topic: Manufacturing and Industrial Egineering	**Session 1C** Venue: Lecture Room 6 Topic: Materials
12:30 - 2:00	Lunch Break and Zohor Prayer		
2:00 –3:30	**Session 2**		
	Session 2A Venue: Lecture Room 1 Topic: Automotive Engineering	**Session 2B** Venue: Lecture Room 4 Topic: Thermo Fluids	**Session 2C** Venue: Lecture Room 6 Topic: Offshore & Naval Architecture
03:30 - 3:40	Afternoon Break		
03:40 – 5:00	**Session 3**		
	Session 3A Venue: Lecture Room 1 Topic: Offshore & Naval Architecture Engineering	**Session 3B** Venue: Lecture Room 4 Topic: Aeronautical Engineering	
END			

TECHNICAL SESSIONS

Session : **1A**
Session Chairman : **Profesor Dr. Musa Mailah**
Room : **Lecture Room 1, Level 3, Block E07**
Time : **10.30 – 12.30 pm**
Topic : **Applied Mechanics and Design**

No.	Title	Author	Presenter
1.	An Intelligent Material Handling System Using Raspberry PI for Industrial Automation and Control	Muhammad Suhaimi Annuar Zaini, Nur Safwati Mohd Nor and Fazila Mohd Zawawi	Dr. Nur Safwati Mohd
2.	Simulation of Vehicle Powertrain Using Energetic Macroshcopic Representation Method	Khairul Anwar Shahordin, Mohamad Hanizan Hassan and Zainab Asus	Dr. Zainab bt Asus
3.	Life Analysis of a Mounting Pivot Structure Prototype Part Versus Plastic Part for Fatigue	Nurain Amiera Omar and Mohd Foad Abdul Hamid	Dr. Mohd Foad Abdul Hamid
4.	Piezoelectric Based Power Generator	Ahmad Faiq Wafi Bin Ab. Patah and M.S. Mohd Ismail	Dr. Mohd Shuisma Mohd Ismail

Session : **1B**
Session Chairman : **Professor Dr. Wong Kuan Yew**
Room : **Lecture Room 4, Level 3, Block E07**
Time : **10.30 – 12.30 pm**
Topic : **Manufacturing and Industrial Engineering**

No.	Title	Author	Presenter
1.	Development of a Job Rotation Model for Noise Hazard Reduction	Nor Zaihan Abd Latiff and Kuan Yew Wong	Profesor Dr. Wong Kuan Yew
2.	Delay Analysis Using Boxplot Graphical Tools	Floridah Jelon, Jafri Mohd Rohani, Istas Fahrurazi Nusyirwan	Floridah Jelon
3.	Reliability Analysis of Quality and Safety Management Constructs at Wood Based Furniture Industry	Fatin Amrina A. Rashid, Jafri Mohd Rohani and Khidzir Zakaria	Fatin Amrina A.Rashid
4.	Development of Survey Instrument to Measure Safety Climate Factors and Safety Performance: A Pilot Study	Shalini Tayaparan and Jafri Mohd Rahani	Shalini Tayaparan
5.	Process Improvement in Tempe Manufacturing Process Using Six Sigma Approach A Case Study	Nurul Atiqah Izzati Muhamad Affandi, Jafri Mohd Rohani, Anis Amira Mat Zuki, Augeny Satik Ayak	Anis Amira Mat Zuki & Augeny Satik Ayak

Session : **1C**
Session Chairman : **Dr. Kamarulafizam Ismail**
Room : **Lecture Room 6, Level 3, Block E07**
Time : **10.30 – 12.30 pm**
Topic : **Materials Engineering**

No.	Title	Author	Presenter
1.	Anticorrosion Performance of Self-Healing Polymeric Coatings on Low Carbon Steel Substrates for Oil and Gas Industries Application	Muhammad Ashraff Ahmad Seri, Esah Hamzah, Abdelsalam Ahdash and Mohd Fauzi Mamat	Mohd Fauzi Mamat
2.	Characteristizations of Eggshell Coated on Grey Cast Iron for Corrosion Applications	Muhammad Fadzli Bin Rosly, Nur Syairahtul Ain Mohamad Jafar, Tuty Asma Abu Bakar	Dr. Tuty Asma Abu Bakar
3.	Thermal and Mechanical Properties of Glass Fibre Reinforced Polymer (GFRP) Composites	Norhayati Ahmad, M. S. Rasman	Dr. Norhayati Ahmad

Session : **2A**
Session Chairman : **Dr. William Chong Woei Fong**
Room : **Lecture Room 1, Level 3, Block E07**
Time : **02.00 – 03.30 pm**
Topic : **Automotive Engineering**

No.	Title	Author	Presenter
1.	Slurry Effect Anlaysis on Brake Noise and Wear Performance of Brake Pad	M.I. Ahmad Zulkefli, M.K. Abdul Hamid, and A.R. Abu Bakar	Dr. Mohd Kameil bin Abdul Hamid
2.	Performance Analysis of Internal Combustion Engine Based on Intake and Exhaust Variable Valve Timing	Mohamad Shahrafi A. Hadi, Afiq Aiman Dahlan, Mohd Farid Muhamad Said	Afiq Aiman Dahlan
3.	Reduction of Disc Brake Squeal Noise Using Constrained Layer Dampers (CLD)	S. Arvin Rao, Muhamad Anuwar Jusoh and Abd Rahim Abu Bakar	Mohamad Anuwar Jusoh
4.	Design and Development of Engine Intake Manifold for Formula SAE Car	Muhammad Fitri Shamsul Bahri, Afiq Aiman Dahlan, Muhammad Hariz Khairuddin, Mahadhir Mohammad, Mohd Farid Muhamad Said	Muhammad Hafiz Khairuddin
5.	Study of Tribological Behaviour on PFAD as Alternative Transmission Fluid for Clutch Application	Megat Abdul Azim Salleh and Mohd Kameil Abdul Hamid	Mohd Kameil bin Abdul Hamid
6.	Optimization of Automotive Exhaust Muffler for Tail Pipe Noise Reduction	Megat Muhammad Asyraf Buang, Afiq Aiman Dahlan, Mahadhir Mohammad, Muhammad Hariz Khairuddin, Mohd Farid Muhamad Said	Mahadhir Mohammad

Session : **2B**
Session Chairman : **Dr. Mohd Fairus Mohd Yassin**
Room : **Lecture Room 4, Level 3, Block E07**
Time : **02.00 – 03.30 pm**
Topic : **Thermo Fluids**

No.	Title	Author	Presenter
1.	Time of Flight (TOF) Improvement of a Counter Rotating Drone	Kugaanesan A/l Periyasamy, Fazila Mohd Zawawi, Kamarulafizam Ismail,	Dr. Fazila Mohd Zawawi
2.	Anti-Friction Performance of Palm Oil Nanolubricant Using Fourball Tribobester	Zulhanafi Paiman, M. M. Faridzuan, S. Syahrullail	Noor Afifah Ahmad
3.	Oxidative Torrefaction for Pulverized Empty Fruit Bunch Using Air	Mohamad Aiman Adnan, Muhammad Ariff Hanaffi Bin Mohd Fuad and Mohd Faizal Hasan	Muhammad Ariff Hanaffi Mohd Fuad
4.	Anti-Friction Performance of Palm Oil Nanolubricant	Nurul Farhanah Azman, Syahrullail Samion and Mohamad Nor Hakim Mat Sot	Nurul Farhanah Azman

Session : 2C
Session Chairman : Dr. Siow Chee Loon
Room : Lecture Room 6, Level 3, Block E07
Time : 02.00 – 03.30 pm
Topic : Offshore & Naval Architecture Engineering

No.	Title	Author	Presenter
1.	Planning of Floating Production Storage Offloading Fabrication using DSM Model	Muhamad Firdaus Bin Ismail and Jaswar Koto	Dr. Jaswar Koto
3.	Safety Improvement at Shipyard Practice	Nur Shaqilah , Ab Saman Abd Kader,Mohd Rajali Jalal	Profesor Ir. Dr. Abd. Saman Ab Kader
5.	Design of a Low Air Draft Passenger Boat for Inland Navigation	Muhammad Akmal Hafiz Bin Zaidi, Ab Saman Abd Kader, Mohd Rajali Jalal	Profesor Ir. Dr. Abd. Saman Ab Kader

Session : 3A
Session Chairman : Dr. Farah Ellyza Hashim
Room : Lecture Room 1, Level 3, Block E07
Time : 03.40 – 05.00 pm
Topic : Offshore & Naval Architecture Engineering

No.	Title	Author	Presenter
1.	Resistance of The Existing Stepped Hull Fitted with Interceptor Plate	Muhamad Asyraf bin Abdul Malek and Jaswar Koto	Dr. Jaswar Koto
2.	Hydrodynamic of Catenary Offset Buoyancy Riser Assembly	Mohd Khirramadhan Bahari and Jaswar Koto	Dr. Jaswar Koto
3.	Comparison Between Polyester and Steel-Wire Taut Mooring System for Coupled Dynamic of Floating LNG Terminal	Afiq Nasrudin, Mukminah Paiman, Siow Chee Loon, Kang Hooi Siang, Lee Kee Quen, and Adi Maimun Abdul Malik	Dr. Siow Chee Loon
4.	Experimental Analysis on Variable Stiffness and Variable Damping Device	Muhamad Farid Ibrahim, Kang Hooi Siang, Lee Kee Quen, and Siow Chee Loon	Dr. Kang Hooi Siang

Session : **3B**
Session Chairman : **Dr. Mastura binti Ab. Wahid**
Room : **Lecture Room 4, Level 3, Block E07**
Time : **03.40 – 05.00 pm**
Topic : **Aeronautical Engineering**

No.	Title	Author	Presenter
1.	Design the Control System for a Stewart Platform Motion System	Muhammad Fuad Bin Denan and Ir. Dr. Istas Fahrurrazi Bin Nusyirwan	Ir. Dr. Istas Fahrurrazi bin Nusyirwan
2.	Design of Air Cooling System for Light Aircraft	Imisi-OLUWA Abiola and Mohd Shariff Ammoo	Dr. Mohd Shariff Ammoo
3.	Experimental Research on Helicopter Horizontal Tail Configuration	Iskandar Shah Bin Ishak and Muhammad Fitri bin Mougamadou Zabaroulla	Dr. Iskandar Shah Ishak
4.	Design and Simulate Quadrotor Control System	Muhammad Naufal Bin Mohd Fuzi, Istas Fahrurrazi Bin Nusyirwan	Ir. Dr. Istas Fahrurrazi bin Nusyirwan

Poster Presentation

Level 3, Block E07

No.	Title	Author
1.	Mechatronic Design and Development of a Semi-Automated on-the-road Painting Machine	Musa Mailah
2.	Study of Physical Workload and Heat Stress Among Housing Construction Workers	Solehan Imran Shariffudin, Jafri Mohd Rohani, Mohd Firdaus Mohd Taib, Khidzir Zakaria, Noorul Azreen Azis and Roseni Abdul Aziz
3.	A Case Study of Safety and Health Improvement in a Printing Company	Syahira Atikah binti Ramle, Rozlina Binti Md Sirat, Masine Md Tap, Wan Nazdah bt. Wan Hussin
4.	R-40 Exhaust Gas Sampling Design and Procedure	Muhd Syahmi Zulfakar, Zulkarnain Abdul Latiff and Mohd Rozi Mohd Perang
5.	Enhancement of Nucleate Boiling Heat Transfer Through Optimization	Chee Kween Wai, Normah Mohd-Ghazali, Yushazaziah Mohd-Yunos
6.	Experimental Investigation on The Effects of Thermocoustic Resonator Surface Area on The Cooling Effects	Mohammad Fakhrulrezza Suhaimi, Normah Mohd-Ghazali
7.	Stress Analysis of Piping Elbow Subjected to Internal Pressure and in-Plane Bending Moment	Jeffrey Ong Seok Wai
8.	Parametric Study of Multi-Cell Thin-Walled Tubes for Crashworthiness	Ahmad Mahadi Razali and Zaini Ahmad

NOTES


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