

# IIUM ENGINEERING JOURNAL

---

## **CHIEF EDITOR**

Ahmad Faris Ismail, IIUM, Malaysia

## **EXECUTIVE EDITOR**

AHM Zahirul Alam, IIUM, Malaysia

## **ASSOCIATE EDITOR**

Anis Nurashikin Nordin, IIUM, Malaysia

## **LANGUAGE EDITOR**

Lynn Mason, Malaysia

## **COPY EDITOR**

Hamzah Mohd. Salleh, IIUM, Malaysia

## **EDITORIAL BOARD MEMBERS**

Abdullah Al-Mamun, IIUM, Malaysia  
Abdumalik Rakhimov, IIUM, Malaysia  
Amir Akramin Shafie, IIUM, Malaysia  
Erry Yulian Triblas Adesta, IIUM, Malaysia  
Erwin Sulaeman, IIUM, Malaysia  
Hanafy Omar, Saudi Arabia  
Hazleen Anuar, IIUM, Malaysia  
Konstantin Khanin, University of Toronto, Canada  
Ma'an Al-Khatib, IIUM, Malaysia  
Md Zahangir Alam, IIUM, Malaysia  
Meftah Hrairi, IIUM, Malaysia  
Mohamed B. Trabia, United States  
Mohammad S. Alam, Texas A&M University-Kingsville, United States  
Muataz Hazza Faizi Al Hazza, IIUM, Malaysia  
Mustafizur Rahman, National University Singapore, Singapore  
Nor Farahidah Binti Za'bah, IIUM, Malaysia  
Ossama Abdulkhalik, Michigan Technological University, United States  
Rosminazuin AB. Rahim, IIUM, Malaysia  
Waqar Asrar, IIUM, Malaysia

## **AIMS & SCOPE OF IIUMENGINEERING JOURNAL**

The **IIUM Engineering Journal**, published biannually, is a carefully refereed international publication of International Islamic University Malaysia (IIUM). Contributions of high technical merit within the span of engineering disciplines; covering the main areas of engineering: Electrical and Computer Engineering; Mechanical and Manufacturing Engineering; Automation and Mechatronics Engineering; Material and Chemical Engineering; Environmental and Civil Engineering; Biotechnology and Bioengineering; Engineering Mathematics and Physics; and Computer Science and Information Technology are considered for publication in this journal. Contributions from other areas of Engineering and Applied Science are also welcomed. The IIUM Engineering Journal publishes contributions under *Regular papers, Invited review papers, Short communications, Technical notes, and Letters to the editor* (with publication charge).

## **REFEREES' NETWORK**

All papers submitted to IIUM Engineering Journal will be subjected to a rigorous reviewing process through a worldwide network of specialized and competent referees. Each accepted paper should have at least two positive referees' assessments.

## **SUBMISSION OF A MANUSCRIPT**

A manuscript should be submitted online to the IIUM-Engineering Journal website:

<https://journals.iium.edu.my/ejournal>. Further correspondence on the status of the paper could be done through the journal website and the e-mail addresses of the Executive Editor: [zahirulalam@iium.edu.my](mailto:zahirulalam@iium.edu.my) Faculty of Engineering, International Islamic University Malaysia (IIUM), Jan Gombak, 53100, Kuala Lumpur, Malaysia.

Phone: (603) 6196 4529, Fax:(603) 6196 4488.

---

## **INTERNATIONAL ADVISORY COMMITTEE**

A. Anwar, United States  
Abdul Latif Bin Ahmad, Malaysia  
Farzad Ismail, USM, Pulau Pinang, Malaysia  
Hanafy Omar, Saudi Arabia  
Hany Ammar, United States  
Idris Mohammed Bugaje, Nigeria  
K.B. Ramachandran, India  
Kunzu Abdella, Canada  
Luis Le Moyne, ISAT, University of Burgundy, France  
M Mujtaba, United Kingdom  
Mohamed AI-Rubei, Ireland  
Mohamed B Trabia, United States  
Mohammad S. Alam, Texas A&M University-Kingsville, United States  
Nazmul Karim  
Ossama Abdulkhalik, Michigan Technological University, United States  
Razi Nalim, IUPUI, Indianapolis, Indiana, United States  
Syed Kamrul Islam, United States  
Tibor Czigany, Budapest University of Technology and Economics, Hungary  
Yiu-Wing Mai, The University of Sydney, Australia.

**PUBLISHED BY**



**IIUM  
Press**

International Islamic University Malaysia  
Jalan Gombak, 53100 Kuala Lumpur, Malaysia  
Phone (+603) 6196-5018, Fax: (+603) 6196-6298  
Website: <http://www.iium.edu.my/office/iiumpress>

Whilst every effort is made by the publisher and editorial board to see that no inaccurate or misleading data, opinion or statement appears in this Journal, they wish to make it clear that the data and opinions appearing in the articles and advertisement herein are the responsibility of the contributor or advertiser concerned. Accordingly, the publisher and the editorial committee accept no liability whatsoever for the consequence of any such inaccurate or misleading data, opinion or statement.

ISSN 1511 - 788X



**IIUM Engineering Journal**  
ISSN: 1511-788X E-ISSN: 2289-7860

Table of Content

<b>EDITORIAL</b> .....	iii
<b>CHEMICAL AND BIOTECHNOLOGY ENGINEERING</b>	
COMPARATIVE METAGENOMICS ANALYSIS OF PALM OIL MILL EFFLUENT (POME) USING THREE DIFFERENT BIOINFORMATICS PIPELINES.....	1
<i>Adibah Parman, Mohd Noor Mat Isa, Farah Fadwa Benbelgacem, Ibrahim Ali Noorbachal and Hamzah Mohd. Salleh</i>	
LIPASE IMMOBILIZATION ON FIBERS GRAFTED WITH POLYGLYCIDYL METHACRYLATE .....	12
<i>Ma'an Fahmi Rashid Alkhatib, Nik Adlin Bahrudin, Hamzah Mohd. Salleh, Mohamed Mahmoud Elsayed Nasef and Teo Ming Ting</i>	
COLONY COMPOSITION AND BIOMASS OF MACROTREMES GILVUS HAGEN (BLATTODEA: TERMITIDAE) IN INDONESIA.....	24
<i>Niken Subekti, Priyantini Widiyaningrum, Dodi Nandika and Dedy Duryadi Solikhin</i>	
<b>CIVIL AND ENVIRONMENTAL ENGINEERING</b>	
A SURVEY OF MATLAB EFFICIENCY IN DAMAGE DETECTION IN CONCRETE GRAVITY DAMS .....	29
<i>Sajad Esmailzadeh, Hassan Ahmadi and Seyed Abbas Hosseini</i>	
IMPLEMENTATION OF GOVERNMENT ASSET MANAGEMENT USING TERRESTRIAL LASER SCANNER (TLS) AS PART OF BUILDING INFORMATION MODELLING (BIM).....	49
<i>Asep Yusup Saptari, S. Hendriatiningsih, Dony Bagaskara, and Levana Apriani</i>	
THE ANALYSIS OF LIQUEFACTION PHENOMENON OF THE FLEXIBLE PAVEMENT USING SEISMIC MONITORING EQUIPMENT .....	70
<i>Rini Kusumawardani, Untoro nugroh, Lashari lashar, Togani Cahyadi Upom and Mareta Aspirilia Fanand</i>	
<b>ELECTRICAL, COMPUTER AND COMMUNICATIONS ENGINEERING</b>	
PSG DYNAMIC CHANGES IN METHAMPHETAMINE ABUSE USING RECURRENCE QUANTIFICATION ANALYSIS.....	79
<i>Ghasem Sadeghi Bajestani and Sayyed Majid Mazinani</i>	
FINITE ELEMENT SIMULATION OF MEMS PIEZOELECTRIC ENERGY SCAVENGER BASED ON PZT THIN FILM.....	90
<i>Aliza Aini Md Ralib, Nur Wafa Asyiqin Zulfakher, Rosminazuin Ab Rahim, Nor Farahidah Za'bah</i>	
EVALUATION ON THE EFFECTIVENESS OF VISUAL LEARNING ENVIRONMENT ON PROGRAMMING COURSE FROM STUDENTS' PERSPECTIVES .....	100
<i>Nasa Zata Dina, Eto Wuryanto and, Rachman Sinatriya Marjianto</i>	
TOWARDS AN EFFICIENT TRAFFIC CONGESTION PREDICTION METHOD BASED ON NEURAL NETWORKS AND BIG GPS DATA	108
<i>Wiam Elleuch, Ali Wali and Adel M. Alimi</i>	
AUGMENTATIVE AND ALTERNATIVE COMMUNICATION METHOD BASED ON TONGUE CLICKING FOR MUTE DISABILITIES....	119
<i>Muhammad Amirul Amin Azmi, Nik Nur Wahidah Nik Hashim and and Hazlina Md. Yusof</i>	
A COMBINED DEEP LEARNING MODEL FOR PERSIAN SENTIMENT ANALYSIS .....	129
<i>Zahra Bokaei Nezhad and Mohammad Ali Deihimi</i>	
MODIFIED CAPACITOR ASSISTED EXTENDED BOOST QUASI Z-SOURCE INVERTER FOR THE GRID-CONNECTED PV SYSTEM .....	140
<i>Hemalatha nagaiyasamy and Seyezhai Ramalingam</i>	
A NOVEL USER PROFILE-BASED FUZZY APPROACH FOR EVALUATING TRUST IN SEMANTIC WEB .....	158
<i>Somayeh Ashtari, Malihe Danesh and Hossein Shirgahi</i>	
PLL-BASED 3 $\Phi$ INVERTER CIRCUIT FOR MICROGRID SYSTEM OPERATED BY ELECTROSTATIC GENERATOR. ....	177
<i>Tawfikur Rahman, S. M. A. Motakabber, Muhammad Ibn Ibrahimy and AHM Zahirul Alam</i>	
INTELLIGENT CONTROL SYSTEM OF A WHEELCHAIR FOR PEOPLE WITH QUADRIPLÉGIA PARALYSIS.....	194
<i>Hayder Fadhil Abdulsada, Saif Hussam Abdulwahed, and Yassen Sadoon Atiya</i>	

## **MATERIALS AND MANUFACTURING ENGINEERING**

- ADSORPTIVE REMOVAL OF Pb (II) USING EXFOLIATED GRAPHITE ADSORBENT: INFLUENCE OF EXPERIMENTAL CONDITIONS and  
MAGNETIC COFe<sub>2</sub>O<sub>4</sub> DECORATION .....202  
*Nguyen Thi Thuong, Nguyen Thi Ngoc Thu, Bach Long Giang, Nguyen Duy Trinh and  
Bui Thi Phuong Quynh*
- GREASE QUALITY ISSUES ON MIDDLE VOLTAGE SWITCHGEAR: CORROSIVITY, RESISTIVITY, SAFETY AND AGEING ..... 216  
*Mohd Sabri Mahmud, Sanuri Ishak, Mohd Najib Razali, Mohd Aizudin Abdul Aziz and Musfifikri Musa*

## **MECHANICAL AND AEROSPACE ENGINEERING**

- RANS K- $\Omega$  SIMULATION OF 2D TURBULENT NATURAL CONVECTION IN AN ENCLOSURE WITH HEATING SOURCES . ..... 229  
*Mehdi Ahmadi, Seyed Ali Agha Mirjalily and Seyed Amir Abbas Oloomi*

## **MECHATRONICS AND AUTOMATION ENGINEERING**

- MAGNETICALLY PLUCKED PIEZOELECTRIC ENERGY HARVESTER VIA HYBRID KINETIC MOTION ..... 245  
*Huda Azam, Noor Hazrin Hany Mohamad Hanif, and Aliza Aini Md Ralib*