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Assalamuala’laikum Warahmatullahi Wabarakatuh and Salam Sejahtera

It is with great honour that Universiti Tun Hussein Onn Malaysia was given the opportunity to host the 4th International Conference on the Application of Science and Mathematics (SCIEMATHIC) 2018. I would like to welcome all the esteemed speakers and attendees, and to convey my gratitude to the SCIEMATHIC organizing committee members for their continuous endeavour in making SCIEMATHIC an annual platform for gathering researchers, academicians and professionals from all around the world.

UTHM is certainly honoured to be a part of the science and technology development team that contributes to the well-being of the community. As a member of the Malaysian Technical University Network (MTUN), UTHM consistently promotes interaction amongst research students and encourages academic staffs to share the insights of their recent research activities.

This conference would definitely furnish the researchers with fruitful knowledge and strong network, which would further stimulate research collaborations across nations for the betterment of economic well-being. Lastly, I would like to welcome all of you to our campus and I hope that you would enjoy all the conference sessions.

Best wishes,

PROF. Ts. Dr. WAHID BIN RAZZALY
Vice Chancellor
UTHM
I am delighted to welcome you all for participating in the 4th International Conference on the Application of Science and Mathematics (SCIEMATHIC) 2018. I would like to thank the organiser of SCIEMATHIC 2018, i.e. Faculty of Applied Sciences and Technology (FAST), Universiti Tun Hussein Onn Malaysia (UTHM) for the effort in shaping SCIEMATHIC into a multi-disciplinary group consisting of scientists and researchers from various backgrounds. SCIEMATHIC 2018 was known as Seminar Kebangsaan Aplikasi Sains dan Matematik (SKASM) in 2007. In 2011, the conference name was revised to International Seminar on the Application of Science & Mathematics (ISASM) and finally SCIEMATHIC in 2016.

This conference is expected to gather academicians from all around the world to cooperate, interact and exchange novel ideas in all aspects of physics, chemistry, biology, mathematics and statistics, food technology, biodiversity, engineering science, education science, to name a few. It encourages researchers to share their findings which would stimulate high impact research ideas in the corresponding research.

Once again, I would like to thank Department of Mathematics and Statistics, FAST and all the SCIEMATHIC 2018 organizing committee members for their great effort in hosting the conference. I would like to appreciate all sponsors for your generous support in SCIEMATHIC 2018. Last but not least, I encourage delegates to participate actively in the coming presentations and discussions. I wish everyone a successful and fruitful conference.

Best wishes,

PROF. MADYA Dr. MOHD KAMARULZAKI BIN MUSTAFA
Dean of Faculty of Applied Sciences and Technology
UTHM Pagoh Campus
FOREWORD BY THE CHAIRMAN OF SCIEMATHIC 2018

On behalf of the organizing committee, I am delighted to welcome all the delegates and their guests to the 4th International Conference on the Application of Science and Mathematics (SCIEMATHIC) 2018. The theme of SCIEMATHIC 2018 is, ‘Diversity towards Sustainability’. The diversity in the field of science should be the catalyst for researchers to cooperate in making the world a better place for future generation. This conference serves as a platform for promoting collaborations among academicians, students and professionals.

The 4th SCIEMATHIC 2018 has received overwhelming response from authors coming from all around the world and we are glad that most of the submitted papers are accepted to be presented in this conference. Selected research papers that are relevant to the theme of the conference will be published in one of the following journals:

I. Journal of Physics: Conference Series (JPCS) (indexed by SCOPUS);
II. International Journal of Engineering and Technology, IJET (UAE) (indexed by SCOPUS);
III. Journal of Science and Technology (JST).

Furthermore, I wish to express my heartfelt thanks to the eminent keynote speakers for their distinguished contribution in the conference despite their busy schedule. Last but not least, I would like to thank all organizing committee members who have devoted their precious time in making SCIEMATHIC 2018 a success.

PROF. Dr. ROZAINI BIN ROSLAN
Chairman of SCIEMATHIC 2018
ACKNOWLEDGEMENTS

The organising committee of the SCIEMATHIC 2018 would like to express the sincere gratitude to the followings for their support, sponsor and generous contribution:
ORGANIZING COMMITTEE

Patron
Prof. Ts. Dr. Wahid Razzaly

Advisor
Assoc. Prof. Dr. Mohd. Kamarulzaki Mustafa

Protocol and Programme Book
Dr. Choy Yaan Yee
Dr. Hamizah Mohd Safuan
Dr Kek Sie Long
Mr. Kamil Khalid

Chairman
Prof. Dr. Rozaini Roslan

Oral Presentations
Dr. Syahira Mansur
Assoc. Prof. Dr. Maselan @ Mazlan Ali

Deputy Chairman
Dr. Mohd Saifullah Rusiman

Technical and Logistics
Dr. Muhamad Ghazali Kamardan
Mr. Muhamad Ghazali Ibrahim
Mr. Zukarnain Abdul Rahim
Mr. Kamarul Affendi Hamdan
Mr. Nooriskandar Sani
Mr. Mohd Marhafiz Marjori
Mdm. Norhafizam Mohamed Yusof

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Mdm. Syahirbanun Isa
Mdm. Noorzehan Fazahiyah Md Shab

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Dr. Maria Elena Nor
Dr. Sabariah Suharan

Assistant Treasurer
Dr. Shuhaida Ismail
Mdm. Normala Tohid

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Dr. Siti Noor Asyikin Mohd Razali
Mdm. Azila Md Sudin
Mdm. Noor Azliza Abd Latif

Scientific Publication
Dr. Siti Suhana Jamaian
Dr. Phang Chang

Website, Promotion and Publicity
Mr. Lee Siaw Chong
Mr. Mohd Hafidz Mohd Aman
Mr. Tajul Asmuawee Abdullah

Editor
Dr. Norziha Che Him
Dr. Fazlina Aman
Dr. Suladi Firdaus Sufahani
Dr. Afishah Alias
Dr. Saliza Asman
Assoc. Prof. Dr. Hjh Rosmila Abdul Kahar

Sponsorship
Dr. Mahathir Mohamad
TENTATIVE PROGRAM OUTLINE

FIRST DAY
13 AUGUST 2018 (MONDAY)

8.00-9.30 am  Registration of Participant & Coffee Break

9.30-10.00 am Keynote Speaker 1 : Dr. Zamros Dzulkifli
Title: Restoring Confidence In The Banking Sector

10.00-12.30 pm Parallel Session 1

12.30-2.00 pm Lunch Break

2.00-2.30 pm Keynote Speaker 2 : Prof. Dr. Nur Iriawan
Title: On the Bayesian Hierarchical Modeling For Capturing The Pattern Of Natural Diversity To Achieving The Sustainable System Of Life

2.30-4.00 pm Parallel Session 2

4.00-5.00 pm Opening Ceremony

5.00 pm Tea Break

SECOND DAY
14 AUGUST 2018 (TUESDAY)

9.00-9.30 am Keynote Speaker 3 : Assoc. Prof. Dr. Zaidi Embong
Title: Advanced Surface Analytical Techniques As Multidisciplinary Platform For Material Science Studies

9.30-10.00 am Coffee Break

10.00-12.30 pm Parallel Session 3

12.30-2.00 pm Lunch Break

2.00-2.30 pm Keynote Speaker 4 : Assoc. Prof. Dr. Sharidan Shafie
Title: Theoretical Studies Of Fluid Flow In Microgravity Environment: g-Jitter Effects

2.30-5.00 pm Parallel Session 4

5.00 pm Tea Break
### PARALLEL SESSION 1, 13TH AUGUST 2018, 10.00 am – 12.30 pm

**Venue: Al-Jazari Auditorium (Auditorium Al-Jazari)**

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<th>ID</th>
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<tbody>
<tr>
<td>009</td>
<td>10.00 am - 10.15 am</td>
<td>The Design of Student Worksheet Based PBL to Improve Problem Solving Ability of the Eighth-Grade Students Junior High School in Indonesia Tio Akma &amp; Suparman</td>
</tr>
<tr>
<td>011</td>
<td>10.15 am - 10.30 am</td>
<td>Design of Student Worksheets based on Learning Cycle 5E Learning Model for VIII Junior High School Students in Indonesia Rima Nur’Afifah &amp; Suparman</td>
</tr>
<tr>
<td>012</td>
<td>10.30 am - 10.45 am</td>
<td>Design of Student Worksheet Mathematics Based on Learning Cycle to Improve Ability of Mathematics Representation Students of Class VIII Junior High School in Indonesia Hasanatul Fu’adah Amran &amp; Suparman</td>
</tr>
<tr>
<td>013</td>
<td>10.45 am - 11.00 am</td>
<td>Design of Mathematics Student Worksheet Based on Discovery Learning Approach to Improving Mathematical Representation Ability Students of Grade VII Junior High School in Indonesia Eka Luthfiya Lathifah &amp; Suparman</td>
</tr>
<tr>
<td>014</td>
<td>11.00 am - 11.15 am</td>
<td>Design of Mathematics Student Worksheet Based on RME Approach to Improving the Mathematical Communication Ability Students of Class VII Junior High School in Indonesia Ruri Handayani &amp; Suparman</td>
</tr>
<tr>
<td>025</td>
<td>11.15 am - 11.30 am</td>
<td>Development of Students Worksheet Based on Realistic Mathematics Education in Indonesia Monif Maulana &amp; Suparman</td>
</tr>
<tr>
<td>026</td>
<td>11.30 am - 11.45 am</td>
<td>Design of Mathematics Module using Problem-Based Learning Approach (PBL) in Indonesia Henry Puspitasari &amp; Suparman</td>
</tr>
<tr>
<td>027</td>
<td>11.45 am - 12 noon</td>
<td>Design Worksheet Approach Realistic Mathematics Education Students Junior High School in Indonesia Heriyadi &amp; Suparman</td>
</tr>
<tr>
<td>028</td>
<td>12 noon - 12.15 pm</td>
<td>Design Development Learning Media Based PMRI Oriented Capabilities Study Creative Students Grade VII of Junior High School in Indonesia Fatim Isdiarti &amp; Suparman</td>
</tr>
<tr>
<td>029</td>
<td>12.15 pm - 12.30 pm</td>
<td>Design of Student Worksheet Based on Guided Discovery Approach in Indonesia Desy Yusnia &amp; Suparman</td>
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**Venue: Lestari Room 1 (Bilik Lestari 1)**

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<tbody>
<tr>
<td>030</td>
<td>10.00 am - 10.15 am</td>
<td>Design of Student Mathematics Worksheet Based on Realistic Mathematics Education (RME) in Indonesia Mega Ratrisna Dyah Ayu Pamungkas &amp; Suparman</td>
</tr>
<tr>
<td>031</td>
<td>10.15 am - 10.30 am</td>
<td>Designing Fun Addition Number Operation Learning Using M-Engklex Game For Deaf Student Maulidiah &amp; Suparman</td>
</tr>
<tr>
<td>032</td>
<td>10.30 am - 10.45 am</td>
<td>Android Based Mathematical E-Book Design Riska Zunanto &amp; Suparman</td>
</tr>
<tr>
<td>033</td>
<td>10.45 am - 11.00 am</td>
<td>Design of Student Worksheet with Open Software Geogebra Mathematic for Junior High School in Indonesia Aulia Fonda &amp; Suparman</td>
</tr>
<tr>
<td>035</td>
<td>11.00 am - 11.15 am</td>
<td>Design of Student Worksheet with a Good Moral Cooperative Learning Approach in Indonesia Ratna Juwita &amp; Suparman</td>
</tr>
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</table>
## PARALLEL SESSION 1, 13TH AUGUST 2018, 10.00 am – 12.30 pm

### Venue: Lestari Room 1 (Bilik Lestari 1)

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<tr>
<td>036</td>
<td>11.15 am - 11.30 am</td>
<td>Designing the Additive Operation Integer Learning Fun Media Using Colored Paper for Deaf Student&lt;br&gt;&lt;br&gt;&lt;i&gt;Erlida Nova Sulisetiawati, Maulidiah &amp; Suparman&lt;/i&gt;</td>
</tr>
<tr>
<td>038</td>
<td>11.30 am - 11.45 am</td>
<td>Design of Mathematics Module Development with Problem Based Learning Approach in Indonesia&lt;br&gt;&lt;br&gt;&lt;i&gt;Nur Idiah Asmarawati &amp; Suparman&lt;/i&gt;</td>
</tr>
<tr>
<td>043</td>
<td>11.45 am - 12 noon</td>
<td>Mathematical Communication With Guided Inquiry&lt;br&gt;&lt;br&gt;&lt;i&gt;Karima Kusuma Wardani, Rully Charitas Indra Prahmana &amp; Suparman&lt;/i&gt;</td>
</tr>
<tr>
<td>050</td>
<td>12 noon - 12.15 pm</td>
<td>A Study of Geometry Concept Matematization Process on Blind Student Visual Imagery&lt;br&gt;&lt;br&gt;&lt;i&gt;Andriyani, I Ketut Budayasa &amp; Dwi Juiati&lt;/i&gt;</td>
</tr>
<tr>
<td>053</td>
<td>12.15 pm - 12.30 pm</td>
<td>Development and Effectiveness of Interactive Learning Media for Courses of Mathematical Logic and Set Reviewed from Students Self Confident on Computer&lt;br&gt;&lt;br&gt;&lt;i&gt;Syanful Fahmi &amp; Saffi Widyanesti Priwantoro&lt;/i&gt;</td>
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### Venue: Lestari Room 2 (Bilik Lestari 2)

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<tr>
<td>165</td>
<td>10.00 am - 10.15 am</td>
<td>The Sufficient Descent Condition of a New Class of Nonlinear Conjugate Gradient Method&lt;br&gt;&lt;br&gt;&lt;i&gt;Srimazura Basri &amp; Mustafa Mamat&lt;/i&gt;</td>
</tr>
<tr>
<td>167</td>
<td>10.15 am - 10.30 am</td>
<td>Effect of Dimensionality Reductions Technique in Modelling and Forecasting River Flow&lt;br&gt;&lt;br&gt;&lt;i&gt;Shuhaida Ismail, Ani Shabri &amp; Siraj Mohammed Pandhiani&lt;/i&gt;</td>
</tr>
<tr>
<td>170</td>
<td>10.30 am - 10.45 am</td>
<td>A New Hybrid of Fuzzy C-Means Method and Fuzzy Linear Regression Model in Predicting Manufacturing Income&lt;br&gt;&lt;br&gt;&lt;i&gt;Nurfarawahida Ramly, Mohd Saifullah Rusiman, Norziha Che Him, Maria Elena Nor, Suparman, Nur Ain Zafirah Ahmad Basri &amp; Nazeera Mohamad&lt;/i&gt;</td>
</tr>
<tr>
<td>171</td>
<td>10.45 am - 11.00 am</td>
<td>The Discrete Time-Space SIR-SI Age-Structured Model for Leptospirosis&lt;br&gt;&lt;br&gt;&lt;i&gt;Nor Azah Samat &amp; Aznida Che Awang&lt;/i&gt;</td>
</tr>
<tr>
<td>172</td>
<td>11.00 am - 11.15 am</td>
<td>Predictive Modelling of Cockles in Malaysia by Using Time Series Analysis&lt;br&gt;&lt;br&gt;&lt;i&gt;Hani Nabihah Aziz, Mohd Saifullah Rusiman, Siti Noor Asyikin Mohd Razali, Abdul Wahab Abdullah &amp; Nur Amira Azmi&lt;/i&gt;</td>
</tr>
<tr>
<td>156</td>
<td>11.15 am - 11.30 am</td>
<td>Creating a GUI Solver for Linear Programming Models in MATLAB&lt;br&gt;&lt;br&gt;&lt;i&gt;Lee Siaw Chong &amp; Chin Jia Xin&lt;/i&gt;</td>
</tr>
<tr>
<td>094</td>
<td>11.30 am - 11.45 am</td>
<td>Forecasting Electricity Consumption using Time Series Model&lt;br&gt;&lt;br&gt;&lt;i&gt;Y.W. Lee, K.G. Tay &amp; Y.Y. Choy&lt;/i&gt;</td>
</tr>
<tr>
<td>129</td>
<td>11.45 am - 12 noon</td>
<td>Forecasting Electricity Consumption Using Fuzzy Time Series&lt;br&gt;&lt;br&gt;&lt;i&gt;K.G. Tay, Y.Y. Choy &amp; C.C. Chew&lt;/i&gt;</td>
</tr>
<tr>
<td>076</td>
<td>12 noon - 12.15 pm</td>
<td>Fuzzy Finite Switchboard State Machine with Complete Residuated Lattices&lt;br&gt;&lt;br&gt;&lt;i&gt;Nur Ain Ebas, Nor Shamsidah Amir Hamzah, Kavikumar Jacob &amp; Mohd Saifullah Rusiman&lt;/i&gt;</td>
</tr>
<tr>
<td>174</td>
<td>12.15 pm - 12.30 pm</td>
<td>Modelling House Price Using Ridge Regression and Lasso Regression&lt;br&gt;&lt;br&gt;&lt;i&gt;Seng Jia Xin, Kamil Khalid, Norziha Che Him &amp; Suladi Firdaus Sufahani&lt;/i&gt;</td>
</tr>
</tbody>
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### PARALLEL SESSION 1, 13TH AUGUST 2018, 10.00 am – 12.30 pm

**Venue: Tutorial Room 8 (Bilik Tutorial 8)**

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<thead>
<tr>
<th>ID</th>
<th>Time</th>
<th>Details</th>
</tr>
</thead>
</table>
| 001 | 10.00 am - 10.15 am| Fuzzy C-Means Clustering in Modelling Dengue Incidence Rate in Malaysia  
Nazeera Mohamad, Norziha Che Him, Mohd Saifullah Rusiman,  
Suladi Suflahani, Siti Afiqah Muhammad Jamil & Azme Khamis |
| 150 | 10.15 am - 10.30 am| Statistical Modelling of Dengue Incidence Rate in Selangor by using Negative Binomial GAM  
Norziha Che Him, Nazeera Mohamad, Mohd Saifullah Rusiman,  
Kamil Khalid & Muhammad Ammar Shafi |
| 118 | 10.30 am - 10.45 am| Survival Analysis to Analyze Factor that Affect the Rate of Recovery Patients of Pneumonia  
Ummi Aulia Septiani & Sugiyarto |
| 020 | 10.45 am - 11.00 am| A Comparison of OLS and Ridge Regression Methods in the Presence of Multicollinearity Problem in the Data  
N S Md. Shariff & H M B Duzan |
| 055 | 11.00 am - 11.15 am| An Application of Proposed Ridge Regression Methods to Real Data Problem  
N S Md. Shariff & H M B Duzan |
| 079 | 11.15 am - 11.30 am| Empirical Bayesian Binary Classification Forests using Bootstrap Prior  
O. R. Olaniran, M. A. A. Abdullah, G. P. Khuneswari & S. F. Olaniran |
| 080 | 11.30 am - 11.45 am| Development of a New Serration Model Using Offset Approach in the Leaf Shape Modeling: Variation of Details of the Leaf Margin  
Norazman Arbin & Siti Noor Asyikin Mohd Razali |
| 109 | 11.45 am - 12 noon | Fuzzy Time Series Forecasting Model based on Frequency Density and Similarity Measure Approach  
Nazirah Ramli, Siti Musleha Ab Mutalib & Daud Mohamad |
| 002 | 12 noon - 12.15 pm | Identifying the Ideal Number Q-component of the Bayesian Principal Component Analysis Model for Missing Precipitation Data Treatment  
Zun Liang Chuan, Azlyna Senawi, Wan Nur Syahidah Wan Yusoff,  
Noriszura Ismail, Tan Lit Ken & Mu Wen Chuan |
| 091 | 12.15 pm - 12.30 pm| Interaction Effects on Prediction of Children Weight at School Entry using Model Averaging  
Khuneswari Gopal Pillay, Sya Sya Syahira Muhammad Fitri Avtar &  
Mohd Asrul Affendi Abdullah |

**Venue: Tutorial Room 9 (Bilik Tutorial 9)**

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<tr>
<th>ID</th>
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</table>
| 111 | 10.00 am - 10.15 am| Batch Kinetics of Removal Nutrients from Synthetic Meat Processing Wastewater by using Microalgae Botryococcus sp.  
Vikneswara A. Shanmugan, Radin M.S.R. Mohammed,  
Amir H.B.M. Kassim, Adel A.S. Al-Gheethi & Nur A.A. Latiffi |
| 113 | 10.15 am - 10.30 am| A Comparative Study of Single-tooth and Multi-tooth Stator of 4S-8P Permanent Magnet FSM for Electric Bicycle Application  
Laili Iwani Jusoh, Erwan Sulaiman, M. Fairoz Omar & Hassan Ali Soomro |
| 116 | 10.30 am - 10.45 am| Leachability of Fired Clay Bricks Incorporated with Sewage Sludge by Using Tank Leaching Test  
Nurul Salhana Abdul Salim, Aeslina Abdul Kadir,  
Mohamad Asyraf Kamarudin & Mohd Hafizul Fadzi Zaidi |
| 074 | 10.45 am - 11.00 am| Cooling Effect Efficiency Prediction of Aluminium Dimples Block using DOE Technique  
Ganesan H. N., Kasim M. S., Anand T.J.S. & Nawi M.A.M |
## PARALLEL SESSION 1, 13TH AUGUST 2018, 10.00 am – 12.30 pm

### Venue: Tutorial Room 9 (Bilik Tutorial 9)

### Chairperson: Dr. Phang Chang

<table>
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<tr>
<th>ID</th>
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<th>Details</th>
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</table>
| 120 | 11.00 am - 11.15 am | Influence of Deposition Parameter to Wear Behaviour of Tungsten Carbide-Nickel (WC-Ni) High Velocity Oxyfuel (HVOF) Coating
Mohd Affifudin Abdul Patar & Z. Kamdi |
| 121 | 11.15 am - 11.30 am | Design and Performances of Multi-Tooth Stator Permanent Magnet Flux Switching Machine for Light Weight Applications
| 123 | 11.30 am - 11.45 am | Preliminary Studies of 12S-8P and 12S-14P Hybrid-Excited Flux Switching Machine with FEC in Radial Direction by Using JMAG-Designer Software
Siti Khalidah Rahimi, Md. Zarafiy Ahmad, Erwan Sulaiman & Syed Muhammad Naufal Syed Othman |
| 146 | 11.45 am - 12 noon | Gas Emission of Palm Oil Waste Bricks during Firing Process at Different Heating Rates
Noor Amira Sarani, Aeslina Abdul Kadir & Hamidah Syd Othman |
| 124 | 12 noon - 12.15 pm | Isolation and Characterization of Bacteria from Earthworms’ Intestines
Shalyda Md Shaarani, Yap Shu Jia, Zatul Iffah Mohd Arshad, Rohaida Che Man, Siti Kholijah Abdul Mu-dalip & Siti Zubaidah Sulaiman |
| 128 | 12.15 pm - 12.30 pm | Development of Smart Kit Rainwater Harvesting System for Potable Water Purpose
## PARALLEL SESSION 2, 13TH AUGUST 2018, 2.30 pm – 4.00 pm

### Venue: Al-Jazari Auditorium (Auditorium Al-Jazari)

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<tr>
<th>ID</th>
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</table>
| 044 | 2.30 pm – 2.45 pm | Hierarchical Bayesian Estimation for Stationary Autoregressive Models using Reversible Jump MCMC Algorithm  
Suparman & Mohd Saifulh Rusiman                               |
| 122 | 2.45 pm – 3.00 pm | Forecasting Stock Price Index using Residual Income Model in Jakarta 
Sugiyarto, Muhammad Randa & Suliani Sufahani                                                        |
| 005 | 3.00 pm – 3.15 pm | Analytical Solution of Mathematical Model for ERK Activation in The Presence of Competitive Inhibitor  
Yudi Ari Adi, Muhamad Irawan Jayadi & Agung Budiantoro                                               |
| 110 | 3.15 pm – 3.30 pm | Dynamic Programming to Solve Picking Schedule at the Tea Plantation 
Siti Mahsanah Budijati                                                                                  |

### Venue: Lestari Room 1 (Bilik Lestari 1)

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<th>ID</th>
<th>Time</th>
<th>Details</th>
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</table>
| 068 | 2.30 pm – 2.45 pm | Physico-mechanical Properties of Porcelain by Substitution of Quartz with POFATreated with 2M HCl Acid 
Sani Garba. Durumin Iya, Mohamad Zaky Noh, Siti Noraiza Ab Razak & Nur Azureen Alwi Kutty           |
| 022 | 2.45 pm – 3.00 pm | Effect on Silicon Nitride Thin Films Properties at Various Powers of RF Magnetron Sputtering 
U Majeed, M K Mustafa & Y Iqbal                                                             |
| 045 | 3.00 pm – 3.15 pm | Impact of Ag Doped on the Ferromagnetic-metallic Transition in Pr$_{0.75}$Na$_{0.25}$MnO$_3$ Manganites 
N N Khairulzaman, N Ibrahim & S Shamsuddin                                                   |
| 059 | 3.15 pm – 3.30 pm | Characterization of Polystyrene/Titanium Dioxide Nanocomposites (PS/TiO$_2$NCs) for Photocatalytic Degradation Application in Tuning the Composite Energy Band Gap: Review 

### Venue: Lestari Room 2 (Bilik Lestari 2)

<table>
<thead>
<tr>
<th>ID</th>
<th>Time</th>
<th>Details</th>
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</table>
| 017 | 2.30 pm – 2.45 pm | Effect of Light Intensity on the Total Flavonoid and Total Phenolic Contents of Mikania micrantha and Tridax procumbens 
Aisha Idris, Alona C. Linatoc, Surayya Mustapha Muhammad & Aisha Muhammad Aliyu  |
| 057 | 2.45 pm – 3.00 pm | Influence of Light Intensity on the Photosynthesis and Phenolic Contents of Mangifera indica 
Alona C. Linatoc & Aisha Idris                                                                |
| 058 | 3.00 pm – 3.15 pm | Assessment and Potential of Carbon Storage Capacity of Species of Herbaceous Plants in Universiti Tun Hussein Onn Malaysia, Main Campus, Batu Pahat, Johor Malaysia 
Yunusa Audu, Alona C. Linatoc & Aisha Idris                                                     |
## PARALLEL SESSION 2, 13TH AUGUST 2018, 2.30 pm – 4.00 pm

### Venue: Lestari Room 2 (Bilik Lestari 2)

**Chairperson:** Dr. Shuhaida Ismail

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</table>
| 052 | 3.15 pm – 3.30 pm | Preliminary Observations of Zooplankton in Pulau Tinggi, Marine Park, Johor, Malaysia  
Nasir Shuaib, Maryati Mohammad, Hazel Monica Matias-Peralta, Mohd Saifullah Rusiman & Shuaibu Babaji Sanusi |
| 092 | 3.30 pm – 3.45 pm | Effect of Light on the Photosynthesis, Pigment Content and Stomatal Density of Sun and Shade Leaves of Vernonia amygdalina  
A Idris, A C Linatoc, A M Aliyu & S M Muhammad |

### Venue: Tutorial Room 8 (Bilik Tutorial 8)

**Chairperson:** Dr. Nurun Najwa Ruslan

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| 139 | 2.30 pm – 2.45 pm | Preparing In-service Teacher using Dynamic Geometry Software  
F Setyawan, Y D Kristanto & N Ishartono |
| 153 | 2.45 pm – 3.00 pm | Contributing Factors to Science Achievement in TIMSS Malaysia: Direct Model and Indirect Model  
Mohd Erfy Ismail, Mohd Ali Samsudin, Nor Fadila Mohd Amin, Nurzatulshima Kamarudin, Khairul Azhar Mat Daud & Lilia Harlin |
| 102 | 3.00 pm – 3.15 pm | Chitosan-Zinc Oxide Composite for Active Food Packaging Applications  
S.R. Abdul Razak & H. Basri |
| 154 | 3.15 pm – 3.30 pm | Effect of Holding Time on Density and Morphological Property of Aluminium Composite Using Recycled Materials by Stir Casting Method  
Awwal Hussain Nuhu, Suzi Salwah Binti Isikan, Saliza Binti Asman, Nur Azam Bin Badarulzaman & Dagaci Muhammad Zago |
| 168 | 3.30 pm – 3.45 pm | Probing Dynamic Mechanical Analysis and Atomic Force Microscopy Interactions of Polypropylene/Kaolin Nanocomposite  
Dagaci Muhammad Zago, Suzi Salwah Binti Isikan, Nur Azam Bin Badarulzaman, Nurun Najwa Binti Ruslan, Awwal Hussain Nuhu & Nazia Bano |

### Venue: Tutorial Room 9 (Bilik Tutorial 9)

**Chairperson:** Dr. Fazlina Aman

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| 152 | 2.30 pm – 2.45 pm | Study of the Effect of Insulator Profile on Electric Field Distributions on SIR Insulators  
Ali A Salem & R Abd Rahman |
| 157 | 2.45 pm – 3.00 pm | Performance of Surface Temperature on Green Roof  
Mohamad Norfekry Bin Md Yacob, Hartini Binti Kasmin & Mohd Khairul Adam Bin Mohd Kori |
| 158 | 3.00 pm – 3.15 pm | Ice Bath Therapy on Athletes Recovery Response using EEG  
Hakimi M.H., Salleh S.M., Afnal H.M.Y., Ngali M.Z., Ismail A.E. & Rahman M.N.A. |
| 159 | 3.15 pm – 3.30 pm | Analysis of Toothbrush Rig Parameter Estimation Using Different Model Orders in Real-Coded Genetic Algorithm (RCGA)  
Afnal H.M.Y., Salleh S.M., Taib H. & Halib N. |
| 169 | 3.30 pm – 3.45 pm | Analysis of Golfer’s Brainwave Signal During Putt, Tee and Driving Range Game  
Yusof M.M.M., Salleh S.M., Afnal H.M.Y. & Siswanto, W.A. |
### PARALLEL SESSION 3, 14TH AUGUST 2018, 10.00 am – 12.30 pm

**Venue: Lestari Room 1 (Bilik Lestari 1)**

**Chairperson: Dr. Ahmad Hadi Ali**

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<tr>
<td>083</td>
<td>10.00 am - 10.15 am</td>
<td>Mechanical Properties of the Concrete Containing Porcelain Waste as Sand&lt;br&gt;Mohammed Jamal, Mohammad Zaky Noh, Mohd Haziman Bin Wan, Shihab Al-Juboori &amp; Zakiyyu Ibrahim Takai</td>
</tr>
<tr>
<td>084</td>
<td>10.15 am - 10.30 am</td>
<td>Preparation of Aniline dimer-COOH Modified Magnetite (Fe3O4) Nanoparticles by Ultrasonic Dispersion Method&lt;br&gt;Zakiyyu Ibrahim Takai, Mohd Kamarulzaki Mustafa, Saliza Asman &amp; Jibrin Muhammada</td>
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<tr>
<td>047</td>
<td>10.30 am - 10.45 am</td>
<td>Comparative Study on Structural, Electrical Transport and Magnetic Properties of Cr-doped in Charge-ordered Pr0.75Na0.25Mn1_xCr_xO3 and Nd0.75Na0.25Mn1_xCr_xO3 Manganites&lt;br&gt;R.A. Zawawi, N. N. Khairulzaman, N. Ibrahim &amp; S. Shamsuddin</td>
</tr>
<tr>
<td>048</td>
<td>10.45 am - 11.00 am</td>
<td>Preparation and Characterization of Magnetite (Fe3O4) nanoparticles by Sol-Gel Method&lt;br&gt;Zakiyyu Ibrahim Takai, M. K. Mustafa &amp; S. Asman</td>
</tr>
<tr>
<td>049</td>
<td>11.00 am - 11.15 am</td>
<td>Observation of Charge Ordering Signal in Monovalent Doped Nd0.75Na0.25xKMn1-xO3 (0&lt;x&lt;0.10) Manganites&lt;br&gt;S. A. Razali, N. Ibrahim, S. Shamsuddin &amp; M. Z. Noh</td>
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<tr>
<td>048</td>
<td>11.15 am - 11.30 am</td>
<td>Depth-dependent Optical Stiffness toward Water-air interface&lt;br&gt;M. S. Mat Yeng, S. K. Ayop &amp; I. R. Mustapa</td>
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<tr>
<td>073</td>
<td>11.30 am - 11.45 am</td>
<td>Synthesis and Characterization of Zinc Sulphide (ZnS) Thin Film Nanoparticle for Optical Properties&lt;br&gt;Salim Oudah Mezan, Alaa Nihad Tuama, Abdullah Hasan Jabbabar, Maytham Qabel Hamzah, M.S.Roslan, Md Shareefuddin &amp; Mohd Arif Agam</td>
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<tr>
<td>082</td>
<td>11.45 am - 12 noon</td>
<td>Invariance in Transverse Momentum of Photons in Double-slit Experiment&lt;br&gt;Muhammad Amssyar Abdul Rahim, Mohd Hafizudin Kamal &amp; Mohd Amir Radhi Othman</td>
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<tr>
<td>106</td>
<td>12 noon - 12.15 pm</td>
<td>Optical Absorption of Plasmonic Cylindrical Gold Nanoparticle in Hexagonal Geometry&lt;br&gt;Norasikin M Nasar, Rosmila Abdul-Kahar, Nor Shamsidah Amir Hamzah &amp; Fahmiruddin Esa</td>
</tr>
<tr>
<td>125</td>
<td>12.15 pm - 12.30 pm</td>
<td>Characterization of Cr/Ag Bi-Layer Thin Metal Contacts Sputter Deposited on n-Type Si Semiconductor&lt;br&gt;Ahmad Hadi Ali &amp; Nurul Syafiqah Paizzi</td>
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**Venue: Lestari Room 2 (Bilik Lestari 2)**

**Chairperson: Dr. Sabariah Saharan**

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<tr>
<td>163</td>
<td>10.00 am - 10.15 am</td>
<td>Forecasting of Unemployment Rate in Malaysia using Exponential Smoothing Methods&lt;br&gt;Maria Elena Nor, Sabariah Saharan, Lok See Lin, Rohayu Mohd Salleh &amp; Norhaidah Mohd Asrah</td>
</tr>
<tr>
<td>164</td>
<td>10.15 am - 10.30 am</td>
<td>Malaysia Tourism Demand Forecasting using Box-Jenkins Approach&lt;br&gt;Diyyana Izyan Amir Hamzah, Maria Elena Nor, Sabariah Saharan, Noor Fariza Mohd Hamdan &amp; Nurul Asmawi Izati Noomad</td>
</tr>
<tr>
<td>095</td>
<td>10.30 am - 10.45 am</td>
<td>Model Building of Multiple Binary Logit using Model Averaging&lt;br&gt;Khunswari Gopal Pillay, Siti Aisyah Mohd Padzil &amp; Rohayu Mohd Salleh</td>
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<tr>
<td>096</td>
<td>10.45 am - 11.00 am</td>
<td>Behaviours of Bursa Malaysia: A Multidimensional Network Analysis&lt;br&gt;San Y. Lim, Rohayu Mohd Salleh &amp; Norhaidah Mohd Asrah</td>
</tr>
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</table>
## PARALLEL SESSION 3, 14TH AUGUST 2018, 10.00 am – 12.30 pm

### Venue: Lestari Room 2 (Bilik Lestari 2)

**Chairperson: Dr. Sabariah Saharan**

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<tr>
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| 089 | 11.00 am - 11.15 am | A Cluster Analysis for Binary Data using Genetic Algorithms  
Sabariah Saharan, Wong Yu Xian & Roberto Baragona |
| 135 | 11.15 am - 11.30 am | A Study on Significant Predictors for Prediction of Undiagnosed T2DM  
using Binary Logistic Regression Model  
S. S. N. Zainal, M. J. Masnan, A. Ahmed, N. A. M. Amin &  
M. I. Omar @Ye Htut |
| 151 | 11.30 am - 11.45 am | Prediction in a Hybrid of Fuzzy Linear Regression with Symmetric  
Parameter Model and Fuzzy C-means Method using Simulation Data  
Muhammad Ammar Shafi, Mohd Saifullah Rusiman, Kovikumar Jacob,  
Nor Shamsidah Amir Hamzah, Norziha Che Him & Nazeeza Mohamad |
| 155 | 11.45 am - 12 noon | Granger Causality Analysis on PLUS Highway Traffic Network  
Norhaidah Mohd Asrah, Maman Abdurachman Djauhari, Azme Khamis,  
Rohaya Mohd Salleh & Sya Syahira Muhammad Fizri Avtar |
| 162 | 12 noon - 12.15 pm | Deseasonalisation in Electricity Load Forecasting  
Maria Elena Binti Nor, Mohd Saifullah Rusiman, Suladi Firdaus Sufahani,  
Mohd Asrul Affendi Abdullah, Sabariah Saharan &  
Sathwinee A/P Bataraja |

**Venue: Tutorial Room 8 (Bilik Tutorial 8)**

**Chairperson: Dr. Kek Sie Long**

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| 041 | 10.00 am - 10.15 am | Numerical Investigation on Effect of Rounded Cutting Edge Radius and  
Machining Parameters in End Milling of AISI H13 Tool Steel  
Husni Nazra Abu Bakar, Jaharah A. Ghani & Che Hassan Che Haron |
| 142 | 10.15 am - 10.30 am | Optimization of Aqueous Two-phase System (ATPS) of Recombinant  
Bromelain by Response Surface Methodology  
Zatul Iffah Mohd Arshad & Azura Amid |
| 046 | 10.30 am - 10.45 am | Determination of Optimum Machining Condition for Surface Roughness  
using Historical Data  
Mohd Shafizal Mohd Ruslan, Haniff Abdul Rahman,  
Jaharah Abdul Ghani, Che Hassan Che Haron & Mohd Shahir Kassim |
| 149 | 10.45 am - 11.00 am | Electromagnetic Flux Analysis of DSHESFM Rotor for Directly Driven  
Actuator used in Aircraft Applications  
H. A. Soomra, E. Sulaiman, M. Jenal, M. F. Omar, L. I. Jusoh &  
S.K. Rahimi |
| 060 | 11.00 am - 11.15 am | Medical Image Compression using Standard Deviation-Based Wavelet  
Coefficients Thresholding Method  
N.S.A.M Taujuddin, R. Ibrahim & S. Sari |
| 061 | 11.15 am - 11.30 am | Removal Heavy Metals from Textile Wastewater using Sugarcane Bagasse  
Activated Carbon  
Mohd Adib Mohammad Razi, Adel Al-Gheethi & Izzatul Ashikin ZA |
| 062 | 11.30 am - 11.45 am | Optimizing Reaction Time for Size-controlled Synthesis of Hydrothermally  
Grown TiO2 Nanostructure  
Norazlina Ahmad, Fariza Mohamad, Mohd Khairul Ahmad,  
Azman Talib & Fakhriah Mohd Razali |
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<tr>
<td>063</td>
<td>11.45 a.m - 12 noon</td>
<td>Recycled Concrete Aggregates as a Filter for Removal of Phosphorus in Synthetic Wastewater</td>
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<td>Norwardatun Abd Roni, Suraya Hani Adnan &amp; Rafidah Hamdan</td>
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<tr>
<td>119</td>
<td>12 noon - 12.15 p.m</td>
<td>Comparisons Study of Phosphate Removal in Uneaerated and Aerated Steel Slag Filter System</td>
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<td>Siti Zu Nurain Ahmad, Hamdan R, Wan Afnizan Wan Mohamed &amp; Nur ‘Ain Nazirah Mohd Arshad</td>
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<tr>
<td>138</td>
<td>12.15 p.m - 12.30 p.m</td>
<td>The Effect of Dissolved Oxygen Distribution on Ammonium Nitrogen Removal in a Pilot-scale of Vertical Upward-flow of Aerated Electric Arc Furnace Slag Filter Systems at Various Hydraulic Loading Rates</td>
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**Venue: Tutorial Room 8 (Bilik Tutorial 8)**

**Chairperson: Dr. Kek Sie Long**

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<tr>
<td>077</td>
<td>10.00 a.m - 10.15 a.m</td>
<td>Dyslexia Risk Screening System Based Fuzzy Logic</td>
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<td>Nur Anida Jumadi, Ng Li Mun, Marlia Morsin &amp; Safiuddin Mohtaram</td>
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<td>081</td>
<td>10.15 a.m - 10.30 a.m</td>
<td>Assessment of Storm Water Quality in Grass Swale using Sand Filter Media: A Case Study at UTHM Campus</td>
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<td>Mohd. Azlan B. Mohd Yusoff, Adel Al-Gheethi &amp; Daniel Alizat B. Dzoin</td>
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<tr>
<td>085</td>
<td>10.30 a.m - 10.45 a.m</td>
<td>Performance Comparison Between Salient and Segmental Rotors Single-phase FEFSM Using Non-Overlap Windings for Home Appliances</td>
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<td>M. F. Omar, E. Sulaiman, H. A. Soomra &amp; L. I. Jusoh</td>
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<td>087</td>
<td>10.45 a.m - 11.00 a.m</td>
<td>Prediction of Pavement Life Using Influence Function and Peak Influence Function</td>
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<td>R. Buhari</td>
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<tr>
<td>088</td>
<td>11.00 a.m - 11.15 a.m</td>
<td>Noise Level Based Denoising Technique Utilizing Patch-Based Noise Level Estimator for Low-Light Condition Surveillance Image</td>
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<td>Suhaila Sari, Wong Zhi Lin, Hazli Roslan, Nik Shahidah Afifi Mohd Taujuddin, Chua King Lee &amp; Siti Zarina M Mujı</td>
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<tr>
<td>098</td>
<td>11.15 a.m - 11.30 a.m</td>
<td>Analysis of Symmetric and Asymmetric Multilevel Inverter Topologies Using Reduced Number of Switching Devices Circuit Structure</td>
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<td>M. H. Yatim, A. Ponniran, A. A. Bakar, A. N. Kasiran, M. K. R. Noor &amp; J.N. Jumadril</td>
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<tr>
<td>100</td>
<td>11.30 a.m - 11.45 a.m</td>
<td>Optimization of PFC SEPIC Converter Parameters Design for Minimization of THD and Voltage Ripple</td>
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<tr>
<td>101</td>
<td>11.45 a.m - 12 noon</td>
<td>Implementation of Resonant and Passive Lossless Snubber Circuits for DC-DC Boost Converter</td>
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<td>A.N. Kasiran, A. Ponniran, A. A. Bakar, M.H. Yatim, M. K. R. Noor &amp; J.N. Jumadril</td>
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<tr>
<td>103</td>
<td>12 noon - 12.15 p.m</td>
<td>The Performance of Earth Retention Pond Water Retain Capability using Geotechnical Properties Evaluation</td>
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<td>Mohd Hazreek Zainal Abidin, Mohd Shalahudin Adnan, Aziman Madun, Mohd Khairid Abu Talib, Ahmad Fahmy Kamarudin, Muhammad Nizam Zakaria, Mohd Ashraf Mohamad Ismail &amp; Mohd Fakhurrazi Ishak</td>
</tr>
<tr>
<td>105</td>
<td>12.15 p.m - 12.30 p.m</td>
<td>Predicting the Capability of Oxidized CNW Adsorbents for the Remediating of Copper Under Optimal Operating Conditions</td>
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<td></td>
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<td>Hazren A. Hamid, H. Harun, N.M. Sunar, Latifah Jasmani &amp; Norhidayah Suleiman</td>
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# PARALLEL SESSION 4, 14TH AUGUST 2018, 2.30 pm – 5.00 pm

**Venue:** Lestari Room 1 (Bilik Lestari 1)  
**Chairperson:** Pn Noorzehan Fazahiyah Md Shab

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</table>
| 115 | 2.30 pm – 2.45 pm | Review on Queuing Problem in Healthcare  
Hajar Ariff, M Ghazali Kamardan, Suliadi Sufahani & Maselan Ali |
| 090 | 2.45 pm – 3.00 pm | The Extended Monod Model for Microalgae Growth and Nutrient Removal in Different Wastewaters  
U A F Sadiq, M E Yow & S S Jamaian |
| 023 | 3.00 pm – 3.15 pm | Movement of Fluid Inside the Sphere  
M. M. Abenov, M. B. Gabbasov & F. Y. Ismagulova |
| 004 | 3.15 pm – 3.30 pm | Application of Caputo-Fabrizio Fractional Order Derivative (NFD) in Simulating the MHD Flow of the Third Grade Non-Newtonian Fluid in the Porous Artery  
Salah Uddin, Mahathir Mohamad, Suliadi Sufahani,  
M Ghazali Kamardan, Obaid Ullah Mehmood, Fazli Wahid & Rozaini Roslan |
| 021 | 3.30 pm – 3.45 pm | Caputo-Fabrizio Time Fractional Derivative Applied to Visco Elastic MHD Fluid Flow in the Porous Medium  
Salah Uddin, Mahathir Mohamad, Mahmud Abd Hakim Mohamad, Suliadi Sufahani,  
M Ghazali Kamardan, Obaid Ullah Mehmood, Fazli Wahid & Rozaini Roslan |
| 071 | 3.45 pm – 4.00 pm | MHD Boundary Layer Flow in Double Stratification Medium  
Nur Suhaida Aznidar Ismail, Ahmad Sukri Abd Aziz, Zaileha Md Ali & Siti Khuzaimah Said |
| 166 | 4.00 pm – 4.15 pm | Boundary Layer of a Dusty Fluid Flow over a Stretching Sheet  
Noorzehan F. M. S., Nurul A. J., Syahira M. & Radiah M. |

**Venue:** Lestari Room 2 (Bilik Lestari 2)  
**Chairperson:** Dr. Radiah Mohamad

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| 064 | 2.30 pm – 2.45 pm | Seed-Mediated Growth of Gold Nanorods Using Silver Seeds: Effect of Silver Seeds Concentration and Growth Time  
Suratun Nafisah, Marlia Morsin, Nur Anida Jumadi, Nafizarizal Nayan,  
Nur Zehan Ani’isa Md Shah, Nur Liyana Razali & Chin Fhong Soon |
| 065 | 2.45 pm – 3.00 pm | Optical Temperature Sensor based on Sagnac Interferometer  
Mohd Azwadi Omar, Noran Azizan Cholan, Aminuddin Mohd,  
Mirsa Nurfarhan Mohd Azhan, Rahmat Talib & Nor Hafizah Ngajikin |
| 066 | 3.00 pm – 3.15 pm | Near-Infrared Spectroscopy (NIRS)-based Digit Skin Tissue Blood Flow Measurement System  
Tan Ying Yin, Farhanahani Mahmud & Nur Ilyani Ramli |
| 086 | 3.15 pm – 3.30 pm | Designing of 3D Sensor Chamber for Plasmonic-Based Toxic Sensor Detection  
Mohammad Farid Abd Karim, Marlia Morsin, Suratun Nafisah & Norhayati Abu Bakar |
| 067 | 3.30 pm – 3.45 pm | Incorporation of Alternative Fuels and Raw Materials (AFR) to Produce a Sustainable Cement  
Ali Benlamoudi, Aeslina Abdul Kadir & Mohamed Khodja |
| 069 | 3.45 pm – 4.00 pm | IoT based Weather Station using Raspberry Pi 3  
P Y Muck & M J Homam |
### PARALLEL SESSION 4, 14TH AUGUST 2018, 2.30 pm – 5.00 pm

**Venue:** Lestari Room 2 (Bilik Lestari 2)  
**Chairperson:** Dr. Radiah Mohamad

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| 126 | 4.00 pm – 4.15 pm | Investigation on the Effect of Centrifugation Speed on the Shape Separation of Gold Nanorods  
Caessandra Addine Minun, Marlia Morsin, Nur Zehan An’Nisa, Nur Liyana Razali, Surtun Nafisah, Rahmat Sanudin & Muhammad Mat Salleh |
| 075 | 4.15 pm – 4.30 pm | Analysis of Physical Distribution of Sediment at Sembrong Reservoir using GRADISTAT  
Syarifah Intan Najla Bt Syed Hashim, Siti Hidayah Bt Abu Talib & Muhammad Salleh B Abustan |
| 072 | 4.30 pm – 4.45 pm | GPS Tracker through HF Radio using FSK Method  
M J Homam, M F M Khazali & S Kamaruddin |
| 114 | 4.45 pm – 5.00 pm | Impact of Indoor Air Quality by Incorporating Agricultural Waste into Fired Clay Brick  
Noor Amira Sarani, Aeslina Abdul Kadir & Zaki Muhamad Yusuf |

### Venue: Tutorial Room 8 (Bilik Tutorial 8)  
**Chairperson:** Dr. Afishah Alias

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| 144 | 2.30 pm – 2.45 pm | Effect of Co³⁺ Substitution on Electromagnetic Properties of Pr₀.75Na₀.25MnO₃ and Nd₀.75Na₀.25MnO₃ Manganites  
Nurhabibah Nabila Ab Mannan, Sufia Aqilah Razali, Suhadir Shamsuddin, Mohammad Zaky Noh & Zakiah Mohamed |
| 161 | 2.45 pm – 3.00 pm | The Influence of Nonlinearity Properties in Generating Octave-spanning Light  
Mofaq M B Alsaady, N A Awang & Z Zahariah |
| 107 | 3.00 pm – 3.15 pm | Influence on the Phase Formation and Strength of Porcelain by Partial Substitution of Fly Ash Compositions  
Nur Azureen Alwi Kutty, Mohammad Zaky Noh, Mohd Zul Hilmi Mayzan & Sanir Garba Durumin Iya |
| 112 | 3.15 pm – 3.30 pm | Effects of Pulsed Nd:YAG Laser on Pt/Ag Thin Film Metal Contacts  
Bibi Zulaika Bhati & Ahmad Hadi Ali |
| 117 | 3.30 pm – 3.45 pm | Passively Q-switched Pulse Erbium Doped Fiber Laser using Antimony (III) Telluride (Sb₂Te₃) Thin Film as Saturable Absorber  
N U H Zulkepali, N A Awang, Y R Yuzaila, A A Latif, F Ahmad, A N Azmi, F S Abdul Hadi & Z Zakaria |
| 127 | 3.45 pm – 4.00 pm | Graphite Saturable Absorber for Q-switched Fiber Laser  
Y R Yuzaila, N A Awang, Z Zakaria, N U H Zulkepali, A A Latif, A N Azmi & F S Abdul Hadi |
| 130 | 4.00 pm – 4.15 pm | The Effect of Nanoparticles Composition on Tensile and Thermal Properties of Polystyrene Reinforced with Graphene Nanoplatelets Baharom M.H., Mat Desa M.S.Z., Izhab I., Yusop M., Kasnan N.Z. & Ab Ghani N.F |
| 140 | 4.15 pm – 4.30 pm | Axial Calibration of QPD Signal based on Stuck Bead Method for Optical Trapping Applications  
Mohd Farid Mohamad Yusof, Muhamad Safuan Mat Yeng & Shahrul Kadri Ayop |
### PARALLEL SESSION 4, 14TH AUGUST 2018, 2.30 pm – 5.00 pm

**Venue:** Tutorial Room 8 (Bilik Tutorial 8)  
**Chairperson:** Dr. Afishah Alias

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**Chairperson:** PM Dr. Nor Shamsidah Amir Hamzah

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Restoring Confidence In The Banking Sector

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Abstract
The global economy continues to evolve as human decides on efficient allocation of resources to maximise output and satisfaction. As resources are not indefinite in terms of supply, sustainability is vital to ensure that our next generations are able to enjoy the same quality of life or even better. The Global Financial Crisis in 2007-2008 provided invaluable lessons as greed and self-centred took centre stage. Hence, under the globalisation era, our decisions here in the region will not only affect us, but also affect the global community as a whole. The globalisation drive has also transformed the banking sector industry from being local in nature into regional and global in its operation. Thus, with the regional and global perspective, the diversity in terms of collective decision making helps to contribute to a much more efficient and sustainable developments as well as to maintain economic prowess.

Keywords
Globalisation; financial crisis; output; economic.
On The Bayesian Hierarchical Modeling
For Capturing The Pattern Of Natural Diversity
To Achieving The Sustainable System Of Life

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Abstract
Data variability is not only due to differences in the behavior of objects of observations, but often due to differences in situations where the object grows. In a social humanity, i.e. territorial regional differences, culture, government service infrastructures, and income per capita can lead to the emergence of significant variability. Analysis of such data requires special methods, namely Bayesian hierarchical modeling. This is because these problems with high diversity are structured hierarchically and their event changes would build a series of facts carried in the dynamics of data as a multilevel prior knowledge. Applying a full Bayesian inference to this case couple with the Bayesian computing, i.e. Markov Chain Monte Carlo (MCMC), would be simplify to get the result. Full predictive distributions expressed as probabilities, involving more uncertainty information, based on the Bayesian hierarchical model, compared to the one-level hierarchy on the traditional deterministic modeling with a single value point estimates, on the other hand, would provide a richer information to facilitate the development of an adaptive strategy to monitor the changing of the diversity pattern. This method has been implemented for analyzing the infant mortality, household expenditure, dengue fever survivor, and the number of patients healing in hospitals in some provinces in Indonesia. The results show that in each level and in each different hierarchical chain has significant different factors which lead to having a different treatment to be sustainable.

Keywords
Hierarchical structure; Bayesian hierarchical model; Full Bayesian inference; Markov Chain Monte Carlo; Multilevel priors.
Advanced Surface Analytical Techniques
As Multidisciplinary Platform For Material Science Studies

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Abstract
This review briefly describes the basic concepts of surface science as multidisciplinary knowledge in material science research, such as condensed matter physics, chemistry and engineering. The physical and chemical properties of the surfaces of materials play an important role in many large scale applications, such as in heterogeneous catalysis and corrosion inhibition. With the shrinking dimensions of electronic and optoelectronic devices, surface properties are of increasing relevance in many fields of modern technology, such as thin film growth. As the formation of a thin film on the materials is mainly in the range of micro or nanometer thickness, hence, advanced surface analytical techniques are required, such as Auger electron spectroscopy (AES), X-ray photoelectron spectroscopy (XPS) and laser Raman spectroscopy. In analysing a surface, AES and XPS would normally be considered first, with AES being applied where high spatial resolution is required and XPS where chemical state information is needed. Laser Raman spectroscopy is useful for determining molecular bonding. A combination of XPS, AES and Laser Raman analysis may reveal some significant information that relate to surface chemical properties such as oxide species and molecular structure of the thin film from the top few atomic layers with a lateral spatial resolution of <10nm.

Keywords
Surface science; advanced surface analytical techniques; XPS; AES; Laser Raman.
Theoretical Studies of Fluid Flow in Microgravity Environment: g-Jitter Effects

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Abstract
In microgravity environments, buoyancy-driven fluid flows and sedimentations are greatly reduced, allowing systems to work under purely diffusive conditions which enhanced the properties and performance of materials. However, aboard orbiting spacecraft, all objects experienced low-amplitude perturbed accelerations, caused by crew activities, orbiter maneuvers, equipment vibrations, solar drag and other sources. Space experiments have revealed this non-existent effects on Earth known as g-jitter, characterized by a broad frequency spectrum can induce significant convective flow which can be detrimental to certain experiments such as crystal growths and solidification processes. This review provides an overview of the existing theoretical studies which rely on the mathematical modelling to gain flow systems indicates that convection in microgravity is related to the magnitude and frequency of gravity modulation and also the alignment of the gravitational field with respect to the direction of the temperature gradient. These theoretical studies are expected to be helpful in understanding the g-jitter effects on fluid mechanic process specifically in microgravity environment.

Keywords
g-Jitter; theoretical studies; fluid flow; microgravity environment.
001: Fuzzy C-Means Clustering in Modelling Dengue Incidence Rate in Malaysia

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Abstract
This study attempts to obtain the best fitted model among two clusters which describe the relationship between dengue incidence rate (DIR) and relevant covariates such as climatic and non-climatic variables. The significant variables include amount of rainfall and number of rainy days with lag 0 until 3 months, number of locality and population density. Fuzzy C-Means clustering (FCM) was applied in clustering DIR data based on the value of membership function. The boundary of membership function has been set as 0.5. There are two clusters identified in this study with Cluster 1 consist of 569 data and Cluster 2 consist of 43 data. Models were developed to predict future DIR in state of Malaysia by using negative binomial Generalised Additive Model (GAM). Results shows the model become useful to Malaysia for future development in controlling and reducing the number of dengue cases particularly in Malaysia.

Keywords
DIR; Fuzzy C-means; negative binomial; generalised additive model.

002: Identifying the Ideal Number Q-component of the Bayesian Principal Component Analysis Model for Missing Precipitation Data Treatment

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Abstract
The grassroots of the presence of missing precipitation data are due to the malfunction of instruments, error of recording and meteorological extremes. Consequently, an effective imputation algorithm is indeed much needed to provide a high quality complete time series in assessing the risk of occurrence of extreme precipitation tragedy. Therefore, this study desired to investigate the effectiveness of various Q-component of the Bayesian Principal Component Analysis model associates with Variational Bayes Algorithm (BPCAQ-VB) in missing precipitation data treatment, which the ideal number of Q-component is identified by using The Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) algorithm. The number of the Q-component investigated in this study is ranging from two to six components, where the precipitation time series has been sorted respect to weekly duration. The effectiveness of BPCAQ-VB algorithm in missing precipitation data treatment is evaluated by using four distinct precipitation time series, including two monitoring stations located in inland and coastal regions of Kuantan district, respectively. The analysis results rendered the BPCA5-VB is superior in missing precipitation data treatment for the coastal region time series compared to the single imputation algorithms proposed in previous studies. Contrarily, the single imputation algorithm is superior in missing precipitation data treatment for an inland region time series rather than the BPCAQ-VB algorithm.

Keywords
Bayesian principal component analysis model; Data treatment; TOPSIS; Variational Bayes.
004: Application of Caputo-Fabrizio Fractional Order Derivative (NFDt) in Simulating the MHD Flow of the Third Grade Non-Newtonian Fluid in the Porous Artery

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Abstract
This study is focused on steady, two dimensional hydromagnetic mixed convection Falkner-Skan flow of Casson fluid over a moving wedge through porous medium in the presence of chemical reaction. The effects of slip and convective boundary conditions are also taken into account. The similarity solutions are obtained using Keller-box method. Comparisons with existing literature are performed and good agreement is obtained. The influence of pertinent parameters on velocity, temperature and concentration profiles as well as skin friction coefficient, Nusselt number and Sherwood number are illustrated graphically. It is found that velocity increases with increase of Casson fluid parameter and slip parameter whereas dimensionless temperature falls for both parameters. It is also noticed that thickness of thermal boundary layer grows with increase of radiation and surface convection parameters. The wall shear stress increases with the increase of slip parameter and porosity parameter while reduces as Casson fluid parameter increased. The mass transfer rate is found higher with increment in chemical reaction parameter.

Keywords
Caputo-Fabrizio fractional derivative; unsteady pulsatile; incompressible fluid.

005: Analytical Solution of Mathematical Model for ERK Activation in The Presence of Competitive Inhibitor

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Abstract
The extracellular signal regulated protein kinase (ERK), a subfamily of mitogen activated protein kinase (MAPK) pathways is one of the most important signals in the regulation of many biological processes. Deregulated of MAPK signaling path-ways has been observed in human cancers with potential involvement in most of cellular processes leading to tumorigenesis so that it became a potential target for therapy in cancer patients. In this paper, we discuss a mathematical model of ERK activation in the presence of a small molecule inhibitor that competes with RAS. We use the He's Homotopy Perturbation Method (HPM) to present analytical expressions for the concentration of RAS, complex RAS-ERK, complex RAS-Inhibitor, and activated ERK in terms of dimensionless parameters. The analytical results are compared with numerical simulation and satisfactory agreement is obtained.

Keywords
Analytical solution; competitive inhibitor; ERK activation; Homotopy Perturbation Methods.
009: The Design of Student Worksheet Based PBL to Improve Problem Solving Ability of the Eighth-Grade Students Junior High School in Indonesia

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Abstract
The ability to problem-solving math student is still low. Student worksheet can facilitate students in a problem-solving exercise. Problem Based Learning can improve problem-solving skills. The purpose of this research is to develop the design of student worksheet based PBL to improve the problem-solving ability to the eighth grade even semester of junior high school. This research used Four-D development model. The development procedure includes four stages: define, design, develop, and dissemination. The subjects of the study were the eighth-grade students' junior high school 9 Yogyakarta, Indonesia. The object of this research is curriculum, student characteristics and evaluation of teaching materials. Data collection instruments include questionnaires, observation guides, interview guides, and questions. This research resulted as a) the results of needs analysis of student worksheet based PBL to improve the problem-solving ability appropriate to the curriculum, characteristics of students, materials, and learning objectives. b) The designs of the student worksheet consist of: a cover, introduction, table of contents, instructions manual, basic competencies and indicators of competency achievement, supporting information, action steps, and exercises. This research can be continued to develop and dissemination.

Keywords
PBL

010: Preparation and Characterization of Magnetite (Fe₃O₄) nanoparticles by Sol-Gel Method

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Abstract
The magnetite (Fe₃O₄) nanoparticles were successfully synthesized and annealed under vacuum at different temperature. These Fe₃O₄ nanoparticles can be used for many applications such as drug delivery system, ferro fluid, and sensing application. The magnetite (Fe₃O₄) nanoparticles prepared via sol-gel assisted method and annealed at 200-400 0C were characterized by, Fourier Transformation Infrared Spectroscopy (FTIR), X-ray Diffraction spectra (XRD), Field Emission Scanning Electron Microscope (FESEM) and Atomic Force Microscopy (AFM). The XRD result indicated the presence of Fe₃O₄ nanoparticles, and Scherer’s Formula calculated the mean particles size in range of 2-25 nm, the FESEM result shows the morphologies of the particles annealed at 400 0C are more spherical and partially agglomerated, the EDS result also indicates the presence of Fe₃O₄ by showing Fe-O group of elements. AFM analyzed the 3D and roughness of the sample; the Fe₃O₄ nanoparticles have a minimum diameter of 79.04 nm, which is in agreement with FESEM result. In many cases, the synthesis of Fe₃O₄ nanoparticles using FeCl₃ and FeCl₂ has not been achieved, according to some literatures, but this research was able to obtained Fe₃O₄ nanoparticles base on the characterization results.

Keywords
Sol-Gel method, magnetite nanoparticles, particles size, Morphologies, XRD
011: Design of Student Worksheets based on Learning Cycle 5E Learning Model for VIII Junior High School Students in Indonesia

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Abstract
The ability of a mathematical connection is one of the skills that must be possessed by students in the learning process of mathematics. Connects mathematical concepts to gain meaningful learning. Learning cycle 5E is one of the learning models that can improve students' mathematical connection ability. Student worksheets can make it easier for students to practice connecting. This article aims to develop a student worksheet design that makes it easier to connect mathematical concepts based on 5E learning cycle model. This research is a research of ADDIE model development which consists of four stages, namely: analysis, design, development, implementation, and evaluation. This research is only up to the design stage. The subjects of the study were students of Junior High School IT-Abu Bakar Muhammadiyah Yogyakarta Indonesia. Data collection instruments include interview sheets, document sheets, and description sheet. Sheet interviews to retrieve curriculum data, student characteristics, document sheets to evaluate teaching materials, description sheets to determine students' mathematical connection ability. Data analysis techniques used qualitative data analysis. This study resulted in the design of student worksheets that fit the characteristics of students, curriculum, and teaching materials. Student worksheets are designed to improve the ability of mathematical connections. Research can be developed in the development, implementation and evaluation stage.

Keywords
5E learning cycle model.

012: Design of Student Worksheet Mathematics Based on Learning Cycle to Improve Ability of Mathematics Representation Students of Class VIII Junior High School in Indonesia

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Abstract
Mathematical representation is very important for students because it can affect students in material matters and problem-solving. Application of 5E learning cycle learning model can help in overcoming students' difficulties in mathematical modeling and geometry understanding. Student worksheets simplify the implementation of learning cycle and can train the ability of mathematical representation. This article aims to develop a learning product in the form of a Learning Cycle based student worksheet oriented to students' mathematical representation abilities. This research is development research with 4D: define, design, development, and dissemination. The research was conducted in class VIII MTs Mu'allimmat Yogyakarta, Indonesia. Subjects in this study were teachers, students, material experts and media experts. Data collection methods used in this study are interviews, questionnaires, and tests. Instruments used in the form of validation sheet, teacher response questionnaire, student response questionnaire, mathematical representation and interview guidance test. From the research result obtained: (1) result of requirement analysis of student worksheet according to curriculum, student characteristic, ; (2) the design of the student worksheet, which consists of: title, introduction, table of contents, user manual, basic competence, competency achievement indicator, material summary, activity steps and evaluation. This study is limited to the design stage. For further research will proceed at the stage of development and dissemination.

Keywords
Student worksheets; learning cycle; mathematical representations.
013: Design of Mathematics Student Worksheet Based on Discovery Learning Approach to Improving Mathematical Representation Ability Students of Grade VII Junior High School in Indonesia

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Abstract
The ability of mathematical representation is very important for someone to help in solving the problem. This type of research is a development research. This article aims to obtain a student workbook design based on Discovery Learning that is oriented towards students' mathematical representation abilities. This research is a research development of Research and Development (R&D) with 4D development model which includes defining, design, development, and dissemination. This study is limited only to the design stage. Subjects in this study are students of junior high school grade VII MTs Ma'arif Ngalian Wonosobo Indonesia. An instrument used in this study in the form of essay questions, questionnaire and interview guidelines. This research resulted in the LKS design based on Discovery Learning based on the ability of mathematical representation to improve the ability of mathematical representation. The next stage will be the research stage of development and dissemination to produce a valid, practical, and useful LKS.

Keywords
Worksheet; discovery learning; mathematics representation.

014: Design of Mathematics Student Worksheet Based on RME Approach to Improving the Mathematical Communication Ability Students of Class VII Junior High School in Indonesia

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Abstract
The ability of math communication is still relatively low. The RME approach can improve the communication skills of mathematics. The student worksheet is used because it is shorter, easier and summarizes the material along with the questions so as to help the students in the ability of mathematical communication. This study aims to develop teaching materials in the form of student worksheets based on Approach of Mathematics Education Realistik Indonesia oriented on students' mathematical communication skills. This research is a development research with ADDIE development model, that is analysis, design, develop, evaluation implementation. The subject is the students of the first grade of VII. Instruments used in the form of validation sheet, mathematical communication ability test and interview guidance manual. Interview guides are conducted to teachers and students to find out the curricula and character of students in the school. The validation sheet is addressed to material experts and media experts. The test to determine students mathematical communication skills is done before and after the use of student worksheet so that it is known whether there is an increase in students' mathematical communication ability namely data reduction, presentation, and conclusions. This research resulted in the design of student worksheets based on the RME approach that suits the characteristics, curriculum, and student tasks. Student worksheets are designed to improve students' mathematical communication skills. Designing student worksheets are part of the ADDIE development procedure. The student worksheet component consists of three parts: The opening; The content and The closing section.

Keywords
Mathematics communication; RME; worksheet.
017: Effect of Light Intensity on the Total Flavonoid and Total Phenolic Contents of Mikania micrantha and Tridax procumbens

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Abstract
Flavonoid and phenolic are secondary metabolites produced by plants in response to harsh environmental conditions. Light is one of the most important ingredients that affect their production. Mikania micrantha and Tridax procumbens are plants belonging to Asteraceae family, and they have bioactivity due to their flavonoid and phenolic contents. The objective of the research is to determine the effect of varying light intensity on the total flavonoid and total phenolic contents of M. micrantha and T. procumbens using three solvents (ethanol, methanol and water). Total flavonoid contents were determined based on the aluminium chloride colorimetry method while total phenolic contents was determined based on the folin-chiocalteau reagent. The results obtained in the study show that ethanol recovers more flavonoid and phenolic than the other solvents (P < 0.05). Besides, T. procumbens had more flavonoid and phenolic content compared to M. micrantha (P < 0.05). Nevertheless, the flavonoid and phenolic contents recovered from sun plants was more than that recovered from shade plants (P < 0.05). This leads to a conclusion that high light intensity can increase the concentration of flavonoid and phenolic of M. micrantha and T. procumbens.

Keywords
Flavonoid; light intensity; Mikania Micrantha; phenolic; Tridax procumbens.

020: A Comparison of OLS and Ridge Regression Methods in the Presence of Multicollinearity Problem in the Data

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Abstract
The presence of multicollinearity often leads to inconsistent parameter estimates in regression analysis. The common procedure in regression analysis that is Ordinarily Least Squares (OLS) is not robust to multicollinearity problem and will result in inaccurate model. To overcome this problem, a number of methods are developed in the literatures and the most common is ridge regression. Although there are many available literatures propose variety method to overcome multicollinearity problem in regression analysis, this study proposes the simplest model of ridge regression which is based on linear combinations of the coefficient of the least squares regression of independent variables to determine the value of k (ridge estimator in ridge regression model). The performance of the proposed estimator is investigated and compared to OLS and some recent existing methods. Thus, simulation studies based on Monte Carlo simulation are considered. The finding of this study is found to produce reliable estimates as in existing method and outperform OLS in the presence of multicollinearity in the data.

Keywords
Multicollinearity problem.
021: Caputo-Fabrizio Time Fractional Derivative Applied to Visco Elastic MHD Fluid Flow in the Porous Medium

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Abstract
In this paper the laminar fluid flow in the axially symmetric porous cylindrical channel subjected to the magnetic field was studied. Fluid model was non-Newtonian and visco elastic. The effects of magnetic field and pressure gradient on the fluid velocity were studied by using a new trend of fractional derivative without singular kernel. The governing equations consisted of fractional partial differential equations based on the Caputo-Fabrizio new time-fractional derivatives NFDt. Velocity profiles for various fractional parameter \( \alpha \), Hartmann number, permeability parameter and elasticity were reported. The fluid velocity inside the cylindrical artery decreased with respect to Hartmann number, permeability parameter and elasticity. The results obtained from the fractional derivative model are significantly different from those of the ordinary model.

Keywords
Laminar flow; Porosity; Hartmann number

022: Effect on Silicon Nitride Thin Films Properties at Various Powers of RF Magnetron Sputtering

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Abstract
Silicon nitride thin films have numerous applications in microelectronics and optoelectronics fields due to their unique properties. In this work, silicon nitride thin films were produced using radio frequency (R.F.) magnetron sputtering technique at various sputtering powers. The prepared thin films were characterized with XRD, FE-SEM, FTIR, surface profiler, AFM and spectral reflectance techniques for structure, surface morphology, chemical bonding information, growth rate, surface roughness and optical properties. The results showed that silicon nitride thin films were amorphous in nature. The films were smooth and densely packed with no voids or cracks at the surface. FTIR characterization informed about Si-N bonding existence which confirmed the formation of silicon nitride films. The sputtering power showed the impetus effect on growth rate, surface roughness and optical properties of produced films.

Keywords
Silicon nitride thin films; radio frequency.

Keywords
Continuity equation; four-dimensional functions; generalized Cauchy - Riemann conditions, The Euler equation.
023: Movement of Fluid Inside the Sphere

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Abstract
The paper presents an exact analytical solution of the stationary problem of an incompressible ideal fluid flow inside a sphere under the action of an external potential mass force.

Keywords
Continuity equation; four-dimensional functions; generalized Cauchy - Riemann conditions, The Euler equation.

025: Development of Students Worksheet Based on Realistic Mathematics Education in Indonesia

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Abstract
The concept of mathematics is one of the essential goals in learning mathematics, providing an understanding that the material taught to students not only as memorization but the concept of the subject matter itself. This study aims to develop student worksheet with a realistic mathematical approach. The method in this study uses the stages of 4-D development research which consists of defining, designing, developing, and disseminating. The data collection instrument is an expert validation instrument to measure students' validity and validity questionnaires to measure their practicality and get product development assessment from experts and students. The result shows that the developed Student Worksheet is valid with the validity level of 3.67 for Student Worksheet content aspect, the validity is 3.60 for the constructed aspect and 3.50 for the language aspect. Student worksheet was tested to 21 students of grade VII MTs N 2 Gunung kidul Indonesia and test results stated that student worksheet got a good response from students and practically used in the process of learning mathematics in class.

Keywords
Development; student worksheet; realistic mathematics education.
026: Design of Mathematics Module using Problem-Based Learning Approach (PBL) in Indonesia

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Abstract
The ability to solve problems is the primary purpose of the educational process. This ability is crucial for students. This study aims to design a learning module to increase students’ ability on problem-solving skills. The method used was the ADDIE model consisting of Analyze, Design, Develop, Implement, and Evaluation. The Instruments of data collection were in the form of the questionnaire, observation guidance, and an interview. Research subjects were teachers and students of Junior High School. Miles and Huberman data analysis technique were used to analyzing the data. The result of the study was in the form of a design of learning module based on the characteristics of students, curriculum analysis, and concept/material analysis. This design has the advantage to improve students’ problem-solving skills by referring to the criteria of problem-based learning approach (PBL). This research can be continued further into the learning module development phase.

Keywords
Instructional module design; problem-based learning; problem-solving

027: Design Worksheet Approach Realistic Mathematics Education Students Junior High School in Indonesia

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Abstract
The ability of mathematical literacy is a 21st-century skill that students must possess. This study aims to design student worksheets to improve students' mathematical literacy. The method used is a plomp model consisting of initial research, development of the prototype, and assessment. Subjects in this study were teachers and students class VIII of junior high school Muhammadiyah Banguntapan, Yogyakarta. Data collection instruments are questionnaires, interview guides. The technique of data analysis using the Likert scale. This research resulted in the design of student worksheets that are by the realistic mathematics education (RME) approach. This design has the advantage of improving students' math literacy skills. Research can proceed further to the assessment.

Keywords
Development of learning device; student worksheet; realistic mathematics education.
028: Design Development Learning Media Based PMRI Oriented Capabilities Study Creative Students Grade VII of Junior High School in Indonesia

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Abstract
The ability of students' creative thinking in solving math problems is still low. The low ability of creative thinking shows that students have not been able to use their learning experience well. To train students more creatively required learning tools that can provide a memorable learning experience. One such learning tool is the student worksheet (LKS) associated with real life so that students gain a memorable learning experience. Realistic Indonesian Mathematics Education (PMRI) is a learning approach that emphasizes a memorable learning experience. This research is trying to develop PMRI based learning tools to improve students' creative thinking ability. This research is a development research with the four-D model that contains define, design, develop, disseminate. This study is limited to the design stage. The design is made of learning media student work sheet based PMRI. Subjects of students of class VII MTs Muhammadiyah Karangkajen Yogyakarta Indonesia. Instruments used to retrieve data are the validation of the Lesson Plan (RPP), the Student Sheet validation sheet (LKS), and the validation sheet of the creative thinking ability test. The result of the research is LKS design based on PMRI which is suitable for student characteristic and curriculum 2013. LKS is designed to improve students' creative thinking ability. Research can be continued at the stage of development and dissemination.

Keywords
Creative thinking; PMRI; student worksheet

029: Design of Student Worksheet Based on Guided Discovery Approach in Indonesia

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Abstract
The ability to solve problem-solving is one of the 21st-century skills students must have. However, the students' ability on this issue is still low. That is due to several factors that are wrong is not yet available teaching materials that provide materials that can improve the ability to solve student problems. This study aims to design student worksheet based on guided discovery to improve problem-solving skills. The method used is a 4D model that is limited to the 2D stage, i.e., define and design. Subjects in this study were a teacher and junior high school students. Data collection techniques used is literature studies and non-test techniques with research instruments in the form of questionnaires. Data analysis techniques using Miles and Huberman. This study resulted in the design of student worksheets created based on the curriculum, materials, and characteristics of students. Besides, student worksheets are designed based on a guided approach to improve the ability to solve student problems. This research can continue in the development and dissemination stage.

Keywords
Guided discovery; problem-solving; student worksheet
**030: Design of Student Mathematics Worksheet Based on Realistic Mathematics Education (RME) in Indonesia**

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**Abstract**

Learning activities are essential in teaching and learning activities. In learning activities, students will solve their problems, try the skills and perform tasks according to the knowledge that students have. This research aims to design worksheet based on Realistic Mathematics Education (RME) to improve student learning activity. The method used is a 4D model that is limited to the 2D stage that are defined and design. The subjects of the research are the students of Junior High School class VII. Data analysis techniques using Miles and Huberman. Data collection techniques used in the form of literature review and non-test techniques with research instruments in the form of questionnaires. This research produces worksheet designs based on curriculum analysis, concept/material analysis, and student characteristic analysis. Other than, worksheet is designed based on RME approach. Worksheet design has advantages to improve student learning activities. This research can continue in the development and disseminate stage.

**Keywords**

Learning activities; RME; worksheet.

**031: Designing Fun Addition Number Operation Learning Using M-Engklex Game For Deaf Student**

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**Abstract**

Learning number operations at the primary school is important for learning other subjects. But several previous studies indicate that students have difficulty in understanding the concept of addition number operations, especially for the case of deaf students. The purpose of this study is to design learning addition operation number use M-Engklex game adapted from a traditional game from Indonesia namely Engklek for deaf students. This study uses a design research approach, the which is an appropriate way to answer the research questions and achieve the research objectives that start from preliminary design, teaching experiments, and retrospective analysis. Data collected by the literature review of relevant studies. The subject in this study is the deaf students from grade IV placed in State Elementary Diffable School in Bantul Indonesia. The result of this study is the role of addition number using M-Engklex game adapted from a traditional Engklek game for deaf students.

**Keywords**

Addition; deaf; design research; M-Engklex
032: Android Based Mathematival E-Book Design

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Abstract
The low ranking of the Indonesian state in the International Mathematics and Science Study (TIMMS) and the development of mobile android technology in Indonesia is the background of the development of the Android-based mathematical e-book design. The research is development research with Analysis, Design, Development, Implementation, and Evaluation (ADDIE) approach which is limited to design phase involving 56 students of class VII A and VII B and two mathematics teachers of Muhammadiyah Banguntapan Junior High School. The purpose of this research is to design an e-book based on mathematics android so ready to be developed into learning media. The results showed that the e-book design paid attention to the interactive multimedia aspect that combines text, image, sound, and video elements, containing algebraic material operation, and able to provide feedback for its users so it is expected to increase students' reading interest.

Keywords
E-book; deaf; mathematics; Android

033: Design of Student Worksheet with Open Software Geogebra Mathematic for Junior High School in Indonesia

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Abstract
Creativity is the soft skill needed for the 21st century. This study aims to design the Student Worksheet with Geogebra to improve student creativity. The design is done by developing model Analyze, Design, Develop, Implement, and Evaluate (ADDIE). The subject of this research is teachers and students of class VIII at State Junior High School 1 Banguntapan Yogyakarta. The instruments of data collection are questionnaires, observation guides, and interview guides. Descriptive data analysis techniques. This research resulted in the design of GeoGebra-assisted Student Worksheets. This design has the advantage of combining student worksheets with the use of GeoGebra as well as designed to enhance students’ creativity. Research can proceed further to Develop, Implement, and Evaluate.

Keywords
Creativity; Geogebra; learning device development; student worksheet.
035: Design of Student Worksheet with a Good Moral Cooperative Learning Approach in Indonesia

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Abstract

The ability of mathematical literacy is a 21st-century skill that students must possess. This study aims to design the Student Worksheet by cooperative learning approach to bring up a good moral character and improve students' mathematical literacy. The method used is an R & D model with the 2D instructional design with defining and planning phases. The data collection instruments used were a non-test, i.e., questionnaire, in the form of questionnaire validation of student worksheet and questionnaire of practicability with Likert scale filled by the validator, teacher, and student. Data analysis technique used in this research is descriptive data analysis technique. Subjects in this study were high school students. This research resulted in the design of student worksheets by curriculum analysis, material/concept analysis, and analysis of student characteristics. This design has the advantage of improving both morale and students' math literacy skills. The research stage is development and dissemination.

Keywords

Cooperative learning; good moral; student worksheet.

036: Designing the Additive Operation Integer Learning Fun Media Using Colored Paper for Deaf Student

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Abstract

Deaf students are now very difficult to understand a concept though knowledge is concrete. Missing or lack of ability to hear deaf students also make it difficult to communicate. This leads to backwardness in terms of education of deaf students compared with other normal students. The research was conducted with the aim to produce designs learning of mathematics at the material operations of addition of integers using colored paper media for deaf students. The method used in this research is the design resign in three stages: preliminary design, teaching experiment, and retrospective analysis. The subjects were students and the fourth-grade math teacher at the State Elementary School Diffable Bantul. Data collected by literature study method. The results of this study are the research design integer addition operation using colored paper medium suitable for deaf students.

Keywords

Addition; colored paper; deaf; design research.
038: Design of Mathematics Module Development with Problem Based Learning Approach in Indonesia

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Abstract
The learning process is related to the students’ ability in developing the concept which is very important to solve their problems, find examples, try the skills and carry out the tasks that depend on the knowledge that the students have. This study aims to design a mathematics module problem-based learning approach to improve student ability in problem-solving. The method used is a plomp model that is limited to the initial research stage and prototype development in the designing stage. The subject of the research is the students of Junior High School (SMP) of class VIII. Data analysis technique using the Likert scale which qualitatively. Data collection techniques in the form of literature review and non-test techniques with research instruments in the form of questionnaires. This research produces mathematical module design by problem-based learning approach which is made based on curriculum analysis, concept/material analysis and the characteristic analysis of students. The design of this module has advantages to improve students’ ability in problem-solving. This research continued at the assessment stage. Deaf students are now very difficult to understand a concept though knowledge is concrete. Missing or lack of ability to hear deaf students also make it difficult to communicate. This leads to backwardness in terms of education of deaf students compared with other normal students. The research was conducted with the aim to produce designs learning of mathematics at the material operations of addition of integers using colored paper media for deaf students. The method used in this research is the design resign in three stages: preliminary design, teaching experiment, and retrospective analysis, The subjects were students and the fourth-grade math teacher at the State Elementary School Diffable Bantul. Data collected by literature study method. The results of this study are the research design integer addition operation using colored paper medium suitable for deaf students.

Keywords
Module; problem based learning; problem-solving.

041: Numerical Investigation on Effect of Rounded Cutting Edge Radius and Machining Parameters in End Milling of AISI H13 Tool Steel

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Abstract
Applications of rounded cutting edge radius are commonly perform on finish cutting, semi-finish cutting, precision machining and micro-machining. The optimum performance of the rounded cutting edge radius is closely related on the work material, tool material and machining conditions. However, for numerous cutting process, the optimal radius of rounded cutting edge radius and machining parameters used in end milling of AISI H13 tool steel is yet unknown Therefore, in order to improve tool life and performance of a cutting tool, a suitable design of cutting edge geometry regarding cutting edge radius as well as machining parameters need to be examined and properly selected. In this regard, the paper deals to investigate the effect of rounded cutting edge radius and machining parameters on cutting forces, cutting temperature and chip formation during the end milling process of AISI H13 using uncoated cemented carbide cutting tool through finite element simulation of Thirdwave AdvantEdge 7.2 software. The machining parameters used in the simulation setup were cutting speed of 200 m/min and 240 m/min, feed rate of 0.03 mm/tooth and 0.06 mm/tooth and axial depth of cut of 0.1 mm and 0.2 mm while radial width of cut is kept constant at 6.0 mm. The cutting geometries includes the cutting edge radius of 0.03 mm and 0.05 mm and tool’s rake angle of 10°. The obtained results reveals that cutting forces and cutting temperature is increase as axial depth of cut and rounded cutting edge radius increases while increasing cutting speed and feed resulted in decreasing the cutting forces but increasing the cutting temperature. The maximum cutting temperature obtained is 674.91 which much lower than the austenitizing temperature of AISI H13 steel which means that the formation of white layer is believed to be difficult to be formed under cutting geometry and machining parameters used.

Keywords
Chip morphology; Cutting edge radius; Cutting temperature; Cutting force; Thirdwave AdvantEdge.
042: Empirical Investigation on Breakdown Characteristics of Air-CO$_2$ Gas Mixture under AC and DC Voltages

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Abstract

For years there have been countless efforts to find an environmental-friendly gas or gas mixtures to minimize SF$_6$. Researchers have been ongoing to find its alternatives where there are few gasses used to minimize SF$_6$, such as carbon dioxide (CO$_2$) and air. This paper aimed to study the effects of field uniformity towards breakdown characteristic of air-CO$_2$ gas mixtures under AC and DC voltage. Two types of electrodes were used in this experiment which are sphere-sphere electrode (D=5cm) and the rod-rod electrode. Other than that, there are five level of gap distances (0.5cm-2.5cm) with three mixing ratios (100% air–0% CO$_2$, 70% air–30% CO$_2$, 50% air–50% CO$_2$) in 2 bar (abs). The results show the breakdown voltage ($U_{50}$) of the sphere-sphere electrode is higher than the rod-rod electrode under AC and DC voltage. Besides, as the $U_{50}$ goes higher, the $E_{max}$ will be decreasing in any mixing ratio under AC and DC voltage. As for the results, the sphere-sphere electrode is more uniform field than the rod-rod electrode. Moreover, the sphere-sphere electrode has shown the highest withstand capacity of breakdown since they have provided less stress to the field gaps.

Keywords

Air; breakdown voltage; CO$_2$; field utilization factor; maximum electric field

043: Mathematical Communication With Guided Inquiry

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Abstract

The ability to communicate is an essential ability of every human being. The importance of communication is also indispensable in the learning process. In mathematical learning mathematical communication ability is very necessary to continue to be developed. The purpose of this research is to produce a valid and practical guided inquiry based mathematical instructional material for the learning of class X SMK students and to know the potential effect of instructional mathematical instructional materials based on guided inquiry for learning of class X vocational students. The research method used in this research is Design Research Type Development Studies. Research is done in two stages of preparation phase (Preliminary) and formative evaluation stage. Formative evaluation stage includes self evaluation, prototyping (expert review and one-to-one (low resistance to revision), and small group), as well as field test (high resistance to revision). The result of this research is the result of instructional material in the form of Student Worksheet (LKS) which valid and practical. Then based on the process of development and analysis of students' work in LKS, the prototype of teaching materials in the form of LKS based on guided inquiry model has a potential effect on students' mathematical communication ability.

Keywords

Development; mathematical communication; teaching materials
044: Hierarchical Bayesian Estimation for Stationary Autoregressive Models using Reversible Jump MCMC Algorithm

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Abstract
The autoregressive model is a mathematical model that is often used to model data in different areas of life. If the autoregressive model is matched against the data then the order and coefficients of the autoregressive model are unknown. This paper aims to estimate the order and coefficients of an autoregressive model based on data. The Bayesian hierarchy approach is used to estimate the order and coefficients of the autoregressive model. In the Bayesian approach, the order and coefficients of the autoregressive model are assumed to have a prior distribution. The prior distribution is combined with the likelihood function of obtaining a posterior distribution. Posterior distribution has a complex shape so that the Bayesian estimator is not analytically determined. The reversible jump MCMC algorithm is proposed to obtain Bayesian estimates. The performance of the algorithm is tested by using simulated data. The test results show that the algorithm can estimate the order and coefficients of the autoregressive model very well. Research can be further developed by comparing with other existing methods.

Keywords
Autoregressive model; hierarchical Bayesian; reversible jump MCMC

045: Impact of Ag Doped on the Ferromagnetic-metallic Transition in Pr0.75 Na0.25MnO3 Manganites

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Abstract
Monovalent doped Pr0.75Na0.25-Ag2MnO3 (y=0–0.10) manganite have been investigated using X-ray diffraction (XRD) and scanning electron microscope (SEM) as well as DC electrical resistivity and AC susceptibility measurement to clarify the influence of Ag doped on charge ordering (CO) state XRD analysis revealed all samples consists of essential single phase and crystallized in an orthorhombic structure with space group Pnma. SEM images of Pr0.75Na0.25-Ag2MnO3 compound shows the enhancement of the grains boundaries and sizes as well as the compaction of particles with increasing Ag content suggestively due to the successful substitution of Ag+ ions in the system. On the other hand, resistivity and susceptibility measurements showed that the y=0 sample exhibits insulating behaviour and anti-ferromagnetic. Interestingly, the metal-insulator transition and ferromagnetic- paramagnetic transition was observed for y=0.05 due the revival of double-exchange (DE) mechanism as a result of weakening the Jahn-Teller effect which caused the CO state to be weakened. However, increasing of Ag doped up to y = 0.10 induce back to anti-ferromagnetic insulating behaviour suggestively due to the weakening of DE mechanism.

Keywords
Monovalent; ferromagnetic-metallic; manganites
046: Determination of Optimum Machining Condition for Surface Roughness using Historical Data

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Abstract
Magnesium alloy is one of the lightest materials with a high strength to weight ratio and excellent machinability, which makes it attractive and suitable for various industrial applications such as automotive and aerospace components. For these particular industrial components, the end products require a mirror-like finish. This article details a statistical analysis about the effect of milling parameters on the surface roughness of Magnesium alloy AZ91D in the dry milling process. The historical data approach in the response surface methodology (RSM) was utilized to determine the cause and effect relationship between the input variables and output response. The effect of milling parameter studied was cutting speed (900 – 1400 m/min), feed rate (0.03 – 0.09 mm/tooth), and radial depth of cut (0.2 - 0.3 mm). The results confirmed that the interaction between feed rate and cutting speed is the primary factor controlling the surface evolution. The responses of various factors were plotted using a two-dimensional interaction graph and the cubic empirical model was developed at 95% confidence level. The optimum condition for achieving the minimum surface roughness was a cutting speed of 977 m/min, a feed rate of 0.02 mm/tooth, and an axial depth of cut of 0.29 mm. With this optimum condition, a surface arithmetic roughness of 0.054 μm is expected. This study confirmed that by milling AZ91D at high speed cutting, it is possible to eliminate the polishing process to achieve a super mirror-like finishing.

Keywords
High speed machining; AZ91D; surface roughness; dry cutting; optimize; response surface method; historical data.

047: Comparative Study on Structural, Electrical Transport and Magnetic Properties of Cr-doped in charge-ordered Pr0.75Na0.25Mn1-xCrxO3 and Nd0.75Na0.25Mn1-xCrxO3 Manganites

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Abstract
Cr doping in charge-ordered Pr0.75Na0.25Mn1-xCrxO3 and Nd0.75Na0.25Mn1-xCrxO3 have been synthesized using conventional solid-state method to investigate its effect on structural, electrical transport and magnetic properties. X-ray diffraction (XRD) analysis for both compounds showed that the samples were crystallized in an orthorhombic structure with Pnma group. The unit cell volume value decreases as the Cr-doped increased indicating the possibility of Mn1+ ion was replaced by Cr3+ due to the different of ionic radius. The temperature dependence of electrical resistivity show the both parent compound (x=0 and y=0) an insulating behaviour down to the lower temperature. Successive substitution of Cr at Mn-site in Pr0.75Na0.25Mn1-x, CrxO3 manganites induced the metal-insulator (MI) transition temperature around TMI ~ 120 K and TMI ~ 122 K for x=0.02 and x=0.04 samples respectively suggestively due to the enhancement of double-exchange (DE) mechanism as a result of suppress the CO state. Analysis of resistivity data of dlnρ/dT-1 vs T in Nd0.75Na0.25Mn1-xCrxO3 manganite, showed a peak around 210 K and 160 K for y = 0 and 0.02 samples respectively while no peak was observed for y = 0.05 sample indicate the charge-ordered (CO) weakened. AC susceptibility, γ measurements in Pr0.75Na0.25Mn1-xCrxO3 showed the Curie temperature, TC increases with Cr content from 132 K for x = 0.02 to 141 K for x = 0.04 and exhibit PM-FM transition indicate the suppression of CO state meanwhile in Nd0.75Na0.25Mn1-xCrxO3 showed PM-AFM transition as Neel temperature TN increases from 115 K for y = 0.02 to 125 K. for y = 0.05.

Keywords
Cr-doped: Pr0.75Na0.25Mn1-xCrxO3; Nd0.75Na0.25Mn1-xCrxO3; manganites.
048: Depth-dependent Optical Stiffness toward Water-air interface

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Abstract

This research attempted to quantify the optical stiffness of trapped polystyrene bead toward water-air interface. The optical tweezers with 975 nm wavelength was used to optically trap a single 3 micron diameter of bead in a water-contained cell with air exposed top water surface. The optical stiffness was justified on effective radius \( r^* \) of the bead lateral spatial distribution. The scattered light signal due to the trapped bead at different laser focus height from the bottom glass-water interface (less than 20 \( \mu \)m) and laser trapping powers (1.7 mW to 7.5 mW) were analyzed to investigate the \( r^* \) profile. It was found that within our experimental condition, \( r^* \) was independent of focus height at fixed power and exponentially decay with respect to laser power at fixed focus height.

Keywords
Depth dependent; optical stiffness; water-air interface; spatial distribution.

049: Observation of Charge Ordering Signal In Monovalent doped \( \text{Nd}_{0.75}\text{Na}_{0.25-x}\text{K}_x\text{Mn}_1\text{O}_3 \) (0<\( x \)<0.10) Manganites

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Abstract

K doping in the compound of \( \text{Nd}_{0.75}\text{Na}_{0.25-x}\text{K}_x\text{Mn}_1\text{O}_3 \) (\( x = 0, 0.05 \) and 0.10) manganites have been investigated to study its effect on crystalline phase and surface morphology as well as electrical transport and magnetic properties. The structure properties of the \( \text{Nd}_{0.75}\text{Na}_{0.25-x}\text{K}_x\text{Mn}_1\text{O}_3 \) manganite have been characterized using X-ray diffraction measurement and it proved that the crystalline phase of samples were essentially single phased and indexed as orthorhombic structure with space group of \( pmma \). The morphological study from scanning electron microscope showed there was an improvement on the grains boundaries and sizes as well as the compactness with K doping suggestively due to the difference of ionic radius. On the other hand, DC electrical resistivity measurement showed all samples exhibit insulating behavior. However, analysis of \( d\ln\rho/dT \) vs \( T \) revealed the clearly peaks could be observed at temperature 210K for \( x = 0 \) and the peaks were shifted to the lower temperature around 190K and 165K for \( x = 0.05 \) and \( x = 0.1 \) respectively, indicate the existence of charge ordering (CO) state in the compound. Meanwhile, the investigation on magnetic behavior showed all samples exhibit transition from paramagnetic phase to anti-ferromagnetic phase with decreasing temperature and the \( T_N \) was observed to shift to lower temperature suggestively due to weakening of CO state.

Keywords
X-Ray Diffraction; scanning electron microscope; electrical properties; magnetic properties.
050: A Study of Geometry Concept Mathematization Process on Blind Student Visual Imagery

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Abstract
Mathematization is organizing activities in finding regularities, relationships, and structures using first knowledge and skills. Mathematical learning classifies mathematization that is are horizontal mathematization and vertical mathematization. The horizontal mathematization deals with generalizing processes, while the vertical mathematization is a form of formalizing. This research analyzes geometry concept mathematization process on blind student visual imagery. This research was an exploratory study using a qualitative approach. The subject of this research was one of the sixth-grade students who experienced a total blind since fifth grade from Elementary School for exceptional children in Surabaya-East Java. The researcher interviewed and observed the subject that carried out two times by using similar problems at two different times for time triangulation. A subject is assigned to explain his thinking about the definition of the angle that his recognize in their way. A blind student who grapples with imaginative ideas on visual imagery that translated into formal definitions. Although the formal definition of the student has not entirely fulfilled his formal mathematical definition, he has been constructed the concept of the angle through mind experiments and sought to give the imagined meaning about the angle with his visual limitations.

Keywords
Visual Imagery; geometry concept; mathematization process.

052: Preliminary Observations of Zooplankton in Pulau Tinggi, Marine Park, Johor, Malaysia

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Abstract
Zooplankton was studied in Pulau Tinggi, Marine Park, Johor, Malaysia for their abundance and species diversity. Water samples were collected within three months, April, June and October 2015. Ten sampling stations were established during the study period. A total of 54 species of copepods from 29 genera and 22 families were identified, comprising of average 86.53 % among the zooplankton groups. Water quality parameters such as depth, dissolved oxygen, pH, temperature, turbidity, and salinity were measured in situ. The present study was taken to observe the abundance and diversity of zooplankton in Pulau Tinggi, Johor. This research will be helpful for fisheries authorities and marine controlling departments. The effect of different physico-chemical parameters on the biomass and density of zooplankton will be discussed in the coming paper.

Keywords
Zooplankton; biomass
053: Development and Effectiveness of Interactive Learning Media for Courses of Mathematical Logic and Set Reviewed from Students Self Confident on Computer

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Abstract
This research aims to find out how to develop and produce interactive learning media using Adobe Flash CS3 for students of mathematics education in the course of mathematical logic and Set in class D academic year of 2017/2018, as well as how the quality of the resulting learning media. The population in this research is the entire class D in first semester student in Mathematics Education academic year of 2017/2018. The model used is the development model of the development of the Borg and Gall which includes: (1) analysis of the content standards, (2) the collection of references to interactive media, (3) the preparation of draft interactive media, and (4) creation of interactive media in the form of digital discs (CD). Interactive multimedia has produced good quality according to the assessment of the learning material and the experts, media experts, and students of D academic year of 2017/2018, with an average score of a maximum score of 260 209.48. As for their effectiveness against the confident students towards computer shows there, 73.81% of students feel able to get good grades if learning with computers, 57.14% of students feel very confident when starting to learn with computers, and 50% students learn to feel confident with computers.

Keywords
Interactive learning media; mathematical logic; set.

054: Finite Element Analysis on Pelvis with Leg Length Inequality

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Abstract
Leg length inequality, also known as leg length discrepancy (LLD) is a condition which the left and right legs of an individual are noticeably different in length. When the level of LLD is high, such as those of 20 mm and above, it would disturb the wellbeing of an individual in terms of gait, and also causes them to experience higher stress in their pelvis compared to individual without LLD. In order to study load due to LLD had affects human bones such as the pelvic bone, finite element analysis (FEA) approach is usually used as it allows limitless attempt to investigate the stress-strain response on human bones and is far more practical than experimenting on real bones, therefore FEA was done with by using ANSYS 15.0. From the data obtained via FEA, the risk of fracture can be calculated, which gives us an insight on how would LLD affects the risk of bone fracture. In this study the effect of pelvic tilt caused by LLD has been studied, along with how loads at various LLD level affects the pelvic bone. The verdict from the study is the pelvic tilt caused by LLD amplifies the maximum stress and strain on the pelvic bone. The analysis using hip load due to LLD shows a downtrend for the maximum stress caused by the longer limb as the level of LLD increases, while the maximum stress caused by the shorter limb shows an uptrend with the increment of LLD. The maximum stress and strain observed are usually distributed around the sacroiliac joint. It is also observed that the higher the level of LLD is, the higher the maximum stress on pelvic bone will become, hence the higher the fracture risk.

Keywords
Finite element; fracture risk; leg length inequality; pelvic.
055: An Application of Proposed Ridge Regression Methods to Real Data Problem

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Abstract
The Ordinary Least Squares (OLS) is a common method to investigate the linear relationship among variable of interest. The presence of multicollinearity will produce unreliable result in the parameter estimates if OLS is employed to estimate the model. Due to such reason, this study aims to use the proposed ridge estimator as linear combinations of the coefficient of least squares regression of explanatory variables to the real application. The numerical example of stock market price and macroeconomic variables in Malaysia is employed using both methods with the aim of investigating the relationship of the variables in the presence of multicollinearity in the data set. The variables of interest are Consumer Price Index (CPI), Gross Domestic Product (GDP), Base Lending Rate (BLR) and Money Supply (M1). The obtained results show that the proposed procedure is able to estimate the model and produce reliable result by reducing the effect of multicollinearity in the data set.

Keywords
Ordinary least squares; multicollinearity.

056: An Overview for Enzymatic Treatment of Xenobiotic in Greywater by Fungi

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Abstract
Xenobiotic organic compounds (XOCs) are aromatic compounds, which are divided into three groups: polyaromatic hydrocarbons (PAHs), benzene/toluene/ethyl benzene/xylene (BTEX) and the synthetic substituted aromatics typified by the chlorophenols. PAHs are among these compounds which have carcinogenic effect and accumulated with high concentration in the industrial sites. XOCs include pesticides, polyfluoroalkyl substances (PFASs), pharmaceuticals and personal care products (PPCPs), endocrine disrupting chemicals (EDCs), active pharmaceutical ingredients (APIs), and phosphorus-containing flame retardants (PFRs). The aromatic structure of XOCs includes two or more benzene rings. Despite many studies conducted and reviewed of those compounds in soil by the fungi. This study aims to review the enzymatic mechanism of fungi to degrade XOCs in the greywater.

Keywords
Fungi; greywater.
057: Influence of Light Intensity on the Photosynthesis and Phenolic Contents of Mangifera indica

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Abstract

Light is an important environmental factor that have an influence on a plants photosynthesis and production of secondary metabolites like phenolic compounds and flavonoid. Mangifera indica from the family Anacardiaceae is known to have bioactivity due to its phenolic and flavonoid contents. The objective of the study is to determine the influence of light on the photosynthesis and phenolic contents of M. indica. Photosynthesis of the plant was measured using a portable photosynthesis system referred to as LICOR- 6400. Photosynthetic pigments as well as phenolic and flavonoid contents were quantified using a UV-VIS spectrophotometer. The outcome derived from the study shows that sun leaves of the studied plant were having the maximum photosynthesis, saturation and compensation points (P < 0.05). Moreover, sun leaves were having higher carotenoid, phenolic and flavonoid contents but lower chlorophyll contents. This leads to a conclusion that sun leaves of M. indica contribute the highest photosynthesis and phenolic contents to the plant.

Keywords

Flavonoid; light intensity; Mangifera indica; phenolic; photosynthetic pigment.

058: Assessment and Potential of Carbon Storage Capacity of Species of Herbaceous Plants in Universiti Tun Hussein Onn Malaysia, Main Campus, Batu Pahat, Johor Malaysia

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Abstract

Carbon dioxide is an important trace gas in earth's atmosphere. Carbon dioxide is a greenhouse gas that plays a vital role in regulating earth's surface temperature through the greenhouse effect. Increase beyond the ambient concentration leads to global warming. Increase in carbon dioxide discharge in UTHM (238.8964 ha), due to the increase number of vehicles, other greenhouse gases release from buildings, amenities and discharges from neighbouring industries appeals for attention. Study was conducted on seven most common species of herbaceous plants for their capacity to sequester a considerable quantity of carbon dioxide. The estimation of carbon storage of herbaceous plants was obtained by the assessments of the aboveground standing biomass and their photosynthetic capacity. Results indicate that Musa sp has the highest carbon dioxide absorption (12.2µmol m⁻² s⁻¹) followed by Heliconia psittacorum (10.63µmol m⁻² s⁻¹). Euphorbia tithymaloides and Costus spicatus had the lowest absorption with 3.63and 3.76 µmol m⁻² s⁻¹ respectively. Calathea lutea and Hymenocallis latifolia had the highest biomass accumulation (0.04 kg), been the highest, this were followed by Euphorbia. tithymaloides and Alpinia purpurata with (0.02 kg) that are higher than Hymenocallis psittacorum and Costus spicatus with the lowest biomass accumulation (0.01 kg). The total standing biomass captured by all the species of herbs is 0.15 kg. Therefore, species of herbaceous plants in UTHM have the potentials to absorb adequate amount of carbon dioxide from the atmosphere thereby contributing to reducing-the effects of localised global warming.

Keywords

Carbon dioxide sequestration; tropical vegetation; global warming; climate change; biomass.
059: Characterization of Polystyrene/Titanium Dioxide Nanocomposites (PS/TiO$_2$NCs) for Photocatalytic Degradation Application in Tuning the Composite Energy Band Gap: Review

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Abstract

Synthetic polymer/TiO$_2$ composite such as Polystyrene/TiO$_2$ has become recent highly research materials due to its potential and significant application in various fields. Both polymer and nanometal particles can be tuned through various style such as varying the materials concentration, molecules and nanoparticles sizes and shapes and recently by introduction of mild laser exposure especially in tuning the energy band gap of the polymer/TiO$_2$ composite. In this review, several methods of preparation are briefly explored such as Pan-Milling, Precipitation, Melt Compounding, Dip-coating, Solution Cast and Sol-Gel method. Some recent advancement that focuses on the two basic elements: polymer and TiO$_2$ are also included especially discussing on Photocatalytic Degradation that introduce photon as manipulate parameter to tune the polymer/TiO$_2$ composite energy band gap. SEM analysis of various polymer/TiO$_2$ (type n concentration) and Polystyrene/TiO$_2$ (concentration and nanoparticles sizes) are as the focus of the discussion before introducing the mild laser exposure as photo-degradation source.

Keywords

Polystyrene, Titanium Dioxide, Nanocomposite, Laser Irradiation, Photocatalytic Degradation.

060: Medical Image Compression using Standard Deviation-Based Wavelet Coefficients Thresholding Method

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Abstract

In recent decades, digital images have become increasingly important. With many modern applications use image graphics extensively, it tends to burden both the storage and transmission process. Despite the technological advances in storage and transmission, the demands placed on storage and bandwidth capacities still exceeded its availability. Moreover, the compression process involves eliminating some data that degrades the image quality. Therefore, to overcome this problem, an improved thresholding and quantization techniques for image compression is proposed. Firstly, the generated wavelet coefficients obtained from the Discrete Wavelet Transform (DWT) process are thresholded by the proposed Standard Deviation-Based Wavelet Coefficients Threshold Estimation Algorithm. The proposed algorithm estimates the best threshold value at each detail subbands. This algorithm exploits the huge number of near-zero coefficients exist in detail subbands. For different images, the distribution of wavelet coefficients at each subband are substantially different. So, by calculating the standard deviation value of each subband, a better threshold value can be obtained. The results are then compared to the existing algorithms and it is found that the proposed compression algorithm shows double increase in compression ratio performance, produces higher image quality with PSNR value above 40dB.

Keywords

Image compression; thresholding; wavelet.
061: Removal Heavy Metals from Textile Wastewater using Sugarcane Bagasse Activated Carbon

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Abstract
Excessive release of textile wastewater with heavy metals into environment has posed a great problem to the natural water system. The efficiency of the adsorption process to remove heavy metals depend on the adsorbent. The commercial activated carbon is one of the most efficient adsorbent, but the limitation lies in the high cost. Therefore, the present study aimed to investigate the efficiency of sugarcane bagasse activated carbon (SBAC) modified by phosphoric acid as adsorbent for the removal of zinc (Zn) and Ferum (Fe) from the textile wastewater. The adsorption process was conducted using batch method as a function for pH (27), contact time (30 min to 24 h) and adsorbent dosage (0.6 to 6g). The finial concentrations of the metal ions were determined by ICP-MS. The results revealed that the adsorption efficiency increased with the contact time, the optimum time was recorded after 2 h. The removal percentage of Zn and Fe associated with the adsorbent dosage due to the because of greater surface area with optimum value of 4.0 g. The increasing of pH from 2 to 6 correlated with high adsorption efficiency, with the optimum condition at pH 5. The maximum percentage removal of Fe, Zn was 80%. These findings indicated that the SBAC is an attractive alternative adsorbent material for the metal ions removal in textile wastewater.

Keywords
Adsorption; heavy metal; sugarcane bagasse; activated carbon.

062: Optimizing Reaction Time for Size-controlled Synthesis of Hydrothermally Grown TiO2 Nanostructure

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Abstract
Titanium dioxide or titania shows a great interest in solar cell application due to its morphology and crystalline structure. Moreover, it is an affordable compound that could make solar cells more economical than traditional silicon solar cells. In this study, one-step hydrothermal method is demonstrated to synthesis TiO2 nanorods and nanoflowers morphology in nano-scale dimension on different hydrothermal reaction times. Increasing the reaction time could influence in formation of highly crystalline rutile phase titania nanostructure before abruptly decreases as the prolong hydrothermal process carry out. The length of the nanorods shows increasing behaviour and the growth of nanoflowers are stacking to each other and become denser obviously. Band gap estimation is 2.75 eV slightly lower than bulk rutile TiO2. It shows that the growth mechanism under different reaction times has great influences on the morphologies and alignment of the nanostructure. These results serve as guiding principles for preparing high quality of thin film for potential applications in low-cost solar cells fabrications.

Keywords
Hydrothermal; nanorods/nanoflowers; rutile phase; titanium dioxide; thin film solar cell
063: Recycled Concrete Aggregates as a Filter for Removal of Phosphorus in Synthetic Wastewater

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Abstract

This paper assesses of recycled concrete aggregates as a filter for removal of phosphorus (P) in synthetic wastewater. Recycled concrete aggregate (RCA) used as a filter system emerged as an alternative technology for phosphorus removal. This can overcome the problem of construction site waste by converting the waste into something valuable products. Thus, this study aim to investigate the physical and chemical characteristic of RCA that influenced adsorption of P and to determine the percentage of P removal by using two different size of RCA which is (5 mm to 10 mm) and (25 mm to 30 mm). A total of five vertical recycled concrete aggregate filter laboratory scale was design using recycled concrete aggregate and five different concentration of synthetic wastewater which is 10–50 mg/L was prepared. Samples were taken from the influent and effluent filters to be tested once a week, and analyzed to determine the amount of pH, the uptake capacity of Phosphorus (q) and the percentage of Phosphorus removal (%). RCA was analyzed using Scanning Electron Microscopy (SEM) and Energy-dispersive X-ray spectroscopy (EDX) testing to determine chemical composition. Results shows that RCA is highly contained with Aluminium, Calcium and Magnesium elements that enhanced the phosphorus adsorption. The RCA with size 5 mm to 10 mm and synthetic wastewater 10 mg/L display high potential in removing P with 99.54% removal at pH 9.77. Furthermore, this RCA also shows the highest uptake capacity (q) of 3.45 at concentration of synthetic wastewater 50 mg/L. The lower concentration of synthetic wastewater, smaller size of RCA and higher pH have slightly better Phosphorus removal efficiency. Thus, RCA has a potential in removing P from synthetic wastewater.

Keywords

Chemical characteristic; phosphorus; physical characteristic; recycled concrete aggregates; synthetic wastewater.


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Abstract

Seed-mediated growth method (SMGMM) in preparation of gold nanoparticles becomes one of the most popular methods due to the simplicity of the experimental procedures and flexibility in structural modifications. In this paper, we report a new method for synthesizing gold nanoparticles using silver seeds. The effect of seed concentration and growth time are investigated in this work. By increasing the silver seed concentration, it is found that the color of the colloidal gold nanorods obtained are changed from light pink to reddish purple, the surface plasmon resonance band is shifted to the blue region whereas absorption spectra becomes narrower. The additional peak is also spotted when increasing silver seed concentration to 5 µl. Meanwhile, increasing the growth time from 5 to 240 minutes tends to increase the color concentration of the solution. Besides that, the absorbance of colloidal gold nanorods is also increased with an increase in the growth time whereas optimum growth time is found to be 45 minutes. FESEM characterization shows that gold nanoparticles shapes are dominated by nanorods with average length, width, and aspect ratio are 129.8 nm, 42.9 nm, and 3.4, respectively. The energy-dispersive x-ray spectroscopy (EDX) shows the chemical composition of the synthesized sample is Gold (Au) with weight % and atomic % are 32.23 and 5.98, respectively. Besides that, signals from Carbon (C), Oxygen (O), and Indium (In) atoms were also recorded from EDS spectra. The present approach thus provides new method for synthesis gold nanoparticles with additional plasmon resonance peak thus it has very potential for application in plasmonic sensing.

Keywords

Localized surface plasmon resonance; gold nanoparticles; gold nanorods; plasmonic sensor.
065: Optical Temperature Sensor based on Sagnac Interferometer

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Abstract
A high sensitivity all-fiber temperature sensor is proposed and experimentally demonstrated in this work. The proposed optical temperature utilizes Sagnac interferometer as the temperature head. The underlying mechanism for this sensor is based on the temperature dependence of a polarization maintaining fiber (PMF) in the Sagnac interferometer. Experimental results indicate that the temperature does affect the PMF characteristic. As the temperature increases from 30°C to 45°C, the wavelength dip reduced from 1553.8 nm to 1536.78nm. This proposed optical temperature sensor has a sensitivity of -1.0345 nm/°C.

Keywords
Fiber optics; optical sensor; sagnac interferometer; sensor sensitivity; temperature.

066: Near-Infrared Spectroscopy (NIRS)-based Digit Skin Tissue Blood Flow Measurement System

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Abstract
The tissue blood flow (BF) and vascular resistance are the important information for consult peripheral vascular system which related to cardiovascular disease. Unfortunately, most of the current BF monitors are costly, built in huge size and preferable use in hospital and clinic. In the present study, a portable digit skin tissue BF measurement system had been developed using Near-infrared spectroscopy (NIRS) method with simple circuitry and low cost that can be afforded by patients to monitor their cardiovascular information. This system consists of a self-developed NIRS probe; LED and a photodiode, and an Arduino Uno board with MATLAB software as the processing unit. The NIR LED transmits 810 nm light source through biological tissue then detected by the photodiode. The output signal from the NIRS probe is based on resistance changes in the photodiode and by applying the voltage divider law, the signal is further processed by the Arduino with the MATLAB software. Then, according to the modified Lambert-Beer Law in scattering medium, the change in total concentration of haemoglobin (ΔcTotalHb) is plotted in order to get a quantitative BF reading which based on its maximum change during venous occlusion. To evaluate the proposed BF measurement system, BF measurement tests had been conducted on four healthy subjects during resting and after exercise. The study had shown that the results of BF after the exercise were in average of 1.5 time higher than the resting BF and this finding agrees with previous research works.

Keywords
Arduino; digit skin tissue blood flow; modified Lambert-Beer law; MATLAB; NIRS.
067: Incorporation of Alternative Fuels and Raw Materials (AFR) to Produce a Sustainable Cement

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Abstract
Throughout the last two decades, tremendous researches have been carried out to investigate the possibility to reduce the cement plants’ costs in terms of raw materials and fuel consumption. Different types of alternative fuels and raw materials (AFR) have been used and proved their efficiencies such as sewage sludge, used tires, crushed aggregates, refuse derived fuel (RDF), red mud, ash and others. Generally, it has been deduced that the possibility to incorporate AFR to produce an acceptable quality of cement is related mainly to its calorific value and its chemical composition. As results, it was reported that incorporation of AFR has reached up to 100% for raw materials substitution and more than 30% for fossil fuel replacement. Nevertheless, the AFR may contain toxic components such as volatile content and heavy metals that need careful attention in its decisive use since it may pose serious problems to the environment and the living things. More parameters may affect the cement production cost including the moisture content of AFR, the burning temperature, the residential time, the accessibility to the AFR, the easy handling and others. The high moisture content of the AFR may increase the total cost of cement production because of the need of a high thermal energy to dry it prior to be incorporated into cement plant. Same thing goes with temperature needed by the AFR to be burned within the kiln. This overview summarizes the studies throughout the last two decades related to cement manufacturing by using AFR based on the main parameters studied by the researchers, the main advantages and the main disadvantages.

Keywords
AFR; cement; calorific value; alternative fuel; raw materials.

068: Physico-mechanical Properties of Porcelain by Substitution of Quartz with POFA Treated with 2M HCl Acid

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Abstract
Palm oil fuel ash (POFA) is a by-product from thermal power plant where palm kernel, shell and fibre used as fuel to generate electricity and disposed with no economic value. POFA is used as quartz replacement in the production of porcelain. POFA was dried in an oven for 24 hrs at 110 °C, ground at a speed of 250 rev/sec for 12 hrs. Some of the POFA amount was treated with 2 Molar of HCl acid and some was kept untreated. Both treated and untreated were substituted with quartz at 15 wt% and mixed with porcelain composition and dry pressed into pellets at a mould pressure of 91 MPa and sintered at 1150 °C, 1200 °C and 1250 °C for 2 hrs soaking time respectively. XRF revealed that, POFA has similar chemical composition with quartz. The highest compressive strength, bulk density and Vickers microhardness being achieved at sintering temperature of 1150 °C using treated sample with the values 169 MPa, 2.432 g/cm³ and 774 HV respectively. HCl treated POFA is a good candidate for quartz replacement and 1150 °C was the best sintering temperature.

Keywords
Porcelain; palm oil fuel ash (POFA); bulk density; compressive strength, XRD.
069: IoT based Weather Station using Raspberry Pi 3

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Abstract
Weather is the day-to-day state of atmosphere that is hard to predict which affects the activities of mankind and has great significance in many different domains. However, the current weather station in the market is expensive and bulky which cause inconvenience. The aim of this project is to design a weather station with real time notifications for climatology monitoring, interface it to a cloud platform and analyse weather parameters. In this project, a weather station is assembled using SparkFun Weather Shield and Weather Meter and Arduino Uno R3 to collect weather parameters. Data collected from the sensors are then stored into Google Cloud SQL using Raspberry Pi 3 Model B which acts as a gateway between them and analysis of weather data are done. A website and mobile application are developed using Google Data Studio and Android Studio respectively to display the real-time weather conditions in graphical presentation which are accessible by administrator and users. Users will receive notification regarding the weather conditions at that particular place on social media platform regularly and irregularly. Weather prediction is done in short term which allows users to get themselves prepared for their future plan in the next thirty minutes.

Keywords
IoT; raspberry Pi 3.

071: MHD Boundary Layer Flow in Double Stratification Medium

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Abstract
Magnetohydrodynamic (MHD) boundary layer flow over an exponentially permeable stretching sheet embedded in thermally and chemically stratified porous medium with heat source is presented in this analysis. The partial differential equations of the governing equations are transformed into a set of nonlinear ordinary differential equations using similarity transformation. These equations are solved numerically using Runge-Kutta-Fehlberg method with shooting technique in MAPLE software environment. The effect of the pertinent parameters on the velocity, temperature and concentration profiles are examined graphically. The results obtained show that the velocity profile decreases with increasing value of porosity, magnetic, and suction parameters. The temperature increases with porosity, magnetic and heat source parameters while the concentration profile increases as the porosity and magnetic parameters increase.

Keywords
Magnetohydrodynamic (MHD) boundary layer flow; Runge-Kutta-Fehlberg method.
Abstract
A GPS tracker through HF radio using FSK method for Blue Force Tracking (BFT) application was developed. The project aims to transmit and receive the location information which is obtained from the GPS data. The system used frequency range of 500 Hz to 2000 Hz for modulating and demodulating the GPS data using FSK method. The smallest frequency gap between characters without affecting the accuracy of the output is 100 Hz, but the transmission time per character must be set to 100 ms. The transmission speed was investigated to find the optimum speed of the system by varying the delay command in the program. The system can accurately transmit and receive the location data in 1350 ms per coordinate. In general, the developed system successfully maintains the performance of transmitting and receiving the location information which can be applied for the future advancement of the BFT.

Keywords
BFT application; FSK method; GPS tracker; HF radio.

073: Synthesis and Characterization of Zinc Sulphide (ZnS) Thin Film Nanoparticle for Optical Properties
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Abstract
In this paper, we studied the synthesis and optical features of non-conventional energy have led us to this work. Neat Zinc sulfide (ZnS) powder was hired for synthesizing ZnS thin films. 0.5 μm thickness thin films of the ZnS was deposited by a thermic volatility system onto oxidized Si substrates at the cool temperature (T cold = –50°C) and at the temperature (T ambient = 25°C). An individual substrate possessor with a thermo-electric cooler was used to cool the substrates, these deposited ZnS thin films were subjected to air annealing at temperatures 100°C, 200°C and 300°C for one hour in a furnace. ZnS synthesis by precipitation technique. UV-Vis spectroscopy and (SEM) scanning electron microscopy used for the study of optical features. Optical features of ZnS thin films were perfected by measuring the absorbance of ZnS films on glass substrates in the range of wavelength 200–900 nm by subtracting the glass substrate as a reference. ZnS thin films used for optical applications.

Keywords
Zinc sulfide (ZnS); thin film; optical properties; UV-Vis spectroscopy; SEM.
074: Cooling Effect Efficiency Prediction of Aluminum Dimples Block using DOE Technique

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Abstract
The main aim of the present work is to study the effect of heat enhancement method on the cooling process of a spherical dimple profile. It was prominently known that introducing dimples configuration causes an enhancement in heat transfer over a surface. In this project, an experimental investigation was carried out to examine the cooling effect of the spherical dimple profile during steady laminar flow in a wind tunnel. Seventeen different sets of parameters related to dimple diameter (mm), dimple orientation (angle) and air stream velocity (m/s) were studied. The Box-Behnken of Response Surface Methodology (RSM) was used as design of experiments (DoE) tool to evaluate these parameters on cooling time. This work deals with the analysis of variance (ANOVA) in order to establish the significant effect of input parameters. The result reveals that an increase in dimple diameter and air stream velocity increase heat dissipation. The shortest cooling time of 7 minutes can be achieved when the dimple diameter is 12 mm; the dimple orientation is 60° and air flow velocity at 18 m/s. The mathematical model has been rendered where the model has been experimentally validated with the average error of 6%.

Keywords
Air stream velocity; cooling time; dimples structure; heat transfer enhancement; response surface methodology.

075: Analysis of Physical Distribution of Sediment at Sembrong Reservoir using GRADISTAT

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Abstract
Sembrong reservoir is a flood-control reservoir which is managed by Syarikat Air Johor since 1984. The reservoir provides clean water supply to 240,000 consumers in the district of Kluang and some parts of Batu Pahat. Reservoir storage is often affected by sedimentation due to soil erosion in the catchment area. As the sediments accumulate, the reservoir gradually loses its ability to store water for the purposes for which it was built. This research is initiated to characterize the sediment which could be used as control in future research in the treatment of contaminated sediment. The objective of this study was to determine the distribution of sediment at Sembrong Reservoir. In this experiment, sediment sampling was done using gravity corer at 6 different points throughout the reservoir. In addition, the physical properties of sediment is investigated by conducted experiments include scanning electron microscope (SEM) and particle size distribution. The analysis of sediment distribution was done using GRADISTAT. Results obtained from the analysis shows that the particle in Sembrong reservoir were classified as very coarse sand and sandy gravel.

Keywords
Particle size distribution; sediment; GRADISTAT; Scanning Electron Mircoscope (SEM).
076: Fuzzy Finite Switchboard State Machine with Complete Residuated Lattices

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Abstract
A finite switchboard state machine is a specialized finite state machine. In this paper, we defined a notion of fuzzy finite switchboard state machine (FFSSM) by the use of general algebraic structures with complete residuated lattices in order to enhance the process ability of FFSSM. The algorithm of complete residuated lattices is given and the examples are provided.

Keywords
Complete residuated lattices; finite state machine; finite switchboard state machine.

077: Dyslexia Risk Screening System Based Fuzzy Logic

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Abstract
It is estimated that more than 314,000 of Malaysian young children are dyslexic, which means having difficulty particularly in reading and spelling. Manual dyslexia screening test ages 6 to 10 years old (in Bahasa Malaysia) produced by Persatuan Dyslexia Malaysia contains 10 sets of tests including reading, rapid naming and pseudowords. However, confirmation of dyslexic status takes several days as the test scores are manually calculated. Therefore, a rapid computerized dyslexia risk screening tool based fuzzy logic has been proposed here. Using the scores obtained from four main tests namely as rapid naming, one-minute reading, two-minute spelling and pseudowords, the fuzzy system is able to determine dyslexic condition instantly. The main fuzzy inputs using pre-existing scores of 17 dyslexia subjects (3 girls and 14 boys) resulted promising system’s accuracy (94.1%) when classifying dyslexic risk in young children.

Keywords
Dyslexia; Dyslexia screening; fuzzy logic; Matlab.
079: Empirical Bayesian Binary Classification Forests using Bootstrap Prior

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Abstract
Random Forest (RF) is an ensemble learning method originally developed to improve the predictive accuracy of decision trees. It is one of the most popular ensemble algorithms which have been applied to different fields. It is widely applicable because of its distribution free assumption, modelling of non-linear effects, computational speed and direct applicability to high-dimensional datasets. Random forest algorithm involves subset selection of input variables to build classification tree. Determining the number of variable subsets is an essential issue with RF especially when there are fewer relevant variables in the predictor space. RF algorithm makes use of an arbitrary value that’s independent of information present in the data. This introduces biasedness and usually results in the selection of irrelevant variables. In this paper, we present an Empirical Bayesian Random Forest (EBRF) classifier with bootstrap prior for binary classification problem. The method addresses explicitly low accuracy problem in RF classifier when the number of relevant input variables is relatively lower compared to the total number of input variables. Comparison of the proposed and existing methods was achieved using five real-life cancer datasets. Performance analysis showed that EBRF provides reasonably higher accuracy than RF in all the datasets used.

Keywords
Empirical Bayesian Random Forest (EBRF) classifier.

080: Development of a New Serration Model Using Offset Approach in the Leaf Shape Modeling: Variation of Details of the Leaf Margin

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Abstract
The aim of this research is to develop a new model of details for the leaf serration before wrapping it onto the overall leaf margin. For this purpose, we used the offset of the original leaf shape outline. The model of the leaf consists of several leaf parts are represented with B-spline curves which also represent the offset. We propose a new algorithm to represent the pattern of the details. The details are applied as an offset to the underlying curve. An algorithm how the pattern combines to the margin was also explained. The results of the drawings are divided into three categories: satisfactory, acceptable, and unsatisfactory. Expert botanist was referred to assess the drawing result to ensure the result is parallel with a botanical point of view. The findings show that the geometry of the details was satisfactory, except for some minor distortion. As the implication, this research allows novice botanists and amateurs to readily see a picture which they might find it hard to visualize before.

Keywords
B-spline; curve; leaf margin; offset; wrapping.
081: Assessment of Storm Water Quality in Grass Swale by using Sand Filter Media: A Case Study at UTHM Campus

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Abstract
Urbanization in Malaysia has contributed to the increased of volume runoff that to the drainage system. As we know SUDS (Sustainable Urban Drainage System) / MSMA (Manual Saliran Mesra Alam) has been implement in Malaysia within several of components. Hence, swale was one of the designed and suggested by SUDS or MSMA in order to control the quantity and quality storm water runoff. University Tun Hussein ONN Malaysia (UTHM) itself has implemented the practice within the main campus area but there is lack of water quality control. The locations of this case study are in front faculty of science computer and information technology (FSKTM). The study aimed to determine the quality of storm water runoff in swale and to analyze storm water runoff treatment using sand column or filter media as a part of filtration process. Water quality parameters that will be tested in the study are COD, BOD5, DO and TSS, which data will be collected from pond inlet, outlet and swale to test the quality. Samples will be test with sand column or filter media D30, D60, D90 and DMIX. Based on the result that each of sand column or filter media to the parameters tested give the positive results, which each parameter has improve the water quality in range 4% to 80% percentage of removal. Conclusion, this case study the treatment need to focus on the pond due to lack of water quality in order to improve the storm water quality and can enhance the natural habitat.

Keywords
Storm water quality; grass swale; sand filtration media.

082: Invariance in Transverse Momentum of Photons in Double-slit Experiment

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Abstract
One of the intriguing mystery in modern physics is the quantum interference phenomena, which the behaviour of photons in double-slit experiment is still ambiguous. Instead of relying on the naive probabilistic point of view, Bohmian mechanics provides the ground base for interpreting quantum system in a deterministic way closely related to classical mechanics such as it constructs the photon trajectory for the double-slit set up. The appearance on the bending in the constructed photon trajectory seem to contravene the notable law of conservation of momentum. Here, we report on conservation of the transverse momentum of photon trajectories based on numerical solution of Bohmian mechanics in double-slit set up for single photon, pair of photons and ensemble of photons until interference pattern is produced. It is shown that the total transverse momentum in the system of Bohmian mechanics is invariance due to the non-local action of quantum potential.

Keywords
Bohmian mechanics; quantum potential; invariance; transverse momentum; double-slit.
083: Mechanical Properties of the Concrete Containing Porcelain Waste as Sand

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Abstract
The demand of concrete have been increases on a daily bases which consume a lot of natural resource such as sand and gravel, there is an immediate need for finding suitable alternative which can be replace sand partially with another materials with high proportion. Many researches study the effect of several waste products such as ceramic tiles, glass, crushed rock flour, building demolition waste are used in the partial replacement of sand. Ceramic waste is one of the strong research areas that include the activity of replacement in all the sides of construction materials. It is main to improve the performance of concrete using ceramic waste. These researches demonstrate the performance of mechanical properties to the concrete with partial replacement of sand by using waste porcelain. For these, we analyzed the mechanical properties of the concrete such as compressive strength, split tensile and flexural strength, the specimen were measured based on 10%, 20%, 30%, 40%, and 50% weight ratio of replace sand with waste porcelain at different time under water for 7 days, 28 days, 60 days. The optimum consideration were given to mechanical properties of the concrete, at different amount of ceramic waste ad.

Keywords
Ceramic waste; Porcelain; sand; cement; mechanical properties.

084: Preparation of Aniline dimer-COOH Modified Magnetite (Fe3O4) Nanoparticles by Ultrasonic Dispersion Method

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Abstract
The magnetite (Fe3O4) nanoparticles capped with certain level of aniline dimer-COOH were prepared via assisted ultrasonic dispersion method and characterized by X-ray Diffraction spectra (XRD), Field Emission Scanning Electron Microscope (FESEM), Ultraviolet UV-visible (UV-vis) and Fourier Transformation Infrared spectroscopy (FTIR). The XRD result shows that both the sample of Fe3O4 nanoparticles synthesized without aniline dimer-COOH have similar peaks with the one that were capped with aniline dimer-COOH, this indicated the higher purity crystalline peaks of Fe3O4 nanoparticles was successfully synthesized. The FESEM result shows that, the aniline dimer-COOH modified magnetite nanoparticles are less agglomerated with spherical shape and continues size distribution, and the obtained image from EDS indicates the present of Fe3O4 nanoparticles by showing Fe-O group of element. The magnetic properties of the magnetite nanoparticles prepared by ultrasonic irradiation method was observed by vibrating sample magnetometer (VSM), the hysteresis loop of Fe3O4 nanoparticles observed by VSM has a saturation magnetization at 89.46 emu g⁻¹ indicating super paramagnetic behavior of the Fe3O4 nanoparticles.

Keywords
Magnetite nanoparticles; magnetic properties; morphologies; ultrasonic dispersion method.
085: Performance Comparison Between Salient and Segmental Rotors Single-phase FEFSM Using Non-Overlap Windings for Home Appliances

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Abstract
Field excitation flux switching machines (FEFSMs) in which their torque performance produced by interaction between armature and field excitation (FE) coils have been widely designed for various applications. In this regard, three-phase salient rotor FEFSM with overlap windings is considered the most suitable candidate for high speed applications because of their advantages of flux controllability, and robust due to single piece of rotor structure. However, the overlap windings cause a high copper loss, hence efficiency of the motor becomes low and higher stack length. Besides, the salient rotor structure is found to produce low torque performance due to the longer flux path in stator and rotor yielding weak flux linkage. In this paper, a new single-phase FEFSM using non-overlap windings between armature coils and FE coils is proposed. Both non-overlap windings FEFSMs with salient and segmental rotors have been designed using JMAG Designer version 15 and the investigation process is conducted via 2D finite element analysis. The proposed motor performances verification has been done by comparing the results of flux linkage, flux line and distribution, flux strengthening, various torque capability, and torque power versus speed characteristics. As a conclusion, single-phase non-overlap windings FEFSM using segmental rotor with power, torque and speed capabilities of 277.5 W, 0.91 Nm and 2,899 rpm, respectively considered as the best candidate for low torque high speed applications.

Keywords
Single-phase; flux switching machine; field excitation; salient rotor; segmental rotor; non-overlap windings.

086: Designing of 3D Sensor Chamber for Plasmonic-Based Toxic Sensor Detection

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Abstract
Plasmonic sensor implementing an optical phenomenon called Localized Surface Plasmon Resonance (LSPR) resulting from the interaction of free electron with electromagnetic field of light at the metal nanoparticles surface. In this study, the plasmonic sensor has been developed for toxic detection in solution form. This system consists of five components which are the light source, duplex fiber optic, sensor chamber, spectrometer and computer. The sensor chamber has been specially designed using SolidWork software and printed using 3D printer with polylactic acid (PLA) material. The sensing activity was done in the sensor chamber with a sliding drawer which is used to place the sensing material or sample. OceanView software was used to analyze the recorded spectrum from the spectrometer. For this project, the experiment of the plasmonic sensor was carried out using targeted analyte namely chlorpyrifos with deionized (DI) water was set as a reference medium. Gold nanoparticles with nanospheres shape used as sensing materials. The sensing parameters are based on changing its intensity and resonance peak position. This plasmonic sensor was compared with UV-VIS spectrometer data to make sure it standardize and function correctly. Besides, the sensing process toward different concentrations of chlorpyrifos from 7.15 mM to 28.60 mM have been done. As a conclusion, the plasmonic sensor was successfully developed for toxic detection in solution form.

Keywords
Plasmonic sensor; gold nanoparticles; Localized Surface Plasmon Resonance (LSPR).
087: Prediction of Pavement Life Using Influence Function and Peak Influence Function

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Abstract
All the aim of this study is to predict the long term pavement life using different method of analysis of the primary response in the pavement layer. The methods are influence function and Peak Influence Function. A tyre-pavement interaction model was used to predict the 3 Dimensional contact stresses under static and dynamic loads. In this model, a truck tyre was loaded on a three layer flexible pavement surface. The load primarily affects the vertical contact stress and the longitudinal contact stress. Statistical method was used to analyse the compare the differences between both methods.

Keywords
Long term pavement life; influence function.

088: Noise Level Based Denoising Technique Utilizing Patch- Based Noise Level Estimator for Low-Light Condition Surveillance Image

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Abstract
Digital Image Processing is a method to obtain a quality image or to take out some useful details or feature from image. It is one type of signal processing that import the image via image acquisition tools to enhance or reconstruct the image and do the analysis and manipulation of an image. The noise will cause the results of error in the image acquisition process that the pixel values do not reflect the true intensities of the real scene. The level of the noise is much higher at the low light condition environment, edges and textures are often over smoothed during the denoising process. These problems become more obvious at low light conditions due to the low signal levels. Thus, this project aims to develop modified denoising techniques for Poisson noise removal in low light condition surveillance images. The Patch-Based Noise Level Estimator is designed to estimate the noise level of noisy image. The noisy image then fed to either OTSU WIE-WATH Filter or OTSU KU-WIE-WATH Filter automatically based on the noise level of image. The OTSU WIE-WATH Filter is used for low and medium Poisson noise removal while OTSU KU-WIE-WATH Filter is used mainly for high Poisson noise removal. The proposed denoising technique performances are analyzed with other existing denoising techniques in terms of Mean Absolute Error (MAE), computational time and visual effect inspection. The results showed that proposed filter is the best in removing low and medium Poisson noise levels as well as removing high level Poisson noise in low light condition surveillance images.

Keywords
Denoising; low-light condition; mean absolute error; Poisson noise; surveillance image acquisition.
089: A Cluster Analysis For Binary Data using Genetic Algorithms

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Abstract
This research was initially driven by the lack of clustering algorithms that focusing on binary data. A promising technique for analyzing this type of data, namely Genetic Clustering for Unknown K (GCUK) became the main subject in this research. GCUK was applied to cluster four binary data sets and there is a presence of an imbalanced data. The results show that GCUK is an efficient and effective clustering algorithm compared to K-means. The other contribution in this research is the ability of this algorithm to cluster the imbalanced data sets, where standard clustering algorithms cannot simply be applied to this data as they could cause misclassification results.

Keywords
Genetic algorithms; binary data; clustering.

090: The Extended Monod Model for Microalgae Growth and Nutrient Removal in Different Wastewaters

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Abstract
Water pollution is a serious issue which always being concerned by public. Microalgae for wastewater treatment is an effective way to solve the problem due to its eco-friendly and apparently low cost. This research aims to investigate the efficiency of the mathematical model to estimate the microalgae growth and nutrient removal by microalgae in wastewaters. The extended Monod model is applied in the Verhulst model to describe the microalgae growth and nutrient removal by microalgae whereas microalgae Botryococcus sp. is the species of microalgae used in this research. The microalgae Botryococcus sp. growth and nutrient removal in domestic, agricultural and industrial wastewater are estimated and the results reveal that the extended Monod model is suitable for the estimation of microalgae growth and nutrient removal by microalgae. In addition, microalgae Botryococcus sp. is promising for treating domestic, agricultural and industrial wastewater.

Keywords
Extended Monod Model; Microalgae growth; nutrient removal; Verhulst Model; wastewater treatment.
091: Interaction Effects on Prediction of Children Weight at School Entry using Model Averaging

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Abstract
Model selection introduce uncertainty to the model building process, therefore model averaging was introduced as an alternative to over-come the problem of underestimate of standards error in model selection. This research also will be focused on using selection criteria between Corrected Akaike's Information Criteria (AICC) and Bayesian Information Criteria (BIC) as weight for model averaging when involving interaction effects. Mean squared error of prediction (MSE(P)) will be used in order to determine the best model for model averaging. Gateshead Millennium Study (GMS) data on children weight will be used to illustrate the comparison between AICC and BIC. The results showed that model selection criterion AICC performs better than BIC when there are small sample and large number of parameters included in the model. The presence of interaction variable in the model is not significant compare to the main factor variables due to the lower coefficient value of interaction variables. In conclusion, interaction variables give less information to the model as it coefficient value is lower than main factor.

Keywords
Model selection; model averaging; interaction; AICC; BIC.

092: Effect of Light on the Photosynthesis, Pigment Content and Stomatal Density of Sun and Shade Leaves of Vernonia amygdalina

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Abstract
Light affects the growth and development of plants by influencing the physical appearance of one leaf as well as the appearance of the whole plant. Plant photosynthesis, stomata density, and pigment contents are all influenced by light. The objective of this research is to determine the effect of light on the photosynthesis, pigment content and stomatal density of Sun and Shade Leaves of Vernonia amygdalina. Gas exchange was measured using Li-6400 and the data obtained was used to create a light response curve where parameters including light saturation point (LSP), light compensation point (LCP) and apparent quantum yield were estimated. Photosynthetic pigment were quantified spectrophotometrically. Moreover, the stomatal density was counted under light microscope, after making a nail polish impression of the leaf. The results discovered shows that as the light intensity increases, the gas exchange and stomatal density increases while the photosynthetic pigment of the studied plant decreases (P<0.05). In addition, LSP and LCP increases with increasing light intensity. Besides, statistically significant negative correlation (P<0.05) was achieved among stomatal density and transpiration rate thereby leading to a conclusion that sun leaves of Vernonia amygdalina contribute the highest assimilation rate to the plant than shade leaves. Yet, the higher stomatal density of sun leaves provides water saving to the plant.

Keywords
Vernonia amygdalina.
093: Effect of Annealing Temperature of CuGaO₂ Thin Films by Using RF Magnetron Sputtering Technique on Optical and Structural Properties

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Abstract
Cu-based conductive oxide such as CuGaO₂ is seen to be a promising transparent p-type oxide material. The study of p-type semiconductor CuGaO₂ thin film has been carried out to investigate the effects of different parameters in providing the optimum result in achieving good optical transparency and conductivity of the thin film. The CuGaO₂ thin film was fabricated on quartz substrate via the Radio Frequency (RF) magnetron sputtering technique with varying substrate temperatures and different annealing temperatures. The p-type thin film was deposited at a temperature ranging from room temperature to 300°C. The samples are also annealed varying from temperature of 500°C to 800°C. The fabricated sample were characterized using X-ray diffraction (XRD), UV-Visible spectroscopy, and Atomic Force microscope (AFM). XRD shows a peak at 2θ = 36.10 ° (012). The optical transparency value achieved from UV-Vis spectrophotometer is seen to be over 80% and the band gaps were found to be in the range of 3.34-3.43 eV which is in line with the band gap value from the research on CuGaO₂. From the AFM, the RMS of the surface roughness decreases with increasing temperature and this is due to the enlargement of grain size.

Keywords
RF Magnetron sputtering; CuGaO₂ thin films.

094: Forecasting Electricity Consumption using Time Series Model

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Abstract
The Universiti Tun Hussein Onn Malaysia (UTHM) electricity consumption was forecasted by using the simple moving average (SMA), weighted moving average (WMA), simple exponential smoothing (SES), Holt linear trend (HL), Holt-Winters (HW) and centered moving average (CMA). The monthly electricity consumption from January 2011 to December 2017 was used to forecast January to December 2018 monthly electricity consumption. HW gives the smallest mean absolute error (MAE) and mean absolute percentage error (MAPE), while CMA produces the lowest mean square error (MSE) and root mean square error (RMSE). As there is a decreasing population of UTHM after the moving of four faculties to Pagoh and HW forecasted trend is decreasing whereas CMA is increasing, hence HW might forecast better in this problem.

Keywords
Universiti Tun Hussein Onn Malaysia; simple moving average; weighted moving average; simple exponential smoothing; Holt linear trend; Holt-Winters; centered moving average; MAE; MAPE; MSE; RMSE.
095: Model-Building of Multiple Binary Logit using Model Averaging

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Abstract

Many researchers had been carried out on the study of statistical modelling, making it easier for new researchers in many sectors (social sciences, economics, medical, and etc.) to obtain knowledge in order to ease their research study. Nevertheless, there is still no agreed guidelines in obtaining the best model for multiple binary logit (MBL) using model averaging (MA). This research will demonstrate the proper guidelines to obtain best MBL model by using MA. Upper Gastrointestinal Bleed (UGIB) data were studied to illustrate the process of model-building using the proposed guidelines. This study will pinpoint the factors with high possibility leading to mortality of UGIB patients using obtained best model. Corrected Akaike Information Criteria (AICc) and Bayesian Information Criteria (BIC) were used to compute the weights in model averaging method. The performance of the models was computed by using Root mean square error (RMSE) and mean absolute error (MAE). Model produced by using BIC shows a better performance. The factors that affects the survivability of UGIB patients are shock score, comorbidity and rebleed. In conclusion, model-building of multiple binary logit using model averaging shows a better performance when using BIC.

Keywords

Model-building; multiple binary logit; model averaging; AICc; BIC; UGIB.

096: Behaviours of Bursa Malaysia: A Multidimensional Network Analysis

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Abstract

In current practice, the similarities between two or more univariate time series of stocks are determined by using the Pearson correlation coefficient (PCC). However, the economic information might be misleading if the analysis applies only the univariate time series of stock price, as each stock is denoted by four types of prices. Therefore, multidimensional of stocks are taken into account in this paper. The similarities between two or more multi-dimensional of stocks are quantified by using Random Vector (RV) coefficient. Additionally, an algorithm is proposed due to the computational of RV coefficient is tedious and time-consuming when a large number of stocks are included. In this paper, the Malaysian stock network analysis in univariate and multivariate setting are conducted and analysed by using the PCC, RV coefficient, forest of all possible MSTs and centrality measures. In summary, there is some important economic information could not be brought out by univariate network analysis alone.

Keywords

Bursa Malaysia; centrality measures, forest of all possible MSTs; multivariate analysis; RV coefficient.
098: Analysis of Symmetric and Asymmetric Multilevel Inverter Topologies Using Reduced Number of Switching Devices Circuit Structure

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Abstract
This paper presents symmetric and asymmetric multilevel inverter principles using reduced number of switching devices circuit structure. Principally, asymmetric multilevel inverter topology able to produce higher output voltage level without modification of the structure in order to reduce total harmonic distortion at the output voltage. In contrast, the number of switching devices need to be increased with symmetric principle when higher output voltage level is considered. In this study, 5-level reduced number of switching devices circuit structure is selected as a circuit configuration for symmetric (5-level structure) and asymmetric (7-level and 9-level structures) multilevel inverters. For switching strategy, modified pulse width modulation and sinusoidal pulse width modulation are selected to produce output voltage levels of the inverter. Modified pulse width modulation used low switching frequency in producing signal and needs higher output voltage levels to achieve low total harmonic distortion. In contrast, sinusoidal pulse width modulation used high switching frequency in order to minimize total harmonic distortion. Theoretically, total harmonic distortion is reduced when number of output voltage level is increased for both cases. The findings show that, the 9-level asymmetric topology has lower total harmonic distortion compared to the 5-level symmetric topology and 7-level asymmetric topology, whereby these inverters using the same circuit configuration. The results show that, the total harmonic distortions of 9-level asymmetric topology, 7-level asymmetric topology and 5-level symmetric topology are 14.54%, 18.08% and 26.92%, respectively with sinusoidal pulse width modulation switching strategy. Meanwhile, with modified pulse width modulation switching strategy, the total harmonic distortions of 9-level asymmetric topology, 7-level asymmetric topology and 5-level symmetric topology are 18.7%, 21.68% and 28.99%, respectively. Therefore, 9-level asymmetric with sinusoidal pulse width modulation switching strategy show the lowest total harmonic distortion with optimum number of switching devices.

Keywords
Symmetric and asymmetric multilevel inverter; pulse width modulation; sinusoidal pulse width modulation; total harmonic distortion.

100: Optimization of PFC SEPIC Converter Parameters Design for Minimization of THD and Voltage Ripple

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Abstract
This paper discusses the current THD and voltage ripple minimization of SEPIC converter based on optimization parameters design. The SEPIC converter is designed to be operated in discontinuous conduction mode in order to achieve almost unity power factor. The passive components, i.e., inductor and capacitor are designed based on switching frequency and resonant frequency. Meanwhile, the ranges of duty cycle for buck and boost operations are 0<D<0.5 and 0.5<D<1, respectively, for the output voltage variation of the converter. The principle of the parameters design optimization is based on the balancing energy compensation between the input capacitor and output inductor. The experimental results show that, the current THD is reduced to 2.66% from 70.9% after optimization process is conducted. Furthermore, it is confirmed that the output voltage ripple frequency is always double from the input line frequency, 50 Hz and the output voltage ripple is always lower than the maximum input voltage ripple. Therefore, the designed parameters of the experimental converter is confirmed with approximately 65 W of the converter output power.

Keywords
Total harmonic Distortion; SEPIC converter; output voltage ripple; optimization parameter design; power factor correction.
101: Implementation of Resonant and Passive Lossless Snubber Circuits for DC-DC Boost Converter

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Abstract
This paper presents the comparison of resonant and passive lossless snubber circuits implementation for DC-DC boost converter to achieve soft-switching condition. By applying high switching frequency, the volume reduction of passive component can be achieved. However, the required of high switching frequency cause the switching loss during turn-ON and turn-OFF condition. In order to reduce the switching loss, soft-switching technique is required in order to reduce or eliminate the losses at switching devices. There are various of soft-switching techniques can be considered, either to reduce the switching loss during turn-ON only, or turn-OFF only, or both. This paper discusses comparative analyses of resonant and passive lossless snubber circuits which applied in the DC-DC boost converter structure. Based on the simulation results, the switching loss is approximately eliminated by applying soft-switching technique compared to the hard-switching technique implementation. The results show that the efficiency of resonant circuit and passive lossless snubber circuit are 82.99% and 99.24%, respectively. Therefore, by applying passive lossless snubber circuit in the DC-DC boost converter, the efficiency of the converter is greatly increased. Due to the existing of an additional capacitor in soft-switching circuit, it realizes lossless operation of DC-DC boost converter.

Keywords
DC-DC boost converter; soft-switching; resonant; passive lossless snubber; switching frequency.

102: Chitosan-Zinc Oxide Composite for Active Food Packaging Applications

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Abstract
Chitosan-zinc oxide (C-ZnO) films were prepared by a simple one pot procedure. In order to investigate the property of C-ZnO films, two composite films were prepared by varying the loading of ZnO and compared with pure chitosan film (C). The films were characterized by various techniques such as FTIR, DSC, tensile, contact angle and water vapour permeability. FTIR analysis showed changes in hydrogen bonds band at 3351 cm\(^{-1}\) band compared to pure chitosan film. The incorporation of ZnO in chitosan films increased the contact angle by 30.5% in C-ZnO1.0 film while water vapour transmission rate decreased by 7.8% compared to C film. From the tensile test, C-ZnO0.5 and C-ZnO1.0 films were found to be much superior by 1.5 times and 2.5 times compared to bare chitosan film. The antimicrobial activity of the film against S. aureus in disc diffusion method is greater when higher concentration of ZnO been incorporated as evidenced by 47% larger inhibition ring of C-ZnO1.0 film than C-ZnO0.5 film. From the results, it is displayed that the incorporation of zinc oxide to chitosan improve their properties which also shown the potential to become a candidate for food active packaging.

Keywords
Active packaging; antimicrobial; Chitosan; contact angle; Zinc oxide.
103: The Performance of Earth Retention Pond Water Retain Capability using Geotechnical Properties Evaluation

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Abstract
Development of a new modern housing areas has demand a retention pond for recreation activity and landscaping purposes. This study deals with the evaluation of water retain ability of a new retention pond from the soil condition perspective. Geotechnical laboratory testing was performed via particle size distribution, Atterberg limits and permeability to assess the retention pond soil condition. All the experiment was performed according to British Standard 1377 (1990). It was found that soil tested has been dominated by fine particles which ranged at 30.84-60.88 % compared to the coarse particles (sand and gravel). Atterberg limits results has found that all soil tested has a liquid limit (LL), plastic limit (PL) and plasticity index (PI) that was varied at 29-74 %, 16.9-33.6 % and 17-40.4 % respectively representing its promising water retain capability. Moreover, permeability result founds that all values of permeability coefficient, k was ranged at 3.11 x 10^-4 -5.65 x 10^-7 cm/s thus conclude that all soil tested has low to very low degree of permeability. Finally, retention pond of a new development area has been evaluated directly according to its soil condition thus provide some valuable information to the responsible parties regarding the future planning and decision making of the sustainable catchment areas.

Keywords
Retention pond; soil condition; geotechnical laboratory testing; permeability.

105: Predicting the Capability of Oxidized CNW Adsorbents for the Remediating of Copper Under Optimal Operating Conditions

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Abstract
Metal pollutants such as copper released into the aqueous environment have been increasing as a result of anthropogenic activities. Ad-sorption-based treatment technologies offer opportunities to remediate metal pollutants from municipal and industrial wastewater effluent. The aim of this work was to evaluate the capability of modified cellulose nanowhisker (CNW) adsorbents for the remediation of copper from water matrices under realistic conditions using response surface methodology (RSM) and artificial neural network (ANN) models. Considerations for design and application to remediate Cu(II) from wastewater by developing a continuous flow experiment are de-scribed in this study. However, the physical structure of modified CNW adsorbents renders them unsuitable for use in column operation. Therefore, a more detailed study of the mechanical properties of CNW adsorbents would be necessary in order to improve the strength and stability of the adsorbents. This work has demonstrated that modified CNW are promising adsorbents to remediate copper from water matrices under realistic conditions including wastewater complexity and variability. The use of models to predict the test parameter system and account for matrix variability when evaluating CNW adsorbents for remediating Cu from a real-world wastewater matrix may also provide the foundation for assessing other treatment technologies in the future.

Keywords
Cellulose; adsorption; copper; optimization; wastewater.
106: Optical Absorption of Plasmonic Cylindrical Gold Nanoparticle in Hexagonal Geometry

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Abstract
A high quality solar cell depends on how good the design of the solar cell can absorb light. In this study, cylindrical gold nanoparticles were embedded into ITO layer and silicon layer arranged in hexagonal geometry on plasmonic solar cell simulation design. The aim is to investigate the optical absorption percentage in terms of wavelength and angle of incidence for the solar cell design. The numerical results showed that the highest absorption has occurred in 480 nm in the range of visible spectrum. In this wavelength, the highest absorption occurred at the incidence angle of 48 degree.

Keywords
Optical absorption.

107: Influence on the Phase Formation and Strength of Porcelain by Partial Substitution of Fly Ash Compositions

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Abstract
This paper presents the study of the influence on the phase formation and strength of the porcelain by the partial substitution of fly ash. The fly ash was calcined at the temperature of 800 °C and partially substituted into feldspar. Each mixture were mixed and pressed into green pellets sintered at different sintering temperature (1100 – 1300 °C) at the interval of 50 °C for 120 min. The compressive strength, crystalline phase and the microstructure of the porcelain were investigated. The optimum physical and mechanical properties were obtained at 5 wt % of fly ash porcelain sintered at 1250 °C. The apparent porosity is 0.22 % and obtained the highest compressive strength of 105.40 MPa. The XRD results reveal that the highest percentage of mullite was obtained at the substitution of 5 wt % of fly ash with 49.0 %. The glassy phase shows an increasing trend with dissolution of mullite content which affects the strength and microstructure of the porcelain.

Keywords
Porcelain; fly ash; phases; strength; microstructure.
108: Brainwave Analysis for Robot Movement Depending on Age and Sex Differences

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Abstract
A Brain-Computer Interface (BCI) is a direct communication pathway between a human and external device. This system is very useful especially for disabled people or person that have a spinal cord injury as their brainwave still can emit electrical activity and can move the machine even with severe motor impairments. This research aims to investigate the brain waves produced by humans in terms of attention level for being applied in every aspect of robot movement based on sex and age category of children (6-12 years), teenagers (18-25 years old) and adult (30 years and over). An Electroencephalography (EEG) device called Neurosky Mindwave Mobile has been used to obtain brainwave signals produced by humans. They were five aspects of robot movement namely forward (F), right (R), left (L), backward (B) and stop (S). From the analysis, the subject is less focus when doing the backward movement compared to another aspect of movements. Based on sex difference, the male has a higher attention level than female in every aspect of movement except for the left movement. The age group that has the highest attention level is teenagers and the lowest is adult. It can be concluded that the attention level produced by human varies according to age and sex difference of the individual itself. The development of a brain-controlled wheelchair can be improved by doing this research.

Keywords
Brain-Computer Interface, brainwave, attention level, Neurosky Mindwave Mobile.

109: Fuzzy Time Series Forecasting Model based on Frequency Density and Similarity Measure Approach

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Abstract
This paper proposes an improved fuzzy time series (FTS) forecasting model which can keep some information under different degree of confidence throughout the forecasting procedure. The forecasting accuracy is developed based on the similarity between the fuzzified historical data and fuzzy forecast value and no defuzzification process involves in the proposed method. The frequency density method is used to partition the interval and the area and height type of similarity measure is used to obtain the forecasting accuracy. The proposed model is applied in a numerical example of the unemployment rate in Malaysia. The results show that on average 96.9% of the forecast values are similar to the historical data. The forecasting error based on the distance of the similarity measure is 0.031. The forecasting accuracy can be obtained directly from the forecast values of TrFNs form without going through the defuzzification process.

Keywords
Area and height similarity measure; forecasting accuracy; frequency density; fuzzy time series; unemployment rate.
110: Dynamic Programming to Solve Picking Schedule at the Tea Plantation

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Abstract
The tea picking schedule at PT Perkebunan XYZ is set to be the same for all plantation blocks, that is every 12-14 days. In fact, the altitude from sea level and the pruning age of each plantation block is different, this results in a difference of buds’ growth. The implementation of the same picking schedule causes the quality and quantity of tea buds often could not be fulfilled. Therefore, it is necessary to determine the precise picking schedule by considering the buds’ growth of each plantation block. Dynamic programming is one of the methods that can be used to solve the scheduling problem. Two steps are needed to complete the problem of tea picking schedule. The first step is to look for picking period and the pattern of buds’ quality for each plantation block, which corresponds to the altitude of the location and the pruning age. The regression method is applied in this first step. The buds’ quality pattern is then used to determine the cost of decreasing buds’ quality and the costs of the buds that left in the plantation. The second step is to develop the picking schedule using dynamic programming, which minimizes the total cost of picking. This model is a modification of inventory-production dynamic model. In addition to this, we also develop a rolling schedule, which schedule time interval is three days. Two important results of this paper are as follows: (i) the proposed schedule gives a better total cost and (ii) the buds’ quality target is easier to achieve.

Keywords
Dynamic programming; minimizes cost; picking schedule.

111: Batch Kinetics of Removal Nutrients from Synthetic Meat Pro-cessing Wastewater by using Microalgae Botryococcus sp.

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Abstract
Disposed meat processing wastewater contains high range of nutrients such as ammonia nitrogen and orthophosphate which will cause eutrophication and lead to destruction of ecosystem. Therefore, batch experiments were carried out to explore the influence of the range of initial concentration of ammonia nitrogen and orthophosphate found in meat processing wastewater in the removal of those nutrients during phycoremediation of synthetic wastewater by using microalgae Botryococcus sp. Biokinetic coefficients k, reaction rate constant, Km, half saturation constant and Y, yield coefficients determined by using Michaelis-Menten rate expression. The experiment was con ducted using synthetic wastewater with initial NH4-N concentration varying between 30-480 mg/l and PO43- concentrations varying be tween 14-239 mg/l. The results demonstrate removal efficiency of NH4-N between 42-100 % and PO43- between 63-96 %. Biokinetic coefficients were established as k = 1.72 mg NH4-N mg−1 chl a d−1, Km = 52.29 mg/L and YN = 0.027 mg chl a mg−1 NH4-N for ammonia nitrogen and k = 1.13 mg PO43- mg−1 chl a d−1, Km = 44.45 mg/L andYP = 0.038 mg chl a mg−1 PO43- for orthophosphate.

Keywords
Batch kinetics; microalgae; nutrients; phycoremediation; synthetic meat processing wastewater.
112: Effects of Pulsed Nd:YAG Laser on Pt/Ag Thin Film Metal Contacts

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Abstract  
This study focused on the effect of laser annealing on Pt/Ag metal contacts deposited on Si substrates. DC sputtering was used to deposit the metal thin films on the Si. The samples were treated by annealing using pulsed Nd:YAG laser. Then, the samples were characterized based on its morphological, optical, structural and electrical properties. From surface morphological, it is clearly shown that the surface roughness of the laser annealed sample is smoother than the as-deposited sample. The calculated energy band gap was obtained as 1.4 eV. For electrical properties, the resistivity for laser anneal was lower compared to as-deposited sample, which are 5.10× 10⁻⁴ ohm·cm and 1.37× 10⁻³ ohm·cm respectively. The conductivity increases when the resistivity decreases.

Keywords  
Band gap; DC magnetron; Nd:YAG laser; Pt/Ag; Thin films.

113: A Comparative Study of Single-tooth and Multi-tooth Stator of 4S-8P Permanent Magnet FSM for Electric Bicycle Application

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Abstract  
This paper present a comparative study of single-tooth and multi-tooth stator of 4S-8P permanent magnet Flux Switching Machine (FSM) for electric bicycle application. Detailed comparison of the performance characteristics of the machines are presented that include important issues such as average torque, volume of PM, back-EMF and speed performance. For a fair comparison, the valid stator slot and rotor combinations is same dimension and analyzed using finite element analysis, and the one among of the design has the best electromagnetic performance is selected. On the basis of the investigation, it can be concluded that the single-tooth design of proposed permanent magnet FSM for a single phase 4S-8P topology has presented higher torque performance compared to multi-tooth design. However, since design of single-tooth exhibits a higher back-EMF, Design optimization and improvement structural is ongoing to achieve the best performance.

Keywords  
Permanent magnet; electric bicycles; flux switching machines; multi-tooth; single-tooth.
114: Impact of Indoor Air Quality by Incorporating Agricultural Waste into Fired Clay Brick

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Abstract
Palm oil is one of the main products that contribute to the development of the agricultural industry in Malaysia. However, the demand for edible oil from all over the world has generated a huge amount of waste in terms of solid waste. Due to that, the problem of disposal method has become a constraint by the authorities. Recently, incorporation of potential waste into fired clay brick has aroused attention from many researchers. Therefore, this study is focusing on the incorporation of palm kernel shell into fired clay brick in terms of indoor air quality assessment. The brick was incorporated with 0% and 5% of PKS and fired at 1050°C with heating rates of 1°C/min. Preliminary analysis was conducted with X-Ray Fluorescence test to determine chemical composition of raw materials used in the study. A further experiment of indoor air quality was obtained by measuring gases emission of total volatile organic compound (TVOC), carbon dioxide (CO₂), carbon monoxide (CO), ozone (O₃), formaldehyde (HCHO) and particulate matter (PM10) in Walk in Stability Chamber with controlled temperature and relative humidity. All parameters were compared with Industry Code of Practice on Indoor Air Quality standard. The result shows that incorporation 5% of PKS into fired clay brick complied with the standard requirement for use as building materials. As the conclusion, the use of palm kernel shell as clay replacement could reduce the waste disposal in landfills whilst provid-ing low-cost building materials.

Keywords
Agricultural waste; palm kernel shell; fired clay brick; indoor air quality.

115: Review on Queueing Problem in Healthcare

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Abstract
This article shows the application of queueing, simulation and scheduling used in the field of healthcare. A summary of queueing, simulation and scheduling theory used in waiting time, appointment system and patient flow are summarised in this article. Different departments in the healthcare system are also considered in this article such as emergency department, outpatient department and the pharmacy. The aim is to provide the reader a general background into queueing, simulation and scheduling in the healthcare.

Keywords
Simulation; queueing; scheduling; healthcare.
116: Leachability of Fired Clay Bricks Incorporated with Sewage Sludge by Using Tank Leaching Test

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Abstract
This research was conducted to fully utilize the sludge that rich in dangerous heavy metals and at the same time act as low cost alternative materials in brick manufacturing. Different series of sludge and clay proportioning ratios were studied, which exclusively involved the addition of sludge with ratios of 0, 1, 5, 10, 20 and 30% of the total weight of sludge-clay mixture. Each molded brick were oven-dried at 105°C for 24 hours followed by heating at 1050°C. The investigation includes determination of heavy metal concentration of the sludge and clay using XRF and heavy metals leachability of the bricks by using Tank Leaching Test according to NEN7345 that has been analyzed by using ICPMS. The leaching behavior of several heavy metals (As, Ni, Cu, Pb, Zn, V, Ba, and Cr) from incorporated sludge into fired clay bricks shows to be insignificant and far below the USEPA regulations limits which fulfill the general requirement for use-age of clay brick in construction and comply with the leaching standard limit. As a conclusion, the utilization of sewage sludge can reduce the disposal to landfill and reduce the leachability of sludge which can effect environment and human.

Keywords
Waste management; heavy metals; leachability; sewage sludge; sewage sludge brick.

117: Passively Q-switched Pulse Erbium Doped Fiber Laser using Antimony (III) Telluride (Sb2Te3) Thin Film as Saturable Absorber

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Abstract
This paper demonstrates on an antimony telluride (Sb2Te3) thin film sandwiched between two fiber ferrule as saturable absorber for Q-switched pulsed Erbium doped fiber (EDF) laser. The saturable absorber is fabricated by dissolving Antimony (III) Telluride powder into PVA solution and dry in the ambient temperature for 48 hours. Then, 1 mm×1 mm Sb2Te3-PVA film based saturable absorber is sandwiched in between FC/PC ferrule for Q-switched laser generation. The modulation depth of the Sb2Te3 is measured as 28.01% with input intensity 0.02 MW/cm². The developed passive saturable absorber integrated in EDF laser in ring cavity and the characterised pulse is with repetition rates of 30.21 kHz, shortest pulse width of 3.26 μs and signal-noise-ratio (SNR) of 42 dB. The maximum output pulse energy is achieved at pump power 69.5 mW with 29.5 nJ and the output power 0.89 mW.

Keywords
Q-switched pulsed Erbium doped fiber (EDF) laser.
118: Survival Analysis to Analyze Factor that Affect the Rate of Recovery Patients of Pneumonia

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Abstract
This study aims to apply survival analysis for the survival of patients diagnosed with Pneumonia and to identify the factor that affects the rate of recovery of Pneumonia patients in the treatment period. The data used in this study is the patients’ initial time when they were entering the hospital until they were experiencing an event—i.e. when the patients have been declared cured of the disease. This study is an applied research with a causal-comparative approach by observing data from the factor that was suspected as the cause, as a comparison to investigate the possibility of causation. After that, analysis was done by using Cox regression model in the case and its application to know the factor that can affect the level of healing Pneumonia patients at PKU Muhammadiyah Bantul Hospital; as the duration of therapy in the hospital is the time of survival. In accordance with the Anderson Darling distribution test, the result of patient’s survival time distribution test is a normal distribution with Box-Cox Transformation. The result shows that respiration rate affects the recovery rate of Pneumonia patients with the coefficient value is -0.04082.

Keywords
Survival analysis; normal distribution; Box-Cox transformation; Cox regression model.

119: Comparisons Study of Phosphate Removal in Unaerated and Aerated Steel Slag Filter System

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Abstract
The present study was conducted to investigate the removal efficiency of phosphate in unaerated and aerated electric arc furnace (EAF-slag) filter systems at different pH values for the treatment of wastewater. Lab-scale column filters study was developed with 25 mg/L synthetic wastewater as the feed and monitored weekly for the phosphate removal efficiency and the total metals (Ca, Fe, and Mg) concentrations in the effluents. The results show that both unaerated and aerated EAF-slag filter systems at acidic pH have high phosphate removal efficiency though the performance of unaerated systems are slightly better compared to the aerated systems. Unaerated systems relatively have slightly better phosphate removal efficiency compared to aerated systems at acidic and neutral pH values but vice versa at extremely high pH. The phosphate removal mechanism was achieved by adsorption and precipitation at acidic pH and the concentration of Ca, Mg and Fe in effluents was related to the phosphate removal efficiency at different pH values.

Keywords
Phosphate removal; adsorption; electric arc furnace slag; pH; rock filters.
120: Influence of Deposition Parameter to Wear Behaviour of Tungsten Carbine-Nickel (WC-Ni) High Velocity Oxyfuel (HVOF) Coating

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Abstract
This study is done to investigate the influence of deposition parameter to the hardness and wear resistance of the tungsten carbide nickel (WC-Ni) High velocity oxy-fuel (HVOF) coating which is sprayed on the AISI 1040 medium carbon steel. Three different spraying parameters were used with the oxygen flowrate of each being changed and all others is kept constant. Oxygen flowrate of 30, 45 and 60 LPM were used. The result of hardness, wear rate and surface morphology were compared between the coatings. To compare the surface morphology of the three different parameter HVOF coatings, a scanning electron microscope was used. No significant changes shown on the surface of the coatings where all shows the same lump and crevices structure. X-ray diffraction was used to observe the elemental composition on the three coatings, all the coatings have the same elements present on them. The method used for hardness test was the Vickers microhardness tester while weight loss test was used to study the wear resistance. Following the test, it is found that the hardness and wear resistance increased as the oxygen flowrate was increased. The highest hardness and wear resistance can be found in the coating with 60 LPM oxygen flowrate.

Keywords
High velocity oxy-fuel; tungsten carbide nickel coating; hardness; wear resistance.

121: Design and Performances of Multi-Tooth Stator Permanent Magnet Flux Switching Machine for Light Weight Applications

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Abstract
Permanent magnet flux switching machines (PMFSMs) in which their torque performance produced by interaction between armature coils and permanent magnet (PM) have been widely designed for various applications. In this regard, single-phase 8Slots-12Poles (8S-12P) PMFSM with single tooth stator is considered the most suitable candidate for light weight applications such as electric bicycles because of their advantages of lower copper loss, high efficiency and robust due to single piece of rotor structure. However, the single-phase 8S-12P PMFSM with single tooth stator have a several issues, which is low torque performance due to weak flux linkage, high of PM volume, and high distortion in back-emf that need to be improved. In this paper, a new design of single-phase PMFSM using multi-tooth stator is proposed. Both PMFSMs with multi-tooth and single-tooth stators have been designed using IMAG Designer version 15 and the investigation process is conducted via 2D finite element analysis. Parameters of stator outer radius, rotor outer radius, air gap, and stack length are set to 37.5 mm, 22 mm, 0.25 mm, and 20.3 mm, respectively. PM with the weight of 10.2 g is 8 times lighter than conventional PMFSM with single tooth stator. Based on the flux linkage analysis, PM flux linkage of the proposed PMFSM using multi-tooth structure is 5 times higher than PMFSM with single-tooth structure. The torque produced by PMFSM using multi-tooth stator is 38% higher than PMFSM using multi-tooth stator. As a conclusion, single-phase 4S-12P PMFSM using multi-tooth stator considered as the best candidate for light weight applications due to the torque and power of 1.44 Nm, 219 W, respectively, and the corresponding based speed is 1,062 rpm.

Keywords
Single-phase; permanent magnet; flux switching machine; multi-tooth stator; light weight applications.
122: Forecasting Stock Price Index using Residual Income Model in Jakarta Islamic Index

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Abstract
This research is using quantitative descriptive methods and case studies approach. The ratio of financial analysis and analysis comparison financial reports are also used as the analysis part. Return on Investment (ROI) is one of the ratios of profitability which capable of measuring the company as a whole in producing the profit with all of the available assets. Other alternative to measure the performance of corporate finance is by Residual Income (RI). The uses of both analyses are expected to reinforce and furnish the result obtained so that it will be more accurate. The result of the analysis indicates the conditions of corporate finance fluctuant. The value of ROI is positive but fluctuant. The analysis of RI condition is good where the score of fluctuation is always positively grown. Companies need to be more efficient and effective in making use of company assets, as well as maintaining and enhancing the value of RI. Through this, the company can continue to objectify the level of the expected returns shareholders and its investors.

Keywords
Financial performance; Return on Investment; Residual Income.

123: Preliminary Studies of 12S-8P and 12S-14P Hybrid-Excited Flux Switching Machine with FEC in Radial Direction by Using JMAG-Designer Software

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Abstract
In this paper, design analysis of Hybrid-Excited Flux Switching Machine (H-EFSM) with 12Slot-8Pole (12S-8P) and 12Slot-14Pole (12S-14P) topologies are presented. H-EFSM has been introduced in which the advantage of Permanent Magnet (PM) machines and DC Field Excitation Coil (FEC) synchronous machines is combined. H-EFSM design proposed less permanent magnet consumption, high to torque/power density and high efficiency. In recent, most of H-EFSM having FEC arranged in theta direction that affect in flux production which cause less flux generation and machines performances. Therefore, a design of 12S-8P and 12S-14P H-EFSM with FEC arranged in radial direction is proposed to prevent flux cancellation and produce high flux linkage. Performance analysis of 12S-8P and 12S-14 H-EFSM such as PM flux, induced voltage, cogging torque and flux distribution are investigated by 2-D Finite Element Analysis (2D-FEA). A design with 12S-14P configuration has achieved the higher torque and power with 220.15Nm and 92.45kW, respectively at maximum field and armature current density.

Keywords
Flux cancellation; H-EFSM; Radial Direction, Theta direction, 2D-FEA.
124: Isolation and Characterization of Bacteria from Earthworms’ Intestines

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Abstract
Vermicomposting; breaking down of organic material by earthworms that feed on wastes and converts them to soil-like mass and liquid, is an alternative to reduce waste into the environment. Nitrogen fixing and Phosphorus solubilizing bacteria in the earthworms’ intestines could promote plant growth through increasing the N and P uptake by plants when used as biofertilizers. The objectives of this study are to isolate, identify and characterize N-fixing and P-solubilizing bacteria from the earthworms’ intestines. The leachate was taken from Sungai Ikan Landfill in Kuala Terengganu and used in the preparation of vermibeds. Standard serial dilution procedure was performed to isolate the microorganisms. Six isolates, (A1, A2, B1, B2, C1 and D1) were successfully isolated. However, only single colony of A1, A2, B1 and B2 were obtained. Next, identification and characterization of these four bacteria were conducted via gram staining and bacteria morphological characteristic studies. All were gram negative and bacilli except for A1. They were screened qualitatively for N-fixing bacteria by Hach Method 8039. Pikovskaya’s Agar containing insoluble tri-calcium phosphate (TCP) was used for screening of P-solubilizing bacteria. A2 showed the highest nitrogen fixing and phosphate solubilizing activity with the nitrate content (148.6 mg/L) and high phosphate solubilization efficiency.

Keywords
Bacteria; intestines; Nitrogen fixing; Phosphorus solubilizing; vermicomposting.

125: Characterization of Cr/Ag Bi-Layer Thin Metal Contacts Sputter Deposited on n-Type Si Semiconductor

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Abstract
Good electrical conductivity of metal contacts on semiconductor are very crucial in determining quality of the energy conversion efficiency. This paper reports on the Cr/Ag thin metal contacts properties sputter deposited on n-type Si. The metal contacts were characterized based on the morphological and electrical properties. The surface morphology of metal contacts were characterized by using atomic force microscopy (AFM) and resulted in increment of the surface roughness from 1.35 nm to 9.21 nm at the thickness of 20 nm to 100 nm. The electrical characteristics were characterized by using four-point probe system. From the measurement, the lowest electrical resistivity was measured as 1.19 × 10^6 Ω cm at Ag thickness of 100 nm. Whereas the electrical conductivity of the thin metal contact was obtained as 8.40 × 10^5 Ω-cm^-1 at Ag thickness of 100 nm. From the analysis, it is clearly shown that as the Ag thin metal thickness gets thicker, the surface roughness gets rougher thus resulting in the improvement of the electrical characteristics of the Si/Cr/Ag contacts.

Keywords
Metal contacts; Cr/Ag; thin films; sputter; Si semiconductor.
126: Investigation on the Effect of Centrifugation Speed on the Shape Separation of Gold Nanorods

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Abstract
High-quality gold nanorods (AuNRs) with a uniform aspect ratio and sizes are crucial for applications in biomedical or sensor industry. AuNRs is implementing Localized Surface Plasmon Resonance (LSPR) as sensing method in sensor application. LSPR is highly dependent on the size, composition, separation of nanoparticles, aspect ratio and the shape of the nanoparticles. Thus, in this process, the shape, surface density and aspect ratio of AuNRs were investigated to be used further as LSPR sensing material. The AuNRs was prepared using Seed Mediated Growth Method (SMGM) and the growth solution of the AuNRs was centrifuged with the speed ranging from 2500 rpm to 5000 rpm to separate the particles shaper prior to deposition as thin film. The XRD result shows the peak at 2θ = 38º which shows the (111) crystal orientation of the AuNRs. There are also two distinct peaks formed at the absorption spectra graph obtained from the UV-Vis result which consists of transverse plasmon peak (t-LSPR) and longitudinal plasmon peak (l-LSPR). The t-LSPR peak is significantly smaller than the l-LSPR and located at the wavelength range of 500 nm to 560 nm while l-LSPR of the AuNRs shows a stronger and a higher peak which is located at the wavelength range of 700 nm to 780 nm. The morphological analysis done by using FESEM shows that the higher centrifugation speed separates the AuNRs with higher aspect ratio and higher surface density.

Keywords
Localized surface plasmon resonance; Gold nanorod; Centrifugation; Separation speed; Plasmonic sensor.

127: Graphite Saturable Absorber for Q-switched Fiber Laser

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Abstract
This paper reported a successful demonstration on Q-switched fiber laser by using graphite as saturable absorber (SA). The graphite is deposited on the fiber ferrule through a simple mechanical exfoliation method. The modulation depth of the graphite SA is 19.2% with a saturation intensity of 85 MW/cm². The maximum achievable pulse repetition rates and pulse width are 42.41 kHz and 3.40 μs respectively. Meanwhile, its optical signal-to-noise ratio is about 50.81 dB. The Q-switched pulses have the maximum pulse energy of 5.84 nJ. These outcomes demonstrated that a stable output of passively Q-switched fiber laser is produced that can be applied for various optical fiber applications.

Keywords
Q-switched fiber laser; saturable absorber (SA).
128: Development of Smart Kit Rainwater Harvesting System for Potable Water Purpose

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Abstract
The Smart Kit RWH (rainwater harvesting) system has the potential to contribute to the conservation of clean water usage. The aim of this study is to build an affordable rainwater storage system for all type houses with easy installation and friendly user. The current constraints on the installation of rainwater storage system in the market requires a fairly expensive cost, and skilled technical workers to install it. In contrast, the Smart Kit RWH, is friendly built in a complete set that is easy to install and easy to maintain by homeowners. This system is very suitable for the use in agriculture and farming. This Smart Kit RWH consist of water storage tank, existing gutter and main pipe, first flush diverter and some connector pipe to create this complete system. This product is limited to storing untreated rain water quality, and the quality of rainwater collected can be used as water storage for household and sanitary equipment such as flushing cistern and other potable water usage. Nevertheless, this contributes to the good and the benefits of individuals, communities and nations. This product able to help the rural population in particular of having problems in getting clean water. Hopefully, with the production of this system, it can foster the public's awareness of the advantages and benefits of installing rainwater storage systems at home, plantation and farming.

Keywords
Rainwater harvesting system; smart kit RWH; rainwater storage system.

129: Forecasting Electricity Consumption Using Fuzzy Time Series

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Abstract
The Fuzzy time series (FTS) with trapezoidal membership function was implemented on the Universiti Tun Hussein Onn Malaysia (UTHM) monthly electricity consumption from January 2011 to December 2017 to forecast January to December 2018 monthly electricity consumption. The procedure of the FTS and trapezoidal membership function was described together with January data. FTS is able to forecast quite well with a 5.84% of mean absolute percentage error (MAPE).

Keywords
Universiti Tun Hussein Onn Malaysia; UTHM, fuzzy time series, MAE; MAPE; MSE; RMSE.
130: The Effect of Nanoparticles Composition on Tensile and Thermal Properties of Polystyrene Reinforced with Graphene Nanoplatelets

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Abstract
This study presents the reinforcement effect of graphene nanoplatelets (GNP) on tensile and thermal properties of polystyrene/graphene nanoplatelets (PS/GNP) nanocomposites. The PLA/GNP nanocomposites were prepared by melt-blending method with the GNP contents varied at 0.5, 1.0, and 1.5 wt %. The tensile properties of PS/GNP nanocomposites were analysed by using universal testing machine, the thermal properties were investigated by thermal gravimetric analysis (TGA), and thermal conductivity analysis, while the morphology were characterized by Transmission Electron Microscopy (TEM) and X-Ray Diffraction (XRD) measurement. Steady improvement of tensile strength and Young’s Modulus was observed as the composition of GNP increased. The study also showed that the thermal stability and thermal conductivity of PS/GNP nanocomposites increase with increasing content of GNP. This study indicates strong influence of GNP contents on reinforcement effect and thermal properties of PS/GNP nanocomposites.

Keywords
Polystyrene; Graphene nanoplatelets; Tensile Properties; Thermal Properties.

131: Chemical and Fresh State Properties of Foamed Concrete Incorporating Palm Oil Fuel Ash and Eggshell Ash as Cement Replacement

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Abstract
Malaysia faces three major environmental problems, out of which solid waste and management is one of them. Palm Oil Fuel Ash (POFA) and eggshells are two agro-food waste materials which are produced in enormous quantities in Malaysia. Due to the characteristics possessed by eggshells and POFA, these waste materials can potentially be utilized in the production as cement replacement, reducing the use of cement which is one of the major production of Carbon Dioxide (CO2) gas emissions. This study was conducted to determine the chemical and fresh state properties of foamed concrete incorporating POFA and eggshell ash (ESA) as cement replacement. Based upon the results, it was observed that the increase in usage amount of POFA and ESA as cement replacement, the workability of foamed concrete reduced without blocking. For the chemical analysis result shows the POFA which had high amount of silicon dioxide and ESA having large amount of calcium oxide were compatible and could be used together as cement replacement. The use of ESA and POFA as cement replacement to reduce the cement consumption with various percentage of ESA (0% - 15%) and POFA (20% - 35%) in 1800 kg/m³ density of foamed concrete.

Keywords
Chemical analysis; fresh state properties; palm oil fuel ash; eggshell ash.
A Study on Significant Predictors for Prediction of Undiagnosed T2DM using Binary Logistic Regression Model

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Abstract
Type 2 Diabetes Mellitus (T2DM) is a chronic and non-communicable disease that can cause premature deaths worldwide. Some T2DM cases remain unidentified which refers to undiagnosed diabetes mellitus. Malaysia is one of the many countries facing this epidemic. The World Health Organization (WHO) has reported that the number of people with diabetes has increased from 108 million in 1980 to 422 million in 2014. WHO has also estimated that Malaysia would have a total of 2.8 million people with diabetes in 2030. Thus, this study aims to identify significant predictors in predicting undiagnosed T2DM patients using the binary logistic regression model. A study was carried out in one of the highest prevalence states of diagnosed T2DM. Based on the findings, four predictors were found significant for prediction of undiagnosed T2DM patients in the respective state.

Keywords
Binary logistic regression model; significant predictors; undiagnosed Type 2 Diabetes Mellitus(T2DM).

Performance Evaluation of G2T FSO Link under Various Weather Conditions

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Abstract
FSO technology has attracted a lot of popularity for a variety of applied telecommunication fields. It presents a wide range of advantages that place it in the frontier of high data rates applications, last mile problem and bottleneck issues. It has been preferred for its ease of deployment without fiber cables, no extra tariff fees, cost-effectiveness, and efficiency. FSO excels in performance when compared to contemporary RF technology. On the other hand, there is an increased demand for alternative rail communications solutions. In order to deliver a safer, reliable and fast internet access. In this paper, performance evaluation of a ground-to-train Free Space Optical link communication (G2T FSO) was performed. The system was simulated at 2.5 Gb/s link under several weather conditions. Receiver and geometrical loss were included as well. Furthermore, performance was evaluated in terms of received power, Q factor, BER and eye diagram. Substantial vulnerability to severe fog attenuation was found. Although the system was able to operate with acceptable eye height with min BER of $10^{-38}$.

Keywords
Free space optical.
137: Finite Element Analysis on Knee Joint with Leg Length Inequality

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Abstract
This study aims to investigate the effect of leg length discrepancy (LLD) on the joint reaction stress and strain of femur particularly in the knee joint. The knee joint model was developed using CATIA and imported into ANSYS to simulate the LLD case based on the value of the joint reaction force from the previous experimental study. The analysis was done under a linear static condition. The effect of LLD on the knee joint was determined by observing the contour of equivalent stress and strain distribution on the knee joint components and the maximum equivalent von-Mises stress and strain. The result shows a higher value of stress and strain was found on the short leg compared to the long leg due to the LLD.

Keywords
Finite element; stress-strain analysis; leg length inequality; knee response.


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Abstract
The performance of an aerated vertical upward-flow electric arc furnace slag filter (VFEAFS) system in treating domestic wastewater was examined in a warm-climate country temperature. Two pilot scale column experiments were conducted at high (2.72 m³/m³.day) and low (1.04 m³/m³.day) hydraulic loading rate (HLR) set-up and the effect of different hydraulic loading levels on pollutant removal efficiency were studied. Aeration was introduced in the filter system at 10 L/min to observe oxygen distribution concentration towards ammonium nitrogen removal. The results demonstrated that both HLR set-up were capable to achieve more than 90% ammonium nitrogen (AN) removal; However in terms of individual efficiency of the filter system, the VFEAFS of lower HLR performed better in comparison to the higher HLR set-up. The average effluent concentration of AN by both systems were found far below standard A of Malaysian sew-age discharge limit (10 mg NH₄-N/L). The results achieved in this pilot scale study indicate that removal of ammonium nitrogen in the aerated VFEAFS was explained by nitrification process, and this treatment system could be implemented to the other industry-environmental, municipal or residential wastewater.

Keywords
Electric arc furnace slag; dissolved oxygen; Ammonium nitrogen; hydraulic loading rate
139: Preparing In-service Teacher using Dynamic Geometry Software

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Abstract
The use of technology is essential in teaching and learning process. Many researchers have already implementing Dynamic Geometry Software (DGS) in teaching and learning process. Literature shows that DGS effective in developing spatial visualization skills. Given the importance of DGS in the mathematics classroom, it is necessary for in-service teachers to use the software in their teaching and learning effectively. Hence, it is important to prepare in-service teacher in utilizing DGS through the professional development program. This is a qualitative research which describes a professional development program to facilitate in-service teachers in utilizing DGS. The questionnaire measured in-service teachers’ perceptions, knowledge and skills transfer, and impact for their practice. According to the findings, some of the in-service teachers recognized that they can interact with geometric figures to move on to the next level by using dynamic geometry software. The teachers felt that DGS has helped them to understand the mathematics concept and demonstrate their understanding in front of the class. Besides, DGS does not only offer opportunities for teachers and students to use them both at home and in the classroom without any restriction, but they also provide a means for developing support and user communities reaching across borders. This study conducted on dynamic geometry tools and the use of these tools in geometry has contributed to realizing the transformations in geometric environments. users easily recognize the geometrical shapes interpretations dynamically on DGS.

Keywords Dynamic geometry software.

140: Axial Calibration of QPD Signal based on Stuck Bead Method for Optical Trapping Applications

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Abstract
Calibration of axial quadrant photodetector (QPD) signal to the trapped bead position in an optical tweezer is important to measure the quantitative mechanical parameter in axial (laser propagation) direction. An alternative calibration based on the Stuck Bead Method (SBM) was proposed in this study. 3μm polystyrene beads were stuck at the surface of glass coverslip and moved axially around the laser focus. QPD was used to obtain the position dependent intensity profile at three different laser powers (19.8 mW, 34.1 mW, 48.5 mW). The QPD signal-to-distance calibration value was consistent at 26 mV/μm for the used bead at the three laser powers. It was found that the calibration values are independent of laser powers and limited by the resolution of distance adjustment.

Keywords Quadrant photodetector.
141: Leg Length Discrepancy Effects on Range of Motion in Lower Limb During Walking

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Abstract
Leg length discrepancy (LLD) refers to the medical condition where legs are of different length that could affect the gait and posture, thus may lead to various orthopedic disorders that can have serious repercussions on the individual. In order to ameliorate the rehabilitation of individuals with LLD, it is important to understand the biomechanics of LLD in these individuals. This paper presents a study to investigate on the effect of LLD on the hip and knee joint range of motion. Sandal with insoles was used to simulate the artificial LLD. The sandal’s thickness was increased starting from 0.5 cm up to 4.0 cm with 0.5 cm increment. The experiment was conducted on a healthy subject that walking over two force plates. Visual 3D and Qualisys Track Manager (QTM) system were employed for data processing. ROM was compared using the one-way blocked analysis of variance and paired t-test. The results showed that a statistically significance difference in hip and knee ROM for long leg in frontal and sagittal direction, respectively. The ROM for hip was found significance at the minimum LLD level of 2.5 cm while for knee at 1.0 cm. No significance difference found in hip and knee ROM for short leg.

Keywords
Discrepancy; range of motion; hip joint; knee joint.

142: Optimization of Aqueous Two-phase System (ATPS) of Recombinant Bromelain by Response Surface Methodology

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Abstract
Recombinant bromelain is a protease that was partially purified using aqueous two-phase system (ATPS). The process variables (pH, PEG 6000 and potassium phosphate concentration) were optimized on enzyme activity and partition coefficient using response surface methodology (RSM) based on a face-centered central composite design (FCCCD) model. The optimum conditions for purification were at 18.47% [w/w] PEG6000 and 13% [w/w] potassium phosphate, pH 7.0 with enzyme activity was obtained as 0.272±0.0036 unit m/L, and partition coefficient as 1.394±0.093. The recombinant bromelain was preferentially partitioned into the top phase and the band was reduced in contrast to crude sample on SDS-PAGE gel.

Keywords
Recombinant bromelain; aqueous two-phase system (ATPS); optimization; response surface methodology (RSM); face-centered central composite design (FCCCD).
143: Evaluation of Performance of Flux Switching Motor in Segmented Rotor using Permanent Magnet for Direct Drive

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Abstract
Torque provided by combustion engine in conventional vehicles has been boosted by electric motors for fuel economy, in what is called hybrid electric vehicle. Meanwhile, the complicated nature of combustion still poses economic imperatives with petroleum resources reaching being used up completely. However, automotive vehicles propelled by electric motor powered by electricity will eliminate combustion engine and also provide clean and reliable driving vehicles for personal transportation. Since electric motor is a core component, high torque motors are necessary for direct drive application. This papers presents a feasible 24 stator and 10 rotor segments flux switching motor (FSM) using 1 kg weight of PM for high torque direct drive application capable of sustaining acceleration for long driving operations. FSM is advance form of synchronous machine with double frequency and locates all active materials on the stator only. Permanent magnet (PM) flux source is chosen because it eliminates external circuit connection that induces high winding loss. With PM, segments allow alternate stator tooth winding for strong peak magnetic flux linkage. JMAG® Studio tool version 14.1 was employed for 2D- FEA design and performance investigation of motor in terms of cogging torque and average torque. Performance of proposed rotor achieved 352Nm and constant power of 36kW showing it is capable of high torque needed for direct drive electric application.

Keywords
Direct drive; flux switching motor; high torque; permanent magnet; segmented rotor.

144: Effect of Co3+ Substitution on Electro-magnetic Properties of Pr0.75Na0.25MnO3 and Nd0.75Na0.25MnO3 Manganites

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Abstract
This paper reports influences of cobalt (Co) substituted at Mn-site of Pr0.75Na0.25MnO3 and Nd0.75Na0.25MnO3 on structure, electrical transport and magnetic properties. All of the samples were prepared via standard solid state reaction method. X-ray diffraction measurement shows that all samples were crystallized in an orthorhombic structure with Pnma space group. Resistivity measurement displays the x = 0 sample manifests an insulator behavior while metal-insulator transition was found at 108 K and 84 K for x = 0.02 and 0.05 respectively for Pr0.75Na0.25Mn1-xCoxO3. On the other hand, all of the samples for Nd0.75Na0.25Mn1-yCoyO3 showed insulator behavior down to low temperature and analysis of the resistivity change with respect to temperature, dlnρ/dT versus T reveals a slope changes of resistivity have been recorded. Two obvious peaks were recorded from the analysis for y = 0.02 and 0.05 which can be suggested to the existence of charge order transition at the vicinity. For magnetic properties, x = 0 sample showed a paramagnetic-antiferromagnetic transition and further substitution of Co, x = 0.02 and 0.05, induce the paramagnetic-ferromagnetic transition and antiferromagnetic arrangement respectively. Meanwhile, further substitution of Co, y = 0.02 and 0.05 indicate antiferromagnetic transition with increasing TN as Co increased.

Keywords
Manganites; charge ordered; double exchange mechanism.
145: Fabrication and Characterization of Copper Matrix Composites
Reinforced Silver-coated Carbon Fibers

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Abstract
Advance copper matrix reinforced silver coated carbon fiber (Cu-Ag/CF) composites were developed in an attempt to meet the critical design requirements of the International Technology Roadmap for Semiconductors (ITRS) for the power electronic packaging materials. The composites were fabricated by using the conventional powder metallurgy method. The electroless coating processes were utilized to coat the carbon fibers with silver and copper layers. JMP Pro software was used in designing the experiments to profile the coefficient of thermal expansion (CTE) and thermal conductivity (TC) of the composites. Based on the experimental results, the thermal properties of the composites were significantly influenced by silver content (wt.% Ag) and the percent-volume of the carbon fiber (vol.% CF). The anisotropic structure of the composites reflexes profoundly on their thermal properties. Furthermore, the presence of silver interface has significantly improved the CTEs and TCs of the Cu-Ag/CF composites.

Keywords
Electroless silver; electroless copper; copper-carbon fiber composite; thermal expansion; thermal conductivity.

146: Gas Emission of Palm Oil Waste Bricks during Firing Process at Different Heating Rates

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Abstract
The demand for brick materials is expected to increase rapidly. However, pollutant emission during the firing process becomes a threat to the human and environment. Therefore, this study is focusing on the release of pollutant gasses during firing waste-brick in order to prevent harmful substances from being emitted into the surrounding. The pollutant gasses may cause a health and environmental problem. The bricks were incorporated with 5% of palm oil waste and fired at different heating rates: 1°C/min, 3°C/min and 5°C/min. All samples were fired until reached 1050°C and retained for 2 hours soaking time. The gas emission measured during firing process includes carbon monoxide (CO), carbon dioxide (CO\textsubscript{2}), nitrogen oxide (NO) and sulfur dioxide (SO\textsubscript{2}). The results of estimated total emission (ETE) of gasses were compared to control bricks and waste-brick. The result has shown that increased heating rates cause decreased in gas emission, especially for CO\textsubscript{2} and CO. Therefore, studies have found that pollutant gasses are least minimal at high heating rates (5°C/min). As a conclusion, several pollutant gasses did not comply with the federal Clean Air Act’s National Ambient Air Quality Standard (NAAQS) set by Environmental Protection Agency.

Keywords
Gas emission; palm kernel shell; empty fruit bunch; fired clay brick.
147: An Automatic Transfusion Set for Accelerating Inoculation Process of Agarwood Artificial Inducer

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Abstract
The formation of agarwood resin can be accelerated by natural or artificial intervention of Aquilaria tree. Many planters developed varies inoculant or inducer in order to accelerate the formation of agarwood. Aquilaria trees require more than 20 years to form natural agarwood formation naturally, thus it becomes impractical especially for commercial purposes. On the other hand, the production of varies booster commonly unequipped with standard inoculating apparatus. The existing agarwood-inducing techniques require longer time to complete the inoculation process for each tree. Therefore, this study aims to develop a novel automated transfusion set for facilitating the inoculation process of Aquilaria tree. An automatic transfusion is equipped with magnetic sensor to monitor the inoculants volume. The automated transfusion set operated by 12V water pump that controlled by Arduino controller to give a constant pressure during inoculation process. The infusion of inoculants also controlled by Arduino controller with aids of magnetic sensor. Hence, the total volume of inoculants being infused inside the Aquilaria tree can be monitored. The result for the automated transfusion is indeed reduces the time of inoculation process which is roughly 70 ml in 2 hours compared to the conventional techniques (whole tree inoculation and syringes inoculation) by 2 hours for 50ml. Thus, this invention is potentially benefitting the planters to reduce time and laborious particularly in inoculating liquid inducers or inoculants.

Keywords
Aquilaria trees.

148: Performance Characteristics of Head-Worn Antenna Based on Dielectric Substrate over WBAN Application

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Abstract
Performance characteristics of head-worn antenna based on dielectric substrate for WBAN application with various dielectric constant for square slot patch antenna are demonstrated in this paper. The impact of Electromagnetic (EM) radiation from antenna to human head and on antenna performance changes due to human head proximity are explored in this paper. The human head exposed to 5.8 GHz on ISM frequency band and radiation pattern, return loss, efficiency, and bandwidth and SAR distribution value performance have been thoroughly explored. Although, reducing the antenna size is a distinguished topic of antenna development, the antenna performance significantly drops for a small antenna. Multilayered human head phantom having five layers are constructed based on different tissues and these tissues represent human head parts such as (Skin, fat, Cerebrospinal fluid (CSF), bone and brain), all of each tissues are based on their electromagnetic properties and set at 5.8GHz. The proposed antenna with human head model simulated through (FDTD) using CST and variation of parameters of antenna with MATLAB. Antenna with FR4 substrate produces the highest SAR values while antenna with RT5880 substrate (loss free) had contributed the lowest SAR values 0.206 W/kg and 0.0784 W/kg at 5.8 GHz frequency exposed for 10g tissue respectively. It can be observed that the radiation characteristics show that the gain of the antenna with substrate of Rogers RT5880 is increased from front –to- back from 7.1 to 7.29 dB in the free space and on human head respectively. A good agreement between simulation and measurements in free space are obtained. The presented prototype has a potential to work for ISM applications.

Keywords
Square slot patch antenna; dielectric constant; ISM; multilayered human head phantom; Specific Absorption Rate; body area networks.
**149: Electromagnetic Flux Analysis of DS HESFM Rotor for Directly Driven Actuator used in Aircraft Applications**

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**Abstract**

This paper presents the electromagnetic flux analysis of dual stator hybrid excitation switched flux machines (DS HESFM) using segmental rotor for the directly driven electromechanical actuator aimed to use in aerospace applications. The advantage of designing a machine with directly driven system is to eliminate the intermediate gear box system with having minor component count and reduced jamming possibility. The design of DS hybrid excitation with high torque density is investigated in this paper as a potential solution for aircraft applications. The key intentions of the design are a high level of actuator integration to reduce the overall weight and volume and fault tolerance ability. The proposed design of DS HESFSM has simple structure, which consist of only six field excitation coils (FECs) housed in outer stator along with six armature coils (ACs) whereas, six permanent magnets (PMs) are positioned in the inner stator. Moreover, DS HESFM structure is analyzed at no load and load conditions using commercial 2D FEA package, JMAG-designer ver. 14.0, released by JSOL Corporation.

**Keywords**

Electromagnetic flux; flux switching; hybrid excitation; segmental rotor; torque analysis.

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**150: Statistical Modelling of Dengue Incidence Rate in Selangor by using Negative Binomial GAM**

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**Abstract**

This study presents the used of Generalised Additive Model (GAM) in modelling Dengue Incidence Rate (DIR) with adopted clustering technique for districts in Selangor. This study identified a pattern for monthly observed dengue count and successfully select variables includes number of rainy days and amount of rainfall with time lags, number of locality and population density which significant to DIR in Selangor. Besides, this study found the districts divided into two clusters based on the value of mean DIR from January 2010 to August 2015. The first cluster consists of 6 districts of Selangor with value of mean DIR from 0 to 200 cases per 100,000 populations. Meanwhile, there are 3 districts classified in the second cluster with value of mean DIR from 200 to 500 cases per 100,000 populations. The Negative Binomial GAM then adopted in this study to able to handle the presence of over dispersion. In conclusion, clustering technique is one of the effective technique to identify the different district with the higher potential of dengue risk.

**Keywords**

Statistical modelling; deviance; DIR; negative binomial; Generalised Additive Model.
151: Prediction in a Hybrid of Fuzzy Linear Regression with Symmetric Parameter Model and Fuzzy c-means Method using Simulation Data

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\textbf{Abstract}

The objective of fuzzy linear regression model (FLRM) to predict the association between respondent and predictor variables in vague phenomenon. Moreover, the hybrid method was applied between fuzzy linear regression (FLRM) and fuzzy c-mean (FCM) method to get the effective new model and best result in this study. Several models such as FLRM, fuzzy linear regression with symmetric parameter (FLWSP) and a hybrid of FLRM and FCM have been applied to be evaluated by simulation data. To improve the accuracy of evaluating, this study employ two measurement error of cross validation statistical technique which are mean square error (MSE) and root mean square error (RMSE). The simulation result suggests that comparison among models using two measurement errors should be to determine the best results. Finally, this study notes that the new hybrid of FLRWSP and FCM is verified to be a good model with the least value of four measurement errors.

\textbf{Keywords}

Fuzzy linear regression; fuzzy c-means; hybrid model.

152: Study of the Effect of Insulator Profile on Electric Field Distributions on SIR Insulators

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\textbf{Abstract}

The silicone rubber (SIR) insulators use widespread on high voltage transmission lines. The electric fields are significantly uneven, so it is very important the studying and determination these fields in the design of the insulator. In this paper, the electric field and potential voltage along weather sheds surface of 11kv three-dimensional composite polymer insulator model with different shed placement and profiles (shed radius, an inclination of angle, length of the shed and the distance between shed and ground electrode) has been simulated using finite element method and compared. Modify of the insulator profile is the best method to optimize the field stress on overvoltage insulators. The value of the electric field was found the greatest close to electrodes (ground and high voltage). The results of the electrical field distribution based on insulator profile were reported using COMSOL Multiphysics 2.5 software. Further alteration was suggested to decrease and balance of the electric field on the insulator surface.

\textbf{Keywords}

Electric field distributions.
153: Contributing Factors to Science Achievement in TIMSS Malaysia: Direct Model and Indirect Model

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Abstract
The purpose of this study is to examine the extent to which home context, classroom context and school context influence students' science achievement in TIMSS 2011. This study involved a total of 5733 respondents from 180 secondary schools in Malaysia based on TIMSS 2011 data. Random sampling using two stage stratified cluster sampling technique was done in selecting the sample. This study also proposes a model containing two exogenous constructs which are parental involvement and school discipline as well as two endogenous constructs which are attitudes towards science and science achievement. This study used structural equation modeling (SEM) technique to test the direct model, indirect model and to determine the strength of the relationship between one variable with another variable. The findings showed that parental involvement has a direct effect on students' attitudes toward science and students' science achievement while the student attitudes towards science have a negative relationship towards students' science achievement.

Keywords
Parental involvement; attitudes; disciplinary; science achievement; TIMSS

154: Effect of Holding time on Density and Morphological Property of Aluminium Composite Using Recycled Materials by Stir Casting Method

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Abstract
Aluminium metal matrix composites were fabricated from recycled materials via stir casting method. The composites differed in there holding time $ht$ that is 30 minutes, 45 minutes and 60 minutes accordingly. The microstructures of the composites were analysed using optical microscope as well as scanning electron microscope in order to examine their morphological make-up. The average densities of the composites were determined and compared with one another. The average densities of the composites fabricated were very similar without any significant difference between them. It was observed that varying the $ht$ has impacted the morphology of the composites especially the composites fabricated at 60 minutes $ht$.

Keywords
Aluminium; composite; holding-time; density; morphology; microstructure.
155: Granger causality analysis on PLUS highway traffic network

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Abstract
PLUS Malaysia Berhad (PMB) is the largest toll expressway operator in Malaysia and South East Asia. Based on this reputation, PLUS handled thousands of vehicles every day. It covers the in-coming and out-coming traffic burdens from the northern areas until the southern areas. In order to manage these traffic burdens, toll plazas are located along this highway. Previous studies revealed that some of these toll plazas are important in managing the traffic burdens. This study is to analyze the importance of Skudai (SKD) toll plaza in Johor from 2009 until 2013. The causal relationship between SKD toll plaza with other toll plazas in Johor is studied to determine if there is any potential correlation or relationship of SKD with other toll plazas by using the Granger causality analysis. There is a bidirectional Granger causality between SKD and Tangkak (TGK) as well as Machap (MAC) toll plazas. Meanwhile, there is only a unidirectional Granger causality between SKD and Yong Peng Utara (YPU) and Yong Peng Selatan (YPS) toll plazas. These results help the PLUS highway management to identify which potential toll plazas that can help in increasing the traffic burden out from SKD toll plaza.

Keywords
Granger causality; highway network; traffic burden; minimal spanning tree; forest; centrality measures.

156: Creating a GUI Solver for Linear Programming Models in MATLAB

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Abstract
The concept of linear programming (LP) was developed to find out the best solution among all feasible solutions in an optimization problem. This technique becomes much popular and attains great attention from researchers due to its wide application in engineering, computer science, marketing, military and industries. Nowadays, there are many commercial software that apply this technique to solve optimization problems, e.g. Excel Solver, TORA, AMPL, LINGO and MATLAB. In this paper, we aim to use MATLAB to develop a Graphical User Interface (GUI) solver for LPs, namely LpSolver. The LP methods that will be included in our solver are the simplex method, the Big-M method, the Two-Phase method and the Dual-Simplex method. We try to make our solver perform calculations in symbolic form so that the result will be free from rounding errors. Besides that, we added a few features such as creating animated 2-D graphs and generating a detailed tableau showing all intermediate iterative results; in which the user can use it to trace the convergence path that leads to the optimal solution. In the later part of this paper we test our solver with a simple classroom sized problem.

Keywords
Linear Programming; Simplex method.
157: Performance of Surface Temperature on Green Roof

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Abstract
Globally, urbanization leads to lots of issues on environmental especially on pollutions and global warming. Climate change has increases temperatures. When the air temperature rises, it will affect the condition of urban areas and create discomfort to the users of buildings, housing and town areas. In this case, the demand for mechanical ventilation will be critical and lead to higher energy consumption in every building. The potential sustainable approach to overcome the global warming issue is to implement green roof technology. Therefore, the purposes of this study were to monitor the changes of temperature of the small scale house with green roofs and to identify the best plant species that has potential to reduce temperature and absorbing more humidity. Three identical small scale house models were constructed during the experiment. One of the house model was used as a control without any green roof installation, whilst the other two house models were planted with Portulaca G. and Alternanthe P. on each of the roof. Temperature and humidity data were collected from inside and on the roof of each model. Results show that the average difference in temperature inside the building between the control roof and the green roofs were 0.02˚C and 0.22˚C for Portulaca G. and Alternanthe P., respectively. While the average difference in temperature on the roof between the control roof and the green roofs were 1.12˚C and 2.84˚C for Portulaca G. and Alternanthe P, respectively. It can be concluded that Alternanthe P. with broad-leaf features as well as close-leaf arrangements has higher temperature reduction. The layers of the plant on the roof provide a clear shade from direct sunlight to the roof.

Keywords
Green roof.

158: Ice Bath Theraphy on Athletes Recovery Response using EEG

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Abstract
Sport recovery system is an integral aspect to help athletes adapt faster to training. This is an important process of physical preparation by reducing fatigue where the athletes can ready for the next competition or training. However, most of an athlete doing training without having the fully recovery after the training and can affect their performance. The cold bath water immersion is the one of common technique to recovery from the fatigue. In this study, Neurosky mindwave is use to extract the brain wave of an athlete to know the response of an athlete when perform the cold water immersion. This project is to know the response of an athlete in terms of meditation which is in alpha wave that state in relax condition and beta wave that is in fatigue condition in sport. The raw brain wave signal that extract using Neurosky mindwave is analysed using Matlab in terms of time domain. After that, Fast Fourier Transform (FFT) will use to analysed in terms of frequency domain. This project used alpha and beta bandto collect the data. The analysis have made based on the peak value in frequency domain to know the best time for cold water immersion and best cold bath temperature.

Keywords
Fatigue; cold ice bath theraphy; EEG; NeuroSky Mindwave; brain wave.
159: Analysis of Toothbrush Rig Parameter Estimation Using Different Model Orders in Real-Coded Genetic Algorithm (RCGA)

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Abstract
System identification is a method to build a model for a dynamic system from the experimental data. The toothbrush experiment rig with complete component which provide circular and forward backward motion to simulate the actual behavior of brushing process was used for data acquisition for the identification of the system. In this paper, optimization technique was applied to optimize the objective function that lead to satisfying solution which obtain the dynamic model of the system. Real-coded genetic algorithm (RCGA) as a stochastic global search method was applied for optimization. Hence, the model of the plant was represented by the transfer function from the identified parameters obtained from the optimization process. For performance analysis of toothbrush rig parameter estimation, there were six different model orders have been considered where each of model order has been analyzed for 10 times. The influence of conventional genetic algorithm parameter - generation gap has been investigated too. The statistical analysis was used to evaluate the performance of the model based on the objective function which is the Mean Square Error (MSE) and standard deviation for 10 times analysis. The pole-zero map and validation test-auto-correlation and cross-correlation analysis were used to validate the model. The real-coded genetic algorithm (RCGA) optimization method from model order of 6, produced the lowest prediction MSE value of 0.02512 with standard deviation for 10 times analysis was 1.57E-06 and 51.2047s convergence time. Generation gap used was 0.5 saving up to 60% of algorithm convergence time without affecting the model accuracy.

Keywords
Modeling; objective function; system identification; validation.

161: The Influence of Nonlinearity Properties in Generating Octave-spanning Light

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Abstract
An efficient system for characterization of nonlinear parameter in a highly nonlinear fiber (HNLF) is demonstrated by using four wave mixing (FWM) techniques. The nonlinearity parameters such as zero-dispersion wavelength (ZDW), chromatic dispersion (CD) and nonlinear coefficient of HNLF has successfully investigated by using FWM techniques. Results from this technique has been achieved approximately similar to the manufacturer specification. By the FWM technique, the CD slope @ 1550 nm of 0.007 ps.nm^-2.km^-1, ZDW of 1531 nm and nonlinear coefficient of 10.7 W^-1.km^-1 are obtained.

Keywords
Four wave mixing (FWM); highly nonlinear fiber (HNLF); nonlinear coefficient; zero dispersion wavelength (ZDW); chromatic dispersion.
162: Deseasonalisation in Electricity Load Forecasting

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Abstract
Nowadays, there is an increasing demand for electricity however overproduction of electricity lead to wastage. Therefore, electricity load forecasting plays a crucial role in operation, planning and maintenance of power system. There were many ways that have been employed towards electricity load forecasting. The present study was designed to study the effect of deseasonalizing the electricity load data in forecast performance and to compare the methods of Exponential Smoothing and Box-Jenkins in electricity load forecasting. The daily seasonality in electricity load data was removed and the forecast methods were employed on both the seasonal data and non-seasonal data. Holt Winters method and Seasonal-Autoregressive Integrated Moving Average (SARIMA) methods were used on the seasonal data. Meanwhile, Simple and Double Exponential Smoothing methods as well as Autoregressive Integrated Moving Average (ARIMA) methods were used on the non-seasonal data. Previous studies employed similar approach in electricity load forecasting for neural network method. This paper focused on the traditional time series forecasting method. The forecast accuracy measures used for this research were mean absolute error (MAE) and mean absolute percentage error (MAPE). The results revealed that both Exponential Smoothing method and Box-Jenkins method produced better forecast for deseasonalised data. Besides, the study proved that Box-Jenkins method was better in forecasting electricity load data for both seasonal and non-seasonal data.

Keywords
Box-Jenkins; deseasonalisation; exponential smoothing; forecast accuracy.

163: Forecasting of Unemployment Rate in Malaysia using Exponential Smoothing Methods

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Abstract
One of the issues that triggers worlds lately is the increasing rate of the unemployment rate. Consequently, this research objective is to compare the most accurate forecast method and to find the most suitable period to predict the future of Malaysia’s unemployment rate in 2016. There are five sets of Malaysia’s unemployment rate and three forecasting methods being used which are Naïve, Simple Exponential Smoothing (SES) and Holt’s method. The forecasting model was then selected based on the smallest accuracy measures. The results indicated that Holt’s is the optimal model in forecasting the overall yearly unemployment rate, male yearly unemployment rate and over-all quarterly unemployment rate. Furthermore, for female yearly unemployment rate and overall monthly unemployment rate, the best forecasting method was SES. Meanwhile, the overall unemployment rate of Malaysia in year 2016 was predicted to be 2.9% while 3.4% was estimated to be the value of unemployment rate for second half year of 2016 by using quarterly and monthly data. The forecast value was remained the same as previous year for overall yearly male data and female data which were 2.9% and 3.3% respectively. Lastly, the best period in forecasting Malaysia’s overall unemployment rate was found to be month with the value of 3.4%.

Keywords
Unemployment rate; forecasting; exponential smoothing; accuracy measures.
**164: Malaysia Tourism Demand Forecasting using Box-Jenkins Approach**

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**Abstract**
Forecasting of tourism demand is very important to enhance country’s economy because it helps planner to make decision for their tourism-related-business. This research paper was focusing on tourism demand forecasting by using Box-Jenkins approach with tourist arrival data in Malaysia from 1998 until 2017. Data (in-sample) from 1998 until 2016 were used for modelling while data (out-of-sample) from January 2017 until December 2017 were used to validate accuracy of forecast. This paper paid attention on forecast performance in order to obtain the best model to forecast tourism demand data. Hence, the error of forecast for each model was measured and compared by using AIC, MSE, MAD, and MAPE. Several candidate models have been proposed but the final model selected was SARIMA (1,1,1)(1,1,4)¹².

**Keywords**
Accuracy comparison; Box-Jenkins; Malaysia tourism; SARIMA; tourism demand forecasting.

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**165: The Sufficient Descent Condition of a New Class of Nonlinear Conjugate Gradient Method**

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**Abstract**
Nonlinear conjugate gradient method plays an important role used in solving large scale unconstrained optimization. Due to their very low memory requirements and the numerical efficiency, numerous studies have been conducted recently to improve these methods. In this paper, a new class of nonlinear conjugate gradient method which guarantee the sufficient descent condition is proposed. Numerical results show that the proposed method is more efficient compared with three classical conjugate gradient methods.

**Keywords**
Nonlinear conjugate gradient method.
166: Boundary Layer of a Dusty Fluid Flow over a Stretching Sheet

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Abstract
The aim of this study is to investigate the effects of suction parameter and fluid-particle interaction parameter on boundary layer of dusty fluid towards the stretching sheet. The governing equations of boundary layer were transformed into system of coupled non-linear ordinary differential equations with the help of similarity transformation. The transformed equations then solved numerically using bvp4c solver of MATLAB software. The effects of physical parameters on velocity profile of fluid phase and dust particle phase were obtained and analysed through several plots. Useful discussion were carried out with the help of plotted graphs and tables. The numerical results obtain were compared and found to be in good agreement with the previous study. It is observed that the presence of suction increase the velocity of fluid meanwhile opposite with velocity of particle. Besides that, the fluid-particle interaction parameter increase the velocity of particle.

Keywords
Boundary layer; bvp4c; dusty fluids; stretching sheet.

167: Effect of Dimensionality Reductions Technique in Modelling and Forecasting River Flow

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Abstract
Accurate information on future river flow is a fundamental key for water resources planning, and management. Traditionally, single models have been introduced to predict the future value of river flow. This paper investigates the ability of Principal Component Analysis as dimensionality reduction technique, by extracting the principal components from lagged input of monthly stream flow data. The technique is then combined with single SVM and LSSVM, referred to as PCA-SVM and PCA-LSSVM. This study also presents comparison between the proposed model of PCA-LSSVM and Single model of SVM and LSSVM. These models are ranked based on four statistical measures namely Mean Absolute Error (MAE), Root Mean Square Error (RMSE), Correlation Coefficient (r), and Correlation of Efficiency (CE). Then, the best ranked model is measured using Mean of Forecasting Error (MFE) to determine its under and over predicted forecast rate. This model also indicates a small percentage of under-predicted values compared to the observed river flow values of 1.36 and 2.32% for Muda and Selangor Rivers, respectively. The comparison results indicate the LSSVM with PCA model is a useful tool and a promising new method for stream flow forecasting. The results showed that LSSVM with PCA as data pre-processing technique were found to provide a better representation and good forecasting results for both rivers.

Keywords
Dimensionality reduction; forecasting; river flow; Principal Component Analysis; least square support vector machine.
168: Probing Dynamic Mechanical Analysis and Atomic Force Microscopy Interactions of Polypropylene/Kaolin Nanocomposite

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Abstract
The Dynamic mechanical analysis (DMA) and Atomic force microscopy (AFM) studies were conducted and evaluated on polypropylene/kaolin (PP/K) nanocomposite treated with maleic anhydride (MA) and dicumyl peroxide (DCP) as additives in an in-situ process. Two-roll mill was used in compounding of the nanocomposites while moulding were done by injection moulding machine. Investigation in to the effect of K and MA/DCP on the nanocomposites (NC) indicates that interfacial interactions between PP and K as filler was eminent. DMA analysis reveals an increase in the storage modulus which was at maximum significantly in PP/K NC with 3 wt% and decrease in damping factor tan δ also at PP/K NC of 3 wt%. The AFM study indicates that there was uniform and smooth surface roughness among the NCs. Thus, addition of MA/DCP on to PP/K NC improves the reinforcing influence on the nanocomposites for better improvement.

Keywords
Polypropylene; Kaolin; additives; nanocomposite; roughness.

169: Analysis of Golfer’s Brainwave Signal During Par Tee Ireland and Driving Range Game

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Abstract
Ways for improving sporting performance become exceptional contemporary interest. Nowadays, many studies use of the human brain as an input signal include eyes blinking, attention and meditation to control the exchange process. Brain-Computer Interface (BCI) requires generating control signals for external device by analyzing and processing the internal brain signal. The objective of this study is to identify the signal of brainwave which gives effect to performance of golfer. This study also wanted to analyze the meditation (α) and attention (β) state of different golf players. In this project, the brainwave of golfer’s will be analyzed based on the movement before club strike the ball. EEG signal were analyzed to find out the features by using Fast Fourier Transform (FFT). The analysis has been done between three categories of player include beginner, intermediate and professional. Two types of game have been considered which are Par Tee Ireland and Driving Range. The project interfaces MATLAB software with an EEG headset. The data that has been interpreted to time domain graph and frequency domain graph showed different level in an attention (β) state for both games. Brainwave signals has indicated players’ performance and will lead in better performance. This data benefits increasing the performance of golfer to become the professional golfer by using electroencephalography (EEG) headset in future study.

Keywords
Neurosky mindwave; attention brainwave; focus of golfer; FFT in alpha and beta wave.
170: A new Hybrid of Fuzzy C-Means Method and Fuzzy Linear Regression Model in Predicting Manufacturing Income

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Abstract
Analysis by human perception could not be solved using traditional method since uncertainty within the data have to be dealt with first. Thus, fuzzy structure system is considered. The objectives of this study to: determine suitable cluster by using fuzzy c-means (FCM) method, to apply existing methods such as multiple linear regression (MLR) and fuzzy linear regression (FLR) as proposed by Tanaka and Ni, to improve the FCM method and FLR model proposed by Zolfaghari to predict manufacturing income. This study focused on FLR which is suitable for ambiguous data in modelling. Clustering is used to cluster or group the data according to its similarity where FCM is the best method. The performance of models will measure by using the mean square error (MSE), the mean absolute error (MAE) and the mean absolute percentage error (MAPE). Results shows that the improvisation of FCM method and FLR model obtained the lowest value of error measurement with MSE=1.825 x 10¹¹, MAE=115932.702 and MAPE=95.0366. Therefore, as the conclusion, a new hybrid of FCM method and FLR model are the best model for predicting manufacturing income compared to the other models.

Keywords
Fuzzy linear regression (FLR); fuzzy c-means (FCM); mean square error (MSE).

171: The Discrete Time-Space SIR-SI Age-Structured Model for Leptospirosis

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Abstract
The aim of this study is to introduce new discrete time-space SIR-SI age-structured disease transmission models for Leptospirosis disease. Here, the age-structured represents two age groups which are children and adult. These models are important because it will later lead to a conclusion either children or adult have highest risk of been infected by Leptospirosis disease. In this study, two types of SIR-SI age-structured model are introduced. These include models with and without the transition rate between age groups. The future application of these two models will be based on the availability of parameter value and Leptospirosis data.

Keywords
SIR-SI age-structured Model.
172: Predictive Modelling of Cockles in Malaysia by Using Time Series Analysis

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Abstract
Cockle farmed in Malaysia are from Anadara genes and Arcidae family which known as blood cockle. Normally, it was found in the farmed around mangrove estuary areas in the muddy and sandy shores. This study aims to predict the production of cockle to ensure sure the cockle supplies are synchronised with the demand. Then, based on the demand, the prediction result could be used to make decision either to import or export the cockle. The data were taken from the Department of Fisheries Malaysia (DFM) and it has cyclic pattern data. There are two methods used in this study which are Holt-Linear method and Auto regressive moving average (ARMA). In determining the best fitted model between the two methods, the mean square error (MSE) values will be compared and the lowest value of MSE will assign as the best model. Result shows that ARMA(1,1) is the best model compared to Holt-Linear. Therefore, ARMA(1,1) model will be used to forecast the production of cockle in Malaysia.

Keywords
Auto regressive moving average (ARMA); Holt-linear; Mean Square Error (MSE).

173: Monitoring Process Variability and Root Cause Analysis in Paper Box Production

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Abstract
Multivariate Statistical Process Control (MSPC) is broadly apply in many sectors for the purpose of process monitoring. It is undeniable that most of the current processes involve multivariate data which required to be monitored concurrently. In this study, a multivariate approach was introduced which performed as a combination of (i) applying Hotelling’s T2 control chart in detecting the out of control signals and (ii) implementing MYT Decomposition and structure analysis technique for root cause analysis. The benefits and impacts of such application was shown by considering a production process of bottom or side opening box set in one of the Malaysian manufacturing industry. The successful application of this multivariate approach could act as a stimulant for most industries to imitate it in process monitoring. Moreover, the computation efficiency in root cause analysis enables multiple quality characteristics to be monitored simultaneously. Based on the findings, the core issue that needs to be concerned by management team is the closure tap of box. This process variation should be solved immediately to avoid the products’ quality from further deteriorate.

Keywords
Multivariate statistical process control; Hotelling’s T2; MYT decomposition.
174: Modelling House Price Using Ridge Regression and Lasso Regression

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Abstract
House price prediction is important for the government, finance company, real estate sector and also the house owner. The data of the house price at Ames, Iowa in United State which from the year 2006 to 2010 is used for multivariate analysis. However, multicollinearity is commonly occurred in the multivariate analysis and gives a serious effect to the model. Therefore, in this study investigates the performance of the Ridge regression model and Lasso regression model as both regressions can deal with multicollinearity. Ridge regression model and Lasso regression model are constructed and compared. The root mean square error (RMSE) and adjusted R-squared are used to evaluate the performance of the models. This comparative study found that the Lasso regression model is performing better compare to the Ridge regression model. As Lasso regression can perform the variable selection, the important variables are selected in the model. The important variables include the aspect of size of house, age of house, condition of house and also the location of the house.

Keywords
Ridge regression; Lasso regression; Root Mean Square Error (RMSE); adjusted R-squared.