CONFERENCE BOOK

4th International Conference on Defence & Security Technology (DSTC),

3rd International Conference on Engineering and Technology (IntCET) &

Seminar on Antidote and Decontamination of Chemical Warfare Agents

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21st – 22nd NOVEMBER 2018
MARRIOTT PUTRAJAYA, MALAYSIA

WELCOME MESSAGE

Dear Participants,

First and foremost, I am grateful to Allah S.W.T, praise be upon Him, the most Gracious and Merciful for His blessings in giving us this precious opportunity and moment to organize this memorable event. The 4th International Conference on Defence & Security Technology (DSTC), 3rd International Conference on Engineering and Technology (IntCET) and Seminar on Antidote and Decontamination of Chemical Warfare Agents mark another historic and important conference to National Defence University of Malaysia as it is the first mega juncture comprising of multiple co-located events: expositions, 4 conferences, 4 workshops and 1 research seminar.

I would like to express thanks as well to the sponsors of this mega juncture: our Gold Sponsor: BAE Systems International Ltd, Silver sponsors: THALES Malaysia Sdn Bhd, Integrasi Erat Sdn Bhd, Vigilant Solution, United Technology (M) Sdn Bhd and PV HiTech Solar Sdn Bhd. Thank you for the support and commitment in this multi-faceted conference.

The Malaysian government has given so much emphasis in the quest of new knowledge through research and innovation. For example, RM10.65 million has been allocated to UPNM to develop detection and antidotes for chemical weapons. UPNM as a whole, has been very proactive in taking up this challenge.

The importance of interaction and networking among research communities of all ages cannot be underestimated and platform like DSTC, IntCET and Antidote & Decontamination Seminar provide great opportunity for the exchange and cultivation of ideas and knowledge, especially in multifaceted research areas such as defence and security.

This multi conference is intended to initiate good working relationship among all researchers from within as well as outside of Malaysia. Apart from that, DSTC, IntCET and Antidote & Decontamination Seminar serve as a forum in which all researchers and practitioners can share their work and experiences in their specific area of expertise, exchanging opinions in multidisciplinary research. It also plays an important role in providing a platform for young researchers for the mutual exchange of knowledge towards improving their academic, scientific and research capabilities.

I am very pleased that after twelve years since our establishment, UPNM has successfully conducted various academic and research activity programs and has received a strong support and co-operation from members of the industry, multinational companies and business entities. Similar support has also been given by our counterparts and peers from the academic world.

Despite being young, research and development at UPNM has been very progressive, thanks to the fusion and clustering of researchers and research exposure. In UPNM, we found that specific guidance, creative ideas and wide experience, coupled with the aggressiveness and creativity of the young and senior researchers has been an effective recipe. This has resulted in UPNM success in various research exhibitions and publications, be it locally or internationally.

I would also like to highlight that UPNM now ranked 28th in the defence niche area based on SCOPUS publications, with more than 24% publications or 595 papers coming from engineering areas alone, the majority contributor to UPNM ranking. 9 out of the top 10 most prolific authors in UPNM are all coming from engineering research areas. I am very happy and proud with the talents that we have in UPNM and would like to foster even more in the future.

We live in the era of rapid technological change of Industrial Revolution 4.0. For Malaysia to compete in a global environment and to be able to take its rightful place amongst the ranks of developed countries by 2020, we need to develop products and services of the highest quality in a timely manner to the global and increasingly discerning market place. This requires knowledge and highly skilled designers, engineers and technologists with the appropriate research, design, fabrication and assembly competencies who are able to transform ideas into first-to-market innovative products and services. We therefore, need to setup a strong base of research and development in our country as well as neighbouring countries so that our competiveness is always sustained via mastery of advanced technologies.

I am therefore delighted to note that the organization of the DSTC conference co-located together with IntCET and, Antidote & Decontamination Seminar is highly significant for merging the research output in defence and security to conventional engineering areas. I hope that this platform for communication and exchange of ideas will be capitalized to the fullest in order to facilitate academic sharing of expertise, teaching methodologies and learning practices.

UPNM wishes to enhance the level of strategic collaborations with all participants in DSTC, IntCET and Antidote & Decontamination Seminar in terms of infrastructure, research focus and creative ideas. This collaboration will then be expected to create new research partnership as well as the supply of potential scientific, technical knowledge and skills. I would like to congratulate the DSTC, IntCET and, Antidote & Decontamination Seminar's committee for their commitment and superb drive in organizing this mega juncture conference. I am more than confident that this multi conference will be able to provide the necessary thrust in more joint research collaborations between our researchers and product commercialization within our research society. It is my aspiration that this conference will be a foundation for the growth of new ideas towards a better tomorrow.

I also would like to thank Prof Dr Kamil Kuca and Dr Euginie Nepovimova, both from University of Hradec Kralove, Czech Republic, for their willingness to deliver the keynote and lecture, respectively for the Conference and Antidote & Decontamination Seminar. I hope this is the beginning of UPNM and University of Hradec Kralove collaboration. My thanks are also to Prof Dr Raja Syamsul Azmir from UPM, for delivering the keynote speech for the Conference. Your contribution is really appreciated and reinforces the existing UPNM-UPM relationship.

I wish all delegates a fruitful discourse and a productive conference.

Thank you., Assalamualaikum w.b.t.

Lt Gen Dato' Haji Abdul Halim bin Haji Jalal
Vice Chancellor
Universiti Pertahanan Nasional Malaysia (UPNM)
Patron of DSTC2018 | IntCET2018 | Detection & Antidote Seminar

KEYNOTE SPEAKER PROFILE

KEYNOTE 1

Prof. Dr. Kamil Kuca has received his PhD in 2005 at Faculty of Military Health Sciences, University of Defence (Czech Republic). In 2009, he got Associate Professorship in Toxicology. From 2010 to 2012 he was Vice-dean for Research at the Faculty of Military Health Sciences, University of Defence (Czech Republic). Currently, he is working as head of the Biomedical Research Centre and in parallel as head of the Centre for Transfer of Biomedical Technologies at the University Hospital Hradec Kralove (Czech Republic). He is serving as an editorial member of several reputed journals like i-Business, Journal of Applied Biomedicine, Military Medical Science Letters, etc. He has authored more than 300 research articles/books. He is a member of plenty scientific societies like American Chemical Society, International society for Neurochemistry, American College of Toxicology, The New York Academy of Sciences, etc. Current research is focused on synthesis and testing (in vitro and in vivo) of novel acetylcholinesterase reactivators as treatment of nerve agent and pesticide intoxications; acetylcholinesterase inhibitors in Alzheimer´s disease and Myasthenia Gravis treatment; synthesis of the detergents as disinfectants, decontamination means and environment for micellar catalysis; drug design and development; chemical warfare agents; toxins; project management, intellectual property, science management.

KEYNOTE 2

Prof. Dr. Raja Syamsul Azmir Bin Raja Abdullah received his BEng. (2000) in Electronic and Electrical Engineering, MSc. (2001) in Communication System Engineering and PhD in 2005 from University of Birmingham, UK. His PhD thesis majoring in Radar and Microwave System. He is currently a Professor at the Faculty of Engineering, Universiti Putra Malaysia (UPM). His professional tenure at the university spanning over 12 years has allowed him to gain expertise especially in conducting research and providing consultancy, along with formal UG teachings and PG supervisions. He held various administrative positions at UPM including; Head of Department, Head of Wireless and Photonics Networks Research Center (WiPNET), General Manager of UPM Holdings Sdn Bhd, Chair of various Committee and Chair for Academic conferences. In 2014, He was tenured as a Visiting Academic and Researcher to The University of Birmingham.

His standing in research is visible to the international research community in his area. His passion towards technological advancement in the field of Sensors, Telecommunications, Radar, Remote Sensing and Signal processing has been manifested through more than 170 publications in Journals, Conference Proceedings and Reports. With current H-index of 13 and Citations of more than 770, his forte in research has been globally visible predominantly in the mentioned areas. He secured a total research funding of more than RM4 million from government agencies and industries. Through his dedication in R&D, he has won numbers of recognition including medal in the R&D exhibition. A milestone in his endeavour took place when He happened to be among the pioneering developer of Advanced Forward Scattering Radar System, which now has been adopted in various applications and technology. As a pioneer researcher, He has been giving regular keynotes and invited speeches including the UK, China, Turkey, Indonesia and Australia. Currently, He involve with a project under the European Horizon2020 grant focusing on massive MIMO. Apart from being a reviewer to many impact factor and flagship journals like IEEE Transactions and IET, he actively involved and giving advice to the Indonesian Agency, Bandung Institute of Technology and Industry panel in Pakistan. His current project focused on “Bio-Inspired Sensing System” involves a collaboration between Ohio State University, University of Birmingham, Durham University and Beijing Institute of Technology (China).

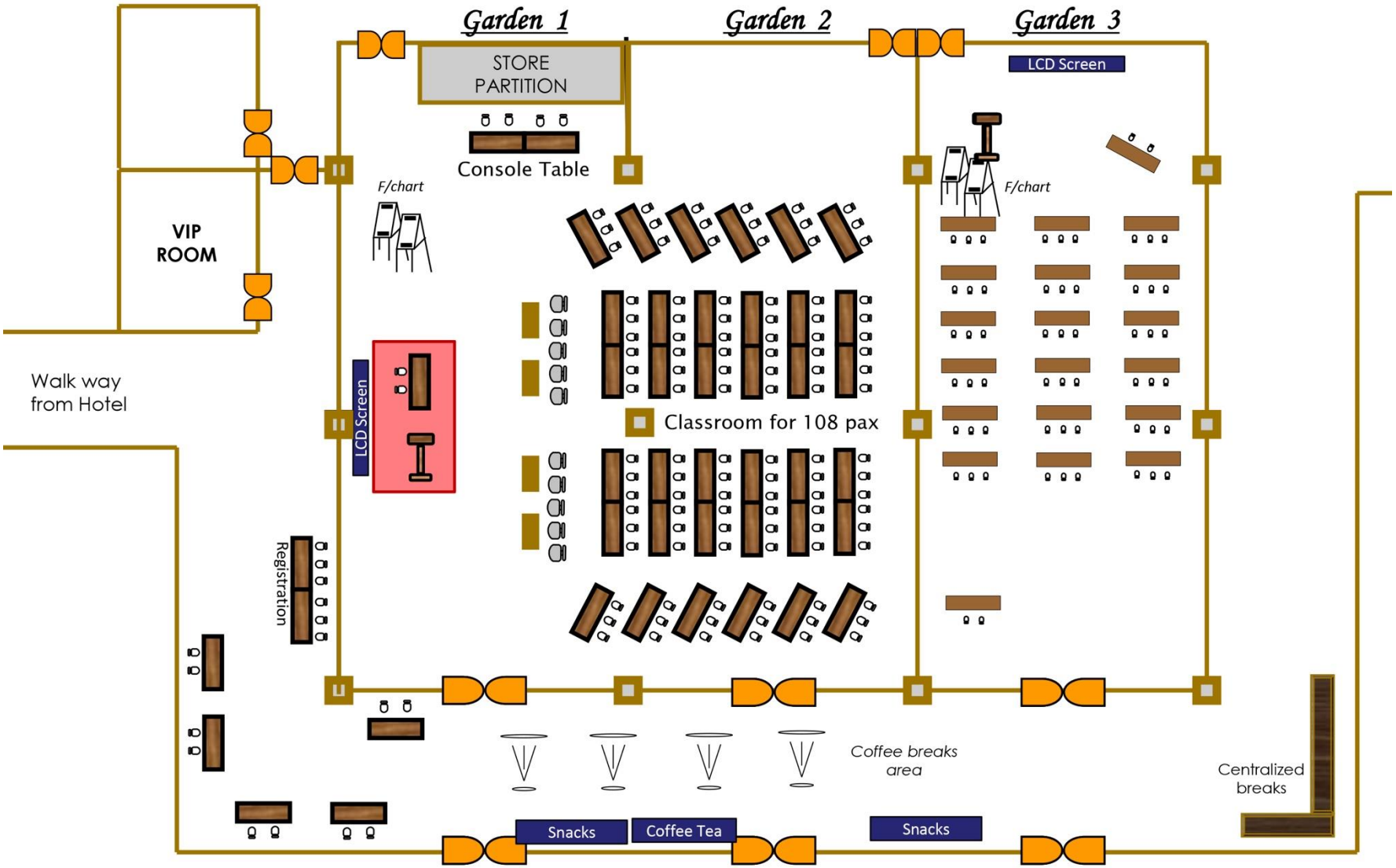
CONFERENCE SCHEDULE

7.00am – 8.30am	Registration and Breakfast
8.30am – 9.00am	Keynote 1: Prof. Dr. Kamil Kuca
9.00am – 9.30am	Welcoming and Opening Speech
9.30am – 10.00am	Industrial Booth Visit
10.00am – 10.30am	Morning Break / Poster session 1
10.30am – 11.00am	Keynote 2: Prof. Dr. Raja Syamsul Azmir
11.00am – 11.30am	Industrial talks (2)
11.30am – 13.30pm	Parallel Session 1
13.30pm – 14.30pm	Lunch / Poster session 2
14.30am – 16.30pm	Parallel Session 2
16.40am – 18.30pm	Parallel Session 3

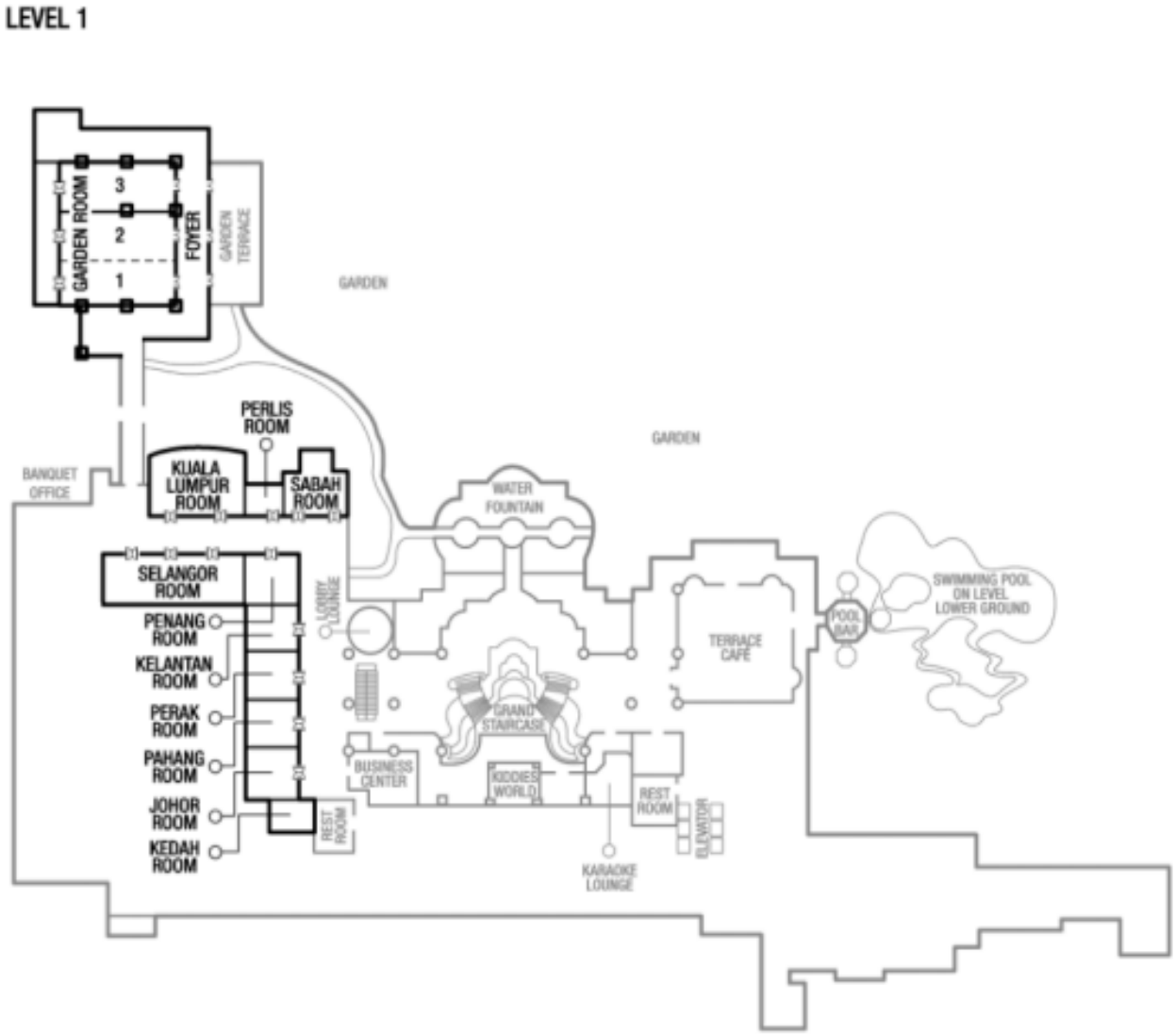
ORAL SCHEDULE

	DSTC - Main Hall	IntCEECE - Perak Room	IntCMecH - Pahang Room	IntCIVEE - Johor Room
Session 1	**DSTC&INTCET2018-020**	**DSTC&INTCEECE-038**	**DSTC&INTCET2018-003**	**DSTC&INTCET2018-012**
11.30 - 13.30	DSTC&INTCET2018-011	DSTC&INTCEECE-007	DSTC&INTCET2018-009	DSTC&INTCET2018-005
	DSTC&INTCET2018-021	DSTC&INTCEECE-058	DSTC&INTCET2018-015	DSTC&INTCET2018-019
	DSTC&INTCET2018-025	DSTC&INTCEECE-049	DSTC&INTCET2018-037	DSTC&INTCET2018-048
	DSTC&INTCET2018-049	DSTC&INTCEECE-032	DSTC&INTCET2018-056	DSTC&INTCET2018-042
	DSTC&INTCET2018-055	DSTC&INTCEECE-046		DSTC&INTCET2018-043
				DSTC&INTCET2018-044
				DSTC&INTCET2018-041
Session 2	**DSTC&INTCET2018-059**	**DSTC&INTCEECE-052**	**DSTC&INTCET2018-030**	**DSTC&INTCET2018-033**
14.30 - 16.30	DSTC&INTCET2018-060	DSTC&INTCEECE-122	DSTC&INTCET2018-026	DSTC&INTCET2018-013
	DSTC&INTCET2018-062	DSTC&INTCEECE-010	DSTC&INTCET2018-028	DSTC&INTCET2018-039
	DSTC&INTCET2018-103	DSTC&INTCEECE-027	DSTC&INTCET2018-029	DSTC&INTCET2018-017
	DSTC&INTCET2018-024	DSTC&INTCEECE-002	DSTC&INTCET2018-045	DSTC&INTCET2018-102
	DSTC&INTCET2018-047	DSTC&INTCEECE-040	DSTC&INTCET2018-106	DSTC&INTCET2018-023
	DSTC&INTCET2018-050	DSTC&INTCEECE-054	DSTC&INTCET2018-108	DSTC&INTCET2018-001
	DSTC&INTCET2018-064	DSTC&INTCEECE-057	DSTC&INTCET2018-018	DSTC&INTCET2018-006
				DSTC&INTCET2018-014
Session 3	**DSTC&INTCET2018-067**	**DSTC&INTCEECE-063**	**DSTC&INTCET2018-035**	**DSTC&INTCET2018-008**
16.40 - 18.30	DSTC&INTCET2018-101	DSTC&INTCEECE-066	DSTC&INTCET2018-016	DSTC&INTCET2018-031
	DSTC&INTCET2018-123	DSTC&INTCEECE-068	DSTC&INTCET2018-104	DSTC&INTCET2018-107
	DSTC&INTCET2018-051	DSTC&INTCEECE-120		DSTC&INTCET2018-034
	DSTC&INTCET2018-061	DSTC&INTCEECE-065		
	DSTC&INTCET2018-069	DSTC&INTCEECE-118		
	DSTC&INTCET2018-105			
	DSTC&INTCET2018-111			

VENUE FLOOR PLAN (Opening Session)



VENUE FLOOR PLAN (Parallel Session)



DSTC PAPER LIST

Bil	Paper ID	Paper Title	Presenter	Authors name	Institusion	Faculty
1	DSTC&INTCET2018-011	Cyberwarfare Act Of War: A Review Based On Clausewitz Perspective	Afiqah M. Azahari	Afiqah M. Azahari, Arniyati Ahmad, Zuraini Zainol, Mohd Hazali Mohamed Halip, Nur Diyana Kamarudin	UPNM	Cyber Security Center
2	DSTC&INTCET2018-020	Stacked Sparse Autoencoders based Outlier Discovery for In Vehicle Controller Area Network (CAN)	Siti Farhana Lokman	Siti Farhana Lokman, Abu Talib Othman, Muhamad Husaini Abu Bakar, Rizal Razuwan	UniKL MSI	
3	DSTC&INTCET2018-021	Optical Observations on Detonation of Shallow Buried Charge in Sandy Soil	Zulkifli Abu Hassan	Zulkifli Abu Hassan, Aniza Ibrahim, Norazman Mohamad Nor	UPNM	FKJ
4	DSTC&INTCET2018-024	The Degree Of Terrain Masking And Radar Exposure Based On Raster Cells For Pre-Flight Planning For Low Flying Helicopters	Shahril Ahmad	Khairol Amali Ahmad; Fakroul Ridzuan Hashim; Wan Mohamed Syafuan	UPNM	FKJ
5	DSTC&INTCET2018-025	Volunteer Management System for Disaster Management: Malaysia Case	Muhammad Ramzul Abu Bakar	Noor Afiza Mat Razali, Nurjannatul Jannah Aqilah Md Saad, Hasmeda Erna Che Hamid, Muhammad Ramzul Abu Bakar, Khairul Khalil Ishak, Nor Asiakin Hasbullah, Norulzahrah Mohd Zainudin, Suzaimah Ramli, Norshahriah Wahab, Zahimi Zainol Abidin	UPNM	FSTP
6	DSTC&INTCET2018-047	Privacy Requirements Classification Method for System Design	Nor Asiakin Hasbullah	Nor Asiakin Hasbullah, Norulzahrah Zainudin, Noor Afiza Mat Razali, Norshahriah Abdul Wahab	UPNM	FSTP
7	DSTC&INTCET2018-049	Sound Velocity Profile (SVP) at Strait of Malacca for Maritime Warfare Usage	Ainul Husna Abdul Rahman	Mohd Najib Abdul Ghani Yolhamid, Ainul Husna Abdul Rahman, Mohd Azzeri Mohd Naiem, Mohd Norsyarizad Razali, Mohd Arif Ahmad	UPNM	FSTP
8	DSTC&INTCET2018-050	An Approach To Mixed Reality And Massive Open Online Courses (Mooc) In Learning The Military Decision Making Environment	Norshahriah Abdul Wahab	Norshahriah Abdul Wahab, Nor Asiakin Hasbullah, Norul Zahrah Zainuddin, Noor Afiza Mat Razali,	UPNM	FSTP

				Yuhanim Hani Yahaya, Syed Nasir Alsagoff		
9	DSTC&INTCET2018-051	The Study On The Techniques of Content-Based Image Retrieval (CBIR) Using Color, Texture and Shape Features	Mohd Afizi Mohd Shukran	M. A. M. Shukran, M. N. Abdullah, F. Ahmad, M. R. M. Isa	UPNM	FSTP
10	DSTC&INTCET2018-055	Study on the Dependence of the Temperature Effect on the Magnetorheological Elastomers Dynamic Properties	Adenen Aziz	Adenen Aziz, Siti Nur Muhamad, Afiqah Rosly, Ainul Rahman, Sarah Isnan, Mohamad Abu Ubaidah Amir, M. N. Azzeri	UPNM	FSTP
11	DSTC&INTCET2018-059	Analysis of Treated Ballast Seawater for Potential Reuse	Siti Nur Muhamad	M. Mazlan, Siti Nur Muhamad, Mohd Norsyarizad Razali, Nanthini Sridewi, Adenen Aziz	UPNM	FSTP
12	DSTC&INTCET2018-060	Data Security Privacy Calculus on Social Media	Lee Fong Yee	Lee Fong Yee, Mohd Afizi Mohd Shukran, Fatimah Ahmad	UPNM	FSTP
13	DSTC&INTCET2018-061	Pixel Value Graphical Password Scheme: Alternative Hash Password Using Hexadecimal Color Codes	Mohd Afizi Mohd Shukran	M. A. M. Shukran, M. S. F. M. Yunus, F. Ahmad, M. F. M. Amran	UPNM	FSTP
14	DSTC&INTCET2018-062	Fracture Behavior of RT-PMMA Under Impact Loading	Norazrina Mat Jali	Norazrina Mat Jali, Patrice Longere	ISAE SUPAERO	
15	DSTC&INTCET2018-064	Electroencephalogram-based Controlled Robot as an Attention Level Indicator	Yuhanim Hani Yahaya	Yuhanim Hani Yahaya, Nurhafizah Moziyana Mohd Yusof, Mohd Fahmi Mohamad Amran, Muslihah Wook, Norshahriah Wahab	UPNM	FSTP
16	DSTC&INTCET2018-067	Online Social Networks as Supporting Evidence for Digital Forensic Investigation: A Revised Model	Norulzahrah Mohd Zainudin	Norulzahrah M. Zainudin, Nor A. Hasbullah, Norshahriah A. Wahab, Suzaimah Ramli, Noor A. M. Razali	UPNM	FSTP
17	DSTC&INTCET2018-069	Materials for Enhanced Organic Light Emitting Transistor	Mukhzeer Mohamad Shahimin	Ravi Rao Simanjalam, Nor Azura Malini Ahmad Hambali, Mohamad Halim Abd Wahid, Khairol Amali Ahmad, Mukhzeer Mohamad Shahimin	UPNM	FKJ

18	DSTC&INTCET2018-101	Electrospun Poly (3-hydroxybutyrate) [P3HB] and Poly (3-hydroxybutyrate-co-3-hydroxyhexanoate) [P(3HB-co-3HHx)] Nanofibers for The Adsorption of Phenol	Nanthini Sridewi	Ainil Hawa, Kumar Sudesh, Nanthini Sridewi	UPNM	FSTP
19	DSTC&INTCET2018-103	Review on Melanoma Cancer Diagnosis Device using Image Processing Techniques	Nor Suraya Mariam Ahmad	Nor Suraya Mariam Ahmad, Mohd Afizi Mohd Shukran, Suzaimah Ramli, Farhana Rahmat	UPNM	FSTP
20	DSTC&INTCET2018-105	A Review on NoSQL (RethinkDB) and MySQL Database Replication From Master to Slave in Big Data	Khairol Amali Bin Ahmad	Dildar Husain, Mohammad Omar, Khairol Amali Ahmad, Khaleel Ahmad	UPNM	FKJ
21	DSTC&INTCET2018-111	Numerical and Experimental Analysis of Activated Carbon Filler on the Mechanical Properties of Wood Composites	Fakroul Ridzuan Hashim	M. Mazlan, F. R. Hashim, K. A. Ahmad, M. N. Omar, A. I. M. Shaiful, M. K. A. A. Razab, S. Mamat, M. B. A. Bakar, M. F. Hamid, A. A. Janvekar, Z. I. Rizman	UPNM	FKJ
22	DSTC&INTCET2018-123	Design and Simulation of Nozzle for Pure Water Jet Portable Cutting Tool	Razali Abidin	Razali Abidin, Mohamad Asmidzam Ahamat, Tarmizi Ahmad, John Paul, Al Imran, Hafizi Nordin, Wan Hanif Wan Yaacob	UPNM	FKJ

IntCEECE PAPER LIST

Bil	Paper ID	Paper Title	Presenter	Authors name	Institusion	Faculty
1	DSTC&INTCEECE-002	STUDENT DROWSINESS DETECTION SYSTEM (SDDS)		Azwan Bin Md Ripin, Chew Sue Ping; Anis Shahida Niza Bt Mokhtar, Latifah Sarah Supian, Khadijah Bt Ismail	UPNM	FKJ
2	DSTC&INTCEECE-007	MULTI- RELATIONAL LATENT SYNTAX-SEMANTIC "SYNTAXLSEM" ANALYSIS MODEL FOR EXTRACTING QURA'NIC CONCEPT A NEW INNO-VATIVE FOR SUSTAINABLE SOCIETY		Dr Asma Abdul Rahman, Dr Ahmad Abdul Rahman, Ir Dr Mohd Fadhil Md Din	USIM	Department of Education in Linguistics ,Faculty of Major Languages studies
3	DSTC&INTCEECE-010	PERFORMANCE COMPARISON OF COLOUR CORRECTION AND COLOUR GRADING ALGORITHM FOR MEDICAL IMAGING APPLICATIONS		Nur Diyana Kamarudin, Mohd Shahrizal Rusli, Ooi Chia Yee, Syarifah Bahiyah Rahayu Syed Mansoor, Afiqah Mohd Azahari, Zuraini Zainol, Kamaruddin Abd Ghani, Siti Noormiza Makhtar	UPNM	CYBER SECURITY
4	DSTC&INTCEECE-027	CORRELATION BETWEEN ANGLE OF ATTACK ESTIMATION WITH MULTIPOINT PITOT STATIC POSITIONING FOR A FIXED-WING UAV		Akram Abdul Azid, Mohd Haziq Zulkeflee, Zuhairi Abdul Rashid, Syed Mohd Fairuz Syed Mohd Dardin, Ahmad Shukri Abu Hasim, Asnor Mazuan Ishak	UPNM	FKJ
5	DSTC&INTCEECE-032	A NEW HEURISTIC METHOD FOR SOLVING PRIORITY-BASED TARGET COVERAGE PROBLEM IN DIRECTIONAL SENSOR NETWORKS WITH ADJUSTABLE SENSING RANGES		Mohd Norsyarizad Razali, Shaharuddin Salleh	UPNM	DEPARTMENT OF SCIENCE & MARITIME TECHNOLOGY
6	DSTC&INTCEECE-038	ENHANCEMENT LTE NETWORK PERFORMANCE BY CONGESTION CONTROL MANAGEMENT		Fadli Sirait, Mohd Taufik Bin Jusoh, Kaharudin Dimyati, Akhmad Wahyu Dani	UPNM	FKJ

7	DSTC&INTCEECE-040	OPTIMIZATION OF UV EXPOSURE TIME FOR MICRO PATTERN TRANSFER ON S1813 MASK LAYER		K.A. Mustafa, J. Yunas, A.A. Hamzah, M. Syaripuddin, M. Mustapha, N.A.A. Mohd Nazam,B. Yeop Majlis	UPNM	FKJ
8	DSTC&INTCEECE-046	STUDY OF DEEP LEARNING ALGORITHM FOR DETECTION OF FAULTY PHOTOVOLTAIC PANEL IMAGES		Suzaimah Ramli, Norazlin Ibrahim, Zaihan Mohd Zin, Norshahira Othman, Mohd Nazri Ismail, Norulzahrah Mohd Zainudin, Noor Afiza Mat Razali	UPNM	COMPUTER SCIENCE DEPARTMENT
9	DSTC&INTCEECE-049	SOUND VELOCITY PROFILE (SVP) AT STRAIT OF MALACCA FOR MARITIME WARFARE USAGE		Mohd Najib Abdul Ghani Yolhamid, Ainul Husna Abdul Rahman, Mohd Azzeri Mohd Naiem, Mohd Norsyarizad Razali, Mohd Arif bin Ahmad	UPNM	Science and Maritime Technology Department, Faculty of Science and Defence Technology
10	DSTC&INTCEECE-052	OPTIMIZATION OF ENERGY HARVESTING IN RUNNING SHOES- A PRELIMINARY STUDY		Elya M.N., Hussainy N.Z.	UPNM	FKJ
11	DSTC&INTCEECE-054	PICO HYDRO GENERATION SYSTEM FOR BUILDING'S SUPPLEMENTARY ENERGY		Mohamad Fakri bin Ishak, Kamarul 'Asyikin Binti Mustafa, Murniati Syaripuddin, Norlaili Ismail, Tengku Abdullah Afiq Tengku Shukri	UPNM	FKJ
12	DSTC&INTCEECE-057	CONDITIONAL CONNECTIVITY WITHIN HIPPOCAMPUS USING MULTIVARIATE PARTIAL COHERENCE ANALYSIS.		Siti Noormiza Makhtar, Siti Anizah Muhamed, Nur Diyana Kamarudin, Anis Shahida Niza Mokhtar	UPNM	FKJ
13	DSTC&INTCEECE-058	FORWARD SCATTERING RADAR FOR THE REAL-TIME DETECTION OF HUMAN ACTIVITIES AND FALL EVENTS CLASSIFICATION		Ali Alnaeb, Raja Syamsul Azmir Raja Abdullah, Asem Ahmad Salah, Aduwati Sali, Nur Emileen Abdul Rashid, Idnin Pasya	UPM	Wireless and Photonic Networks Research Centre, Faculty of Engineering

14	DSTC&INTCEECE-063	MULTIPLE RENEWABLE INPUT AND OUTPUT EMERGENCY PORTABLE POWER SUPPLY		Suresh Thanakodi, Ahmad Mujahid Ahmad Zaidi, Azizi Miskon, Nazatul Shiema Moh Nazar, Nik Zamiri Nik Hanapi	UPNM	FKJ
15	DSTC&INTCEECE-065	THE DEVELOPMENT OF SMART ELECTRICITY METER (SEM)		Muhammad Hakirin Roslan, Suresh Thanakodi, Muhammad Syafiq Najmi Mazlan, Nazatul Shiema Moh Nazar, Mohd Solehin Mohd Nasir, Hizrin Dayana Mohd Hidzir	UPNM	FKJ
16	DSTC&INTCEECE-066	ENERGY HARVESTING FROM KNEE-JOINT MOTION		Siti Nooraya Mohd Tawil, Muhammad Amzar Mohd Noh, Murniati Syaripuddin, Azizi Miskon	UPNM	FKJ
17	DSTC&INTCEECE-068	CONJUGATED POLYMER PERFORMANCE COMPARISON FOR ORGANIC SOLAR CELLS		NurulBariah Idris, Nor Azura Malini Ahmad Hambali, Mohamad Halim Abd Wahid, Khairol Amali Ahmad, Mukhzeer Mohamad Shahimin	UPNM	FKJ
18	DSTC&INTCEECE-118	RADIATION PATTERN PERFORMANCE OF BOW TIE PATCH ANTENNA FOR GROUND PENETRATING RADAR (GPR) APPLICATIONS		Mohammad Al-Khusairi Mohamed, Hizrin Dayana Hidzir, Mohd Taufik Jusoh	UPNM	FKJ
19	DSTC&INTCEECE-120	ELECTRICAL PERFORMANCE OF PALM OIL AND RICE BRAN OIL AS TRANSFORMER INSULATING LIQUID		Mardiah Hayati Abdul Hamid, Dr Mohd Taufiq Ishak, Nursabrina Suhaimi, Fakroul Ridzuan Hashim	UPNM	FKJ
20	DSTC&INTCEECE-122	SMART CONTROL AND MANAGEMMENT SYSTEM FOR HYDROPONIC PLANT GROWTH		Fina Supegina, Yuliza, Fadli Sirait, Mohd Taufik Jusoh	UPNM	FKJ

IntCMecH PAPER LIST

Bil	Paper ID	Paper Title	Presenter	Author Name	Institusion	Faculty
1	DSTC&INTCET2018-003	SIMPLE DURABILITY PROGRAMMING INTEGRATED WITH LSDYNA FOR AUTOMOTIVE APPLICATIONS	Aidy Ali	Aidy Ali, B. B. Sahari and M.S. Salwani	UPNM	FKJ
2	DSTC&INTCET2018-009	EXPERIMENTAL STUDY OF DETERMINING ENERGY DISTRIBUTION AND PLASMA DIAMETER OF EDM PROCESS	Adel Saleh Warregh	Adel S. O. Warregh, Zahiruddin M. bin Md. Zain	UNIMAP	-
3	DSTC&INTCET2018-015	FATIGUE CRACK GROWTH BEHAVIOUR OF SANDWICHED METAL PANEL OF ALUMINIUM AND MILD STEEL UNDER CONSTANT AMPLITUDE LOADING	Mohd Khairul Faidzi	M. K. Faidzi, A. K. Hamizi, M.F Abdullah, M.A Aliimran, K.Z Ku Ahmad, Raja Nor Othman, Aidy Ali	UPNM	FKJ
4	DSTC&INTCET2018-016	EXPERIMENTAL STUDY ON HEAT TRANSFER FROM PLATE FIN	Mohd Rosdzimin Abdul Rahman	M.R.A. Rahman, M.F.M. Zahar, M.R. Saad, A.C. Idris, N.A. Rahim	UPNM	FKJ
5	DSTC&INTCET2018-018	BALLISTIC RESISTANCE OF MAGNESIUM ALLOY, AZ31B REINFORCED WITH CARBON NANOTUBE AND LEAD UNDER GAS GUN SIMULATION	Mohamad Faizal Abdullah	M.F. Abdullah, S. Abdullah, M.S. Risby, M.K Faidzi	UPNM	FKJ
6	DSTC&INTCET2018-026	STUDY OF LOW SPEED AIRFOILS AT HIGH REYNOLDS NUMBER BY GAIN X	Ahmad Hamizi Ahmad Kamal	A.H. Kamal, Norzaima Nordin, M.T. Ahmad	UPNM	FKJ
7	DSTC&INTCET2018-028	MECHANICAL PROPERTIES OF EPOXY COMPOSITES CONTAINING CARBON BLACK AND GRAPHENE	Raja Nor Othman	Raja Nor Othman, Iliyas Abdul Rahman, M K Faidzi, K Z Ku Ahmad	UPNM	FKJ
8	DSTC&INTCET2018-029	DESIGN OF AIRCRAFT LATERAL CONTROL LAWS SIMULATION FOR TEACHING AND LEARNING	Zuhairi bin Abdul Rashid	Z.A. Rashid, V. Budinger, P. Pastor, S. M. F. S. M. Dardin, A. A. Azid	UPNM	FKJ
9	DSTC&INTCET2018-030	3D PRINTING MODELS FOR WIND TUNNEL TESTINGS	Mohd Rashdan Saad	Haziq Idraki Shahidin, Mohd Rashdan Saad, Nur 'Izzati Mohmad Ismail, Azam Che Idris, Mohd Rosdzimin Abdul Rahman	UPNM	FKJ

10	DSTC&INTCET2018-035	PREDICTION OF FLOW PATTERN BEHAVIOUR BEHIND SQUARE CYLINDER USING COMPUTATIONAL FLUID DYNAMIC (CFD) APPROACH	Norzaima Nordin	Norzaima Nordin, Emmanuel Benard, A. Hamizi A. Kamal, M. Tarmizi Ahmad and Norwazan A.R	UPNM	FKJ
11	DSTC&INTCET2018-037	IMPACT RESISTANCE STUDY ON RIGID POLYURETHANE FOAM	Mahmod Abd Hakim Mohamad	Mohamad M. F. F., Mohamad M. A. H., Mat W. A. W., Zaidi A. M. A., Noraniah K., Zin A. F. M., Mustapa M. S., Mantari M. H. A. R.	UTHM	-
12	DSTC&INTCET2018-045	MECHANICAL AND THERMAL PROPERTIES OF EPOXY TAMARIND SHELL COMPOSITE	Mohd Khairul Faidzi	K.Z Ku Ahmad, Abbas Harun, M.K Faidzi, Raja Nor Othman, A.A Kamarolzaman	UPNM	FKJ
13	DSTC&INTCET2018-056	STUDY ON THE DEPENDENCE OF THE TEMPERATURE EFFECT ON THE MAGNETORHEOLOGICAL ELASTOMERS DYNAMIC PROPERTIES	Adenen Aziz	Adenen Aziz, Mohamad Abu Ubaidah Amir, M.N.Azzeri, Ainul Rahman, Sarah Isnan, Mohd Norsyarizad Razali, Siti Nur Muhamad	UPNM	FSTP
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15	DSTC&INTCET2018-106	OPTIMIZATION OF FRICTION STIR WELDING PARAMETERS FOR AA1100 – H14 ALUMINIUM ALLOYS SHEET	Dian Darina Indah	D.D.I. Daruis, K.Z. Ku Ahmad, M.A. Roslan	UPNM	FKJ
16	DSTC&INTCET2018-108	PRELIMINARIES STUDIES OF VIBRATION ISOLATION USING ELECTROMAGNETIC DAMPER	Mohd Fazli Mohd Yusoff	Mohd Fazli Mohd Yusoff, Ahmad Mujahid Ahmad Zaidi, Saiddi Ali Firdaus Ishak, MS Risby, MF Md Din	UPNM	FKJ

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2	DSTC&INTCET2018-044	Behaviour of Residual Soil with High Silt Content under Low Frequency Cyclic Loading Using Modified Direct Simple Shear Apparatus	Sivadass Thiruchelvam	Sivadass Thiruchelvam, Kamal Nasharuddin Mustapha & Lee Choon Yong	Universiti Tenaga Nasional	Institute of Energy Infrastructure
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5	DSTC&INTCET2018-042	Implementation of early earning system in Kg. Jenagor, Kuala Berang as an effort to increase human resilience towards flood disaster	Azrul Ghazali	Azrul Ghazali, Sivadass Thiruchelvam, Kamal Nasharuddin Mustapha, Rahsidi Sabri Muda, Nora Dato' Yahya, Hasril Hasini , Ng Yu Jin, Fatin Faiqa Norkhairi	Universiti Tenaga Nasional	Institute of Energy Infrastructure

6	DSTC&INTCET2018-043	Application of GIS as part of flood risk management for evacuation of vulnerable communities during disaster in Kenyir, Terengganu Darul Iman	Fatin Faiqa Binti Norkhairi	Fatin Faiqa Norkhairi, Sivadass Thiruchelvam, Hasril Hasini, Lariyah Mohd Sidek, Rahsidi Sabri Muda, Azrul Ghazali, Kamal Nasharuddin Mustapha, Hidayah Basri, Ranjit Singh Dharam Singh	Universiti Tenaga Nasional	Institute of Energy Infrastructure
7	DSTC&INTCET2018-017	Economic comparison between Bamboocrete multi-purpose panel and typical reinforced concrete panel	Norhasliya Mohd Daud	N.M. Daud, N.M. Nor	UPNM	FKJ
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9	DSTC&INTCET2018-023	Energy savings performance of heat resistance Wall Panel (HRWP) System	Umi Nadiah Nor Ali	Umi Nadiah Nor Ali, Norazman Mohamad Noor, Maidiana Othman, Vikneswaran Munikanan	UPNM	FKJ
10	DSTC&INTCET2018-001	Simulation of explosive storage building subjected to explosion	Mohammed Alias Yusof	Mohammed Alias Yusof, Norazman Mohamad Nor, Muhammad Azani Yahya and Vikneswaran Munikanan, Ariffin Ismail	UPNM	FKJ
11	DSTC&INTCET2018-006	Mechanical properties of concrete with activated sugarcane bagasse ashes as cement replacement	Noor Aina Misnon	Noor Aina Misnon, Siti Khadijah Che Osmi, Hapsa Husen, Faridah Hanim Khairuddin	UPNM	FKJ
12	DSTC&INTCET2018-012	High tensile bollard using macro synthetic fiber for building protection	Muhamad Azani Yahya	Muhamad Azani Yahya, Atiq Farwiez Marukhi, Mohammed Alias Yusof, Vikneswaran Munikanan, Norazman Mohd. Nor, Ariffin Ismail	UPNM	FKJ
13	DSTC&INTCET2018-013	Characteristic of Glow in the Dark Powder Application as Road Line Materials in Malaysia	Vikneswaran Munikanan	Vikneswaran Munikanan, Ng Choy Peng Muhammad, Azani Yahya, Mohammed Alias Yusof, Khairun Redza	UPNM	FKJ

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16	DSTC&INTCET2018-041	Compressibility Characteristics of Peat Soil Treated with MUF-P Resin	Mohd Nazrin bin Mohd Daud	M. N. M. Daud, N. N. Nik Daud	UPNM	FKJ
17	DSTC&INTCET2018-008	Effects of rainfall intensities and aggregate size on sediment concentration and hydraulic parameter	Zuliziana Suif	Zuliziana Suif, Siti Zulaikha Baharom, Nordila Ahmad, Maidiana Othman, Mohd Asri Md Nor	UPNM	FKJ
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20	DSTC&INTCET2018-033	Preliminary experimental study on effectiveness of aquatic vegetation on sedi-ment transport capacity	Nordila Ahmad	Nordila Ahmad, Ahmad Naqiuddin Azha, Zuliziana Suif, Maidiana Othman	UPNM	FKJ
21	DSTC&INTCET2018-034	Recycling waste practice at Faculty of Engineering Universiti Pertahanan Nasional Malaysia	Maidiana Othman	Maidiana Othman, Md Firdaus MD Farid, Zuliziana Suif , Nordila Ahmad	UPNM	FKJ

DSTC ABSTRACTS

(DSTC&INTCET2018-011)

CYBERWARFARE ACT OF WAR: A REVIEW BASED ON CLAUSEWITZ PERSPECTIVE

Afiqah M. Azahari, Arniyati Ahmad, Zuraini Zainol, Mohd Hazali Mohamed Halip & Nur Diyana Kamarudin

Today, it is almost impossible to launch a war without utilizing cyber capabilities. Many developing countries compete to enhance their defensive and offensive cyber capability. While nations are racing to upsurge their cyber capabilities, researchers still struggling to define a comprehensive theory about 'cyberwarfare'. The aim of this article is to make a comprehensive review about the existing definition of cyberwarfare shared among military experts and researchers. As a result, existing definitions of 'cyberware' are sometimes ill-defined, complex and remain unclear. Moreover, qualification as act of war during cyber-attack against nation is still vague due to issues such as lack of object permanence, limited effectiveness in offensive cyber, anonymity and computational speed dependency. Then it also not explicitly addresses by existing international law. Hereafter, this article theoretically makes a comprehensive comparison on declaration of war with the Clausewitz's theory of war. This paper agrees that one cross-country cyber-attack could be a reason of war declaration if the attack have a clear actor of attacker, lethal and being political.

(DSTC&INTCET2018-020)

STACKED SPARSE AUTOENCODERS-BASED OUTLIER DISCOVERY FOR IN-VEHICLE CONTROLLER AREA NETWORK (CAN)

Siti Farhana Lokman, Abu Talib Othman, Muhamad Husaini Abu Bakar & Rizal Razuwan

Security researches have proven that with the development of wireless connectivity's technology in modern vehicles, it provides a substantial number of attack surface for attackers to compromise the entire vehicle system. However, the security threats can be alleviated effectively using security defence mechanism known as anomaly detection. Judging from this fact, we proposed an anomaly detection approach in-spired by unsupervised deep learning-based which is based on Stacked Sparse Autoencoders (SSAEs). The proposed SSAEs model is constructed using multiple of stacked layers of spared Autoencoders. With unlabelled normal and attack CAN data as inputs, the usurpervised greedy layer-wise training algorithm is utilized so that a bottleneck in the network can be imposed, forcing a compressed information representation of the original CAN input features. Consequently, the learned CAN input structure is leveraged in order to detect anomalies within CAN bus data. Finally, the overall results of anomaly detection using SSAEs model yields a recall of 98.5%, precision of 98%, F-score of 98% and Area Under the Curve (AUC) score of 86.1%, which outperform other autoencoders approach.

(DSTC&INTCET2018-021)

OPTICAL OBSERVATIONS ON DETONATION OF SHALLOW BURIED CHARGE IN SANDY SOIL

Zulkifli Abu Hassan, Aniza Ibrahim & Norazman Mohamad Nor

Small-scale blast tests were carried out to observe and measure the influence of sandy soil towards explosive blast intensity. The tests were to simulate blast impact imparted by anti-vehicular landmine to a vehicle with reference to light armoured vehicles. At scale factor 10, a steel apparatus weighing about 22 kg was used to represent the size and weight of a vehicle, and mass of 20 g high explosive charge was used as surrogate landmine. The observations and measurements were made by way of optical method using high-speed video camera. Time of occurrence of the three phases of detonation phase in soil with respect to upward translation time of the test apparatus were recorded. The recorded flight time and peak height reached by the apparatus allow the determination of energy transfer and initial velocity. Data from detonation in soil and previous data from air blast detonation were compared. At identical stand-off distant, it showed that blast intensity of detonation in sandy soil is higher than intensity of air blast detonation. Based on optical observations and quantified data, the effect of soil in amplifying blast intensity is distinct and possibly attributed to the effect of soil funnelling on blast wave, and from the impact of soil ejecta.

(DSTC&INTCET2018-025)

VOLUNTEER MANAGEMENT SYSTEM FOR DISASTER MANAGEMENT: MALAYSIA CASE

Noor Afiza Mat Razali, Nurjannatul Jannah Aqilah Md Saad, Hasmeda Erna Che Hamid, Muhammad Ramzul Abu Bakar, Khairul Khalil Ishak, Nor Asiakin Hasbullah, Norulzahrah Mohd Zainudin, Suzaimah Ramli, Norshahriah Wahab & Zahimi Zainol Abidin

Based on National Security Council (NSC) Directive No. 20 that concern in coordinating responsible agencies and committee, Malaysian government have established a disaster management coordination and preparedness agency. During disaster relief and operation, volunteer's involvement also can be important part of the disaster relief. Researchers are proposing usage of systematic volunteer management system (VMS) to manage volunteer's activities on scene by optimizing volunteer involvement. This study provides an overview of VMS and its challenges focusing on process of volunteers' recruitment and management of volunteers' personal information that needed to be handled according to information security concept which are privacy, security, accessibility and control of that information. This paper proposes VMS design for Malaysia and review security concern which also include concern on trust issues that may arise between government coordination agencies and the volunteers in managing sensitive information either from government agencies side or volunteers side. The proposed VMS include the concept of trust and the implementation of a security by design concept at development phase.

(DSTC&INTCET2018-047)

PRIVACY REQUIREMENTS CLASSIFICATION METHOD FOR SYSTEM DESIGN

Nor Asiakin Hasbullah, Norulzahrah Zainudin, Noor Afiza Mat Razali & Norshahriah Abdul Wahab

It is important to get users' privacy requirements through data or information classification during the system design. Currently, the citizen-centric perspective of privacy requirement is not well understood. To fill this gap a study with the objectives of to investigate citizens' privacy requirements and need through their privacy preferences has been done. From the data analysis, the citizen-centric preferences' set was developed based on the classification of personal and sensitive information that has been obtained through a survey of 350 respondents. The result is configured into a reference table and sensitivity classification tool respectively. Therefore, we suggested the tool to be used as a classifying method to classify sensitive and personal information for system design.

(DSTC&INTCET2018-049)

SOUND VELOCITY PROFILE (SVP) AT STRAIT OF MALACCA FOR MARITIME WARFARE USAGE

Mohd Najib Abdul Ghani Yolhamid, Ainul Husna Abdul Rahman, Mohd Azzeri Mohd Naiem, Mohd Norsyarizad Razali & Mohd Arif bin Ahmad

Nowadays, many tragedies and accidents happen in the oceans due to human negligence in handling equipment and also the ship itself. Therefore, it is important to do the hydrographic survey as it is the study about the physical of the sea. In the other words, the hydrographic survey also comes out with the prediction of their change over time, for the primary purpose of safety of navigation and in support of all other marine activities, including the economic development, security and defences, scientific research, and environmental protection. The sound velocity profile is a plot of propagation speed or velocity of sound as a function of depth and it is a fundamental tool for predicting how the sound will travel. The sound velocity profiles around the world are different. There are three factors affecting the sound velocity profile which is temperature, salinity, and pressure. The survey to get the sound velocity profile is using the sound velocity probe. The survey was done at 9 chosen locations at Straits of Malacca to get their sound velocity profile. The data from the sound velocity probe from the survey being collected by the hydrographic department and the sound velocity profile for 9 chosen locations at Straits of Malacca have been plotted. Therefore, the profile can be used as a reference for the tactical warfare usage and also for calibration of the echo sounder on board the ship.

(DSTC&INTCET2018-050)

AN APPROACH TO MIXED REALITY AND MASSIVE OPEN ONLINE COURSES (MOOC) IN LEARNING THE MILITARY DECISION MAKING ENVIRONMENT

Norshahriah Abdul Wahab, Nor Asiakin Hasbullah, Norul Zahrah Zainuddin, Noor Afiza Mat Razali, Yuhanim Hani Yahaya & Syed Nasir Alsagoff

In teaching and learning of making the decision in military environment require an efficient and effective interaction and control in order for learners to actively participate in conducting an operation. In this day and age, people are exposed to mixed reality concept in line with the growth of software application technology where people started to demand on their needs for applications used. In fact, software application has shown a rapid development in computing technology world regarding processing power, memory capacity and battery life simultaneously with the new technology supplied such as improvement of the connectivity, external peripherals, GPS and location-based services. This paper proposed the implementation of mixed reality technology specifically on 3 Dimensional (3D) geospatial terrain and Massive Open Online Courses (MOOC) as the tool and platform to con-duct the learning of military decision making in an operation. The research was carried out to determine the appropriate elements and features of mixed reality for this application consists of virtual elements; mixed reality space and interaction; reaction and interaction within 3D mixed reality object. The technology of mixed reality is considered to provide an effective and efficient 3D map that learners can interact and control for military operation using the platform of MOOC.

(DSTC&INTCET2018-051)

THE STUDY ON THE TECHNIQUES OF CONTENT-BASED IMAGE RETRIEVAL (CBIR) USING COLOR, TEXTURE AND SHAPE FEATURES

M. A. M. Shukran, M. N. Abdullah, F. Ahmad & M. R. M. Isa

Digital image collection as rapidly increased along with the development of computer network. Image retrieval system was developed purposely to provide an efficient tool for a set of images from a collection of images in the database that matches the user's requirements in similarity evaluations such as image content similarity, edge, and colour similarity. Retrieving images based on the content which are colour, texture, and shape is called content based image retrieval (CBIR). The content is actually the feature of an image and these features are ex-traced and used as the basis for a similarity check between images. The algorithms used to calculate the similarity between extracted features. There are two kinds of content based image retrieval which are general image retrieval and application specific image retrieval. For the general image retrieval, the goal of the query is to obtain images with the same object as the query. Such CBIR imitates web search engines for images rather than for text. For application specific, the purpose is try to match a query image to a collection of images of a specific type such as fingerprints image and x-ray. In this paper, the general architecture, various functional components, and techniques of CBIR system are discussed. CBIR techniques discussed in this paper are categorized as CBIR using colour, CBIR using texture, and CBIR using shape features. This paper also describe about the comparison study about colour features, texture features, shape features, and combined features (hybrid techniques) in terms of several parameters. The parameters are precision, recall and response time.

(DSTC&INTCET2018-055)

STUDY ON THE DEPENDENCE OF THE TEMPERATURE EFFECT ON THE MAGNETORHEOLOGICAL ELASTOMERS DYNAMIC PROPERTIES

Adenen Aziz, Siti Nur Muhamad, Afiqah Rosly, Ainul Rahman, Sarah Isnan, Mohamad Abu Ubaidah Amir & M. N. Azzeri

Magnetorheological elastomers (MREs) are smart and well-known material in the engineering industries due to its unique rheology properties that can be changed and controlled when subjected to a magnetic field. These active materials are composed of matrix material that has the viscoelastic characteristics and filled with iron particles which enhanced its magnetic properties. One of the MREs application is the marine engine vibration isolator. As severe vibration can cause damage to the engine, thus this excessive vibration must be isolated to prevent damage from occurring. In this research, the dynamic properties of MREs are investigated by conducting several tests on the anisotropic MREs sample under different types and ranges of variables. Due to the main focus of this study which is to study the coupling effect of these variables, hence the temperature dependence of the MREs are examined under different ranges of frequencies, strain amplitudes and the effect of magnetic field. The experimental results are compared under the guidance of British Standard to provide a better understanding of the dynamic behaviour of anisotropic MREs.

(DSTC&INTCET2018-059)

ANALYSIS OF TREATED BALLAST SEAWATER FOR POTENTIAL REUSE

M. Mazlan, Siti Nur Muhamad, Mohd Norsyarizad Razali, Nanthini Sridewi & Adenen Aziz

The International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) has already commencing on 8 September 2017 after ratified by 51 States represent 35% of the global gross tonnage in September 2016. However, there is no value recovered for the treated ballast water as it simply discharged during de-ballasting. In order to evaluate value creation of treated ballast water, three seawater applications which are seawater toilet flushing, cooling tower and desalination was studied and compared with treated ballast seawater. An exploratory study was conducted in Singapore as a case study as this country is facing water scarcity issues and a busy port in the world which received more than 28 billion m3 of ballast water in 2015. This project is approached by understand the treated ballast water and comparing treated ballast water and seawater at pre-treatment of desalination plant using experimental methods. Based on the results, the treated ballast water is suitable to remove the usage of the raw seawater for desalination. However, this research only covers two water quality parameters, and further analysis and technical development is required.

(DSTC&INTCET2018-060)

DATA SECURITY- PRIVACY CALCULUS ON SOCIAL MEDIA

Lee Fong Yee, Mohd. Afizi Mohd. Shukran & Fatimah Ahmad

Privacy breaches are rampant on social media and there are many cases of companies and users have been hit tremendously. The study aims to explore the personal data disclosure and privacy concern over social media in Malaysia. Three focus groups of undergraduate students were conducted to explore the issues faced. The data collected from the focus group were transcribed into basic transcription and thematically analysed. The result shows that majority of the participants think of the social and financial benefits outweigh its perceived risks. The findings of the study will benefit all companies and users on social media which bring up the current critical situation of the privacy arguments and suggestions for improvement.

(DSTC&INTCET2018-061)

PIXEL VALUE GRAPHICAL PASSWORD SCHEME: ALTERNATIVE HASH PASSWORD USING HEXADECIMAL COLOR CODES

M. A. M. Shukran, M. S. F. M. Yunus, F. Ahmad & M. F. M. Amran

Pixel value graphical password scheme was designed in 2012 to simplify the user authentication process and reducing implementation setup resource of graphical password authentication system. It was developed and tested in lab control environment using a camera captured photo. Through a dynamic analysis on password strength, accuracies output and usability study, pixel value graphical password scheme shows a promising result with huge potential to put into practice. In some cases, there are few limitations need to be solve in order to implement the pixel value graphical authentication system and this study is aimed to find an alternative for password text length and size on storage disk. This paper is organized as 5 sections where the background of pixel value graphical password scheme was describing in introduction section, following section discussed on the password style, brief description of hexadecimal code on following section, then the comparative discussion between 8 bits' code and hexadecimal code, and the conclusion section. The references are listed at the end of this paper.

(DSTC&INTCET2018-062)

FRACTURE BEHAVIOR OF RT-PMMA UNDER IMPACT LOADING

Norazrina Mat Jali & Patrice Longere

Fracture mechanism of polymer under high strain rate loading is to date a complicated issue in developing their design as protection structure. In this paper, we aim to investigate the crack arrest capability of RT-PMMA when subjected to impact loading. For that purpose, Kalthoff and Winkler (KW)-like impact tests are performed using the STIMPACT platform gas launchers. Double notched specimens were impacted on the edge within a range of impact velocities (50-140 m/s). During the investigation, the failure mechanism is recorded by a high speed camera. The stress whitening phenomena is explained and it is shown that addition of rubber to PMMA matrix aids to enhance its impact toughness. This involves energy dissipation by the rubber and higher energy required for crack propagation in rubber toughened RT-PMMA as compared in neat PMMA. High impact velocities promote greater effect proved by large number of fragments produced aftermath. By carrying out uniaxial tensile tests, it was established that the mechanical behaviour of RT-PMMA strongly depends on strain rate and temperature.

(DSTC&INTCET2018-064)

ELECTROENCEPHALOGRAM-BASED CONTROLLED ROBOT AS AN ATTENTION LEVEL INDICATOR

Yuhanim Hani Yahaya, Nurhafizah Moziyana Mohd Yusof, Mohd Fahmi Mohamad Amran, Muslihah Wook & Norshahriah Wahab

In this paper, an attention level indicator was developed in measuring the attention level. Lego Mindstorm EV3 robot was programmed using Brain-Computer Interface (BCI) with the help of NeuroSky Technology and MATLAB. NeuroSky MindWave headset was used to acquire the brain wave attention signals. MATLAB code was developed to perform the signal processing which includes data extraction and command setting. The extracted attention levels were set as input command for the EV3 robot to move forward. The experimental prototype shows the change on the attention levels for moving the EV3 robot.

(DSTC&INTCET2018-067)

ONLINE SOCIAL NETWORKS AS SUPPORTING EVIDENCE FOR DIGITAL FORENSIC INVESTIGATION: A REVISED MODEL

Norulzahrah M. Zainudin, Nor A. Hasbullah, Norshahriah A. Wahab, Suzaimah Ramli & Noor A. M. Razali

The growth of online social networks has encouraged new ways of communicating and sharing information and is used regularly by mil-lions of people; it has also resulted in an increase in its use for significant criminal activities and perpetrators are becoming increasingly so-phisticated in their attempt to use technology in order to evade detection and perform criminal acts. Hence a systematic model for forensic investigation of online social networks is required in order to obtain optimum results from the networks' investigation. We have reviewed the existing literature of digital forensic investigation models and frameworks, most have quite similar approaches, and some of the models are generic which do not focus on the purpose of the investigation. In addition, there is no standard and consistent model, only sets of procedures and tools, thus many digital crime investigations are performed without proper guidelines. Moreover, there is no model built specifically for online social networks but in contrast digital crimes related to them are growing rapidly. To address these challenges, previously, we have developed a standard model of digital forensic investigation for online social networks in this research. This model incorporates the existing traditional frameworks, allowing us to compile a comprehensive digital forensic investigation model specifically for the networks. This model has been revised and we have come out with more comprehensive activities for better result in digital forensic investigation specifically for online social networks.

(DSTC&INTCET2018-069)

MATERIALS FOR ENHANCED ORGANIC LIGHT EMITTING TRANSISTOR

Ravi Rao Simanjalam, Nor Azura Malini Ahmad Hambali, Mohamad Halim Abd Wahid, Khairol Amali Ahmad & Mukhzeer Mohamad Shahimin

Organic light emitting transistors which are vertically combined with the organic static induction transistor and organic light emitting diode is fabricated. This unique device has dual function, emitting light as an OLED and switching current as transistor. When the Static induction transistor under bias, the storage on the thin electrode shared by two cells modulate the charge injection of the OLED active cell, hence con-trolling the current flow and subsequently tuning the light emission. The following advantages are expected in the OLET; low gate voltage, high-speed operation and ease of production.

(DSTC&INTCET2018-101)

ELECTROSPUN POLY (3-HYDROXYBUTYRATE) [P3HB] AND POLY (3-HYDROXYBUTYRATE-*CO*-3-HYDROXYHEXANOATE) [P(3HB-*CO*-3HHX)] NANOFIBERS FOR THE ADSORPTION OF PHENOL

Ainil Hawa, Kumar Sudesh & Nanthini Sridewi

This investigation focused on the adsorption treatment of phenol as the pollutant. In this work, Poly (3-hydroxybutyrate) [P3HB] and Poly (3-hydroxybutyrate-co-3-hydroxyhexanoate) [P(3HB-co-3HHx) were extracted from bacterial cells and the electrospun nanofibers were fabricated through the electrospinning technique for the adsorption of phenol. The electrospun nanofibers were optimized after preliminary study of the electrospinning parameters of different applied voltages, polymer concentrations and mixed solvent ratios. The effects of adsorption under different variables of contact time, pH, initial concentration, temperature and simultaneous degradation under different light conditions were studied. The maximum phenol adsorption capacity of optimized nanofiber with weight of only 0.14 g was 35.7 mg/g. The trend of adsorption isotherm followed Freundlich (R2= 0.99) and adsorption kinetics followed pseudo-2nd-order. The equilibrium contact time was 10 minutes with 99.8 % of phenol removal and attained 99.9% removal after optimal contact time of 270 minutes for all sample.

(DSTC&INTCET2018-103)

REVIEW ON MELANOMA CANCER DIAGNOSIS DEVICE USING IMAGE PROCESSING TECHNIQUES

Nor Suraya Mariam Ahmad, Mohd Afizi Mohd Shukran, Suzaimah Ramli & Farhana Rahmat

Melanoma is well-known skin cancer that cause fatal. Therefore, detection of melanoma at early stage are essential to enhance the successful of survival rate. For the detection of melanoma, proper analysis is carried out on the skin lesion according to a set of specific clinical characteristics. This skin lesion clinically diagnosed begin with primary clinical screening and dermoscopic analysis, a biopsy and histopathological examination. Lastly, this skin lesion is classified as either "potential melanoma" or "non-melanoma". The process involved are lengthy to the patient and painful. Nevertheless, it can be reducing by automated skin cancer diagnosis base on skin lesions images classification. Automated classification of skin lesions using images is usually challenging, where it is needed to solve multiple task. The input to this tool is the skin lesion images, next apply image processing techniques, and later on this skin lesion images are analyses to conclude occurrence of melanoma. Typically, the analysis to checks for the various Melanoma are using pre-defined thresholds in classification stage such as Asymmetry, Border, Colour, Diameter and Evolution (ABCDE) where colour, texture, size and shape are being analysis for image segmentation and feature stages. Within the Feature Extraction stage the Feature Values Extracted are being compared and the skin lesion is classified as Melanoma or Normal skin. For most of the skin images, this particular classification method proves to be efficient. This paper intends to provide useful information and methods that been use in skin cancer diagnosis. Hence, it gives good start for researchers to understand automated skin cancer detection at basic level phase.

(DSTC&INTCET2018-111)

NUMERICAL AND EXPERIMENTAL ANALYSIS OF ACTIVATED CARBON FILLER ON THE MECHANICAL PROPERTIES OF WOOD COMPOSITES

M. Mazlan, F. R. Hashim, K. A. Ahmad, M. N. Omar, A. I. M. Shaiful, M.K.A.A. Razab, S. Mamat, M. B. A. Bakar, M.F. Hamid, Ayub Ahmed Janvekar & Zairi Ismael Rizman

This research is conducted by using numerical and experimental analysis of filler using carbon as main material. The effect of carbon filler was studied to improve mechanical properties of composite between plywood, medium density fibreboard (MDF). The properties of wood composite are well known to have high strength, ductility, elasticity and high modulus of rupture. The function of this filler are to fill the gap or void between particles of atom in wood particles. The carbon is known to have high thermal, mechanical and high hardness properties. The numerical and experimental analysis was using the same parameter such as dimension of wood composite including the thickness, thermal conductivity, pressure and force applied to the wood composite. The numerical analysis was using solidwork software to simulation the modelling of the wood composite with all the parameter that been used in experimental setup. The result of numerical analysis by using solidwork are in term of stress, strain and displacement. The result between numerical and experimental analysis has been compare to ensure the accuracy and validation of the result. It was found that the different between numerical and experimental results are less than 10%. From the result, it was found that medium density fibreboard (MDF) has the highest strength compare with others wood composite material.

(DSTC&INTCET2018-123)

DESIGN AND SIMULATION OF NOZZLE FOR PURE WATER JET PORTABLE CUTTING TOOL

Razali Abidin, Mohamad Asmidzam Ahamat, Tarmizi Ahmad, John Paul, Al Imran, Hafizi Nordin & Wan Hanif Wan Yaacob

A pure water jet at subsonic speed provides an opportunity for application in cutting soft material with the advantage of not contaminating the work piece. Inside the nozzle, water is flowing through various cross sections, which lead to pressure drop and loss of energy. This requires a nozzle with a design that causes minimum pressure drop. In this work, Computational Fluid Dynamics (CFD) and Finite Element Analysis (FEA) were used to analyse the flow through five different nozzles. For each nozzle, the pressures of 10 MPa, 20 MPa and 30 MPa were applies at the inlet. For the inlet pressure of 10 MPa, the highest outlet velocity us 136.12 m/s at the pressure of 9.261 MPa. The impact pressure at stand distance of 0.5 mm and 1.0 mm were 8.26 MPa and 8.02 MPa, respectively. For this nozzle, the Factor of Safety for 10 MPa, 20 MPa and 30 MPa were 6.4, 3.2 and 2.961, respectively. The findings are relevant to the development of pure water jet cutting machine.

IntCEECE ABSTRACTS

(DSTC&INTCEECE-038)

ENHANCEMENT LTE NETWORK PERFORMANCE BY CONGESTION CONTROL MANAGEMENT

Fadli Sirait, Mohd Taufik Bin Jusoh, Kaharudin Dimyati, Akhmad Wahyu Dani

LTE (Long Term Evolution) standard is support hight data rate transfer up to 100 Mbps while the range of bandwidths from 1.4 MHz up to 20 MHz. This paper worked in LTE MIMO 2×2, 1800 Mhz bands, 64 QAM modulation technique, and used 10 MHz and 15 MHz channel bandwidth respectively. There is more than 90% utilization of 10 MHz, thus the peak data rate in 10% remaining of utilization is 10.08 Mbps. This situation lead to congestion and degraded accessability of the LTE network. To avoid network congestion, we proposed to upgrade the used of channel bandwidth to 15 MHz. The presented implementation results show the highest utilization reach to 84%, the peak data rate in 16% remaining of utilization is 24.19 Mbps. There is an increasing utilization and performance improvement of the network since implementation of the new channel bandwidth.

(DSTC&INTCEECE-007)

MULTI- RELATIONAL LATENT SYNTAX-SEMANTIC "SYNTAXLSEM" ANALYSIS MODEL FOR EXTRACTING QURA'NIC CONCEPT A NEW INNO-VATIVE FOR SUSTAINABLE SOCIETY

Dr Asma Abdul Rahman, Dr Ahmad Abdul Rahman, Ir Dr Mohd Fadhil Md Din

Al Quran is a divine text which represents the purest and most authentic form of the classical Arabic language. In order to understand the meaning of each verse, a deep knowledge of Arabic linguistic is essential. Therefore, our scholars have made their efforts by engaging themselves in the works of explaining al Quran's words, interpreting its meanings into Arabic and other languages. Currently, more people are interested in knowing the content of al-Quran, especially for non-Muslim, after 9/11 tragedy. Thus, a flexible model that can represent Qur'anic concept is required for people to understand the content of the Quran. In this research, we propose a Multi-Relational Latent Syntax-Semantic Analysis Model (SYNTAXLSEM) based on a combination of Arabic Semantic and six multiple relations between words, which are synonym, antonym, hypernym, hyponym, holonym and meronym, to precisely extract Qur'anic concept. The existing literatures focus only on very limited relationships between words which could not extract the in-depth concept of Qur'anic without considering the importance Arabic Semantic. Therefore, the objectives of this research are: (1) to analyse and categorize Quranic words according to Arabic Semantic patterns, (2) to propose a new model for extracting Quranic concept using SYNTAXLSEM, (3) to investigate semantic relationships between Qura'nic words, and (4) to validate the proposed model with Arabic linguistic, and Qura'nic experts. This research will be conducted qualitatively through content analysis approach a new innovative technological technique. It is expected that the model will come out with a precise analysis for extracting Qur'anic concept. This will be very significant in enhancing the overall Quran's understanding among the society in Malaysia and Muslim's world for sustainable society.

(DSTC&INTCEECE-058)

FORWARD SCATTERING RADAR FOR THE REAL-TIME DETECTION OF HUMAN ACTIVITIES AND FALL EVENTS CLASSIFICATION

Ali Alnaeb, Raja Syamsul Azmir Raja Abdullah, Asem Ahmad Salah, Aduwati Sali, Nur Emileen Abdul Rashid, Idnin Pasya

Detecting and categorizing of various human activities that have simultaneously done by two persons or more is an important task in the human detection, recognition, and monitoring systems. Fall is the one of the most significant problems which may form a big threat of the older people's life aged 65 and above, therefore, an efficiently real-time detection of human activities and fall recognition system is required both in their houses and in the health care institutions. Forward Scattering Radar has been proposed as a motion sensing device for the real-time categorizing features of falls from non-fall activities. The joint time-frequency representations are utilized for detection, while, based on the short-time Fourier transform features, the support vector machine has been used in classification operations. An indoor experiment was accomplished to imitate the sitting on a chair of the older and forward falling down event, where 50 trials were carried out by 5 adults for each of these activities. The analysis results indicated that the Forward Scattering Radar has a high capability in the detecting of the daily activities and classification of fall from the different overlapping activities. The preliminary classification result is 100% for the classifying of the fall event when the two activities, the forward falling and sitting on a chair are simultaneously happened.

(DSTC&INTCEECE-049)

SOUND VELOCITY PROFILE (SVP) AT STRAIT OF MALACCA FOR MARITIME WARFARE USAGE

Mohd Najib Abdul Ghani Yolhamid, Ainul Husna Abdul Rahman, Mohd Azzeri Mohd Naiem, Mohd Norsyarizad Razali, Mohd Arif bin Ahmad

Nowadays, many tragedies and accidents happen in the oceans due to human negligence in handling equipment and also the ship itself. Therefore, it is important to do the hydrographic survey as it is the study about the physical of the sea. In the other words, the hydrographic survey also comes out with the prediction of their change over time, for the primary purpose of safety of navigation and in support of all other marine activities, including the economic development, security and defenses, scientific research, and environmental protection. The sound velocity profile is a plot of propagation speed or velocity of sound as a function of depth and it is a fundamental tool for predicting how the sound will travel. The sound velocity profiles around the world are different. There are three factors affecting the sound velocity profile which is temperature, salinity, and pressure. The survey to get the sound velocity profile is using the sound velocity probe. The survey was done at 9 chosen locations at Straits of Malacca to get their sound velocity profile. The data from the sound velocity probe from the survey being collected by the hydrographic department and the sound velocity profile for 9 chosen locations at Straits of Malacca have been plotted. Therefore, the profile can be used as a reference for the tactical warfare usage and also for calibration of the echo sounder on board the ship.

(DSTC&INTCEECE-032)

A NEW HEURISTIC METHOD FOR SOLVING PRIORITY-BASED TARGET COVERAGE PROBLEM IN DIRECTIONAL SENSOR NETWORKS WITH ADJUSTABLE SENSING RANGES

Mohd Norsyarizad Razali, Shaharuddin Salleh

The extensive applications of directional sensor networks (DSNs) in a wide range of situation have attracted a great deal of attention. One significant problem linked with DSNs is the surveillance of a set of targets in a given area and hence maximization of the network lifetime. This is explained by the limitation in the sensing angle and battery power of directional sensors. This problem gets more difficult when the targets are shown to have different coverage requirements and the sensors have multiple sensing ranges. In the present study, this problem is referred to as Priority-based Target Coverage with Adjustable Sensing Ranges (PTCASR). As sensors are normally densely deployed, allocating the sensors into several cover sets and then activating them successively (known as scheduling technique) stand out a promising solution to this problem. In this paper, we propose a greedy-based scheduling algorithm to solve the problem. Several simulations were conducted to evaluate the performance of the proposed algorithm, in terms of extending the network lifetime.

(DSTC&INTCEECE-046)

STUDY OF DEEP LEARNING ALGORITHM FOR DETECTION OF FAULTY PHOTOVOLTAIC PANEL IMAGES

Suzaimah Ramli, Norazlin Ibrahim, Zalhan Mohd Zin, Norshahira Othman,
Mohd Nazri Ismail, Norulzahrah Mohd Zainudin, Noor Afiza Mat Razali

To ensure the efficiency of power output, solar farms are usually far away from cities and reside in complex terrains. Routine inspection and maintenance are challenging tasks for solar farms. The traditional manual inspection method can only support the inspection frequency of once in three months. Because of the hostile environment, solar panels may have defects; broken solar panel units reduce the power output efficiency. In addition to that, the maintenance of PV panels is usually done in a manual way by experts or workers. They regularly check, inspect and monitor the PV panels to detect any defect that might exist on the panels. Beside physical defect, object such as dead leaf on the panels which from the surrounding area could also reduce the ability for the panels to generate the expected amount of electricity. Therefore, the PV panels must have intelligent algorithm to improve the inspection efficiency and reducing traditional monitoring time. The objectives of this study to detect PV defect using image analysis and deep learning algorithm. This article presents the earliest work of this study. It is hoped that this study will achieve all the objectives outlined and the results of this study can be utilized by all parties.

(DSTC&INTCEECE-052)

OPTIMIZATION OF ENERGY HARVESTING IN RUNNING SHOES- A PRELIMINARY STUDY

Elya M.N., Hussainy N.Z.

It is very common to see energy harvesting (EH) projects applied on running shoes as a source of electrical energy utilizing piezoelectric discs. While proved to be successful in generating electrical energy, dependent on piezoelectric transducer alone may not be sufficiently stable electrical energy to keep power-up lower power devices. This paper proposed an additional source of energy transducer with different working principle, particularly solar cell and thermoelectric Peltier to be implemented together with existing piezoelectric transducers in the running shoes. The addition of solar cell and thermoelectric Peltier is expected to enhance the performance in terms of giving a more stable electrical energy output when combined with the energy provided by piezoelectric discs. This paper presents the preliminary results from the study.

(DSTC&INTCEECE-010)

PERFORMANCE COMPARISON OF COLOUR CORRECTION AND COLOUR GRADING ALGORITHM FOR MEDICAL IMAGING APPLICATIONS

Nur Diyana Kamarudin, Mohd Shahrizal Rusli, Ooi Chia Yee, Syarifah Bahiyah Rahayu Syed Mansoor, Afiqah Mohd Azahari, Zuraini Zainol, Kamaruddin Abd Ghani, Siti Noormiza Makhtar

Different type of image acquisition devices rendered different measure of colour depending on the specification of devices; even a same device will give different values of colours rendered, taking at certain duration of times. Most of the researches nowadays have attempted to solve these limitations and the researches of colour correction algorithm has been evolved recently. Colour correction algorithm has been widely used in various fields such as food industry, medical imaging, forensic cyber applications, film industries etc. In medical imaging, researchers have considered colour correction as an essential part in their pre-processing step prior to diagnosis. There are various statistical methods in colour correction and colour grading algorithm being implemented nowadays and finding the best algorithm with high accuracy and reproducibility is non-trivial. This paper presents comparative analyses of colour correction techniques that combine colour correction and colour grading algorithm using conventional gamma correction, polynomial regression and proposed polynomial regression with modified gamma Look-up Table (pgLUT). It has been observed that our proposed pgLUT colour correction algorithm outperformed the conventional methods by 27.3%.

(DSTC&INTCEECE-027)

CORRELATION BETWEEN ANGLE OF ATTACK ESTIMATION WITH MULTIPOINT PITOT STATIC POSITIONING FOR A FIXED-WING UAV

Akram Abdul Azid, Mohd Haziq Zulkeflee, Zuhairi Abdul Rashid, Syed Mohd Fairuz Syed Mohd Dardin, Ahmad Shukri Abu Hasim, Asnor Mazuan Ishak

Pitot static system is used to measure differential air pressure and calculate air speed of a certain aerial vehicle. This air speed information can be manipulated and analyzed to estimate the angle of attack (AoA) of a fixed-wing UAV. In this paper a multipoint positioning of pitot static had been studied to find the relationship between different position/placement of pitot and AoA. This study has been conducted in a controlled situation using a wind tunnel. The result proven that there is a direct correlation between air speed reading from the pitot static and AoA for UAV.

(DSTC&INTCEECE-002)

STUDENT DROWSINESS DETECTION SYSTEM (SDDS)

Azwan Bin Md Ripin, Chew Sue Ping, Anis Shahida Niza Bt Mokhtar, Latifah Sarah Supian, Khadijah Bt Ismail

This paper demonstrates a smart system to detect drowsiness among the students in the classroom. The detection system is able to detect sleeping individual by using a web camera to obtain real-time continuous images. The camera is positioned directly towards the students in the classroom. An alert signal will be triggered when the system detects fatigue among the students. The developed system detects the condition of the eye: opening and closing conditions. The captured image is binarized in order to find the edges of the face of the students. The conditions of the eye will vary the distance between two consecutive dips of the light intensity. Experiments were carried out at several classrooms with one target of a student at one time. The effects of light intensity and the distance of camera placement were studied. The closing eye yielded greater distance value than the threshold value. Meanwhile, the open eye condition yielded shorter distance value than the threshold. The system is limited to detect one target at a fixed position.

(DSTC&INTCEECE-040)

OPTIMIZATION OF UV EXPOSURE TIME FOR MICRO PATTERN TRANSFER ON S1813 MASK LAYER

K.A. Mustafa, J. Yunas, A.A. Hamzah, M. Syaripuddin, M. Mustapha, N.A.A. Mohd Nazam, B. Yeop Majlis

This paper reports the optimization process conducted to obtain UV exposure duration required to transfer pattern of uniform pore arrays with size of 1.8 µm on chrome mask onto S1813 photoresist which later functions as the mask layer during photolithography process. The developed pattern on S1813 photoresist coating later will be essential for silicon etching process in order to create uniform micropore structure on silicon substrate used. The objective is to fabricate silicon membrane with uniform pore for filtration application. The pattern development of uniform pore comprises of standard cleaning process, photoresist coating process, UV exposure in photolithography process and pattern development process. The result shows that uniform pore pattern of 1.8 µm is successfully transferred from chrome mask onto S1813 mask layer when the UV exposure time is set at 15 s. UV exposure time lower than 15 s caused smaller size is produced or no pattern at all. Excessive UV exposure will cause the developed uniform pore pattern on S1813 photoresist mask layer is bigger than the one in chrome mask. The optimization study is beneficial for the repeatable fabrication of uniform pore arrays for application in filtration of blood cell from other solutes based on molecule size.

(DSTC&INTCEECE-054)

PICO HYDRO GENERATION SYSTEM FOR BUILDING'S SUPPLEMENTARY ENERGY

Mohamad Fakri bin Ishak, Kamarul 'Asyikin Binti Mustafa, Murniati Syaripuddin, Norlaili Ismail, Tengku Abdullah Afiq Tengku Shukri

Renewable energy is an important source in supplying energy to the masses as it is sustainable, environmental friendly, and require less maintenance cost compared to the conventional fossil fuel resources. This paper describes the study of a pico hydro generation system. The power generation system uses water utilized by a building as the source to generate energy. In the study, the system prototype is designed using several combinations of piping system where different sizes, shapes and turbine positions are used. The energy from the water flowing through the piping system will be converted into electrical energy through the turbine system that is placed in the main water tank. The best combination of pipeline system for the prototype is by using two different positions of water jet. This combination requires lower water pressure and is able to generate 198 W of energy.

(DSTC&INTCEECE-057)

CONDITIONAL CONNECTIVITY WITHIN HIPPOCAMPUS USING MULTIVARIATE PARTIAL COHERENCE ANALYSIS.

Siti Noormiza Makhtar, Siti Anizah Muhamed, Nur Diyana Kamarudin, Anis Shahida Niza Mokhtar

The emergence of Multiple Electrode Array recording in capturing high volumes of physiological and neuronal signals benefit researchers to study the essential processes of functional connectivity in the brain. Appropriate methods for multivariate analysis becomes crucial to study the pattern of interactions between neurons on various condition of the brain. This study was conducted to analyze conditional connectivity across different sub-regions of hippocampus, namely left CA1, right CA1, left CA3 and right CA3 in isoflurane-anaesthetized Lister-hooded rats. Pairwise conditional connectivity among neurons were computed using multivariate partial coherence analysis. Time-frequency plots show the comparison between conditional and unconditional pairwise interactions. These analyses could be used to compare the strength of direct and indirect connectivity which localized in specific frequency bands. Further investigation on particular pairwise interaction reveal the predictor neurons that contribute to the unconditional connectivity. Multivariate partial coherence analysis could reduce the network complexity by representation of true connectivity without the influence from predictor neurons as shown in unconditional relationship.

(DSTC&INTCEECE-065)

THE DEVELOPMENT OF SMART ELECTRICITY METER (SEM)

Muhammad Hakirin Roslan, Suresh Thanakodi, Muhammad Syafiq Najmi Mazlan,
Nazatul Shiema Moh Nazar, Mohd Solehin Mohd Nasir, Hizrin Dayana Mohd Hidzir

The conventional electricity energy meter currently used in Malaysia provides limited information on the electricity usage by the consumers. The consumer only able to view the electricity usage when the electricity bill being delivered to the respective premises. This scenario unable to facilitate in providing the trend of electricity usage in real time, thus unable to encourage and create awareness among consumers to use electricity wisely. Hence, this paper proposes a prototype of a smart electricity meter which able to display electricity usage and billing in real time. This prototype has been developed using Proteus software for simulation and Arduino Uno with GSM module for hardware implementation. The developed Smart Electricity Meter (SEM) prototype able to provide real time electricity usage for a single-phase system in kWh unit and RM (Ringgit Malaysia) for domestic consumer through a LCD Display and SMS (Short Messaging System). The developed prototype has been verified with the TNB electricity meter and the sensitivity for the prototype recorded to be at 1 pulse for 0.1187 kWh. It's also found through the case study, the users able to reduce the electricity usage from 451.892kWh (RM 98.29) to 420.113kWh (RM 91.58). In addition, this prototype also able to function as smart home controller to control home appliances such as lights and fan. It's believed through this SEM, consumers are more aware of electricity utilization and at the same time SEM would facilitate the introduction of Enhanced Time of Usage (ETOU) by Tenaga Nasional Berhad (TNB) in Malaysia.

(DSTC&INTCEECE-063)

MULTIPLE RENEWABLE INPUT AND OUTPUT EMERGENCY PORTABLE POWER SUPPLY

Suresh Thanakodi, Ahmad Mujahid Ahmad Zaidi, Azizi Miskon, Nazatul Shiema Moh Nazar, Nik Zamiri Nik Hanapi

Currently portable power supply unit either powered by diesel generator or solar powered only able to supply for alternating current (AC) or single direct current (DC) loads. In this work, multiple renewable input and output emergency portable power supply (E-PPS) prototype were developed and the functionality were explored. The developed prototype usage duration was determined by varying electrical loads. Verifications were carried out to demonstrate E-PPS functionality and usage during emergency with Malaysian Health-care Department, Malaysian Civil Defence Agency and Malaysian Royal Signals Regiment. It was found that E-PPS able to successfully supply simultaneously power for both alternating current (AC) and various direct current (DC) loads at an average of 88% efficiency.

(DSTC&INTCEECE-066)

ENERGY HARVESTING FROM KNEE-JOINT MOTION

Siti Nooraya Mohd Tawil, Muhammad Amzar Mohd Noh, Murniati Syaripuddin and Azizi Miskon

Based on human motion, the knee joint has been selected as part of the energy harvesting device since it shows the high possibility to generate energy from its large motion. This work mainly uses the piezo ceramic bimorph cantilever as the energy harvesting sensor and the N35 MAGNET (3mm x 3mm x 3mm) for the magnetic plucking mechanism. Technique of magnetic plucking has been selected to overcome the low human frequency motion. Force from the magnet acting on the bimorph causing the bimorph to vibrate and then generate electricity. Two categories of magnet are used which consist of primary and secondary magnet. The primary magnet (PM) is mounted on the outer ring and the secondary magnet is fixed on the bimorphs. A prototype has been developed and later examined its performance. Power management module which is integrated circuit is used in managing the harvested energy from the bimorph. The module consisting RC circuit to convert AC voltage to DC voltage and stepper motor controller to do demonstration of knee joint motion. The highest power successfully harvested from the prototype is 1.596 mW at the speed of 0.386 m/s and 115° angle of knee flexion.

(DSTC&INTCEECE-068)

CONJUGATED POLYMER PERFORMANCE COMPARISON FOR ORGANIC SOLAR CELLS

Nurul Bariah Idris, Nor Azura Malini Ahmad Hambali, Mohamad Halim Abd Wahid, Khairol Amali Ahmad, Mukhzeer Mohamad Shahimin

This paper review based on the bulk heterojunction (BHJ) solar cell using poly [N-9'-heptadecanyl-2,7-carbazole-alt-5,5-(4',7'-di-2-thienyl-2',1',3'-benzothiadiazole)] (PCDTBT) and [6,6]-Phenyl-C71-butyric acid methyl ester (PCBM). This project investigates on the performance perspectives and theoretical of the solar cell. In this project, we also investigate the performance when we add nanoparticle to the active layer film. Several parameters such as concentration of solution being control and some parameter will be varying in order to achieve the desired output.

(DSTC&INTCEECE-120)

ELECTRICAL PERFORMANCE OF PALM OIL AND RICE BRAN OIL AS TRANSFORMER INSULATING LIQUID

Mardiah Hayati Abdul Hamid, Dr Mohd Taufiq Ishak, Nursabrina Suhaimi, Fakroul Ridzuan Hashim

This paper presents a study on the Palm oil (PO) and Rice Bran oil (RBO) as alternatives to transformer oil. The nature of biodegradability, environmental friendly and easy availability makes these oils a suitable replacement for liquid insulation in transformer. Comparative studies of AC breakdown voltage between these two oils were investigated using two different electrode configurations with a gap distance of 2.5mm. This experimental works were done according to the IEC 60156. The statistical analysis was used to find the withstand voltage and evaluate breakdown probability for both oils. The results indicated that the breakdown voltages of PO and RBO are comparable to each other under different configurations. The Weibull distribution determined the withstand voltage at 1% for RBO are higher than PO eventhough the average of PO is slightly higher compared to RBO.

(DSTC&INTCEECE-118)

RADIATION PATTERN PERFORMANCE OF BOW TIE PATCH ANTENNA FOR GROUND PENETRATING RADAR (GPR) APPLICATIONS

Mohammad Al-Khusairi Mohamed, Hizrin Dayana Hidzir, Mohd Taufik Jusoh

This paper presents a directional bow tie patch antenna for ground penetrating radar (GPR) applications. There are four purposed design for this paper. Three of the antenna is designed by introducing sierpinski gasket fractal concept on bowtie patch antenna. There is some modification on this design in order to create a new different fractal design that applicable for GPR applications. The bowtie antenna performance is studied across 1 GHz to 4 GHz. The best return loss obtained for this paper is at 3.7 GHz where all four design have its best performance. The comparison at 3.7 GHz of these four antenna design presented in this paper.

(DSTC&INTCEECE-122)

SMART CONTROL AND MANAGEMMENT SYSTEM FOR HYDROPONIC PLANT GROWTH

Fina Supegina, Yuliza, Fadli Sirait, Mohd Taufik Jusoh

Hydroponics is one of planting method that use water as a medium of plants growth, in this technique, mineral solution added into the water solvent, allowing the nutrient uptake process by the plants. Farming by hydroponic method must pay attention to the following parameters namely, temperature, humidity, the level of water needs and nutrients and also the level of sunlight need for photosynthesis process. This research used hydroponic technique in hydroponic growth room, and there is a LED growth light as an alternate of sunlight, due to this room is closed without sunlight. There are outputs displayed in monitoring system namely, temperature sensor, humidity sensor, ultrasound sensor to detect height of the plant and water level sensor to measured height of the water as a medium of the plant. Results of measured sensor in hydroponic growth room explained as the following: fan cooler worked when temperature $> \mathbf{30^oC}$, and humidity $> \mathbf{60}\%$. Water pump worked when water level is less than 50% accordance set point. Control on LED Growth Light and LED Bulb when LDR sensor reached set point > 500 in bright condition, and < 500 in dark condition respectively. The average of Time update/received data in thing speak web is 2.4 second.

IntCMecH ABSTRACTS

(DSTC&INTCET2018-003)

SIMPLE DURABILITY PROGRAMMING INTEGRATED WITH LSDYNA FOR AUTOMOTIVE APPLICATIONS

Aidy Ali, B. B. Sahari and M.S. Salwani

The study involved in development of integration of simple durability programming with LS-DYNA executed via Automotive Grid, integration of components for the car, weight reduction assessment, crash analysis for child dummy and determination of natural frequencies of Body in White (BIW) of commercial Malaysian car. For integration of programming with LS-DYNA, LS-Prepossess was used and FORTRAN compilation and durability calculation was conducted at MIMOS Malaysia. At present, aluminum and steel durability equations are incorporated. As for the weight reduction, combinations of steel, aluminum, glass fiber composites and carbon fiber composites provide a reduction of 147.71 kg to the BIW weight. This means that the kerb weight is, presently, reduced from 1248 kg to1100.29 kg. Crashworthiness analyses with child dummy and pedestrian, particularly the Head Injury Criteria (HIC) and Chest Severity Index (CSI) have been obtained. The natural frequencies and mode shape of BIW car also have been determined.

(DSTC&INTCET2018-009)

EXPERIMENTAL STUDY OF DETERMINING ENERGY DISTRIBUTION AND PLASMA DIAMETER OF WEDM PROCESS

Adel S. O. Warregh, Zahiruddin M. bin Md. Zain

Electrodes removal phenomena of WEDM are important to understand the efficiency and the accuracy of the process. Energy distribution into electrodes and plasma diameter are required to clarify the phenomena. However, reports on energy distribution and plasma diameter are scarce. In this work, the energy distribution and plasma diameter of WEDM process were obtained. They were determined by comparing the boundary of the melted material in the crater which was obtained by the metallographic method and the isothermal curve of the thermalphysical model using finite element method (FEM). From this work, results indicate that the expansion of the plasma diameter must be taken into consideration in order to be more consistent with the real WEDM process. By applying this method, the energy distribution and plasma diameter in different dielectrics with different polarity were investigated. However, by comparing the results of this work and the previous works, it shows that the energy distributed into the workpiece and the plasma diameter can be determined by this method.

(DSTC&INTCET2018-015)

FATIGUE CRACK GROWTH BEHAVIOUR OF SANDWICHED METAL PANEL OF ALUMINIUM AND MILD STEEL UNDER CONSTANT AMPLITUDE LOADING

M. K. Faidzi, A. K. Hamizi, M.F Abdullah, M.A Aliimran, K.Z Ku Ahmad, Raja Nor Othman, Aidy Ali

This study concerned about the sandwiched metal panel on the fatigue crack growth of mild steel and aluminium. The fatigue crack growth consists of 3 layer of metal sheet or panel that bonded together using adhesive of epoxy resin by hand lay-up technique. The 3 layers are consist of 2 face metal sheets and 1 metal sheet as a core for the sandwiched; sandwiched of aluminium with mild steel panel (SAMSP) and sandwiched of mild steel panel (SMSP). The specimen was cut using Electrical Discharge Machine Wire Cut (EDM-wire cut) to get tensile test specimen based on American Standard Testing Method (ASTM) E8 before tested with speed rate of 3mm/min using Universal Testing Machine Instron 5569A (UTM). The stress strain curve was plotted in order to analyse the yield strength, Ultimate Tensile Strength (UTS) and the Young's Modulus of the sandwiched. UTS value is used for the fatigue test in the maximum stress applied between 0.50%, 0.60%, 0.70%, 0.80% and 0.90% of UTS. The fatigue test was conducted under ASTM E647 compact tension C(T) standard using Instron 8801 Fatigue Machine with constant frequency of 20Hz and subjected to 1 million cyclic loading to reach failure. The crack growth behaviour of the specimen were discover that indicate the fatigue life, (*a-N*), fatigue crack growth, $\frac{da}{dN}$ vs ΔK and failure of the structure by the initial notch. The sandwiched of mild steel panel (SMSP) is compared with the sandwiched of aluminium with mild steel panel (SAMSP) to observe the crack growth behaviour and mechanical properties of the specimen in this study. It can be determined that SAMSP has two times better crack growth behaviour that improve the structure properties compare to the SMSP.

(DSTC&INTCET2018-037)

IMPACT RESISTANCE STUDY ON RIGID POLYURETHANE FOAM

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Polyurethane foam was synthesizes generally using isocyanate and polyol that already mix with the surfactant or catalyst as to aid polymer processing and modify properties of the polymer. Polyurethane can be divided to two types which are flexible foam and rigid foam. Usually, the flexible foam will be used in furniture industry to produce soft furniture cushioning and bedding. Rigid foam generally used for composite structured component and insulation. Main focus of this research is to produce a prediction assessment against penetration resistance of rigid polyurethane foam under specific dynamic load. Evaluation is by using analytical prediction method to evaluate the depth of penetration and energy absorption. The fabricated rigid polyurethane foam was undergoing compression test to obtain its mechanical properties and impact test to verify the prediction model with two significant measurements concerned, impact energy and the penetration depth leave by impactor. The impact speed was set up at 1.5 m/s, 1.7 m/s and 2 m/s. Results of experiment shows a variations for depth of penetration and energy absorption to the predicted value from the analytical model. This variation is caused by the specimens rigidity disordered during the specimen producing process.

(DSTC&INTCET2018-056)

STUDY ON THE DEPENDENCE OF THE TEMPERATURE EFFECT ON THE MAGNETORHEOLOGICAL ELASTOMERS DAMPING PROPERTIES

Adenen Aziz, Mohamad Abu Ubaidah Amir, M.N.Azzeri, Ainul Rahman, Sarah Isnan,
Mohd Norsyarizad Razali, Siti Nur Muhamad

Magnetorheological elastomers (MREs) are smart and well-known material in the engineering industries due to its unique rheology prop-erties that can be changed and controlled when subjected to a magnetic field. These active materials are composed of matrix material that has the viscoelastic characteristics and filled with iron particles which enhanced its magnetic properties. One of the MREs application is the marine engine vibration isolator. As severe vibration can cause damage to the engine, thus this excessive vibration must be isolated to prevent damage from occurring. In this research, the damping properties of MREs are investigated by conducting several tests on the anisotropic MREs sample under different types and ranges of variables. Due to the main focus of this study which is to study the cou-pling effect of these variables, hence the temperature dependence of the MREs are examined under different ranges of frequency and magnetic field. The experimental results are compared under the guidance of British Standard to provide a better understanding of the dynamic behavior of anisotropic MREs. An analysis of data that was recorded shows the dependence on temperature as the transition point for changing moduli and loss factor was recorded at 50°C.

(DSTC&INTCET2018-030)

3D PRINTING MODELS FOR WIND TUNNEL TESTINGS

Haziq Idraki Shahidin, Mohd Rashdan Saad, Nur ‘Izzati Mohmad Ismail,
Azam Che Idris, Mohd Rosdzimin Abdul Rahman

Traditionally, wind tunnel models are made of metal and the processes are very expensive. Since then, many researchers have been looking for new alternatives to do more with less, hence 3D printing technology is the solution. Under right test conditions, 3D printed parts could be tested in a wind tunnel to get the aerodynamic performances. By using 3D printing technology, the cost and time can be significantly reduced to produce the wind tunnel models. This investigation was done to compare the aerodynamic performances which are drag and lift forces of the existing wind tunnel models with 3D printed wind tunnel models. Polylactic acid (PLA) was used as the printing materials by using two 3D printers which are Poseidon X and CR-10 S5. The wind tunnel testing covered the wind speed in the range of 0.57 m/s to 10.35 m/s at angle-of-attack of 0°. Results from experiments show that the drag and lift forces of the 3D printed models show very close similarities with the metal models. It can be concluded that the wind tunnel models that are produced by using 3D printing technology can be used in wind tunnels for early testing.

(DSTC&INTCET2018-026)

STUDY OF LOW SPEED AIRFOILS AT HIGH REYNOLDS NUMBER BY GAIN X

A.H. Kamal, N. Nordin, M.T. Ahmad

This paper presents the study of several airfoils' performances with flap at high Reynolds number, Re = 10^5 Determination of lift to drag ratio is very important in aircraft design and it never reach the end. The performances are mainly focus on gain X. Preliminary test has been conducted with 10 airfoils to determine their lift to drag ratios by using XFLR 5 software. Based on this, only the best 3 were analyzed further to gain highest value of gain X. Gain X is the product between lift to drag ratio without flap and maximum flap lift ratio. The gain is the main parameter to indicate flapping performance in this paper. In order to maximize the value of X, the geometry of each airfoil has been optimized such as thickness, thickness position, camber and camber position. These airfoils have been simulated with angle of attack (AOA) between -5º and 20º. Types of flap that has been used is plain with the deflection of 5º The highest value of gain X is 117.05 coming from the optimized SD7032 airfoil with increment of 34%. For Aquila airfoils, the gain X could be increased by 26% while SD800 obtained gain X of 108.80 with 22.8% increment. The higher value of gain X represents the performance of the aircraft in term of longer distance and higher endurance.

(DSTC&INTCET2018-028)

MECHANICAL PROPERTIES OF EPOXY COMPOSITES CONTAINING CARBON BLACK AND GRAPHENE

Raja Nor Othman, Iliyas Abdul Rahman, M K Faidzi, K Z Ku Ahmad

Epoxy composite has been widely used in various industrial applications due to its high strength. Nevertheless, its high strength causes it to fracture easily. Fillers are often added to improve its fracture toughness and other properties. In this work, epoxy composites containing carbon black (CB) and graphene have been synthesized to assess their mechanical properties. Series of analysis have been performed on composites containing single filler (CB or graphene) of various loadings to evaluate the values of Young's Modulus, yield strength, and K_{IC}. The results demonstrate an improvement in Young's Modulus, yield strength, and K_{IC} values by adding different carbon fillers, compared to neat epoxy. Based on these results, composites containing dual fillers are fabricated to understand the resultant synergistic effects. The hybrid fillers shows an increment in both fracture toughness and yield strength test for the epoxy composite with an optimum improvement at (3.0 wt.% CB + 0.1 wt.% Graphene) loading which is an increase of 256% in the values of Young's Modulus, compared to neat epoxy. The addition of carbon fillers enhances the mechanical properties of epoxy composites, with dual fillers demonstrate the highest improvement, which could be due to the improvement in the dispersion degree.

(DSTC&INTCET2018-029)

DESIGN OF AIRCRAFT LATERAL CONTROL LAWS SIMULATION FOR TEACHING AND LEARNING

Z.A. Rashid, V. Budinger, P. Pastor, S. M. F. S. M. Dardin, A. A. Azid

This paper will study the design of a simulator to simulate the general behavior of an aircraft in its lateral motion. The study will be in two parts: the aircraft lateral natural system and the design of the control laws. In the aircraft lateral natural system, all modes will discuss including the Pure Roll mode, the Dutch Roll mode, and the Spiral mode. In the design of the control laws, two type of control laws will be discussed which are the yaw damper and the poles placement method. The results is a complete simulator for aircraft lateral motion which allow user to simulated and studies the lateral characteristic of an aircraft given the desired input. This simulator is suitable to be used for teaching and learning purposes as all results can be display and manipulated.

(DSTC&INTCET2018-045)

MECHANICAL AND THERMAL PROPERTIES OF EPOXY/TAMARIND SHELL COMPOSITE

K.Z Ku Ahmad, Abbas Harun, M.K Faidzi, Raja Nor Othman, A.A Kamarolzaman

This study explores the potential of tamarind shells as a filler in epoxy composites. The tamarind shells were colected from local supply and processed by washing it repeatedly using distilled water. The tamarind shells were dried and crushed until becomes particle. Epoxy composites were produced by mixing epoxy and hardener with varying (0.25,40,50,60) wt % of tamarind shells particle to achieved desired properties. The samples were undergoing density test, flexural test, hardness test, heat stability test and morphology to analyse the mechanical and thermal properties of the samples. With the addition of tamarind shell particle, hardness and flexural strength shows improvement about ~ 80% and 147% respectively. However, density and thermal stability shows decrement in value.

(DSTC&INTCET2018-106)

OPTIMIZATION OF FRICTION STIR WELDING PARAMETERS FOR AA1100 – H14 ALUMINIUM ALLOYS SHEET

D.D.I. Daruis, K.Z. Ku Ahmad, M.A. Roslan

A previous trial-and-error study has proven the feasibility of Friction Stir Welding (FSW) on Aluminum plates using conventional milling machine. This study aims to identify the optimized parameters to produce high strength and good surface finish butt joint FSW of 2mm AA1100-H14 Aluminum alloy plates utilizing a design of experiment (DOE) technique. More importantly, the study aims to recognize whether heat output during the process could be used to monitor the quality of the weld produced. The parameters that aORre found significant are depth of penetration which was set at 1.2mm and 1.6mm, spindle speed at 1300rpm and 1890rpm, and traverse speed at 2mm/s and 3mm/s. It was also shown that at temperature of 146ºC -165ºC, the weld surface and the strength of weld are at optimum. The online heat monitoring showed good correlation with the tensile stress.

(DSTC&INTCET2018-108)

PRELIMINARIES STUDIES OF VIBRATION ISOLATION USING ELECTROMAGNETIC DAMPER

Mohd Fazli Mohd Yusoff, Ahmad Mujahid Ahmad Zaidi, Saiddi Ali Firdaus Ishak, MS Risby, MF Md Din

This paper presents the review of electromagnetic damper as a vibration/isolation material. A bunch of articles about vibration and suspension system was reviewed and the key factors that contribute to electromagnetic damper was identified. Electromagnetic damper has been given special attention from many researchers and thus being among the important research area in vibration system. Vibration concept of electromagnetic damper has been elucidate by referring to several paper that demonstrate the usage of electromagnetic damper. A vibration test rig with a simple electromagnetic damper has been designed and tested in order to investigate the effect of electromagnetic force. Preliminaries simulation of electromagnetic damper was done using FEMM and initial experimental result from the vibration test rig also has been captured.

(DSTC&INTCET2018-018)

BALLISTIC RESISTANCE OF MAGNESIUM ALLOY, AZ31B REINFORCED WITH CARBON NANOTUBE AND LEAD UNDER GAS GUN SIMULATION

M.F. Abdullah, S. Abdullah, M.S. Risby, M.K Faidzi

This paper presents the increment ballistic resistance of magnesium alloy, AZ31B with reinforcement of carbon nanotubes and leads. Magnesium alloy can support high shock absorbency for 100 times greater than aluminium alloys. However, it is necessary to increase the impact energy absorption properties better. Thus, the nano materials can merge together with the structure of magnesium alloy to increase ballistic resistance. Ballistic resistance was determined using simulation of magnesium alloy under gas gun impact. Cowper-Symonds model was used to improve the simulation impact. From the simulation, the ballistic limit was determined using Retch-Ipson model. The results of the simulation showed that the ballistic resistance of magnesium alloy increased as much as 40%. In addition, the ballistic limit also increased from 600 m/s to 680 m/s. It shows that a mixture of magnesium alloy and nano material can enhance the ballistic resistance and ballistic limit.

(DSTC&INTCET2018-035)

PREDICTION OF FLOW PATTERN BEHAVIOUR BEHIND SQUARE CYLINDER USING COMPUTATIONAL FLUID DYNAMIC (CFD) APPROACH

Norzaima Nordin, Emmanuel Benard, A. Hamizi A. Kamal, M. Tarmizi Ahmad and Norwazan A.R

The aim of this study is to investigate the flow pattern behaviour by using Computational Fluid Dynamic (CFD) approach. The square profile was chosen in purpose to have a better understanding of the behaviour which is relevant to the engineering applications. Numerical simulation was performed on various turbulence models with the range of Reynolds number from 6000 to 80000 with three incidence angles of 0°, 15°, and 30°. Mesh dependency study was performed with coarse, base and fine meshes. Fine mesh and standard k–ω were chosen as the best meshing and turbulence model to perform the simulation due to the capability in terms of less absolute error on aerodynamic coefficient and clear flow visualisation capture. It was found that the average values of Strouhal number for square profile was 0.12. The changes of incidence angle and variation of Reynolds number gave a significant flow pattern behind a square profile. The size of the vortices became smaller and closer to the structure as the incidence angle increased. At high Reynolds number, it was also observed that the size of the vortices increased progressively. The prediction of flow pattern behind square cylinder was successfully determined by using CFD approach.

(DSTC&INTCET2018-016)

EXPERIMENTAL STUDY ON HEAT TRANSFER FROM PLATE FIN

M.R.A. Rahman, M.F.M. Zahar, M.R. Saad, A.C. Idris, N.A. Rahim

This work is to study mesoscale plate fins under natural and forced convection. Five different designs of plate fins are used to investigate the efficiency of thermal performance under natural and forced convection. The heating plate power is 350 watt. Various air velocities are used for the forced convection study. Size of the testing enclosure is 0.4 m (W) × 1.0 m (L) × 0.09 m (H). Two axial fans are fitted at one end of the testing enclosure. It is found that the Nusselt number increases as increase in Reynolds number for all plate fin design. In the natural convection case, it is found that there is an optimum value of the Rayleigh number where the Nusselt number is at the peak. In overall, result shows that the design 4 gives the best thermal performance for both natural convection and forced convection cases.

(DSTC&INTCET2018-104)

PERFORMANCES OF JATROPHA AND WASTE COOKING OIL BIODIESEL BLENDS FUEL COMBUSTION USING DIESEL ENGINE

Norwazan, A.R., Norzaima, N., Mohd. Rosdzimin Abdul Rahman, Nasir, M.S.R.

High demands on biodiesel fuel usage on diesel engine is influences the manufacturer to produce more biodiesel fuel especially by using waste products instead of plant oil. Currently, waste products are easily to recycle in many ways including fuel production in order to get better environment. In addition, biodiesel fuel consuming is claimed in HC and CO emissions reduction. It shows that biodiesel fuel combustion is promising to emit the green emissions into environment and protect our planet from global warming. Biodiesel fuel consumption also is one of an alternative to support high demand and depleting of fossil fuel. Jatropha oil and waste cooking oil biodiesel fuels were produced using a two-step of transesterification process using methanol with sulfuric acid catalyst to diminish their free fatty acid level. Then, the transesterification was continued with methanol and the catalyst of potassium hydroxide. The paper focuses on the determination of chemical properties of biodiesel blends fuel using jatropha oil and waste cooking oil biodiesel fuel in different percentages. It also presents the combustion performances and emissions of both biodiesel fuels in diesel engine.

IntCIVEE ABSTRACTS

(DSTC&INTCET2018-001)

SIMULATION OF EXPLOSIVE STORAGE BUILDING SUBJECTED TO EXPLOSION

Mohammed Alias Yusof, Norazman Mohamad Nor, Muhammad Azani Yahya, Vikneswaran Munikanan, Ariffin Ismail

Explosives storage building is also known as a magazine or bunker. These buildings are made of hardened materials and also have very strict security and safety procedures. The objective of this research is to simulate the blast effect due to explosion of explosive storage building using AUTODYN simulation program. In this study a reinforced concrete explosive storage building was designed to resist a blast load with the capacity of 50, 000 kg of high explosive. The size of the building is 41400 mm × 26000 mm and the height of the building is 4600 mm. The simulation of explosion were carried out using AUTODYN simulation program to investigate the behaviour of the explosive storage magazine due to accidental explosion with a storage limit of 50,000 kg and also 70,000 kg of high explosive. From the results obtained, it was found that the explosive storage building with the design capacity of 50,000 kg high explosive was remain safe and not blown up due to detonation of high explosive storage, however, when the quantity of the explosive was further increase up to 70,000 kg, the explosive storage building damaged and completely blown off.

(DSTC&INTCET2018-005)

A CONCEPTUAL APPROACH FOR DEVELOPING AN ERGONOMIC INTERVENTION FOR PREVENTING WORK-RELATED MUSCULOSKELETAL DISODERS (WMSD) AMONGST WORKFORCE AT POWER PLANTS

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Work at fossil-fuelled power plant is physically strenuous and could expose workers to Work-related Musculoskeletal Disorder (WMSD) such as Carpal Tunnel Syndrome (CTS), low-back pain (LBP) or shoulder tendonitis. WMSDs are considered as a leading factor in disabilities and absenteeism, reduced production and increased costs. WMSDs in the workplace have been studied extensively and it is a common notion that the work itself is a major cause of MSDs. Work environment contributed to these types of disorders and are made worse by the working conditions or workplace risk factors. All those mentioned common occupational diseases are related with the ergonomic field of study. By implementing appropriate ergonomic interventions, the above-mentioned work-related injuries and resulting disability is potentially preventable. The major workforce in these plants are either associated with handling of machineries or serving as control room operators. Hence, this category of manpower is subjected to physical stress and workplace injuries if there is no any form of ergonomic interventions. Previous studies shown that common tasks performed by workers in the electric power industry often involve the use of a manual tool and revealed that less than 1% of the general population has sufficient strength to manually perform the task resulting in decreased productivity and worker injury. Departing from the aforementioned need, this study embarks to assess exposure to risk factors for WMSDs and

to pro-vide a basis for ergonomic intervention at the workplace. Therefore, by focusing on health and safety matter of workers at our power plants, we are actually applying a form of business risk management (BRM) to consider possible impacts of related foreseeable significant risks on any electricity utilities performance. It is envisaged that this study could identify the ergonomics interventions which will reduce staff medical bills, compensation and lost time injury from MSDs.

(DSTC&INTCET2018-006)

MECHANICAL PROPERTIES OF CONCRETE WITH ACTIVATED SUGARCANE BAGASSE ASHES AS CEMENT REPLACEMENT

Noor Aina Misnon, Siti Khadijah Che Osmi, Hapsa Husen, Faridah Hanim Khairuddin

Sugarcane baggase waste is one of the disposed of wastes being dumped in a landfill area in Malaysia. To minimise the waste production, this study investigates the potential of the sugarcane bagasse waste to be used as a cement replacement in a concrete mixture by converting the bagasse waste into activated carbon ashes using physical activation method. The mechanical properties of sugarcane bagasse activated-carbon concrete were carried out to determine the effectiveness of activated sugarcane bagasse ash (SBA) in the concrete mix by performing concrete hardened test i.e. compressive test, splitting tensile test and flexural test. The SBA replacement in concrete mixture showed a promising result and has a great potential to be pozzolan materials.

(DSTC&INTCET2018-008)

EFFECTS OF RAINFALL INTENSITIES AND AGGREGRATE SIZE ON SEDIMENT CONCENTRATION AND HYDRAULIC PARAMETER

Zuliziana Suif, Siti Zulaikha Baharom, Nordila Ahmad, Maidiana Othman, Mohd Asri Md Nor

The purposes of this study were to investigate the relationship between sediment concentration and hydraulic parameters effects from rainfall intensities and aggregate sizes. The hydraulic parameters including flow velocity, flow depth, shear stress and stream power. It also related to the effect of different rainfall intensities with different aggregate size ($D_{1.18mm}$ and $D_{2.00mm}$) were also being examined. The different aggregate size, $D_{1.18mm}$ and $D_{2.00mm}$, were set up under the rainfall simulator on flat surface and slope angle 20^{o}. The rainfall simulator was adjusted to the lowest rainfall intensity and highest rainfall intensity, 0.004 $mmhr^{-1}$ and 0.044 $mmhr^{-1}$ respectively. The runoff flow was collected at several intervals (30, 60, 90 and 120 min) for 2 hours. Then, the hydraulic parameters and sediment concentration were measured. As the result, increasing of the rainfall intensity producing the greater sediment concentration at the steep slope. Taking the average of sediment concentration increased as the slope also increased, from 7.988 to 3233.569 gm^{-3} and 2.954 to 976.736 gm^{-3} for aggregate size $D_{1.18mm}$ and $D_{2.00mm}$, respectively. The measured of sediment concentration was higher as the flow depth and shear stress was decreased. On the other hand, flow velocity and unit stream power were directly related between the sediment concentrations.

(DSTC&INTCET2018-012)

HIGH TENSILE BOLLARD USING MACRO SYNTHETIC FIBER FOR BUILDING PROTECTION

Muhamad Azani Yahaya, Atiq Farwiez Marukhi, Mohammed Alias Yusof, Vikneswaran Munikanan

The usage of bollard is very important in protecting buildings. It can prevent vehicles from passing through to the building. But the public now is less sensitive about the use of bollards. They assume the use of bollard is wasteful and for aesthetic only. Therefore, most of the building is not installed the bollard to protect the building. Besides that, there are also mounted bollards installed inappropriate to that place. For example, some bollards installed on buildings not a concrete type that can withstand strong impacts. Furthermore, some important and historic buildings need to install an explosive proof type of bollard as building protection. A method that uses for this research is non destructive testing and destructive test. Non destructive test is slump test and destructive test is compression test, tensile test, flexural test and air blast test. Seven mix that's been used and tested in this research. From the compression result, it shows that the concrete mix with 0.5% of macro synthetic is much stronger than control sample and others mixtures. From the tensile test, it shows that the control sample of the concrete achieves tensile strength of 3.48N/mm2 while the mix concrete with 0.5 % mix of macro synthetic fiber give higher tensile strength. The flexural test shows that the concrete mix with the percentage ratio of 0.5%, 1.0% and 1.5% of the macro synthetic fiber give higher strength than the control sample which is only 2.77 N/mm^2. Based on experiments that have been carried out, it can fulfil the objective one which is to evaluate the type of blast safety for building envelope with the concrete bollard grade 30. The quality of concrete in terms of strength, tensile and flexure of the proposed material with 0.5% of macro synthetic fiber is capable of producing the same quality and meets the quality grade C30 concrete**.**

(DSTC&INTCET2018-013)

CHARACTERISTIC OF GLOW IN THE DARK POWDER APPLICATION AS ROAD LINE MATERIALS IN MALAYSIA

Vikneswaran Munikanan, Ng Choy Peng, Muhammad Azani Yahya, Mohammed Alias Yusof, Khairun Redza

Road markings are used as a mean of controlling and guiding traffic. They are highly important on urban roads and intersections as they promote road safety and bring out smooth and harmonious flow of traffic along guided paths of travel. The objective of this study is to investigate the properties of road lining material and examine the illuminance properties of glow in the dark powder applied in road marking material. The use of Photo Luminescent glow-in-the-dark material was tested in the lab for its suitability (luminosity and the glow duration). The method that involve are selection of suitable type of glow in the dark material, selecting optimum mixing ratio of the glow in the dark powder and thermoplastic powder and laboratory analysis for the properties of the type of the material chosen. At the end the fine granular Strontium Aluminate Compound, SrAl2O4 was selected as the most suitable type of glow in the dark material. Based on the lab analysis, the optimum ratio of the glow in the dark material to be used with thermoplastic powder is 55% in mass of the total mix volume. The average visible light emission period is in acceptable range which is 20m. This is suitable distance to implement the road line because of the high visibility on the road during dark or night.

(DSTC&INTCET2018-014)

ALTERNATIVE WATER RESOURCES IN UPNM CAMPUS

Vikneswaran Munikanan, Aye aye Mon, Nik Noorul Shakira Mohamed Shakrin, Mohd Asri Md Nor, Florence Lim Jing En

Water crisis is become a global issue in recent decade. Alternative water resources are an important method to mitigate the issue of water shortage. The aim of this research is to identify and compare the alternative water resources in UPNM campus. The study of water catchments in UPNM campus was conducted to examine the amount of water resources available that can be developed for water supply. The water quality of the stated alternative resources was tested and analysed to propose new alternative water resources for UPNM campus. Rainwater from the previous area in UPNM, multipurpose green field and natural water from Lestari area surface water collection area were selected for raw water quality standard. To justify the quality of water, physical, chemical and biological assessment were performed. Water quality from each parameter is determined based on American Public Health Association Method (APHA). Peak flowrate of water discharged from both areas were determined using Rational method. Based on the analysis from the study, Lestari area without rain shown a better result whereby WQI for this location is 88.59 compared to UPNM multipurpose green field area which is only 71.68 and a result of 61.17 of WQI for Lestari area with rainwater.

(DSTC&INTCET2018-017)

ECONOMIC COMPARISON BETWEEN BAMBOOCRETE MULTI-PURPOSE PANEL AND TYPICAL REINFORCED CONCRETE PANEL

Norhasliya Mohd Daud, Norazman Mohamad Nor

This study investigated the economic comparison between the bamboo reinforced concrete called Bamboocrete with the conventional reinforced concrete panel. Materials contribute significantly to the construction cost. Bamboo can be an alternative to replace steel bars in typical reinforced concrete as it is low in cost and sustainable material. To optimize the benefit, this study used whole solid bamboo as the reinforcement as well as to reduce amount of concrete in the panel, thus reducing the panel weight. Further, the concrete used is lightweight concrete by partially replaced course aggregate with Palm Kernel Shell (PKS). The Bamboocrete panel at 1500 mm height, 300 mm width, and 125 mm thick can sustain axial load of more than 100 kN (10 ton), and flexural bending load between 32.51 to 35.20 kN. Bamboocrete panel contribute towards economical building structures when it is 14% cheaper than steel reinforced concrete. Further, bamboocrete panel is 23% lighter.

(DSTC&INTCET2018-019)

PRELIMINARY STUDY ON PROPERTIES OF SUPERSULFATED FLOWABLE MORTARS CONTAINING ELECTRIC ARC FURNACE SLAG AS FINE AGGREGATE

Nurshafarina Jasme, Cheah Chee Ban

Electric arc furnace slag (EAF), an industrial by-product of the steel industry has been known as high-density material and the usage of this material as fine aggregate in flowable concrete production is still scarce. This paper describes the study of properties of hybrid supersulfated mortar consisting of ground granulated blast furnace slag (GGBS), pulverised fuel fly ash (PFA), gypsum and calcium hydroxide as binder materials. The usage of quarry dust as a fine aggregate is partially replaced with EAF up to 100% by total mass of aggregate. A total of eleven mix designs were fabricated with constant w/b ratio of 0.30 and cured under ambient temperature and prevented from moisture loss by plastic wrapping. The mortar samples of 50 x 50 x 50 mm cubes were prepared and tested for their flexural and compressive strength at the age of 7, 14 and 28 days. It was found that increasing the replacement level not essentially promote the need of superplasticizer to achieved targeted flow as it is prone to bleeding without improving the flow. Laboratory test results on strength performance of hybrid supersulfated mortar studies indicate that the use of electric arc furnace slag up to 40% by weight of aggregate is suitable to be used as fine aggregate in fabrication of mortar.

(DSTC&INTCET2018-023)

ENERGY SAVINGS PERFORMANCE OF HEAT RESISTANCE WALL PANEL (HRWP) SYSTEM

Umi Nadiah Nor Ali, Norazman Mohamad Nor, Maidiana Othman, Vikneswaran Munikanan

This study investigated the thermal resistant performance of wall panel (Heat Resistant Wall Panel) with embedded PVC pipe and water flowing in it. The flowing water concept that was applied in this study is regulated from rainwater harvesting system. This is to minimize the electricity and water bills while reducing the indoor building temperature. By observing the results, it shows that the internal surface temperature of the heat resistant wall panel is 3°C lower than conventional building wall. In addition, a comparative analysis of energy saving costs has been calculated to identify energy efficiency for typical building with air-conditioning system and typical building with the Heat Resistant Wall Panel which resulted about 30% of cost savings.

(DSTC&INTCET2018-031)

STABILITY ANALYSIS OF MAN-MADE SLOPE: A CASE STUDY AT UPNM CAMPUS, SG. BESI, KUALA LUMPUR.

Jestin Jelani, Mohamad Saiful Adli Hah, Hapsa Husen

Stability analysis is performed to evaluate the performance of man-made slopes constructed along the newly constructed road infrastructure located inside UPNM campus in Sungai Besi Camp, Kuala Lumpur. One of the slope which has steep slope angle, is selected in this case study to re-examine its safety thus to advert possible danger to person who will be using the road or to the existing building located nearby the slope hill. The factor of safety (FOS) of the slope is determined by using an ordinary method of slices and the result is compared with finite element program, SlopeW for validation purposes. It was found that the factor of safety range from 0.64 to 0.88 by using ordinary method of slices and SlopeW respectively. Apart from that, soil nailing is proposed to be installed on the slope to increase its factor of safety. The results from this study will help local authorities to define potential failure zone and develop possible remedial measures

(DSTC&INTCET2018-033)

PRELIMINARY EXPERIMENTAL STUDY ON EFFECTIVENESS OF AQUATIC VEGETATION ON SEDI-MENT TRANSPORT CAPACITY

Nordila Ahmad, Ahmad Naqiuddin, Zuliziana Suif, Maidiana Othman

Vegetation affects sediment transport by obstructing the flow and changing the turbulence characteristics. Common sediment transport equa-tions are not applicable to situations with submerged vegetation. A laboratory experiment was carried out in which flow, vegetation, and sediment transport were measured in an open channel model with a 240 cm long section of 50 cm high x 50cm width with submerged vege-tation in a sand bed. Measured data from various vegetation density and height were analyzed to obtain estimates of the trapping efficiency. Results show an increment of the trapping efficiency with 86.7% and 94.2% reduction in sediment concentration compared to a case without vegetation.

(DSTC&INTCET2018-034)

RECYCLING WASTE PRACTICE AT FACULTY OF ENGINEERING UNIVERSITI PERTAHANAN NASIONAL MALAYSIA

Maidiana Othman, Md Firdaus MD Farid, Zuliziana Suif, Nordila Ahmad

A study has been conducted to determine the amount of recycle waste and the effective method of recycling management at Faculty of Engineering, Universiti Pertahanan Nasional Malaysia (UPNM) using the recycling bins system to reduce waste disposal at landfills. The primary data were collected through daily waste collection in Faculty of Engineering, UPNM. Several recycle waste bins have been located at specific area to ease student and staff the throw the recycle waste. The result shows that the recycling bin system successfully recovered recycle waste item by 3000 to 5000 gram. Thus, it is believing that the implementation of waste separation at source can improved the current waste management system in UPNM and helps to save the environment.

(DSTC&INTCET2018-039)

AGING EFFECT ON THE PHYSICAL PROPERTIES OF POLYURETHANE MODIFIED BITUMEN

Faridah Hanim Khairuddin, Ahmad Nazrul Hakimi Ibrahim, Suzielah Rahmad,
Nur Izzi Md Yusoff, Khairiah Haji Badri, Noor Aina Misnon, Norfarah Nadia Ismail

One of the ways oxidation affect pavement properties is through the aging of bitumen. The aim of this research is to evaluate the effects of aging on 60/70 penetration grade bitumen modified with polyurethane (PU). The unmodified and modified bitumen were artificially aged using the rolling thin film oven (RTFO) and pressure aging vessel (PAV) methods to simulate short term aging (STA) and long-term aging (LTA), respectively. Effects of aging were evaluated by performing consistency tests, namely penetration, softening point, viscosity tests at 135°C, and through aging index. The results of these tests shows that adding 3% PU to the bitumen decreases the penetration value while at the same time increasing its softening point in comparison to base bitumen (B-B). A very high increase in viscosity was observed due to the hardening effect of PU. The computed aging index (AI) shows that PU reduces aging effects on the physical properties of the bitumen as indicated by the lower aging index value of the penetration, softening point, and viscosity tests subsequent to aging. The addition of PU clearly results in improved bitumen resistance to oxidative aging. Morphology observation shows that no separation occurs in the polyurethane modified bitumen (B-PU) and that the sample was homogeneously blended and uniformly dispersed during the mixing process.

(DSTC&INTCET2018-041)

COMPRESSIBILITY CHARACTERISTICS OF PEAT SOIL TREATED WITH MUF-P RESIN

Mohd Nazrin Mohd Daud, Nik Norsyahariati Nik Daud

Peat is commonly described as a soil that is possess to high rate of compressibility due to present of high organic substance derived from plant origins. Primarily, peat soil naturally associated with settlement and consolidation characterized by its high initial void ratio, organic content and water holding capacity. This paper presents the performance of peat soil treated with powdered MUF resin (MUF-P) in term of compression and consolidation behaviour under standard compressibility test. In this study, series of one-dimensional oedometer consolidation test were carried out with the load increment method from 12.5 to 400 kPa after 24 hours of each loading. Preliminary, peat soils under high moisture condition were mixed with MUF-P as for rapid 3 days of stipulated periods of curing times. The results indicate that increasing the MUF-P proportion has improved the compressibility characteristics of peat soil. As the results, the values of compression index (Cc), swell index (Cs) and secondary compression index (Cα) were increased with the increase of peat MUF-P proportions.

(DSTC&INTCET2018-042)

IMPLEMENTATION OF EARLY WARNING SYSTEM IN KG. JENAGOR, KUALA BERANG AS AN EFFORT TO INCREASE HUMAN RESILIENCE TOWARDS FLOOD DISASTER

Azrul Ghazali, Sivadass Thiruchelvam, Kamal Nasharuddin Mustapha, Rahsidi Sabri Muda, Nora Dato' Yahya, Hasril Hasini, Ng Yu Jin, Fatin Faiqa Norkhairi

Residence living downstream of Kenyir dam (Stesen Janaelektrik Sultan Mahmud) are at risk of being flooded due to overflow through spillway, or worst, dam breaks. The nearest community to Kenyir dam is Kampung Jenagor (Kg. Jenagor) residents. A disaster preparedness action plan was proposed to equip the residents with essential knowledge on how to response to such disaster and how to safely evacuate to designated safe havens. This paper presents one key element of the mentioned action plan, which is, to develop and install a flood disaster early warning system. The system is aimed to effectively disseminate warning to Kg. Jenagor residents and ensure that there is a constant state of preparedness. The paper discusses the fundamentals of effective warning dissemination and basic design of Kg. Jenagor's early warning system

(DSTC&INTCET2018-043)

APPLICATION OF GIS AS PART OF FLOOD RISK MANAGEMENT FOR EVACUATION OF VULNERABLE COMMUNITIES DURING DISASTER IN KENYIR, TERENGGANU DARUL IMAN

Fatin Faiqa Binti Norkhairi, Sivadass Thiruchelvam, Hasril Hasini, Lariyah Mohd Sidek, Rahsidi Sabri Muda, Azrul Ghazali, Kamal Nasharuddin Mustapha, Hidayah Basri , Ranjit Singh Dharam Singh

Flood due to the dam break incidence could hardly happen although there are some isolated cases reported around the world. While the probability of the dam to break might be lower, we should be cautious that disaster might strike at any time due to natural or manmade reasons. The flood management plan due to dam break need to be prepared as part of flood risk management which will act as a guideline for the dam owner to manage impending threats. The flood due to dam break could leave catastrophic impact towards the affected area in terms of loss of lives as well as destruction of properties. The usage of geographic information system (GIS) application software in the flood management could assist the dam owner to obtain a clearer picture of the disaster-stricken area should any untoward incidents occur in the future. The GIS data is important in the production of the flood risk management plan. The aim of this study is identify the probable flood risk area by using GIS method. The hydrodynamic data obtained from MIKE-21 will be layered with the image on the Google Earth to obtain the affected area during such flood. The results shows that the area that are near to the dam will have high probability to be shattered by the flood.

(DSTC&INTCET2018-044)

BEHAVIOUR OF RESIDUAL SOIL WITH HIGH SILT CONTENT UNDER LOW FREQUENCY CYCLIC LOADING USING MODIFIED DIRECT SIMPLE SHEAR APPARATUS

Sivadass Thiruchelvam, Kamal Nasharuddin Mustapha

This paper elaborates the development of a modified simple shear device capable of performing low frequency cyclic loading tests. In actual field conditions, we might experience situations associated to cyclic loading. At times, this kind of loading are often ignored due to simplification of design calculations. Last decade has testified that there have been numerous cases related to movement observed or evidence of seismic activity in Malaysia. Therefore, it would be inappropriate to disregard the importance of soil properties under cyclic loading for design purposes in this region. This study embarked to develop a simplified device which could allow soil samples to be tested under plain strain simple shear cyclic loading condition. Upon the successful tests on a Malaysian sedimentary residual soil sample, it was found that the results exhibit increase of shear stiffness, GSTIF, and gained strength after 30 cycles. The rate of soil volume change increases with increasing magnitudes of cyclic load and cyclic displacement. However, the rate of volume change decreases with increasing number of cycles due to densification of the soil sample. It is anticipated that the obtained parameters could assist in the design of infrastructures which accounts for cyclic conditions.

(DSTC&INTCET2018-048)

A CASE STUDY OF SAFETY ASSESSMENT IN WORKPLACE FOR ELECTRICITY UTILITY COMPANY IN MALAYSIA

Sivadass Thiruchelvam, Faizal K.P Kunchi Mohamed, Kamal Nasharuddin Mustapha, Azrul Ghazali, Razi Ishak, Hazlinda Hakimie

Electricity utility technical workforce are often exposed to risk, danger and hazards at workplace ranging from accidents, electrocution, electric shock, burns, coal dust and noise. Globally, electricity utility recorded the lowest occupational accidents compared to other sectors but the number of fatalities seems to be quite significant. These accidents cause personal loss to employees as well as financial loss to organizations and the economy. This study was conducted in a local electricity utility company with the main aim of assessing the relationship between awareness and compliance of occupational safety and health amongst the technical workforce. The variables utilized to measure occupational safety and health (OSH) compliance included job safety, co-worker safety, supervisor safety, management safety practices and satisfaction with the safety program. This study was done cross-sectionally, by using 174 respondents from main arms of the utility such as generation, transmission, distribution and other related subsidiaries. Results indicated that OSH compliance relies upon co-worker safety, supervisor safety, management safety practices and satisfaction with the safety program. Dominant factors such as supervisor safety and satisfaction with the safety program have great implications towards OSH compliance. The implication of this study is defined by its contribution to the understanding of numerous ways management in an electricity utility could endeavor in its effort of increasing employees' well-being based on the needs of the employees and organizations.

(DSTC&INTCET2018-102)

INVESTIGATION OF PILE BEHAVIOUR USING ROTARY- JACKING METHOD

Nor Syamira Hassan, Aniza Ibrahim, Adika Muhammad Abd Jalil, Mohd Norfaris Mohd 'Lut

This research introduced new pile installation using rotary and jacking. The uses of static jacking force applied using hydraulic rams avoids noise and ground vibration compared to the traditional percussion and vibro-hammer methods. Therefore the objectives of this paper are to determine the loading effect of pile by using different method of installation and to determine the subsequent response under axial working loading. A new innovative method, rotary jacking method is introduced and will be compared with the current method such as jacking only method. A screw pile type of pile model was used in the experiment. The experiments were done in the laboratory using a large container filled with silica sand, and the experiment were consists of two main processes : installation and static load test of the piles. Results hows that this new method of pile installation is successfully obtained in the experiments. It shows that using the rotary jacking method, pile need less loading to achieve a required depth due to the reduction of resistance between sand and the surface of the pile. Besides, experiment proved this method reduce the soil settlement, and time taken for the pile driven into the soil is also decreased. This new innovative method is believed will enhance performance of pile installation in construction industry.

(DSTC&INTCET2018-107)

PILOT-SCALE OF CONSTRUCTED WETLAND FOR TREATING STORMWATER IN UNIVERSITY CAMPUS

Maidiana Othman, Muhammad Ibnu Syawal, Nur Afiqah Samsudin, Zuliziana Suif, Nordila Ahmad, Vikneswaran Munikanan, Mohd asri Md Nor, Muhammad Azazni Yahya

Water scarcity and storm water management are two major challenges that effect the ecosystem and urban environment. In hot and humid country such as Malaysia, wastewater reuse should be encouraging whenever it is safe and economically feasible. Constructed wetlands (CW) have been recognized as one of the environmental friendly technologies and successfully used for treating a diverse range of wastewaters. Constructed wetland can also be suitable habitat for native wetland plants and associated fauna. In an urban setting such as a university campus, a constructed wetland can also be landscaped as an educational and attractive green space, providing service learning and teaching opportunities for campus and surround community members. This study examines the performance of pilot-scale constructed wetlands as a sustainable wastewater treatment in Universiti Pertahanan Nasional Malaysia (UPNM) campus for treating and reusing the stormwater in the mini-reservoir. The pilot-scale of constructed wetlands have been designed and constructed in the laboratory using native wetland plant, the Cat-tail *Typha Angustifolia.* The pilot-scale of CW with vertical subsurface flow (VSF) system able to remove all parameters better that horizontal subsurface flow (HSF) system. The highest percentage of removal of all parameters was at hydraulic retention time (HRT) of 5 hours and percentage of removal increased with an increase in HRT. The percentage of removal for total suspended solid (TSS), chemical oxygen demand (COD), biological oxygen demand (BOD) and dissolved oxygen (DO) approximately 84%, 71%, 68% and 25%. Thus, the constructed wetland had the potential to increase the water quality level of stromwater in UPNM campus.

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