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**UNIVERSITI TEKNOLOGI BRUNEI**

# UTB RESEARCH e-BULLETIN

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EDITORIAL TEAM:
GRADUATE STUDIES AND RESEARCH OFFICE

RANKED 2022
QS WORLD UNIVERSITY RANKINGS

RANKED 2021
Petroleum Engineering
QS WORLD UNIVERSITY RANKINGS
BY SUBJECT

QS WORLD UNIVERSITY RANKINGS
TOP 50 UNDER 50
TOP 50
2021

RANKED ASIA
QS WORLD UNIVERSITY RANKINGS
2021

ISO 9001
BUREAU VERITAS
Certification
BUREAU VERITAS
1828

OUTSTANDING
★★★★★+
QS

**ISSUE 1**
**JULY 2021**

## Centre for Transport Research (CfTR)

The Centre for Transport Research (CfTR) remains an active research centre at the university in implementing research projects to address challenges related to the national transport system. CfTR also maintains an active role-in providing R&D management, advice and support to the Brunei Darussalam National Road Safety Council (MKKJR) chaired by the Honourable Minister of Transport and Infocommunications (MTIC).

## Road Accident Data Enhancement and Development (RADED)

The Road Accident Data Enhancement and Development (RADED) project started in July 2019 and was completed in December 2020. The objective of the project was to enhance and develop our national road accident database. The project was funded by MKKJR with a research grant worth B$135,002. It was implemented by a multi-disciplinary group of researchers from the university. The Co-Principal Investigators were Dr Tan Soon Jiann (Director of CfTR) and Dr Wida Susanty binti Haji Suhaili (Deputy Director of CIE) together with two recent graduates from the School of Computing and Informatics. The team collaborated with multiple national agencies and organisations. The outcome of the project included an Android application for on-site data collection, and an integrated and centralised national road traffic accident (RTA) data system for Brunei Darussalam.
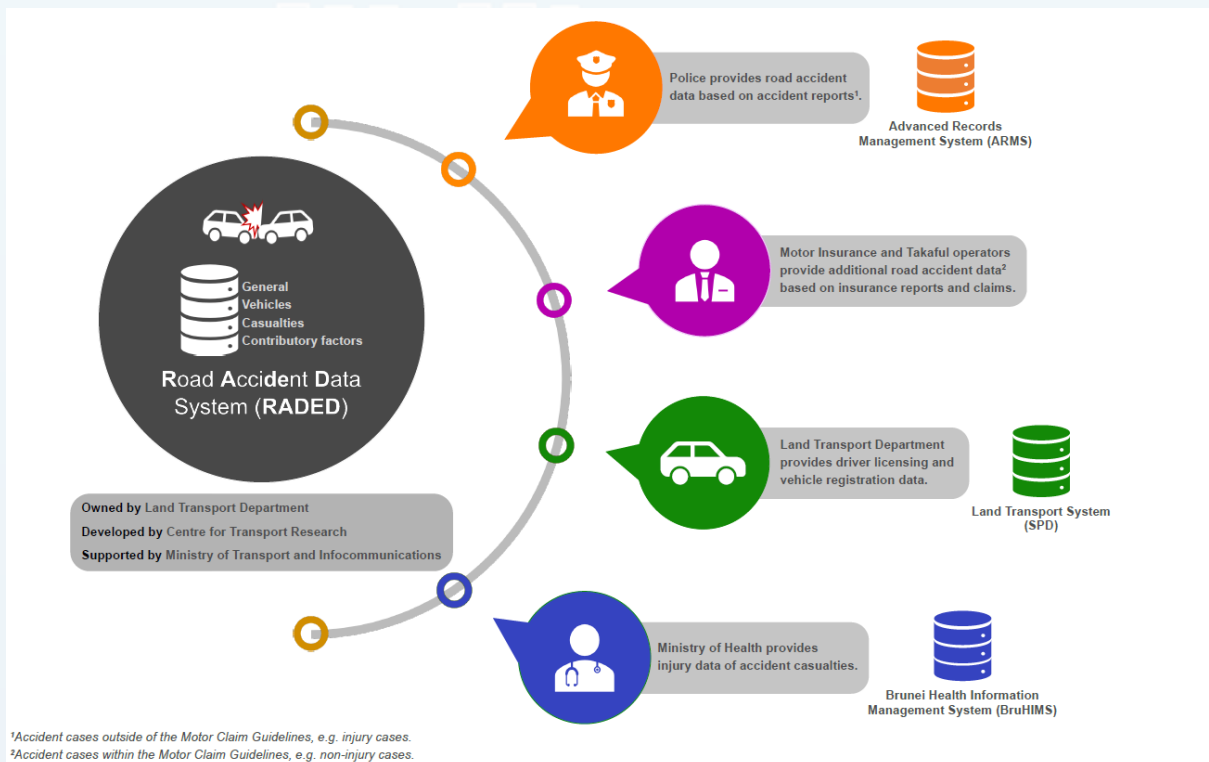


Overview of the RADED system

The system was deployed on a trial basis from 1st July to 31st December 2020 and was fully deployed on 1st January 2021. Several user consultation and training sessions were conducted by the project team with the end-users including Royal Brunei Police Force (RBPF), Brunei Insurance and Takaful Association (BITA), Land Transport Department (LTD) and Ministry of Health (MoH).
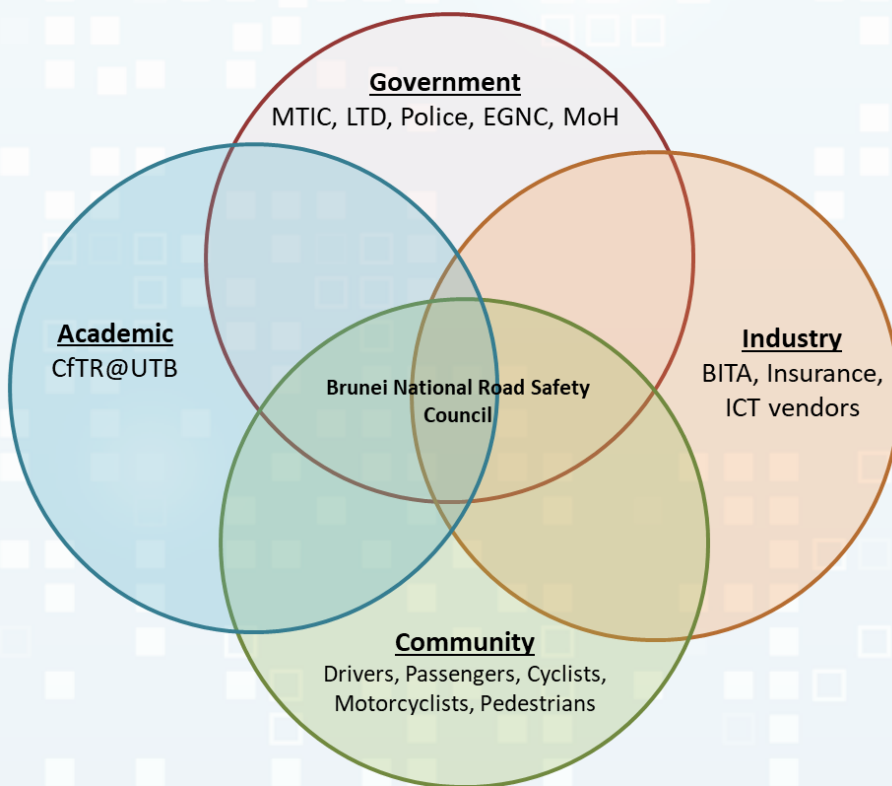


Exhibition of the RADED project during World Day of Remembrance for Road Traffic Victims 2019 at Taman SOAS on 29th December 2019



RADED system training workshops for relevant police officers at UTB from 16th to 17th December 2019

RADED has enhanced the process of RTA data collection, through the deployment of a web-based system for recording, storing, retrieving, presenting and analysing RTA data. Mobile computer tablets with a new purpose-built apps have also been introduced to enable on-site recording of RTA information by RBPF. By improving RTA data management, RADED is expected to enable more focused and evidence-based interventions, with the ultimate objective of reducing road casualties in Brunei Darussalam. The system also helps our national road accident data recording to comply with international standards. The data collected in the system will form the basis for several future in-depth data analytics and research projects on road safety in Brunei Darussalam, which could further contribute towards RTA reductions.

This project supports the key national initiative to improve road safety. The project has promoted a network of collaboration between academia, industry, government and the community. It also directly contributed towards the Quadruple Helix Engagement" of UTB's Strategic Plan. CfTR is committed to continually propose and implement multidisciplinary and collaborative projects that will generate beneficial outcomes aligned with the strategic plans of the university and MKKJR.



**Government**
MTIC, LTD, Police, EGNC, MoH

**Academic**
CfTR@UTB

**Industry**
BITA, Insurance, ICT vendors

**Brunei National Road Safety Council**

**Community**
Drivers, Passengers, Cyclists, Motorcyclists, Pedestrians

Quadruple Helix Engagement of the RADED project

# Centre for Innovative Engineering  (CIE)

The Centre for Innovative Engineering (CIE) in their commitment of promoting-innovative engineering had conducted two workshops this year. The two workshops were 2nd Networked ASEAN Peatland Communities (NAPC) and  Smart Watering System (SWS) for Paddy Plantation, The workshops were both  under the NICT ASEAN IVO 2018 project that was parked under CIE and were held in a hybrid mode where presentations were made to both virtual and live audiences. The  first workshop was the 2nd Bru-NAPC which was held on 4th March 2021 while the second workshop on SWS  was held on 10th March 2021.    Both events were held at Lecture Theatre 2, Library Complex, Universiti Teknologi Brunei.

## The 2nd Workshop on Bru-NAPC Social Innovation



Poster of the 2nd Workshop on Bru-NAPC Social Innovation

The '2nd Networked ASEAN Peat Swamp Forest Communities' (NAPC) is a 2 years project where researchers from Malaysia, Indonesia and Brunei have agreed to work together to implement an IoT-based peat swamp forest monitoring system in their respective peat swamp forest regions. The objective of this project is to adopt an IoT-based solution for peat swamp forest monitoring, targeting the environmental and agricultural issues and at the same time engaging with the peat swamp forest communities for social innovation aspects.

The aim of the 2nd Bru-NAPC workshop was to share peatland's status and condition from all the 3 countries.



Welcoming remark by Emoto-san and Video Launching by Guest of Honor (VC)
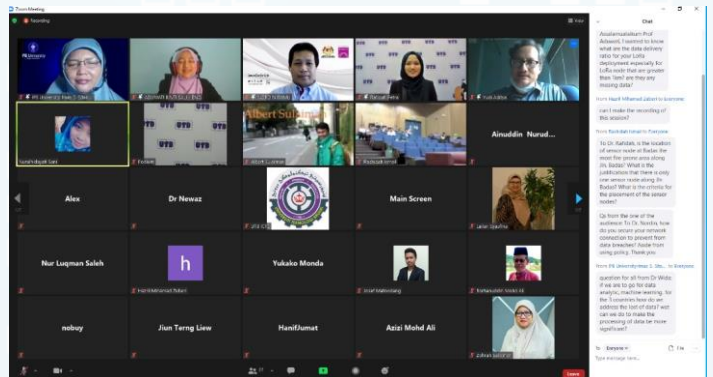


Activities during The 2nd Workshop on Bru-NAPC Social Innovation

# Smart Watering System: Paddy Plantation, Social Innovation Workshop 2021



Poster of the Smart Watering System: Paddy Plantation, Social Innovation Workshop 2021

As one of the Project's initiative, the Smart Watering System (SWS) workshop aimed to bring together experts within the ASEAN region to share the knowledge and experience with relevant parties consisting of government and non-government bodies dealing with paddy.

Research with paddy projects started in 2018 when SWS project was accepted by ASEAN IVO. The kick off was done in Japan and advance technology on how data communicate through a nervenet network adopting mesh networking concept was shown. This was discussed further if it can be adopted it in Paddy plantation. Site visits to Myanmar and Thailand were arranged to help understand the context further within the ASEAN region. This project addresses the irrigation issue in paddy plantation especially with the climate change. A plot in Wasan has been identified as a testbed allocated by Department of Agriculture and Agrifood. This plot is suitable as the problem of water shortage will be addressed by regulating the water entering and leaving the plot using Alternate Wetting and Drying.



Activities during Smart Watering System: Paddy Plantation, Social Innovation Workshop 2021

# Centre for **research** on Agri-Food Science and Technology (CrAFT)

## UTB fosters collaborative relationship with Siberian Federal Scientific Center of Agrobiotechnology of the Russian Academy of Sciences



Online discussion between UTB and SFSCA-RAS.

The University's partnerships at international level provided a huge number of opportunities for students and staff alike. Along with research opportunities and cultural awareness, institutions can offer international experiences, including study abroad programs and staff exchanges.

Univerisiti Teknologi Brunei (UTB) through Centre of Research for Agri-Food Sciences and Technology (CrAFT) had the opportunity to embark on an online discussion with Siberian Federal Scientific Centre of Agrobiotechnology of the Russian Academy of Sciences (SFSCA-RAS) on potential collaboration between the two institutions. SFSCA-RAS is a Siberian Branch of Russian Academy of Sciences, the largest academy of research and development and scientific educational institution in the Eastern Russia. The online meeting was held on 23rd March 2021 with the presence of **Mr. Tamerlan MUNCHAEV,** Senior Counsellor from the Embassy of the Russian Federation in Brunei Darussalam.

The meeting was chaired by Professor Dr Beston Nore, Director of CrAFT and the SFSCA-RAS team was led by Professor Dr Vladimir Kalichkin.

The discussion focussed on:

1. **Partnership**: To develop Agro-BioTechnologies projects with respect to global issues.
2. **Scientific Cooperation**: Professional exchange of knowledge and skills, including educational programmes.
3. **Data Exchange and Sharing**: Machine learning technologies requires large amount of data flow, thus aiming to share data related to the experience of growing local crops in various climate zones.

The discussion has led to the identification of a niche area of research in tackling issues and challenges on climate change: "Global Climate Change Impact on Agriculture and Environment". The Proposed specialised areas included the application of artificial intelligence to reduce the impact of global agriculture on climate changes, smart-agrotechnology to tackle food insecurity issues and sustainable resource management.

# 3rd UTB Postgraduate Colloquium 2021



Welcoming Remarks by Guest of Honor, Vice-Chancellor followed by keynote speech delivered by Assistant Vice Chancellor (Research)

The Faculty of Engineering and Graduate Studies and Research Office co-organised the 3rd UTB Postgraduate Colloquium on 10th April 2021. The colloquium was officiated by Professor Dr Hjh Zohrah binti Haji Sulaiman, Vice Chancellor of UTB, followed by a keynote speech delivered by Professor Dr Mohamed Hasnain Isa, Assistant Vice Chancellor (Research) UTB titled : " Translational Research at UTB : Supporting Wawasan Brunei 2035".

The theme of the 3rd PG Colloquium was 'IMPACTFUL RESEARCH FOR THE SOCIETY'. The theme displayed the effort UTB has made in promoting multidisciplinary and interdisciplinary approach of research activities where various disciplines from different backgrounds are integrated to produce optimised outputs. The Colloquium is a platform to inculcate the culture of interdisciplinary integration among young researchers by disseminating their research findings and exposing them to different disciplines. The event was designed to bring together the graduate students  and for them to share their research findings while also creating networks for further collaboration.

The colloquium called for oral presentations in the following specific areas;
a)  Engineering, Technology and Design
b)  Accounting, Business Management and Economics
c)  Applied Sciences and Mathematics
d)  Computing and Informatics

Fifty-three (53) papers were presented during the one-day event through four (4) parallel sessions, with overwhelming participation from UTB PG students who presented their works and findings. From these 53 papers,  23 papers were presented from Faculty of Engineering, 7 papers from School of Computing and Informatics, 16 papers from School of Business, 6 papers  from School of Applied Sciences and Mathematics and 1 paper from School of Design.

As part of the event, certificates and cash prizes for the winners of oral presentations were awarded to PhD and Masters by Research categories. Each presentation was judged by two senior UTB researchers; one from the representing faculty/school and the other from other different faculty / school. The winners of the oral presentation for both categories are as follows:

PhD category

| Winner | Name | Faculty/School |
|--------|------|----------------|
| 1st place | Nur Wardhyana Binti Yahya | Faculty of Engineering |
| 2nd place | Datin Dayang Hjh Aisah Binti Awang Haji Timbang | Faculty of Engineering |
| 3rd Place | Awangku Muhammad Salihin Bin Pg Hj Abd Rahim | School of Computing and Informatics |

Masters by Research category

| Winner | Name | Faculty/School |
|--------|------|----------------|
| 1st place | Muhammad Asyraf bin Hj Daruis | Faculty of Engineering |
| 2nd place | Dayangku Siti Hamizah Binti Pg Sharifulazar | School of Applied Sciences and Mathematics |
| 3rd Place | Salwa Binti Mohammad Sofri, | Faculty of Engineering |



The winners of oral presentations for PhD and Masters by Research categories.

The colloquium ended with prize presentation and colloquium proceedings were also published online.

* Link to Colloquium Proceedings 2021

# School of Computing and Informatics

## The 4th International Conference On Computational Intelligence In Information Systems 2020 (CIIS 2020)




CIIS conference 2020 was held online.

CIIS 2020 was the first online conference to be held in UTB. It was held for 3 days from the 25th to 27th January 2021 and was organised by the School of Computing and Informatics.

The conference was initially planned in 2020 but was postponed due to the worldwide COVID-19 pandemic. Due to the uncertainties surrounding the pandemic, a technical preparation for a virtual event was eventually planned to accommodate the international participants. The theme for the 4th CIIS conference was "Digital Innovation towards Sustainable Development Goals (SDGs)".

The aim of the conference was to foster a rich knowledge exchange and at the same time to equip individuals with hands-on experience with the latest digital technology on graph analytics, and innovative technologies on Blockchain and Data analytics. The conference included events such as paper presentation, poster competition, pre-conference workshop and Virtual Presidential Forum 2021. The Virtual Presidential Forum 2021 brought together leaders in the international Higher Education Institutions as well as from Industries as speakers. These activities were tailored to embrace the conference's theme.

The conference consisted of four parallel sessions focusing on Digital Transformation towards SDGs, Computational Intelligence in application, Networking Domain, and a special session for AUN SEED-NET JICA members. A total of 55 submissions were received from various countries worldwide and after a rigorous review process, 23 papers were presented in the conference and published in the proceedings of CIIS 2020 by Springer in the Advances in Intelligent Systems and Computing Book Series. An additional 4 papers from AUN SEED-NET JICA members were also presented in the conference. The CIIS 2020 opening ceremony was officiated by Yang Mulia, Awang Haji Mohammad Nazri bin Haji Mohammad Yusof, the Permanent Secretary at the Ministry of Transport and Infocommunications as the Guest of Honour.

UTB was honoured to receive the support from AUN SEED-NET JICA for the two Keynote speakers: Prof Kenji Araki and Prof Kazuhiko Hamamoto from Japan. The event was also supported by the 5G Taskforce AITI on the two invited international speakers, Dr Afif Osseiran from Ericsson, Sweden and Dr Kisuk Kweon from Samsung Corporation, South Korea. The conference also received sponsorships from various local companies; Bank Islam Brunei Darussalam (BIBD), Datastream Digital Sdn Bhd (DST), TechOne Global Brunei, Sprintville Technologies Sdn Bhd, AP Solution and Pinecone Consultant and Training.

CIIS is a biennial conference, and the School of Computing and Informatics will host the next CIIS conference in 2022.

# Featured Research Project

## Project between AITI and UTB on Initiative to Showcase 5G Use Cases

The collaborative agreement is to nurture the development of 5G use cases such as remote video monitoring, Augmented Reality (AR) and Virtual Reality (VR) applications, and advanced Smart Campus. Through this agreement, a 5G innovation technology lab is set up in UTB. The 5G Innovation Lab aims to showcase the implementation of the 5G use cases prototype applications (http://www.utb.edu.bn/aiti-and-utb-sign-collaborative-agreement-on-5g-use-cases/).

The 5G Innovation Lab is in line with the recommendation set by the 5G National Taskforce (to be presented to YB MTIC on the 3 April 2021): to set up a 5G Innovation Lab situated at higher learning institutions, in order to promote active participation from academics and students to engage in 5G research and project development. The smart campus applications in specific can be used to replicate a small-scale smart city.



MoA was signed by Yang Mulia Ir. Haji Jailani bin Hj Buntar, Acting Chief Executive, AITI and Yang Mulia Professor Dr. Dayang Hajah Zohrah binti Haji Sulaiman, Vice-Chancellor, UTB.



Group photo session.

With this replication, it can act as a testbed before smart city applications are deployed on a national level. With support from AITI, this lab will become a collaborative platform between academia and industry. The lab will also become a testbed for any Proof of Concept (POC) or new products designed by the industry. This will further narrow down the gap between academia and industry.

The MOA signed between AITI and UTB on 28 January 2021 involved AITI purchasing and sponsoring project equipment for the MATLAB in UTB. The one-year MATLAB academic license paid by AITI have currently software available for used. In mid-February, UNN installed the external 5G base station at the existing UTB cell tower with a limited range of 100 metres. Once all equipment is available, the 5G Innovation Lab will be utilising respective rooms in UTB for 5G project groups consisting of 1. Remote video monitoring; 2. Augmented Reality (AR) and Virtual Reality (VR) applications, and 3. Smart Campus.

The details of the subprojects under this agreement are as follows:

**Use Case No. 1: Remote Video Monitoring**
- AI-Based Trace and Track Systems
- Recognizing complex faces captured in challenging unconstrained scenarios

**Use Case No. 2: AR, VR & Video Applications**
- Virtual Tourism
- Mobile Edge Computing and Cloud Assisted Ultra-high-definition Video Streaming

**Use Case No. 3: Smart Campus**
- Smart Campus Initiatives: Car entrance, exit and parking management.
- IoT Based Smart Garbage Monitoring System for Campus/City
- Sustainable Smart Building System with IoT
- IoT-based Smart Farming/Agriculture System

**Principal Investigator details**

| | |
|---|---|
| **Project Lead** | Dr. Mohammad Saiful Bin Hj Omar |
| **Deputy Project Lead** | Dr. Muhammad Norfauzi bin POKDP DP Haji Dani |
| **Use Case No. 1: Remote Video Monitoring** | Dr. Ibrahim Venkat<br>Dr. S H Shah Newaz<br>Dr. Lim Tiong Hoo |
| **Use Case No. 2: AR, VR & Video Applications** | Awang Hj Idham Maswadi bin Hj Mashud<br>Awang Ibrahim bin Edris<br>Dr. S H Shah Newaz |
| **Use Case No. 3: Smart Campus** | Awang Zainidi bin Hj Abd. Hamid<br>Dr. Ravi Kumar Patchmuthu<br>Dr. Ibrahim Venkat<br>Dr. Dina Shona Laila<br>Awang Khairuddin bin Hj Abdul Ghafar<br>Pg Dr. Rafidah binti Pg Hj Petra<br>Dr. Hjh Norzainah binti Hj Siau<br>Dr. Lim Tiong Hoo<br>Dayang Hjh Nur'azmina binti Hj Lingas<br>Dk. Norhafizah binti Pg Hj Muhammad |

# New Research Projects

## Internal Grant Projects 2021/2022

UTB in its effort in achieving recognition in research with the ever-increasing academic staff with high research potentials, had been offering Internal Research Grants every year to encourage and promote research to all academic staff. Priority is given to research projects which are multidisciplinary and transdisciplinary in approach and in-line with the current vision of the nation.

The following are 11 research projects that were awarded the internal grant:

| No. | Title | Principal Investigator | Research Thrust | Members |
|---|---|---|---|---|
| 1 | A Global Englishes Corpus of Online Interaction in Brunei | Dr. Lee Kok Yueh | Society and Enterprise | Dr. Chau Meng Huat<br>Prof. Dr. Su Hang<br>Dr. Man Deliang |
| 2 | Nature-Based Tourism in Adding Value Towards Domestic Tourism: Synergies between Tourist Activities, Physical Health and Well-Being | Dr. Fahmi Ibrahim | Society and Enterprise | Dr. Hjh Farahiyah Hj Kawi<br>Dr. Malai Zeti Sheikh Abd. Hamid<br>Dr. Norihan Abu Hassan<br>Dk. Ida Nurul-Fitri Pg. Hj. Kahar<br>Dayang Liana Artini Hj. Mohd. Nor<br>Prof. Dr. Kamariah Ismail |
| 3 | Financial Well-being and Its Potential Antecedents: A Study of Young Adults in Brunei | Dr. Shaista Wasiuzzaman | Wellness | Dr. Hjh Farahiyah Hj Kawi<br>Dr. Hajah Siti Wardah Haji Abdul Rahman<br>Prof. Dr. Kamariah Ismail<br>Dr. Norihan binti Abu Hassan |
| 4 | Empirical Analysis of Brunei Darussalam's Micro, Small and Medium Businesses' Acceptance Behaviour in Adopting Industry 4.0 Technologies | Dr. Fadzliwati Mohiddin | Society and Enterprise | Dr. Haji Mohammad Saleem<br>Dayang Izzati Naqibah Zaidi |
| 5 | Development and Analysis of Digital Image Correlation for Strain Measurement in Mechanical Properties Testing of Materials | Dr. Denni Kurniawan | Agri-Food | Awang Ahmad Shamil bin Hj Abd Rahman<br>Ak Muhammad Rahimi bin Pg Hj Zahari<br>Prof. Dr. Mohd Nasir Tamin<br>Dr. Fethma M Nor |

# Internal Grant Projects 2021/2022

| No. | Title | Principal Investigator | Research Thrust | Members |
|---|---|---|---|---|
| 6 | Eco-Friendly Machining of Marine Grade AISI 316 Stainless Steel | Prof. Dr. Mohammad Yeakub Ali | Sustainable Built Environment | Pg. Dr. Seri Rahayu binti Pg Ya'akub Prof. Ir. Dr. Ramesh Singh Kuldip Singh |
| 7 | Intelligent Resource Management Mechanism in Fog Computing to Support Latency-stringent and High Bandwidth Demanding Applications in 5G and Beyond | Dr. S. H. Shah Newaz | Digital and Creativity | Dr. Mohammad Saiful Bin Hj Omar Dr. Au Thien Wan |
| 8 | Development of Durable, Aesthetic and Biocompatible Ceramics for Dental Restorations | Dr. Abdur-Rasheed Alao | Wellness | Assoc. Prof. Ling Yin Dr. Greg Wheatley |
| 9 | Optimizing Investments for Predictive Pipeline Maintenance in Oil and Gas Industry | Dr. Mohamed Saleem Haja Nazmudeen | Society and Enterprise | Dr. Fadzliwati Mohiddin Awang Firdaus Basheer |
| 10 | Optimising Monthly Tilt and Azimuth Angles of Photovoltaic (PV) Panels in Brunei Darussalam | Dr. Ang Swee Peng | Centre for Innovative Engineering (CIE) | Professor Ir. Dr. Hazlie bin Mokhlis Dr. Ashraf Fathi Khalil Sulayman Pg. Dr. Rafidah Pg. Hj Petra Awang Saiful Bahri Hj Md Ja'afar Mr. Namruta Kanianthara |
| 11 | Development of a Novel Cooling Scheme for Solar Panel | Dr. Kenneth Siok Kiam Yeo | Energy | Pg. Dr. Rafidah Pg. Hj Petra Awang Abdul Hadi bin Hj Mohaimin |

**Call for Papers**



## Call for Papers

8th Brunei International Conference on Engineering and Technology 2021

## BICET2021

www.utb.edu.bn/bicet2021/

**8-10 November 2021**

Faculty of Engineering, Universiti Teknologi Brunei

Bandar Seri Begawan, Brunei Darussalam