e ISBN 978-967-19663-5-8

9 7 8 9 6 7 1 9 6 6 3 5 8

First published

eISBN: e-978-967-19663-5-8

Publisher:
UiTM Cawangan Johor
Kampus Pasir Gudang
81750 Masai Johor

PREFACE

This ebook is the report for the 4th Digitalised International Invention, Innovation, and Design (DIIID) Johor 2021. For the past 11 years, UiTM Cawangan Johor has organised Invention, Innovation and Design Competitions (IID) at both national and international levels. This year, UiTM Cawangan Johor maintains its pre-eminence because of the encouraging participation from prior sessions. The incorporation of digital online features changed the ambiance of traditional IID with physical booth exhibition-style, which is in line with the aim of the Ministry of Education to transform learning effectively and living productively in the digital world. The 4th Digitalised International Invention, Innovation, and Design (DIIID) Johor 2021 begun from 20th February 2021 until 3rd August 2021, with an overall total of 131 projects. The projects revolve around issues that are encompassing the following areas of research: Science and Technology and Social Science from international and local universities, government agencies, and schools (primary and secondary). This ebook is hoped to give memories to all the participants this year and expected to promote the culture of innovation and creativity at the national level. Moreover, to contribute the generation of new ideas and products commercialisation.

89	Science & Technology Level A: Professional Level	**Siti Nor Zawani Ahmmad[1], Mohamad Rashid Abd Razak[2], Mohd Faizul Roslan[3], Ahmad Adlan Anuar[4], Eileen Su Lee Ming[5]** [1,2,3,4]Universiti Kuala Lumpur MITEC, Johor (MALAYSIA) [5]Universiti Teknologi Malaysia, Johor (MALAYSIA)	Sensor-Based System for Surgical Skill Assessment
109	Science & Technology Level A: Professional Level	**Rahadian Z[1], Muhammad Adri[2], Sriadhi[3], Khaerudin[4], Neny Wahyuningtyas[5]** [2]Jl Prof. Dr Hamka, Air Tawar Barat, Padang, West Sumatera (INDONESIA) [3]Jl. Wiliam Iskandar Ps. V, Kenangan Baru, Kec. Percut Sei Tuan, Kab. Deli Serdang, North Sumatera (INDONESIA) [4]Jl. Rawamangun Muka Raya No. 11, RW. 14, Rawamangun, Kec. Pulo Gadung, East Jakarta (INDONESIA) [5]Jl. Semarang No. 5, Sumbersari, Kec. Lowokwaru, Malang, East Java (INDONESIA)	Kuliah Smart: Educational Innovation and Digital Marketing in The Disruptive Era
12	Science & Technology Level A: Professional Level	**Zaharah Johari, Muhamad Hairi Sulaiman, Mohd Fairus Mohd Yusoff** Universiti Teknologi Malaysia, Johor (MALAYSIA)	Visitor Monitoring System for Smart Building Application
141	Science & Technology Level A: Professional Level	**Syah Runniza Ahmad Bakri, Noriham Bujang, Juliza Salleh, Anniza Hamdan, Aidil Azli Alias** Universiti Teknologi MARA, Cawangan Sarawak, Kampus Samarahan (MALAYSIA)	The Pirate Continuity Correction (CC)
72	Science & Technology Level A: Professional Level	**ASHRAF ROHANIM ASARI, MUHAMMAD AINUL HAYAT OSMAN, ERNIE MAZUIN MOHD YUSOF, MOHD ALIFF AFIRA HJ SANI** Universiti Kuala Lumpur (MITEC), Johor (MALAYSIA)	Container Monitoring System In Logistic Application
16	Science & Technology Level B: Tertiary Level	**Muhammad Arif Nor Sharizan, Muhammad Aiman Alif Rosman, Muhd Azhar M Ikhsan, Surayya Abu Bakar, Nurulnatisya Ahmad** Universiti Teknologi MARA, Cawangan Johor, Kampus Pasir Gudang (MALAYSIA)	Mechanical Trolley
59	Science & Technology Level B: Tertiary Level	**Muhammad Shafique Ashroff Md Nor, Mohd Aliff Afira Hj Sani, Ahmad Raziq Mirza, Mohd Ismail Yusof, Ashraf Rohanim Asari** Universiti Kuala Lumpur (MITEC), Johor (MALAYSIA)	Development Of Low-Cost Bio-Inspired Swimming Robot (SROB) With IOT
77	Science & Technology Level B: Tertiary Level	**Muhammad Shafiq Saruddin[1], Mohd Aliff Afira[2], Nik Ahmad Nizam Nik Malek[3], Mohd Ismail Yusof[4], Nor Samsiah[5]** [1,2,4]Universiti Kuala Lumpur (MITEC), Johor (MALAYSIA)	Development Of Alcohol Distillation Plant

		[3]Universiti Teknologi Malaysia, Cawangan Johor, Kampus Pasir Gudang (MALAYSIA) [5]Universiti Kebangsaan Malaysia (MALAYSIA)	
79	Science & Technology Level B: Tertiary Level	**Ahmad Syamim Aminuddin[1], Mohd Aliff Afira[2], Mohd Ismail Yusof[3], Sairul Izwan Safie[4], Nor Samsiah[5]** [1,2,3,4]Universiti Kuala Lumpur (MITEC), Johor (MALAYSIA [5]Universiti Kebangsaan Malaysia, Selangor (MALAYSIA)	MRAI Robot
83	Science & Technology Level B: Tertiary Level	**Mohammad Ismail Mohd Nasir, Noor Wahida Jamil, Nur Syuhada Muhammat Pazil, Nurul 'Azwa Kamarudin** Universiti Teknologi MARA, Cawangan Melaka Kampus Jasin (MELAKA)	Workshop Inventory Management System
85	Science & Technology Level B: Tertiary Level	**Zulfakhri Zulkafli, Norzainul Ariffin Norjaip, Tuan Aziem Amrie Tuan Saiden, Fatin Farhah Abd Aziz, Mazleenda Mazni** Universiti Teknologi MARA, Cawangan Johor, Kampus Pasir Gudang (MALAYSIA)	EZCARE Wheelchair
91	Science & Technology Level B: Tertiary Level	**Muzdalifah Ismail, Wan Adilah Wan Adnan, Nor Hapiza Mohd Ariffin, Zan Azma Nasruddin** Universiti Teknologi MARA, Shah Alam (MALAYSIA)	E-Didik Solat Check Reward Gamification App
93	Science & Technology Level B: Tertiary Level	**Adam Nazri Aizan, Maizatul Akmar Ashari, Nur Ainin Sofiya Hilmy, Rohani Mohamad Khalid, Ahmad Idzwan Yusuf** Universiti Teknologi MARA, Cawangan Johor, Kampus Pasir Gudang (MALAYSIA)	SSA - Site Safety Assistant
121	Science & Technology Level B: Tertiary Level	**Nur Ain Zulaikha Jamaluddin, Azma Melia Jafri, Zahidah Zulkifli** International Islamic University Malaysia (MALAYSIA)	Cybersecurity Awareness Mobile App for Secondary School Students: LetSecure
122	Science & Technology Level B: Tertiary Level	**Mohammad Tahmid Lodi, Mujib Mehran, Zahidah Zulkifli** International Islamic University Malaysia (MALAYSIA)	EBazaar IIUM
140	Science & Technology Level B: Tertiary Level	**Muhammad Faris Ahmad Sabri, Muhammad Luqmanul Hakim Sa'ari, Nurul Nuha Abdul Molok** International Islamic University Malaysia, Selangor (MALAYSIA)	Secure Expense Manager: A Mobile Application for Managing Expenses
144	Science & Technology Level B: Tertiary Level	**Fazlinashatul Suhaidah Zahid, Mohamad Syukri Mohamad Nizam, Mohamad Nazim Nasiruddin, Muhammad Aiman Samsul Anuar, Nor Diyana Md. Sin** Universiti Teknologi MARA, Cawangan Johor, Kampus Pasir Gudang (MALAYSIA)	Smart Luggage for Smart Traveller

93	**Adam Nazri Aizan, Maizatul Akmar Ashari, Nur Ainin Sofiya Hilmy, Rohani Mohamad Khalid, Ahmad Idzwan Yusuf** *Universiti Teknologi MARA, Cawangan Johor, Kampus Pasir Gudang (MALAYSIA)*	**SSA - SITE SAFETY ASSISTANT**	Many construction-related accidents are caused by lack of inspection, carelessness, and negligence to the basic safety rules. Construction site accidents have become a serious issue which concerns the organizations involved. Sometimes, the construction workers need to work or deal with dangerous situations and accidents usually involve heavy machinery and scaffolding located high above the ground level. Accidents with serious injury or death are also recorded at the construction site. Such a casualty can bring a bad reputation to the construction companies and require them to provide medical support to the workers who are involved in the accidents during the working period. Hence, the construction sites need to be monitored at all times to prevent such accidents. Generally, there are only one or two officers in charge of construction site safety. Plus, the inspection task cannot be carried out frequently due to limited manpower. As an alternative, a drone known as Site Safety Assistant (SSA) is introduced to monitor the construction sites. This SSA is built with a high antenna signal frequency to enable it to fly at a high altitude, a high-resolution camera to capture the activities on the site, a built-in speaker and microphone to provide two-way communication between safety officers and workers, and LED light to keep it operating during day and night. The safety officer will arrange a schedule for the SSA to carry out inspections on site every 2 hours, with one drone per one site. In case any accidents happen, the workers can report immediately to the safety officers via built-in microphones. The implementation of this SSA cannot only reduce the accident rate but also facilitate daily inspection, save budget, reduce time consumption, and provide a live situation of the sites in a shorter time.
104	**Mohamad Afiq Izzuddin Mohd Sulaiman, Dafina Imani Ibrahim, Syaza Nurbatrisyia Mohd Razif, Mohamad Azim Mohammad Azmi** *Universiti Tun Hussein Onn Malaysia, Johor (MALAYSIA)*	**THE MSF-CON (MICRO STEEL FIBER CONCRETE)**	Normal concrete has a moderate strength capacity which makes this material easily brittle and consequently, the compressive strength will be greatly reduced. One of the materials that can increase the strength of concrete is Micro Steel Fibre (MSF). However, the use of this material is still in the consideration because the appropriate ratio must be obtained to ensure that the concrete is more ergonomic. Therefore, the aim of the research is to investigate the effect of adding MSF into concrete mixed towards compressive strength development. A widespread experimentation was performed to investigate the strength development of concrete containing MSF. In present, a pre-determined concrete mixed design according to the British Standard Design of Experimental (DOE) Method has been calculated and the concrete cubes of 100x100x100 mm in size were casted with different percentage of MSF (by volume). In this research, the compression test was performed towards concrete with 0%, 0.50%, 0.75%, 1.00% and 1.25% MSF after cured at 14 and 28 days using Compression Strength Machine available in Concrete Laboratory, Universiti Tun Hussein Onn Malaysia (UTHM), Pagoh Campus. The result indicated that, the highest compressive strength is produced by the sample containing 1.25% MSF at 28 days with 64.22 MPa. In the same way, compressive strength for other sample containing 0.50%, 0.75 and 1.00% MSF is constantly higher compared to the sample without MSF with 46.38 MPa, 50.21 MPa and 59.21 MPa respectively. As expected, sample without MSF (0% of MSF) showing the lowest strength at 42.16 MPa below the targeted strength mean of 43.12 MPa as calculated in the mixed design. In a nutshell, the objective of the research has been successful where by adding MSF at suitable percentage into the concrete mixed, the compressive strength is improved and the aim to produce the ergonomic concrete achievable.

110	**Muhamad Zharif Samion, Aizuddin Ahmad Kamely, Rizal Ramli, Leonard Bayang, Harith Ahmad** *Universiti Malaya, Kuala Lumpur (MALAYSIA)*	**2 µM OPTICALLY-FIBERIZED Q-SWITCHED THULIUM LASER**	Conventional lasers are based on free-space solid-state lasers, which are expensive to be maintained as they require precise optical alignments over time and they are extremely bulky. Meanwhile, optically-fiberized lasers use optical fibers as the medium to carry light and they do not require complicated alignments since they could be easily joint by fusion splicing or by using optical connectors. They are also more flexible as they could be easily bent and at the same time be able to guide light effectively. In addition, fiber lasers operating in the 2 µm wavelength region have been the focus in photonics industries as they have shown extreme versatility for applications in numerous fields, especially for medical applications. As such, we have developed a compact 2 µm fiber laser that is optically fiberized. With the use of a novel optical switcher, the laser generates stable microsecond pulses in the 2 µm wavelength region. The optical switcher is a compact passive device that makes it easier to be integrated into the laser system as it is compact and does not require the use of external drivers compared to the use of an active optical switcher. The 2 µm wavelength region is popularly known as the “eye-safe” region, as light in this wavelength range is strongly absorbed in the eye's cornea, and therefore, it could not reach the significantly more sensitive retina. This makes lasers in this wavelength region suitable for medical applications such as surgery, urology and tissue ablation. The compact 2 µm optically-fiberized Thulium laser being developed in this project could replace the bulkier conventional lasers as it is space-efficient and also portable. The project is in line with the National Policy on Industry 4.0 to acquire knowledge and technological advancement in advanced materials.
120	**Syukur Samsudin, Nurul Kausar Ab Majid, Amalia Aida Abdul Hali, Rohaina Jaafar, Kamilah Jaafar** *Universiti Teknikal Malaysia, Melaka (MALAYSIA)*	**FISH DEBONING MACHINE FOR BUTTERFLY FILLET**	The demand for fish and seafood products in Malaysia has increased over the years. However, fish filleting process for these products is mostly manual and time consuming. Hence, we, a team of researchers from Universiti Teknikal Malaysia Melaka have developed an automatic fish filleting machine to improve the productivity in fish and seafood industry. The fish filleting machine has the ability to cut and gut the fish in two different ways: ordinary fillet and butterfly fillet without bones.
121	**Nur Ain Zulaikha Jamaluddin, Azma Melia Jafri, Zahidah Zulkifli** *International Islamic University Malaysia (MALAYSIA)*	**CYBERSECURITY AWARENESS MOBILE APP FOR SECONDARY SCHOOL STUDENTS: LetSecure**	The increasing number of cybersecurity cases recently is not something new. Moreover, during this pandemic and lockdown, the demand for internet services is extremely high, which has changed people's lifestyles. People spend more time using the internet and devices but at the same time, many of us still lack cybersecurity awareness especially people who do not have formal knowledge on IT and cybersecurity. Hence, this project, LetSecure Application, aims to create awareness of cybersecurity among secondary school students and to assist them in choosing the best course in higher education and developing their career plan in the area of ICT and cybersecurity. This application could be utilized in teaching cybersecurity to them through the quiz module without changing the existing school curriculum for an optimum learning experience. In addition, this application offers guidance and tips on how users can prevent themselves from being cybersecurity victims. Another aim is to provide information about cybersecurity and give exposure to users on choosing cybersecurity as a career. LetSecure Application has been developed by Flutter as a framework and using Dart programming language. Firebase for the authentication while Firestore to store the database of the users. The User