UNIMAS
UNIVERSITI MALAYSIA SARAWAK
30 years
Crossing frontiers
1992-2022

InTEX 22

INNOVATION TECHNOLOGY EXPO

EXPOSITION & CONFERENCE

"INSPIRING INNOVATION THROUGH DIGITALISATION"

The 13th UNIMAS Research & Development Exposition

PRODUCT PROFILES

15 - 16 JUNE 2022

PULLMAN HOTEL, KUCHING, SARAWAK

Main Organiser

UNIMAS
UNIVERSITI MALAYSIA SARAWAK

Co-organisers

SDEC Digitalising Sarawak

SWINBURNE UNIVERSITY OF TECHNOLOGY SARAWAK CAMPUS

Curtin University Malaysia

UNIVERSITI TEKNOLOGI MARA

UPM UNIVERSITI PUTRA MALAYSIA

Partner

BUSINESS EVENTS SARAWAK

TRIBE LEGACY SARAWAK CAMPAIGN

Information Compiled by:
Research, Innovation and Enterprise Centre
Universiti Malaysia Sarawak

Chief Editors:
Professor Dr Lo May Chiun
Assoc. Prof. Ir Dr Mah Yau Seng

Assistant Editors:
Dr Abang Azlan Mohamad
Dr Charles Bong Hin Joo
Ts. Dr Mohamad Imran bin Bandan

Designer:
Sandra Khoo Ying Ying

Layout and Design by:
Research, Innovation and Enterprise Centre
Universiti Malaysia Sarawak

Printed in Malaysia by:
Techno-Graphic,
Lot 319, Jalan Rubber,
94300, Kuching,
Sarawak, Malaysia.

Published in Malaysia by:
UNIMAS Publisher,
Universiti Malaysia Sarawak,
94300 Kota Samarahan,
Sarawak, Malaysia.

ISBN: 978-967-2298-95-3

UNIMAS
UNIVERSITI MALAYSIA SARAWAK
30 years
Crossing frontiers
1992-2022

InTEX 22

INNOVATION TECHNOLOGY EXPO

Inspiring Innovation Through Digitalisation

Product Profiles

15 & 16 June 2022
Pullman Hotel, Kuching

Table of Contents

45	Direct Extraction of Chitosan from Snail Shells by Natural Deep Eutectic Solvent	PS-11
46	Dot2Math: Puzzle Game for Learning Number Facts	ICT-11
47	Dual-Action Membrane for Water Treatment	T&E-2
	E	
48	Eclecticism in Architecture of Masjid Bandaraya Kuching, Malaysia	SSH-1
49	Eco-Friendly and Sustainable Dielectric Material Made of Natural Banana Fiber for Printed Circuit Boards	T&E-27
50	Effervescent Apong Keto Coffee	PS-11
51	Energy from Flywheel Storage System Using Light-Weight Hybrid Material	T&E-28
52	Enhanced Version of Turning Wastewater to Electricity: PFCELL2.0	T&E-9
53	Enhancing Sustainable Livelihood Framework (SLF): Discovering the Pertinence of Indigenous Knowledge in Sago Cultivation	SSH-3
54	Ethnomedicine and Its Potential	SSH-2
55	Evaluation of Polyethylene Terephthalate in Concrete by Using Non-Destructive Testing Method	T&E-26
56	Exploring Multi-Modal Fusion-Based Indoor Navigation for Human-Following using Perception Scenes and Deep Learning	ICT-21
	F	
57	Fast and Excellent Enhanced Water Organic Contamination Treatment by Photodegradation using Al-and/or Ag-doped ZnO Nanopowders under UV and Blue Laser Irradiation	T&E-25
58	FaultSense: Early Streetlight Fault Sensing and Monitoring using Real-time Current Differential Technique	ICT-10
59	Fenomena Gempa Bumi di Melangkap Kota Belud, Sabah: Analisis Integrasi Islam dan Sains	SSH-3
60	FIREKA	T&E-16
61	Food Drying Machine with Smoker	T&E-12
62	Footstep Power Generation System Using Piezoelectric Sensor Technology (PIEZOFOOT)	T&E-8
63	Forest Alert: Satellite-based Monitoring System	T&E-13
64	Formulation of Specific Consortium Bacteria for Ammonia Removal in Wastewater	T&E-6
65	Friend Circle Solution	ICT-15
	G	
66	Gamma Generalized Linear Models for Analysing Environmental Factors Influencing Population Structure of Mud Crab	PS-4

67	Green and Sustainable Environmental Remediation via High-Performance Pebax 1657/Hierarchical Zeolite T Composite Membrane for Monetization of Waste Into Biofuels	T&E-14
68	Green Tech Brick	T&E-22
69	Guideline to Gadget Usage for Children: An Infographic Method	SSH-12
	H	
70	Hawker Locator Mobile Application	ICT-15
71	HazHunt: Marker-based AR App for Physical & Chemical Hazard Identification Training	ICT-5
72	Healthy Red Seaweed Beverages	PS-6
73	HEXAPODX GO! An Interactive Digital Game-Based Learning for Entomology Course	ICT-19
74	HPS: Hybrid Palm Sugar Stove	T&E-11
75	Hybrid Binary Harmony Search with Artificial Bee Colony Algorithm for Classification of Human Activity Recognition	ICT-12
76	Hypertension Prediction in Adolescents Using Anthropometric Measurements: A Machine Learning Approach	ICT-9
	I	
77	iCOLLABS (Immersive Collaboration System)	SSH-10
78	Immersive Museum System	SSH-10
79	Indigenous Knowledge: The Last Melanau Traditional Healing Rituals (Belum)	SSH-7
80	International Student Mobility Goes Virtual: The e-EduTour	SSH-7
81	In-vitro Study of Chemopreventive Mechanisms of Clinacanthus nutans Extracts on Human Colorectal Cancer Cell Lines HT-29 and HCT116	PS-10
82	IoT Based Cost-Effective Smart Energy Meter	T&E-15
83	IoT-Based Smart City Air-Quality Monitoring System (IOT-SCANS)	T&E-8
	J	
84	JA-WHEEL: A Reading Tool to Read Journal Articles	SSH-5
85	JUMET	T&E-16
86	Knowledge, Perception and Psychosocial Impact of COVID-19 Misbeliefs among General Public in Malaysia 2020	SSH-4
	L	
87	La Farmilia - A Proprietary Game-based Learning Game for Children with Autism Spectrum Disorder	ICT-20
88	Landslide Real-Time Remote Monitoring and Alert System	T&E-13

89	Landslide Susceptibility Map in Malaysia Landslide Prone Areas by Using Geographic Information System (GIS) And Machine Learning	ICT-9
90	Laser assisted Synthesis Silver Nanowires for enhancement properties: Adhesion, Transmission and Conductivity	T&E-25
91	Light Transmitting Concrete	T&E-22
92	Light Weight High Performance Bearing Material	T&E-28
93	Luminescent Emergency Signage for Disaster Relief Centres	T&E-21
	M	
94	Managing Insecticide Susceptibility Data of Dengue Vectors using Insecticide Resistance Management System (IRMS)	PS-4
95	Millennials in the Digitalised Industry: Reshaping Technical Communication Skills Mastery	SSH-1
96	Mobile Care Apps for Job Creation Among Youth in the Elderly Care Industry	SSH-12
97	Modular Velocity Attenuation (MOVA) unit for Subsurface Stormwater Detention and Conveyance	T&E-4
98	Motor Bearing Non-Invasive Fault Detection (MOBIT)	T&E-24
99	Multifunctional Children's Clothing	SSH-8
100	MUNSHI: Multi Unilinguals High Integers	ICT-19
101	My Zakat Kripto: Modul Pembayaran Zakat Ke Atas Mata Wang Kripto	SSH-4
	N	
102	NanoShield - The Next Generation Nanobiocides for Bamboo Protection	PS-9
103	NATKAP - An Oil Filter Using Kekabu (Kapok) for Cage Fish Farming	T&E-10
104	Nutrition Chatbot System Deep Learning	ICT-12
	O	
105	OciPin: Online Canvass Instrument for public perception of Pineapple Intake	SSH-5
106	Open Innovation Business Model Strategic Plan for Malaysian Small Medium Enterprise in the Software Industry	ICT-17
107	Otak Me! A Brain Training App to Boost Memory for Elderly	ICT-1
	P	
108	Patient Information Registration System using IoT (Internet of Things) Technology	ICT-3
109	Performance Appraisal Tracker	SSH-9
110	Pocket Park Model for Enhancement Social-Learning Experience in Malaysian Public Universities	SSH-15
111	Probiotic Feed	PS-9

	Addition	
151	Environmental-Friendly Luffa Reinforced Polymer Composite (PoLuff)	Z1
152	Development of Phytobiotics as Disinfectant for Sustainable Water Treatment	Z1
153	Employability of People with Down Syndrome in Malaysia: Barrier and Opportunity from Employers, Family and Community Perspectives	Z2
154	Multifunction Set Design for Theatre Performance	Z2
155	Improved Visual Person Re-Identification Using Deep Learning	Z3
156	Implementation of Digital Twinning in Malaysian Construction Industry	Z3
157	Smart Monitoring IoT-Based System for Indoor Hydroponic Plant	Z4
158	A New Integrated Model for Yellowness Index Measurement	Z4
159	Digital-Twin and Predictive Maintenance Software of Dry-Low Emission Gas Turbine	Z5
160	Edible and Topical VCE Film	Z5
161	VR Game-Based Tourism for Sarawak Museum (VRG-TSM)	Z6
162	Prediction Children Resilience with Resilience Assessment Tool 25 (RAT-25)	Z6

Otak Me! A Brain Training App to Boost Memory for Elderly

Suriati Khartini binti Jali*, Nurul Farinah binti Mohsin, Mohamad Imran bin Bandan, Nurfauza bt Jali, Amelia Jati anak Robert Jupit

**Universiti Malaysia Sarawak*

Otak Me! is an Android-based digital game designed for the elderly to experience digital games. It is a brain game that focuses on memory, attention, and critical thinking tests. By considering that the elderly is still capable of and allowed to enjoy games, the game's features are tweaked to better suit the elderly's abilities. The user interface, colour, and font size are designed and chosen in a way that will not burden the elderly. Therefore, a 2D environment is implemented as it does not complicate the game environment as much as 3D does. Three categories make up the entire Otak Me!, namely puzzles, trivia, and painting. All of the categories have unique attributes and play styles, allowing the elderly to enjoy a variety of gameplay in Otak Me!

BOOS: An Android Application on Learning KadazanDusun for Non-Native KadazanDusun Speakers

Amelia Jati anak Robert Jupit*, Elvianney Marius

**Universiti Malaysia Sarawak*

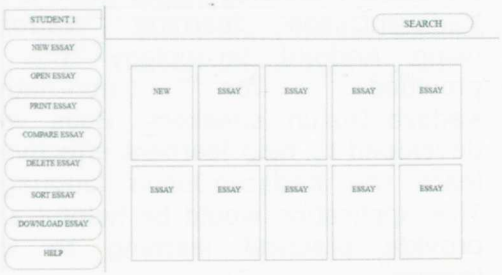
Language learning using the mobile application has become a revolution for a learning platform as more people turns to smartphones and tablets. As there are numerous language learning mobile apps that have been developed, it indicates that everyone from different backgrounds and ages can now learn a new language. Hence, an Android application on learning the KadazanDusun language is introduced as a learning platform to respond to the latest technology since there is no KadazanDusun learning platform using Android technology that is provided for non-native KadazanDusun speakers. Boos was developed to help learners effectively learn the KadazanDusun language. This application would be helpful and provide practical learning to the learner.

Rev - Natural Language Processing to Assist Learners to Write

Tan Ping Ping*, Chan Wen Xian, Isabella binti Jali

Universiti Malaysia Sarawak

Writing is the hardest skill to acquire through self-learning compared to grammar and vocabulary. This project provides a platform for students to write and get feedback from the teachers. Revision to one's essay has shown to improve one's writing skill. Hence, the innovation to the project is the incorporation of natural language processing to allow learners to revise their own essay while helping them improve other than the feedback from the teachers.

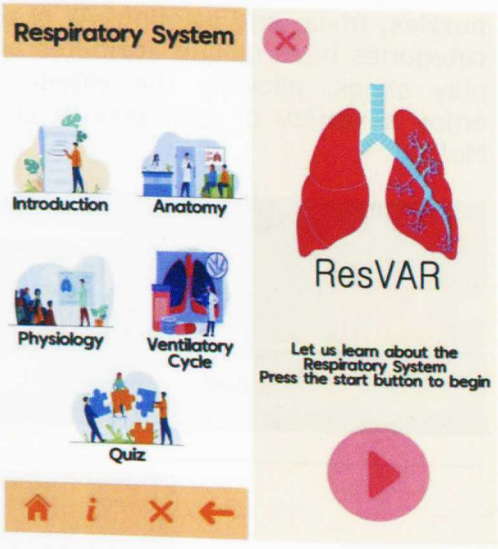


ResVAR (Respiratory Ventilatory Augmented Reality) Application, a Teaching and Learning Tool for Medical Students

Azmah binti Sa'at*, Rahmita Wirza O.K. Rahmat, Heba Ahmad Mahmoud Zahran

Universiti Putra Malaysia

The respiratory module is a difficult subject to study especially regarding the ventilatory cycle. ResVAR (Respiratory Ventilatory Augmented Reality) is an application which is used to help medical students to assist in their learning during MDR3007, Respiratory Module. The application provides them with an augmented-reality visualisation of the lungs, 2D animation of the ventilatory cycle graph, video explanation regarding inspiration/expiration and quiz which consists of 5 multiple-choice questions.

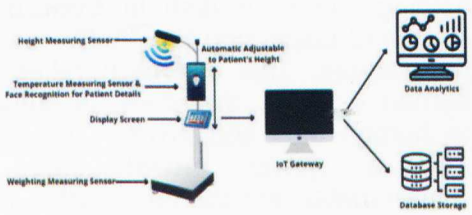


Patient Information Registration System using IoT (Internet of Things) Technology

Loong Qing Zhe*, Burra Venkata Durga Kumar, Teh Jia Yew

Xiamen University Malaysia

This project is a Patient Data Collection System (PDCS) design. It focuses on the front-end architecture design and implementation using IoT (Internet of Things) navel framework. It is useful data collection functionalities will be designed and implemented by applying some advanced architecture and technologies and following the software development lifecycle model. Meanwhile, the API of the clinic front desk site is supported by system platform, so that the patient data is always up-to-date and authorized. The main objective of the research and project development is to use IoT framework with WebStorm IDE tool to design and build a clinic website with specific functionalities to meet the functional requirements and non-functional requirements.



WIMICS: A New Approach to Crop Protection and Efficient Information Management in Sarawak

Asmah Salowi*, Lai Lee San, Nur Najwa bt Hamsein, Rahimah Sallehudin, Jisia Jimbau, Yazid Bostaman, Fillicia William, Jong Tai Loi

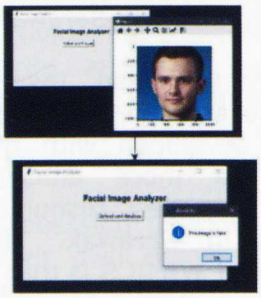
Department of Agriculture, Sarawak

WIMICS, acronym for Weed, Insect, Microorganism Collection in Sarawak is initiated and developed with the aim to enable a more efficient management of crop pest resources and information in Sarawak. The distinctive feature of WIMICS is that it is a dynamic system as new information can be continually added or their content can be regularly updated. Currently, there are 724 pest information and 151 specimens records available in the system that consist of insects, microorganisms, nematode, virus, weed and others.

Detection of Artificially Generated Facial Images Using Ensemble Learning

Khaled Yahya Mohamed Mahmoud ELKarazle*, Valliappan Raman, Patrick Then

**Swinburne University of Technology, Sarawak Campus*



Given the rapid advancement of artificial intelligence, we witness the emergence of algorithms such as Generative Adversarial Networks (GANs), which are capable of constructing images from a noise vector. With these algorithms, individuals can generate a set of realistic-looking facial images just by visiting thispersondoesnotexist.com or running a pre-trained model on their local machine. These artificial images, yet natural-looking images, could be used to carry out malicious activities such as frauds, scams or forgery of official documents. To overcome the issues mentioned above, we introduce a system that differentiates between artificially-generated facial images and actual images. The system is based on ensemble learning, and it consists of three pre-trained deep learning networks, VGG16, VGG19 and DenseNet121. The proposed system can be used as a desktop or web application, as demonstrated in the product image.

ShroomGrowth

Hamimah binti Ujir*, Irwandi Hipni Bin Mohamad Hipiny, Mohamad Hasnul bin Bolhassan, Besar bin Ketol, Paul Ruben Anak Michael Mowet, Malverick Irvine Anak Moris @ Michael, Sharifah Khairunnisa binti Wan Alwi

**Universiti Malaysia Sarawak*

ShroomGrowth App is an app to predict the growth of Rhizomorph Mycelium and to predict if Rhizomorph Mycelium is contaminated or not. Our choice of mushroom is Pleurotus ostreatus or better known as oyster mushroom. The average accuracy of the growth prediction for the mycelium is 89% while the average accuracy prediction of contaminated/good mycelium is 98%. During mushroom cultivation, a human expert classifies rhizomorph and fluffy growing mycelium by holding the petri dish in front of a lamp and inspecting the "fluffiness" of the sample. This approach relies on human experts, therefore, is subject to human bias and errors. The ones with a slower growth rate or contaminated are then discarded. This is where the ShroomGrowth App could assist to determine the quality and the right moment to pluck the rhizomorph mycelium to be grown in a petri dish.

RORO – Medicine Apps Reminder

Noralifah Binti Annuar*, Rohayah binti Sinaro

Universiti Malaysia Sarawak

While well-designed smartphone apps can improve compliance with medications and medical appointments, their use has been limited due to a shortage of studies. Acknowledging the importance of vigilant monitoring in medication management, this project intends to design and develop an android-based medication reminder called RORO – Medicine Reminder. The purpose of this system is to help the patients, primarily the elderly and those with hectic schedules who are on medications, take their medications on time and comply with medical appointments. Also, it provides direct communication between patients and caregivers as it will immediately notify the caregiver if the patient missed their pill. RORO – Medicine Reminder wishes to support patients who comprise their medication management responsibility into their smartphone-friendly lifestyle via its dual functionality as a reminder for medication and medical appointments. It helps family members and caregivers with remote monitoring. RORO is therefore anticipated to improve the overall health quality in the long run.

HazHunt: Marker-based AR App for Physical & Chemical Hazard Identification Training

Ahmad Alif bin Kamal*, Syahrul Nizam bin Junaini, Abdul Halim bin Hashim

Universiti Malaysia Sarawak

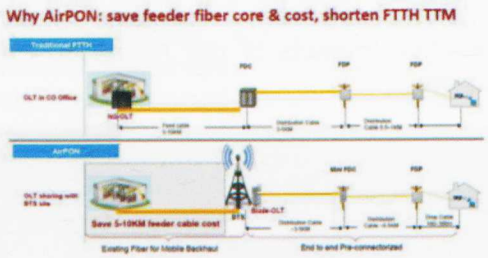
HazHunt is an AR-based app designed as a tool to enhance the teaching-learning process for physical and chemical hazard identification trainings. HazHunt utilizes the marker-based AR type for its purpose. Stickers with physical and chemical hazard symbols were used as the markers for HazHunt. The app features and requirements were provided and reviewed by OSH experts. Vuforia software was used to develop the app. HazHunt functionality includes (i) AR, the module to scan the markers through the devices' camera to display a 3D symbol of the scanned hazard, description of the hazard and video elaborating the hazard; (ii) Info, the module that displays the user guide on how to use the app; and (iii) Quiz, the module that allows the users to answer physical and chemical hazard related questions. The training implemented with HazHunt shows positive impacts of the AR-based app usage.

The Implementation of Broadband Solution using Radio over IP (RoIP) with GPON Blade in Rural Areas

Tamrin Amboala*, Soffri bin Yussof, Hadzariah bte Ismail, Tadad bin Tasir, Nordin bin Saad

**Universiti Malaysia Sabah*

Our motivation comes from seeking advantage when developing the RoIP GPON broadband system infrastructure that encompasses rural institutions. The primary beneficiary of the proposed project is rural community institutions which consist of schools, health services, local businesses and government agencies. The primary objective of this proposed work is to formulate a fundamental functional baseline for a reliable broadband solution and implementation architecture and process in remote areas. The proposed work has thus been developed to put into action reliable broadband implementation architecture and model implementation for the most underserved remote areas.

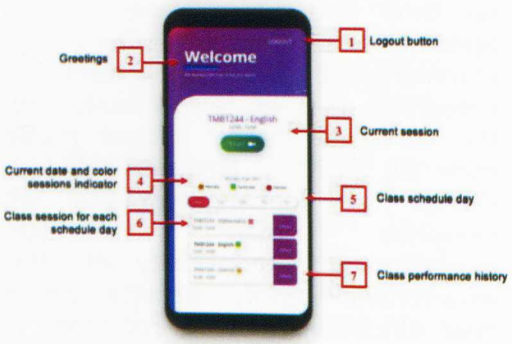


Student Emotion Detection Systems (SEEDs)

Johari bin Abdullah*, Nik Muhammad Irfan

**Universiti Malaysia Sarawak*

For educators, understanding students' emotion or mood during a teaching and learning session is important to measure the effectiveness of the content and the teaching method. However, with ever increasing class sizes (in both number and space), and the fast pace of teaching and learning session, it is very hard for an educator to keep track of students' emotion throughout a session. This project aims to design, develop and formulate a student emotion detection system (SEEDs) through deep learning approach. A video feed of the session is recorded and stream to the framework which will generate individual student state of emotion at specific interval during a teaching and learning session.

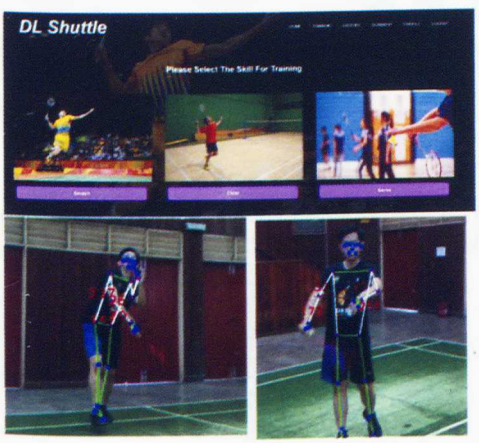


Badminton Coaching Assistance System Using Deep Learning

Johari bin Abdullah*, Chai Zi Jian

**Universiti Malaysia Sarawak*

This project proposes a badminton coaching assistance system using deep learning which allows users to train on their own without meeting with coaches. It can perform at any badminton court and anytime. Besides, one of the best things of this coaching system is it is free-of-charge for every user. In the development of this project, 33 key point joints of the player are identified and an algorithm is created to verify the player's posture. A usability testing on 15 random users was run and it showed that the proposed system was able to provide good coaching session for users. This system is expected to attract a lot of beginners to use it as it is free to use and it is able to detect the player's posture accurately and give comment for them to improve their skills.

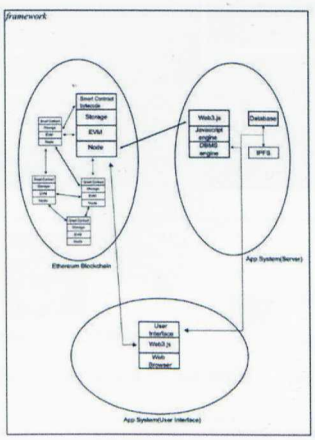


A Framework to Protect Unique Cultural Product using Blockchain Technology

Johari bin Abdullah*, Hassif Harris

**Universiti Malaysia Sarawak*

Songket market in Sarawak has been established since 1970, making it one of the longest existing cultural and handmade products. Songket preservation is essential to ensure the originality of the artwork in the community. An effort can be done by encouraging the community to report pirated patterns. Songket in Sarawak are mainly copied by parties that want to make profit from creating copycat products of lesser quality and value but being sold as original merchandise. By creating a new system that can detect the ownership of the songket patterns, it will increase their value. This is achieved through the introduction of a framework for traceability of songket product and production process, by utilizing a blockchain solution.



Augmented Reality (AR) Photobooth With Camera-based Head Tracking Technology

Irwandi Hipni Bin Mohamad Hipiny*, Hamimah binti Ujir

**Universiti Malaysia Sarawak*

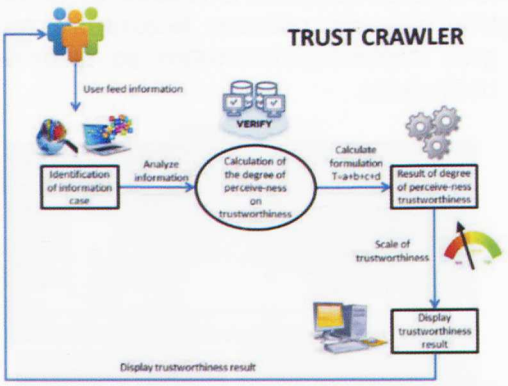
The software captures a live video of the user using an RGB webcam. Another layer of video is superimposed on the live video containing moving characters (e.g., celebrities, athletes, animated characters, etc.). The user then gets into position and after the timer ends, a frame is captured and shown on the screen. The captured frame (i.e., photo) can be downloaded by scanning a QR code. The user has the option to enable head tracking using a novel Computer vision algorithm. Once the feature is enabled, the user can add fun overlay 2D graphics such as party hat, moustache, sunglasses, covid mask et cetera.

Trust Crawler: An Automated Verification Tool

Mohamad Nazri bin Khairuddin Yap*, Massila binti Kamalrudin

**Universiti Malaysia Sarawak*

There are difficulties in determining the trustworthiness of information, especially on social media. This study focuses on developing an approach that assists social media users to make judgments on the information they obtained from social media. For this reason, an approach has been developed to verify the trustworthiness of information in social media by using an automated tool named Trust Crawler. Once the information is inserted into the tool, it will objectively determine the level of trustworthiness based on a algorithm. The level of trustworthiness identified as either high, average or low will then be displayed to the users.

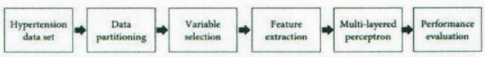


A Multilayer Perception Neural Network Model to Classify Hypertension in Adolescents Using Anthropometric Measurements

Chai Soo See*, Cheah Whye Lian, Goh Kok Luong

**Universiti Malaysia Sarawak*

In this study, anthropometric measurements are used to predict hypertension in adolescents using a machine learning approach. The prototype promises a cost-effective way to predict hypertension in adolescents and could serve as an early warning system for individuals who may be hypertensive, particularly when a blood pressure monitor is not available.

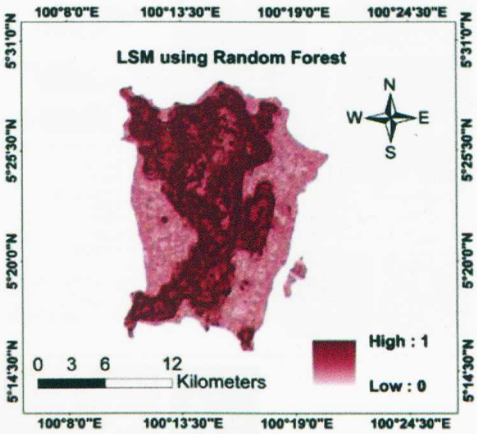


Landslide Susceptibility Map in Malaysia Landslide Prone Areas by Using Geographic Information System (GIS) And Machine Learning

Chai Soo See*

**Universiti Malaysia Sarawak*

The ultimate goal of this project is to use Geographic Information System (GIS) and machine learning to develop a landslide susceptibility map. In two different landslide-prone areas in Malaysia, the performance of the two different machine learning models, Random Forest and Extreme Gradient Boosting (XGBoost) are evaluated and cross-validated. The Cameron Highland and Penang Island, Malaysia which are the subjects of this study, have a total of 233 and 443 landslides locations, respectively. The final prediction map from this study might be useful for better planning in mitigating the occurrence of landslides.



An Interactive R-Shiny Application for Geo-visualization of COVID-19 Exposed Location in Kuching

Yap Ming Yan*, Phang Piau, Jane Labadin

**Universiti Malaysia Sarawak*

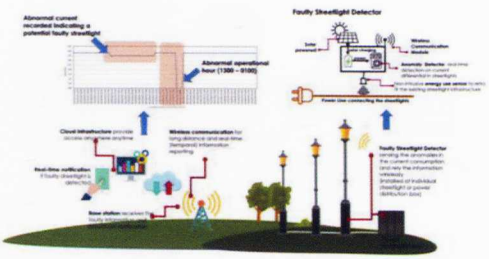
The state government of Sarawak with the help of the Sarawak Disaster Management Committee (SDMC) has continuously provided updated information on the state COVID-19 situation and its ensuing control measures available to general public in the form of daily media statements. There is an urgent need to convert this textual information into more valuable insights by applying geo-visualization techniques. Specifically, interactive map visualization will be developed for the list of location visited by COVID-19 patients prior to being tested positive in Kuching division using R-Shiny, resulting in either better dissemination of the information or better decision-making for imposing applicable disease control intervention at division level.

FaultSense: Early Streetlight Fault Sensing and Monitoring using Real-time Current Differential Technique

Lau Sei Ping*, Chang Yee Heng, Tan Chong Eng

**Universiti Malaysia Sarawak*

Street lighting is an important utility; it has been shown to reduce crime, improve road safety, and increase economic activity. Thus, it is essential to have faulty streetlight repaired in the shortest time possible. But most of the faulty streetlights are reported by locals or daytime scouting team from the service provider. These mechanisms are not efficient and reactive, which can prolong turnaround time of the maintenance cycle. Our solution detects the defective streetlight by sensing anomalies in electricity flow in streetlight as fault indicator and then reports the potential fault to the cloud system.

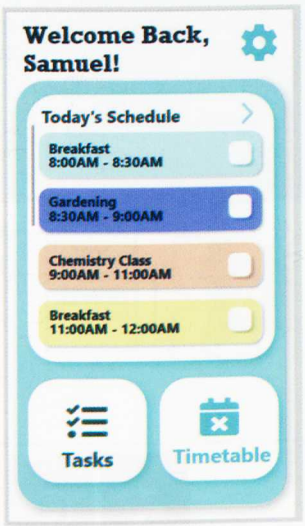


Auto Timetable Management Mobile Application

Samuel Chai Ye Ler*, Ling Yeong Tyng

**Universiti Malaysia Sarawak*

Timetabling is a common way to manage time and plan the task to be done. However, manually managing a timetable can be a challenging task. Movement of one timeslot could possibly affect other timeslots in the timetable and the process of rearranging the whole timetable manually due to a single change requires a lot of time and planning. The objective of this project is to develop a timetable management mobile application with algorithm that can generate and rearrange timetable with input of tasks details including priority level and preferred timeslot. This auto timetable management application can create timetable based on the priority scheduling algorithm designed by the user.

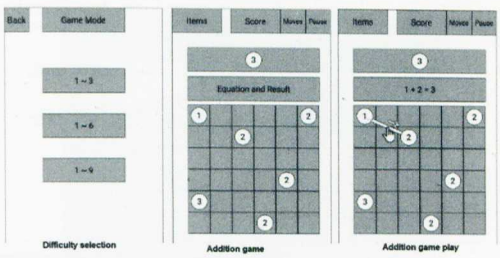


Dot2Math: Puzzle Game for Learning Number Facts

Lim Phei Chin*, Tan Chuanan

**Universiti Malaysia Sarawak*

Game is an activity that one participates in for entertainment or fun and has been part of human's childhood. The classic point puzzle game, Connect-The-Dots is done on paper by using pen or pencil to complete a drawing while connecting all the given dots following certain rules. A serious game is a good medium for children to experience point puzzle game while ensuring the learning occurs. 'Unforced learning' is the 'fun' that children are actively seeking, thus gamification of education can be used to learn number facts, which are usually learned through repetitive memorizing of basic addition, subtraction, multiplication, and division of 2 numbers.

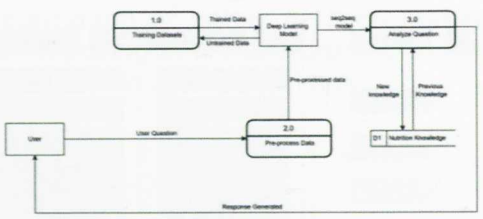


Nutrition Chatbot System Deep Learning

Pang Juin Yu*, Ling Yeong Tyng

**Universiti Malaysia Sarawak*

The goal of this project is to design and develop a chatbot system using deep learning model which is able to provide accurate nutrition guideline. The proposed chatbot system is able to provide a set of solution to the user based on the description of users input. Instead of looking for resources on the internet, the chatbot system will provide the most suitable solutions and suggestions to the user directly. Besides, the chatbot system will also perform self-learning from the data based on human-to-human dialogues. Last but not the least, having a nutrition deep learning chatbot can reduce the necessity of physical appointment between the nutritionist and users.

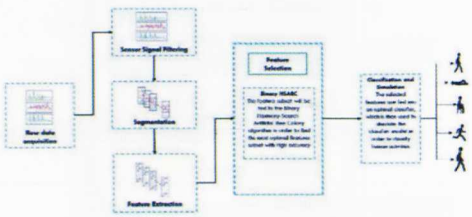


Hybrid Binary Harmony Search with Artificial Bee Colony Algorithm for Classification of Human Activity Recognition

Norfadzlan bin Yusup*, Azlan Mohd Zain

**Universiti Malaysia Sarawak*

This research aims to propose a hybrid feature selection technique for optimal human activity recognition. A local search with an Artificial Bee Colony (ABC) algorithm was employed, where ABC was applied to optimise harmony memory as a learning mechanism in the harmony memory. Then, a second new harmony vector will be produced. Two HAR datasets using accelerometer and gyroscope sensors from the smartphone device were evaluated, covering various daily human activities. An ensemble Random Forest (RF) was used as the base classifier to evaluate the performance of the hybrid algorithm. The hybrid BHS-ABC that was suggested for this research can get the best feature subsets with high accuracy.



Solar-Powered Real-Time Low Water Pressure Early Warning System

Kim-Mey Chew*, Siew-Ping Yiiong, Nancy Bundan, Mohammad Syahmi Bin Yunus

**University of Technology Sarawak*

Currently, the case of low water pressure throughout the DMZ / DMA at the Sibu Water Board, is largely dependent on complaints from residents in the supply area. We proposed to have a water pressure measure-meter at the back/critical points in the area to facilitate the monitoring of the whole area. This is a web-based real-time monitoring system which can perform a monthly water pressure analysis for evaluation and improvement.

Solar-Powered Arduino Flood Detection System

Kim-Mey Chew*, Siew-Ping Yiiong, Nancy Bundan, Kien-Fung Tsai

**University of Technology Sarawak*

Arduino microcontroller-based prototype can be proposed due to its cost-effective and its equivalent functionality. An energy harvesting system which is the solar-powered system can be proposed as an alternative to the battery-powered source in order to confront the insufficient of power source and consumption of the prototype system. The flood detection system involves the use of two different wireless communication IoT technologies which are the WiFi module and the GSM module. Both modules contain different level of the power consumption. The power consumption of both modules during the data transmitting will be tested.