## **2021 IEEE International Conference on Artificial** Intelligence in Engineering and **Technology (IICAIET 2021)**

Kota Kinabalu, Malaysia 13-15 September 2021



**IEEE Catalog Number: CFP21Q84-POD ISBN**:

978-1-6654-2900-9

## Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP21Q84-POD

 ISBN (Print-On-Demand):
 978-1-6654-2900-9

 ISBN (Online):
 978-1-6654-2899-6

## **Additional Copies of This Publication Are Available From:**

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



## **Table of Contents**

	Page
Organizing Committee	iii
Programme Committee	iv
Table of Contents	vi
Abandoned-Cart-Vision: Abandoned Cart Detection Using a Deep Object Detection Approach in a Shopping Parking Space  Mark P. Melegrito, Alvin Sarraga Alon, Sammy V. Militante, Yolanda D. Austria, Myriam J. Polinar and Maria Concepcion Mirabueno	1
Mask-Vision: A Machine Vision-Based Inference System of Face Mask Detection for Monitoring Health Protocol Safety Rovenson V. Sevilla, Alvin Sarraga Alon, Mark P. Melegrito, Ryan Carreon Reyes, Bobby M. Bastes and Roselle P. Cimagala	6
Drive-Awake: A Yolov3 Machine Vision Inference Approach of Eyes Closure for Drowsy Driving Detection  Jonel R. Macalisang, Alvin Sarraga Alon, Moises F. Jardiniano, Deanne Cameren Evangelista, Julius C. Castro and Meriam L. Tria	11
Herb Classification with Convolutional Neural Network  Jia Wei Tan, Kian Ming Lim and Chin Poo Lee	16
Mobile Application for Bird Species Identification using Transfer Learning Srijan, Samriddhi Singh and Deepak Gupta	20
1D Convolutional Neural Network with Long Short-Term Memory for Human Activity Recognition  Jia Xin Goh, Kian Ming Lim and Chin Poo Lee	26
Stacked Bidirectional Long Short-Term Memory for Stock Market Analysis  Jing Yee Lim, Kian Ming Lim and Chin Poo Lee	32
Photovoltaic-Thermoelectric Generator Monitoring System using Arduino Based Data Acquisition System Technique  Umar Abubakar Saleh, Siti Amely Jumaat, Muhammad Akmal Johar and Wan Akashah Wan Jamaluddin	37
Federated Learning: Optimizing Objective Function  Aishwarya Asesh	43
Utilization of Response Surface Methodology and Regression Model in Optimizing Bioretention Performance	49

Jason Lowell Jitolis, Awang Nasrizal Awang Ali, Nurmin Bolong, Ismail Saad, Juferi Idris and Nazaruddin Abdul Taha	
IoT-Based Tracing and Communication Platform for Disease Control Yi Zhen Quak, Yi Xin Loke, Zhi Yuan Chan, Sze Qi Chew and Pei Cheng Ooi	55
Comparison of Anomaly Detection and Solution Strategies for Household Service Robotics using Knowledge Graphs	61
Daniel Hofer, Pranav Krishna Prasad and Markus Schneider	
Generic Expressions for Early Estimation of Performance of Binary Multipliers	67
Junqi Huang, Thulasiraman Nandha Kumar and Haider Abbas Almurib	
Preliminary Design of Portable Electromyography (EMG) System for Clinical Signal Acquisition	73
Bun Seng Chan, Ismail Saad, Nurmin Bolong and Eng Siew Kang	
Brain Tumor Classification from MRI Images Using Convolutional Neural Network	78
Md. Farhad Hossain, Md. Ariful Islam, Syed Naimatullah Hussain, Debprosad Das, Ruhul Amin and Mohammad Saydul Alam	
Kiwi Fruit IoT Shelf Life Estimation During Transportation with Cloud	84
Computing John Julius Danker Khoo, Solomon Wei Wern Haw, Nicholas Kwong Howe Su and Muhammad Shakeeb Mulaafer	
Fuzzy Image Enhancement Based on Algebraic Function and Cycloid Arc Length	89
Libao Yang, Suzelawati Zenian and Rozaimi Zakaria	
Convolutional Neural Network - Long Short Term Memory based IOT Node for Violence Detection	93
Nouar Aldahoul, Hezerul Abdul Karim, Rishav Datta, Shreyash Gupta, Kashish Agrawal and Ahmad Albunni	
Unique Approach to Detect Bowling Grips Using Fuzzy Logic Contrast Enhancement Rafeed Rahman, Sifat Tanvir and Md. Tawhid Anwar	99
·	
Multi-Scale Texture Analysis for Finger Vein Anti-Spoofing Nurul Nabihah Ashari, Thian Song Ong, Tee Connie, Jackson Horlick Teng and Yu Fan Leong	105
Wi-Fi Group Monitoring System Using Free Space Propagation Model with Active Scanning	111
Pang Zhen Tong, Lee-Yeng Ong and Meng Chew Leow	

An Evaluation of PatchMatch-based Copy-Move Forgery Detection (CMFD) on Social Media Images	117
Noor Atikah Mat Abir, Nor Bakiah Abd Warif and Nurezayana Zainal	
A Study on Multiword Expression Features in Emotion Detection of Code- Mixed Twitter Data	123
Kathleen Swee Neo Tan, Tong Ming Lim and Chi Wee Tan	
Text Analytics on Twitter Text-based Public Sentiment for Covid-19 Vaccine: A Machine Learning Approach	128
Hassan Adamu, Mat Jasri Mat Jiran, Keng Hoon Gan and Nur Hana Samsudin	
Text Analytics on Course Reviews from Coursera Platform Huan Yang Chan, Ramindhran Rajamohan, Keng Hoon Gan and Nur Hana Samsudin	134
Facial Expression Based Automated Restaurant Food Review System using	140
CNN Niazi Mahrab, Saad Ahmed Salim, Abdullah Ibne Ali, Israt Jahan Mim and Riasat Khan	
Convolutional Autoencoder for Image Denoising: A Compositional Subspace Representation Perspective	144
Matthew Yok Wooi Teow	
From Conventional to Sustainable SHM: Implementation of Artificial Intelligence in The Department of Civil Engineering, University of Malaya	150
Meisam Gordan, Khaled Ghaedi, Zubaidah Ismail, Hamed Benisi, Huzaifa Hashim and Haider Hamad Ghayeb	
Incorporating Unstructured Text in Multi-Layer Perceptron (MLP) Network: Factors Affecting Partner Selection in Pair Programming	156
Soo See Chai, Kok Luong Goh, Hui Hui Wang and Bui Lin Wee	
<b>Evaluation of Machine Learning Methods for Android Malware Detection using Static Features</b>	161
Ferdous Zeaul Islam, Ashfaq Jamil and Sifat Momen	
Prediction and Detection In Change Of Cognitive Load For VIP's By A Machine Learning Approach	167
Fahim Rahman, Md. Istiyak Ahmed, Saif Shahnewaz Saad, Md Ashrafuzzaman, Sharita Shehnaz Mogno, Rafeed Rahman and Mohammad Zavid Parvez	
Raspberry Pi based ANPR for Smart Access	173
Callistus Joann Fernandez and Rosalyn R Porle	
Particle Swarm Optimization for Tuning Power System Stabilizer towards Transient Stability Improvement in Power System Network	178

Ahmad Adel Alsakati, Chockalingam Aravind Vaithilingam, Kanendra Naidu, Gowthamraj Rajendran, Jamal Alnasseir and Arthanari Jagadeeshwaran	
ECG-Derived Respiration for Sleep-Wake Stage Classification Roneel Sharan	184
Sizes of Superpixels and their Effect on Interactive Segmentation Kok Luong Goh, Giap Weng Ng, Muzaffar Hamzah and Soo See Chai	188
Comparing Topic Modeling Techniques for Identifying Informative and Uninformative Content: A Case Study on COVID-19 Tweets  Qaisar Khan and Hui Na Chua	193
Synchronization of Dual Servo Motor Using CMAC Neural Network-based Lugre Friction Model	199
Suprapto Suprapto, Taufik Taufik, Aris Nasuha and Edy Riyanto	
Sensitivity Analysis of Tracking Point for A Visual Tracking System on Lower Limb Joint Assessment	205
Chee Chin Lim, Marwan Affandi, Muhammad Nazrin Shah, Shafiza Nisha Basah, Xiao Jian Tan and Muhammad Yazid Din	
Securing mHealth Applications with Grid-Based Honey Encryption Soo-Fun Tan, Ka-Man Chris Lo, Yu-Beng Leau, Gwo-Chin Chung and Fatimah Ahmedy	210
Performance of Machine Learning Classifiers in Distress Keywords Recognition for Audio Surveillance Applications	215
Mazlina Mamat, Nadhirah Johari and Ali Chekima	
NDM-Finder: A Machine Learning Based Approach for Type-2 (Neonatal) Diabetes Mellitus Prediction	220
Mounita Ghosh and Ferdib-Al-Islam	
Using Machine Learning to Forecast Residential Property Prices in Overcoming the Property Overhang Issue	226
Lim Wan Yee, Nur Azaliah Abu Bakar, Noor Hafizah Hassan, Norziha Megat Mohd Zainuddin, Rasimah Che Mohd Yusoff and Nor Zairah Ab Rahim	
<b>Exploitation of Meta-Heuristic Search Methods with Bio-Inspired Algorithms for Optimal Feature Selection</b>	232
Mohammad Aizat Basir and Mohamed Saifullah Hussin	
Feature Selection using Pre-Clustering via Affinity Propagation for Speech Classification in Low-resource Languages	237
Bhagath Parabattina, Komal Bharti, Abhishek Kotiya and Pradip Kumar Das	
Performance Comparison of Convolutional Neural Network Models on Cervical Cell Classification	243

Syed Mohd Zahid Syed Zainal Ariffin, Hazwani Hasnun Ali Musa and Nursuriati Jamil	
Predicting Network Traffic Anomalies in Denial-of-Service Attacks – A Non- Linear Approach	248
Ding Wei Lau, Yu Beng Leau, Soo Fun Tan and Po Hung Lai	
<b>Evaluation of Assistance System to Predict Sit-to-stand Speed using Trunk Angle and Lower Limb EMG</b>	254
Tsuyoshi Inoue, Kosuke Uehata and Chihiro Tomoda	
Eye-Tank: Monitoring and Predicting Water and pH Level in Smart Farming Chee Hong Ting, Yu Beng Leau, Soo Fun Tan, Po Hung Lai and Tahir Asni	258
Optimization of Signalized Traffic Network using Swarm Intelligence Min Keng Tan, Mohd.Riezman Ladillah, Helen Sin Ee Chuo, Kit Guan Lim, Renee Ka Yin Chin and Kenneth Tze Kin Teo	263
Optimization of Photovoltaic Energy Harvesting using Artificial Neural Network	269
Min Keng Tan, Norman Lim, Nurul Izyan Kamaruddin, Kit Guan Lim, Soo Siang Yang and Kenneth Tze Kin Teo	
Optimization of Yeast Fermentation Process using Genetic Algorithm Helen Sin Ee Chuo, Christine Yuh King Lo, Min Keng Tan, Heng Jin Tham, Sivakumar Kumaresan and Kenneth Tze Kin Teo	275
Engine Fault Diagnosis using Probabilistic Neural Network Sheng Zhu, Min Keng Tan, Renee Ka Yin Chin, Bih Lii Chua, Xiaoxi Hao and Kenneth Tze Kin Teo	281
Advanced Fault Detection in DC Microgrid System using Reinforcement	287
<b>Learning</b> Min Keng Tan, Kar Leong Lee, Kit Guan Lim, Ahmad Razani Haron, Pungut Ibrahim and Kenneth Tze Kin Teo	
Optimized Energy Extraction in Tidal Current Technology using Evolutionary Algorithm	293
Min Keng Tan, Chun Chong Loo, Kit Guan Lim, Pungut Ibrahim, Hui Hwang Goh and Kenneth Tze Kin Teo	
Enhanced Multi-Hop Mechanism in Vehicular Communication System using Swarm Algorithm	299
Kit Guan Lim, Ke Wen Teh, Min Keng Tan, Herwansyah Lago, Soo Siang Yang and Kenneth Tze Kin Teo	
Optimization of Crop Disease Classification using Convolution Neural Network	305

Kit Guan Lim, Chii Soon Huong, Min Keng Tan, Chung Fan Liau, Min Yang and Kenneth Tze Kin Teo	
A Study on Region of Interest in Remote PPG and an Attempt to Eliminate False Positive Results Using SVM Classification	311
Hiroki Takeuchi, Mieko Ohsuga and Yoshiyuki Kamakura	
<b>Electrical Impedance Tomography with Fuzzy Logic Classification in Lungs Image Reconstruction</b>	316
Cassandra Sze Jin Yong, Soon Yee Chong, Chelvam Dasaratha Raman, Renee Ka Yin Chin, Sainarayanan Gopalakrishnan and Kenneth Tze Kin Teo	
Mobile Machine Vision for Railway Surveillance System using Deep Learning Algorithm	322
Kit Guan Lim, Daniel Siruno, Min Keng Tan, Chung Fan Liau, Sha Huang and Kenneth Tze Kin Teo	
Adaptive Route Optimization for Mobile Robot Navigation using Evolutionary Algorithm	328
Kit Guan Lim, Yoong Hean Lee, Min Keng Tan, Hou Pin Yoong, Tienlei Wang and Kenneth Tze Kin Teo	
Detection of Drowsiness Using EEG Probes Sensory Logic Signals Activeness Topology.	334
Muhyi Yaakop, Sazali Yaacob, Addzrull Hi-Fi Syam Ahmad Jamil, Muhammad Azli, Mohd. Fauzi Abu Hassan and Azurahisham Sah Pri	
Author Index	340