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Program Book

***The 5th International Conference on Electrical,
Control and Computer Engineering 2019***



Sustainable Engineering and Technologies

Swiss Garden Beach Resort,
Pahang | 29-30 July 2019

Secretariat:



FKEE

Faculty of Electrical &
Electronics Engineering



All accepted papers will be published in



Preface | General Chair

DR. AHMAD NOR KASRUDDIN NASIR



Selamat Datang (Welcome!) to the 5th International Conference on Electrical, Control & Computer Engineering or more warmly known as InECCE2019. As the 5th in the series, this flagship conference gathers experts, research scholars, academicians and engineers from the field of electrical, electronic, control and computer engineering. It has a good reputation for quality and a forum for valuable exchange of novel ideas, knowledge and research outputs confronting the issues related to the advancement of new technologies for shaping the future engineering in our civilized society. It gains participation of esteemed researchers from both the local and international arena.

This year, 130 papers were submitted by authors from various countries, among which, 74, i.e., 57 % of the papers were accepted and are to be presented at the conference. All the accepted and presented papers will be considered for inclusion in a Lecture Notes of Electrical Engineering (LNEE) Springer, a Scopus-indexed proceeding. On behalf of the InECCE2019 committee members, I would like to express our appreciation to all authors who have contributed high quality technical and research papers.

I would like to take this opportunity to extend my appreciation to all committee members for their dedication, hard works and efforts to make the 5th InECCE2019 conference as a reality and great success. Our appreciation to all reviewers, who shared their expertise to review the submitted papers with constructive and valuable comments to ensure high quality of accepted technical papers. Appreciation goes to the invited keynote speaker for sharing his knowledge on the state-of-the-art technology in the conference related field. Appreciation also goes to Faculty of Electrical & Electronics Engineering and University Malaysia Pahang for financial support and Board of Engineers Malaysia for approving Continuing Professional Development (CPD) points.

Finally, InECCE2019 has always been envisioned and targeted as a platform for networking and long-lasting collaborations /relationships between a group of like-minded people in the electrical engineering field. With this aim, on behalf of the organizing committee, I encourage you to make full use of the facilities and opportunities available to connect and share, and contribute greater achievements to this field.

Do enjoy the beauty of nature, have a pleasant, beneficial and memorable InECCE2019! Hope to see you in our future event.





Profile | Keynote Speaker

PROF. SYED AB RAHMAN BIN SYED ABU BAKAR

Syed Ab Rahman bin Syed Abu Bakar received his first degree in Electrical Engineering (B.Sc.E.E) from Clarkson University, New York in 1990 and a master degree (M.Sc.E.E) majoring in Signal Processing from Georgia Institute of Technology, USA in 1991. He received his Ph.D in the area of Image Processing for application in Video Surveillance from University of Bradford, England in 1997.

In 1992, he joined Universiti Teknologi Malaysia as a lecturer and now he is a full professor in the Electronics and Computer Engineering division under the School of Electrical Engineering, Faculty of Engineering. Presently, Prof. Syed has successfully supervised many PhD students and master students by research. His current research interest is in image processing focusing in video security and surveillance, medical imaging, and biometrics.

Dr. Syed has lead and managed many research projects securing grants from both the government and private sector. In total, he has secured more than RM 1 million worth of research funds. He has published more than 180 scientific papers both at national and international levels. He is a senior member of IEEE and currently serves as the past chair for the IEEE Signal Processing Society Malaysia chapter after holding the reign of the chapter for more than 5 years. In 2014 he received the Certificate of Merit from the IEEE Signal Processing Society (SPS) for dedicated leadership as Chapter Chair and support of the activities of the SPS Malaysia Chapter.



Program Schedule

Time	29th July 2019				30th July 2019
8:00 AM	Registration				Post-Conference Reflection & Free Activity
9:00 AM	Welcoming note by Chair InECCE				
9:10 AM	Opening Speech by Prof. Ts. Dr. Kamal Zuhairi Zamli Deputy Vice-Chancellor (Research & Innovation), UMP				
9:25 AM to 10:30 AM	Keynote by Prof. Dr. Syed Abdul Rahman Bin Syed Abu Bakar Universiti Teknologi Malaysia <i>Human Action Recognition in Computer Vision Perspective: Research Opportunities and Challenges</i>				
	Photography session				
10:30 AM	Tea break				
11:00 AM to 12:45 PM (10 minutes presentation and 5 minutes Q&A session for each presentation)	Parallel Session 1 Room:Ixora	Parallel Session 2 Room:Dahlia	Parallel Session 3 Room:Lotus	Parallel Session 4 Room:Jasmine	
	Paper ID:	Paper ID:	Paper ID:	Paper ID:	
	13	40	12	19	
	18	104	14	34	
	26	105	16	41	
	29	49	17	45	
	32	50	21	58	
	33	56	22	59	
37	60	30	61		

1:00 PM to 2:00 PM	Break				Post-Conference Reflection & Free Activity
2:00 PM to 5:00 PM (10 minutes presentation and 5 minutes Q&A session for each presentation)	Parallel Session 5 Room:Ixora	Parallel Session 6 Room:Dahlia	Parallel Session 7 Room:Lotus	Parallel Session 8 Room:Jasmine	
	Paper ID:	Paper ID:	Paper ID:	Paper ID:	
	43	129	35	85	
	44	131	42	91	
	65	132	46	107	
	67	69	51	62	
	68	72	53	64	
	80	74	57	66	
	96	76	63	88	
	108	81	71	92	
109	130	75	98		
112	133	77	99		
124		78	106		
128		83	117		
5:00 PM to 6:00 PM	Closing and Award Ceremony				

Abstract

PAPER ID: 12

TITLE: *Open-Set Face Recognition in Video Surveillance: A Survey*

AUTHORS: Wasseem Al-Obaydy and Shahrel Suandi

AFFILIATION: Universiti Sains Malaysia

ABSTRACT:

Face recognition has received a substantial attention by the vision community over the past few decades. Most of the proposed frameworks have adopted the closed-set form of face recognition. However, when a novel unregistered face is presented to the system, the result will be misclassification. A more general and challenging open-set face recognition scheme is highly desirable due to its ability in dealing with the unknown persons which are not enrolled before. We observed that there is a shortage in survey papers that explore the research endeavors in open-set face recognition. In this paper, we present a literature survey of the open-set face recognition approaches that have been introduced for real-world scenarios focusing on video surveillance applications. Moreover, we discuss the current difficulties and suggest the promising directions for future research. The paper also describes the evaluation metrics and available benchmarking face video surveillance databases.



Abstract

PAPER ID: 13

TITLE: *Grey Wolf Optimizer Fine-tuned Model-Free PID Controller for Depth Control of Hovering Autonomous Underwater Vehicle*

AUTHORS: Mohd Zaidi Mohd Tumari, Amar Faiz Zainal Abidin, Ahmad Anas Yusof, Mohd Shahrieel Mohd Aras, Nik Mohd Zaitul Akmal Mustapha and Mohd Ashraf Ahmad

AFFILIATION: Universiti Teknikal Malaysia Melaka, Universiti Malaysia Pahang

ABSTRACT:

Traditionally, the tuning of PID controller is a wearisome job and always result-ing in erroneous system response. This paper recommends the development of tuning method for model-free PID controller parameters by using Grey Wolf Op-timizer (GWO) to control the depth of Hovering Autonomous Underwater Vehi-cle (HAUV). PID controller is responsible to control the speed of thrusters where three PID parameters are fine-tuned using GWO algorithms. Sum Square Error (SSE), percentage overshoot and settling time of the depth response are chosen as the fitness functions. In order to confirm the design of control scheme, one degree of freedom nonlinear equation of the HAUV system in heave direc-tion is considered. Supremacy of the proposed approach is shown by comparing the results with Sine Cosine Algorithm (SCA). The performances of the control schemes are accessed in terms of time response specifications of depth tracking capability with the presences of external disturbances, model nonlinearities, buoyancy force, hydrodynamic drag force and added mass on the HAUV sys-tem. Finally, it is seen from the simulation results that the proposed tuning meth-od guarantees a fast depth tracking capability.

Abstract

PAPER ID: 14

TITLE: *Flexible Graphene-silver nanowires Polydimethylsiloxane (PDMS) Directional Coupler*

AUTHORS: Noorlindawaty Md Jizat, Nor Nadiah Aliff and Nazihah Ahmad

AFFILIATION: Multimedia University

ABSTRACT:

In this research paper, graphene-silver nanowires are demonstrated as transmission line of directional coupler fabricated on an elastomeric substrate, PDMS at 2.4 GHz. In the experimental process, highly conductive of 0.6 mg/ml silver nanowires (AgNWs) is embedded in the graphene dispersion and spin coated onto flexible and durable PDMS elastomer. The proposed directional coupler provides excellent correlation coefficient, good mutual coupling and comparable phase difference between output ports between S21 and S31 with value of $90^\circ \pm 1^\circ$. The directional coupler has a compact size of 9.82cm² with bandwidth of 23% covers from 2.15 GHz till 2.72 GHz. The measured results have comparable value with simulation results, indicating graphene-silver nanowires on PDMS elastomer as a good substrate material for flexible devices, inexpensive and able to withstand mechanical strains without degrading the performance of the directional coupler. The compact sizes and unique properties of the coupler can be realized for wearable electronics applications and biomedical communication engineering.



Abstract

PAPER ID: 16

TITLE: *Design and Analysis of Circular Shaped Patch Antenna with slot for UHF RFID Reader*

AUTHORS: Mohd Hisyam Mohd Ariff, Muhammad Solihin Zakaria, Rahimah Jusoh, Sabira Khatun, Mohammad Fadhil Abas and Mohd Zamri Ibrahim

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

This paper presents an analysis of microstrip circular shaped antenna with slot for portable Radio Frequency Identification (RFID) Reader Applications. The fabricated antenna is designed to work with UHF RFID system in Malaysia with frequency allocated from 919 MHz to 923 MHz. The antenna design was made with circular patch with slot that has the dimension of 122 mm x 122 mm. Moreover, the FR-4 material used in this project has thickness of 1.6 mm with dielectric constant of 4.7 and loss tangent of 0.019. Thus, it is easily connected to the port-able RFID reader module together with the antenna characteristics of easy fabrication, low profile and simple structure. From the results, the antenna has the re-flection coefficient (S_{11}) less than -10 dB along the bandwidth of 33 MHz (3.6%) for operating frequency at 921 MHz.



Abstract

PAPER ID: 17

TITLE: *Comparative Analysis for LED Driver with Analog and Digital Controllers*

AUTHORS: Shaheer Durrani and Abu Zaharin Ahmad

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The trend of utilizing light emitting diodes (LEDs) in some applications has attracted the attention of many researchers, to study its applications. This article investigates the performance analysis of the dc-dc converter systems based on analog and digital controllers for a low voltage dc-dc buck converter, to drive strings of LEDs at different conditions, to judge system's robust performances. This particular converter comprises of a single controller, working with a voltage control feedback system, in a continuous conduction mode. The analog and digital type- 3 controllers, are designed for the said system while using standard frequency response techniques. Simulations are shown to validate the design and the response of these controllers under various dynamic load conditions.

Abstract

PAPER ID: 18

TITLE: *Intelligent Gender Recognition System for Classification of Gender in Malaysian Demographic*

AUTHORS: Yap Su Chi and Syafiq Fauzi Bin Kamarulzaman

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Intelligent gender recognition is the ability in identify whether a person is a male or female based on the past experiences by the features of face such as eyes, mouth, cheek that makes the significant contribution to the appearance. Detecting human gender is difficult but important for some purposes, especially where safety issues related to female gender in public amenities is concerned. There were criminal cases that happened around the world concerning female gender in the public bathroom. The objectives of this research is to identify the techniques for classifying the different face features of male and female, embed as a system and validify using photos within Malaysian demographic. The scope of the project is focused on the face features for gender classification in real time, utilizing deep learning based gender recognition and HAAR Cascade classifier using pre-trained caffe model in OpenCV library to detect the gender.



Abstract

PAPER ID: 19

TITLE: *Residual Current Device Nuisance tripping due to Grounding Resistance Value*

AUTHORS: Izzatul Liyana Aziz, Farhan Hanaffi and Mohd Hendra Hairi

AFFILIATION: Universiti Teknikal Malaysia Melaka

ABSTRACT:

Protection against leakage current is vital in electrical system to protect humans and equipment from electric shocks and fire risk. Residual Current Device (RCD) is a protective device used for protection against small leakage current. This device is designed to disconnect the circuit whenever fault is occurred, by measured the different value of current between phase and neutral. However, inappropriate tripping also known as nuisance tripping is influenced by the improper grounding system, high frequency from power supplied and presence of harmonics. The aim of this paper is to investigate the residual operating current and operating time of RCD behavior towards the poor grounding resistance value. Besides that, effect of different type of load were considered in the experiments. The sensitivity of RCD sample used in this research is 30mA type-AC. RCD operating current and voltage are evaluated and compared with requirement by international standard. The results show grounding system with high resistance value affect the operating time of RCD, thus lead to nuisance tripping

Abstract

PAPER ID: 21

TITLE: *EEG Pattern of Cognitive Activities for Non Dyslexia (Engineering Student) Due To Different Gender*

AUTHORS: Engku Mohd Nasri Engku Mat Nasir, Norfaiza Fuad, Nurul Ain Bahali, Mohd Erwandi Marwan and Danial Md. Nor

AFFILIATION: Universiti Tun Hussein Onn Malaysia, Kolej Poly-Tech Mara Batu Pahat

ABSTRACT:

The purpose of this study is to identify the brainwave or electroencephalogram (EEG) distribution of male and female Non Dyslexia (engineering student) during the cognitive activity. EEG is a method to monitoring electrical activity in the brain and has four main brainwave signal Delta Wave, Theta Wave, Alpha Wave and Beta Wave. Delta wave is slow wave generated in deepest meditation, Theta Wave usually occurs in sleep, Alpha Wave dominant in calming, relaxing condition and Beta Wave dominant in wakeful condition. The raw data collected analysis using SPSS and Microsoft Excel to analysis the accuracy and the brainwave pattern between male and female. The average, standard derivation, correlation and Q-Q Plot are used to identify the EEG pattern between male and female during cognitive activity. Cognitive one of the bloom taxonomy formulate for education activities. The process involved in decision making, understanding of information, attitudes and solving. Subjects are given a set of question to answer. Total 24 students, 12 male and 12 female involve to recorded their EEG signal during answered the cognitive question by wearing the Emotive Insight device. All subjects are from UTHM engineering students. Data collected are focused in Alpha Wave and Beta wave which exist in when someone wake condition. From the discussion and analysis there have the different between male and female brainwave during the cognitive activity. For future recommendation for this research is could increase the number of subject to get more accurate data.

Abstract

PAPER ID: 22

TITLE: *Hardware Development of Auto Focus Microscope*

AUTHORS: Dwi Pebrianti, Rosyati Hamid, Faradila Naim, Mohd Falfazli Mat Jusof, Nurul

Wahidah Arshad and Luhur Bayuaji

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The scientific instrument technology has growth faster than we all could imagine, there are many research team keeping their momentum in creating new innovation in scientific instrumentation technologies. The optical microscopes are still being used widely in the scientific research especially by researcher and medical practitioners. Manually deal with the microscope could make the user spend so much time to obtain the result of cleared image. It could cost hours to obtain the desire result. From this problem, this study proposes the development of hardware system for auto focused of an optical microscope. The proposed system consists of two stepper motors that will move the fine focus knob and the course focus knob on a microscope. The timing belts are being used as mounting between the stepper motor and the fine / course focus knob. The motor will moves step by step in same degree given from the command of a program. The motor are able to be controlled and it moves slowly to perform an auto focus task. Additionally, it is able to move in a small angle to find the proper exposure of the images scan. The hardware implementation of auto focus on the optical microscope has been tested and it worked perfectly. The result presented in this study shows that the proposed system is able to do auto focus in precise step which is 5° step.

Abstract

PAPER ID: 26

TITLE: *Experimental study of optimization of electrode dimension for non-invasive electrical resistance tomography application*

AUTHORS: Yasmin Abdul Wahab and Mahanum Muhamad Sakri

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Electrical resistance tomography is used to reconstruct the image of the objects within the medium of interest based on electrical conductivity distribution. Besides, the ordinary technique of ERT applied invasive technique and causing corrosion to the electrodes because of the contact between the electrode and the conductive liquid. Therefore, the ERT system proposed in this work is to investigate the optimize dimension of the electrode in ERT using experimental approach for non-invasive measurement. In this project, four electrodes are used as transmitter and receiver. All the electrodes are arranged side by side around the pipe. In this process, only one electrode is used as a transmitter and the rest as a receiving sensor. When water is inserted in the pipe, the output of the voltage will be compressed and recorded. Nine different dimensions are investigated and it produces a different voltage output. Therefore, the appropriate electrode dimension must be determined as it also affects the conductivity of the conducting medium. In addition, the appropriate electrode dimension which is 35.34 mm (width) x 250 mm (height) was chosen as the optimize dimension from the experiment to improve the performance of the existing system.



Abstract

PAPER ID: 29

TITLE: *A Novel Approach towards Tamper Detection of Digital Holy Quran Generation*

AUTHORS: Md. Milon Islam, Muhammad Nomani Kabir, Muhammad Sheikh Sadi, Md Istiak Morsalin, Ahsanul Haque and Wang Jing

AFFILIATION: Khulna University of Engineering & Technology, University Malaysia Pahang

ABSTRACT:

Quran Phrases are found in many Arabic websites. Lamentably, many mistakes and typos appear in the most of the websites embedded with Quran texts. For this why, it becomes very difficult to recognize the legal document of the religious book, or whether the online document is tampered or not. Hence, verifying the Quran expression has become a crucial issue for the most of the online users who read the digital copy. We propose a novel approach for the tamper detection of a digital document of Holy Quran. We have implemented a desktop application having modified UI that utilizes Jaro-Winkler distance and DiffLib function as String Edit distance algorithm to highlight the words in the Holy Quran for the verification purpose. There has been a development of a reliable and trustworthy database that is used for the purpose of searching. The results obtained from the application show higher performance and some Arabic words sample are tested. The system achieved the detection accuracy of 95.9% and 95% by Jaro-Winkler and DiffLib individually along with the precision of 93.29% and 96% in the case of with diacritics. Additionally, Fscore is 93.22% and 96.41% obtained by Jaro-Winkler and DiffLib respectively in the case of without diacritics.



Abstract

PAPER ID: 30

TITLE: *The Multifocus images fusion based on a generative gradient map*

AUTHORS: Ismail Ismail and Kamarul Hawari Bin Ghazali Hawari

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The limitation of camera lens is inability to make focus region for whole scene. The camera can create one focus object for one image. It is needed several images to get focus for several objects of the scene. Multifocus image fusion is a process of combining important information from several images into one image. The purpose of this operation is to serve important information from several images easier to read. This operation generally implemented in medical examination, robotics and bioinformatics fields. The clearness information enables machine, computer and human understand the image. Since the clear object is only located in focus region, it is needed to generate all objects are in focus. This goal obtained through fusing those multifocus images into fused image. Our method is the multifocus image fusion based on generative gradient map. The generative gradient map is the external information, generated from gradient of blurred random number image. The generative gradient map helps to generate initial focus map through gradient subtraction operation. This procedure substitutes complicated mathematical equations or hard algorithm sequence implementation. Our algorithm produces a fused image with high quality to be understood by human visual system, machine or computer

Abstract

PAPER ID: 32

TITLE: *A Fictitious Reference Iterative Tuning Method for Buck Converter-Powered DC Motor Control System*

AUTHORS: Mohd Syakirin Ramli, Seet Meng Sian, Mohd Naharudin Salim and Hamzah Ahmad

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

This paper presents a model-free optimization algorithm for a PID controller based on Fictitious Reference Iterative Tuning and Simulated Kalman Filter. The modeling of a buck converted-powered DC motor system is first provided to form the basis of data collection and fictitious reference signal derivation. The system's model is however not a necessity in the scope of this work. A cost function is formulated based on the minimization of error between the output response of the desired model with the output response of the closed-loop system. Simulation analyses using Matlab Software have been conducted for results validation and verification. Furthermore, a performance comparison between the proposed method and a model-based controller design has been carried out. From the numerical example, it shows that the system with the tuned PID controller exhibited a better angular velocity trajectory tracking compared to the system with the state feed back controller with integral gain.

Abstract

PAPER ID: 33

TITLE: *Forecasting Road Deaths in Malaysia using Support Vector Machine*

AUTHORS: Nurul Qastalani Radzuan, Mohd Hasnun Arif Hassan, Anwar Pp Abdul Majeed, Khairil Anwar Abu Kassim, Rabi Muaza Musa, Mohd Azraai Mohd Razman and Nur Aqilah Othman

AFFILIATION: Universiti Malaysia Pahang, Malaysian Institute of Road Safety Research

ABSTRACT:

An average of 6,350 people died every year in Malaysia due to road traffic accidents. A published data of Malaysian road deaths in 20 years since 1997 reveals that the number of fatalities has not really declined with a difference of less than 10% from one year to the next. Forecasting the number of fatalities is beneficial in planning a countermeasure to bring down the death toll. A predictive model of Malaysian road death has been developed using a time-series model known as autoregressive integrated moving average (ARIMA). The model was used in the previous Road Safety Plan of Malaysia to set a target death toll to be reduced in 2020, albeit being inaccurate. This study proposes a new approach in forecasting the road deaths, by means of a machine learning algorithm known as Support Vector Machine. The length of various types of road, number of registered vehicles and population were among the eight features used to develop the model. Comparison between the actual road deaths and the prediction demonstrates a good agreement, with a mean absolute percentage error of 2% and an R-squared value of 85%. The Linear kernel-based Support Vector Machine was found to be able to predict the road deaths in Malaysia with reasonable accuracy. The developed model could be used by relevant stakeholders in devising appropriate policies and regulations to reduce road fatalities in Malaysia.

Abstract

PAPER ID: 34

TITLE: *DC-Link Protection for Grid-Connected Photovoltaic System: A Review*

AUTHORS: Muhamad Zahim Sujod and Wan Nur Huda Aqilah Alias

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

As the economic growth and population increase, the demand on energy supply has also increases. The disadvantages that energy production based on non-renewable energy sources bring to the environment has stimulate the idea of producing a clean and sustainable power in huge quantities from renewable energy sources such as solar and wind energy. In recent years, photovoltaic (PV) systems are mostly used due to its light and easy-installable characteristics. It has two approaches which are stand-alone PV system (off-grid) and grid-connected PV system. Although it is said to be the most promising renewable energy, it could not avoid from disturbance. In grid-connected PV system, faults could occur on the grid side, leading to the increase in DC-link voltage and overshoot grid current. These situations could stress electrical components and decrease power quality of the system. Therefore, many protection schemes have been introduced to overcome this matter. In this paper, the development of grid-connected PV system was expressed and the impacts of grid faults on were discussed. Several conventional protection schemes implemented in the grid-connected PV system were reviewed. In the end, this paper proposed a new protection scheme which namely zero protection scheme that has the same function to limit the overshoot in DC-link voltage.



Abstract

PAPER ID: 35

TITLE: *A Comparative Study of AFM-Assisted Direct and Least-Square Attitude Determination Algorithm*

AUTHORS: Suqing Yan, Yue Wu, Yuanfa Ji, Kamarul Hawari Ghazali and Xiyun Sun

AFFILIATION: Guilin University of Electronic Technology, University Malaysia Pahang

ABSTRACT:

Based on GNSS (Global Navigation Satellite System) technology, the importance of vehicle attitude calculation has become more and more prominent in military and civilian fields. In this paper, an attitude determination algorithm assisted by ambiguity function method (AFM) is proposed. Due to the characteristics of the AFM algorithm is insensitive to cycle slip and independent of initial ambiguity, and considering the large amount of computation and the long computation time, it is used as an auxiliary means for initial attitude search and error correction in the search process, and C-LAMBDA algorithm is used to complete the ambiguity resolution. The attitude angle is calculated by direct and least square method, and the accuracy of the attitude angle based on the AFM-assisted method is compared. Through the static experiment of dual antenna direction finding and three antenna attitudes finding, the accuracy of direction and attitude angle is analyzed. It is concluded that the attitude calculation accuracy based on AFM-assisted least square method is usually higher.

Abstract

PAPER ID: 37

TITLE: *A Salp Swarm Algorithm for Improving Wind Farm Power Generation*

AUTHORS: Ahmad Zairi Mohd Zain and Mohd Ashraf Ahmad A

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

In the present day, one of the primary issue of the wind farm power generation is the controller of wind turbine unable to deal with turbulence effect and thus degrades the total power production. Therefore, this paper suggested a Salp Swarm Algorithm (SSA) as a data-controlled approach to improvise the controller parameter and consequently maximize the total power generation of the wind farm. The SSA is one of meta-heuristic techniques and mimics the swarm behavior of salps chain navigate according to the food position. The model implemented in this paper comes from the real Horns Rev wind farm in Denmark. Simulation outcome indicates that SSA produces considerably better total wind power generation than Particle Swarm Optimization (PSO) and Spiral Dynamic Algorithm (SDA) approach.

Abstract

PAPER ID: 40

TITLE: *Design and Development of Wearable Human Activity Recognition for Healthcare Monitoring*

AUTHORS: Hamzah Ahmad, Nurul Syafiqah Mohd, Nur Aqilah Othman, Mohd Mawardi Saari and Mohd Syakirin Ramli

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

This research deals with a development of wearable sensing system for human activity recognition focusing on hand and leg assessments. The system is designed by applying Arduino as the main controller with the help of accelerometer to identify human movements and then classifying them into soft, medium and hard motions categories. At this stage, extracted data acquired from the assesment is then imported into Microsoft Excel by using Guino software to describe the human motions. The accelerometer sensors are placed as follows; the on the right hand for three position which are on the wrist, on the elbow and on the shoulder. Meanwhile on right leg for three position which is in thigh, calf and ankle. The recognition for the activity is based on physiotherapist consultation which provides early descriptions of human various activities using hands and legs. The proposed system can be applied for rehabilitation and monitoring system to realize a home-based smart monitoring and assessment system.

Abstract

PAPER ID: 41

TITLE: *An Improved Efficiency Of Solar Photo Voltaic System Applications By Using DC-DC Zeta Converter*

AUTHORS: A.S. Veerendra, M.R. Mohamed, M.H. Sulaiman and K. Peddakapu

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

This study investigates on how a DC-DC Zeta converter act as intermediate among SPV and VSI, in which it drag the maximum power from the solar photovoltaic (SPV) system and to drive BLDC motor connected to a water pumping system application. Here INC-MPPT (Incremental Conductance Maximum Power Point Tracking) method is utilized smartly to control the zeta converter in order to drive brushless DC (BLDC) motor smoothly. Soft starting current prevents the influence of peak starting current on the BLDC motor windings. The fundamental frequency of Electronic commutational from the BLDC motor is used to avoid the voltage source inverter losses. The proposed converter is also suitable to increase voltage of DC link connected to the VSI. The major benefit of this configuration is designed and modeled in such a way that even under dynamic conditions the performance of a solar photovoltaic applications are not affected. The suggested system is developed by using MATLAB / Simulink software.

Abstract

PAPER ID: 42

TITLE: *Region of Interest Extraction of Finger-Vein image using Watershed Segmentation with Distance Transform*

AUTHORS: Yuan Zhang Lim and Bakhtiar Affendi Rosdi

AFFILIATION: Universiti Sains Malaysia

ABSTRACT:

Finger Vein Recognition System (FVRS) is a biometric technology that identifies or verifies an individual based on unique vein patterns. Region of interest (ROI) extraction is one of the essential steps in FVRS. Current ROI extraction methods cannot extract an accurate ROI for a finger vein image with non-uniform background illumination. In this paper, we propose a new ROI extraction method that is immune to non-uniform background illumination. To detect the edge of the finger for the ROI extraction, we utilise watershed segmentation with distance transform and Canny edge detector. Experimental results show that the proposed ROI extraction method can extract consistent ROI from a finger vein image with non-uniform background illumination.



Abstract

PAPER ID: 43

TITLE: *Depth Evaluation of Slits on Galvanized Steel Plate Using A Low Frequency Eddy Current Probe*

AUTHORS: Nurul A'In Nadzri, Mohd Mawardi Saari, Mohd Aufa Hadi Putera Zaini, Aiman Mohd Halil, Ahmad Jamil Sulaiman Hanifah and Mahadzir Ishak

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

This study performs an analysis of a small eddy current probe configuration based on differential anisotropic magnetoresistance (AMR) sensors for characterization of small surface defects in galvanized steel plates. Owing to the advantage of the AMR sensor, the eddy current testing (ECT) system with the AMR sensor has a huge benefit to detect sub-millimeter defects in steel structures. In this study, an ECT probe is developed by using AMR sensors to evaluate the performance of crack detection in 2-mm galvanized steel plates with regards to the depth of artificial slits where the sensor probe is line-scanned above the slits' area. The output signal that is detected by a lock-in amplifier is investigated with different frequencies of an excitation coil. The line-scanned differential signal in-tensity shows clear intensity change at the crack position. These signals depend on the depth and frequencies. Finally, a correlation between depth and detected signals are clarified with respect to different frequencies.

Abstract

PAPER ID: 44

TITLE: *Effect of Excitation Frequency on Magnetic Response Induced by Front- and Back-side Slits Measured by A Differential AMR Sensor Probe*

AUTHORS: Mohd Aufa Hadi Putera Zaini, Mohd Mawardi Saari, Nurul A'In Nadzri, Aiman Mohd Halil, Ahmad Jamil Sulaiman Hanifah and Mahadzir Ishak

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

A non-saturated differential MFL probe consists of two AMR sensors has been fabricated for the detection of front and back side slits. A measurement system which incorporates the developed probe attached on an XY-stage, an amplifier circuit, a set/reset circuit, a DAQ card and PC is constructed where an XY-stage controller and a digital lock-in amplifier are developed via LabVIEW. Then, the performance of the developed MFL probe is evaluated by running a number of line scan measurements on a 2-mm galvanized steel plate sample engraved with artificial slits with variable depths ranging from 1.0 mm to 1.6 mm with variable excited frequencies. The results show promising output where the slits could be successfully detected and its position could be further estimated. Furthermore, the correlation between the slit depth and difference (Δ) between the signal peaks and troughs could also be founded. Consequently, the optimum excitation frequency can be determined by plotting a graph of slope of trendline of the Δ values versus the frequency.

Abstract

PAPER ID: 45

TITLE: *Direct Power Control Method of Maximum Power Point Tracking (MPPT) Algorithm for Pico-Hydrokinetic River Energy Conversion System*

AUTHORS: Wan Ibrahim, Raja Mohd Taufika Raja Ismail and Mohd Ruslim Mohamed

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

In this paper, a design of maximum power point tracking (MPPT) algorithm for the pico-hydrokinetic system in river application has been proposed. The design topology consists of the permanent magnet synchronous generator (PMSG), a three-phase bridge rectifier and a DC boost converter. The proposed MPPT algorithm is a combination of modified hill-climbing search algorithm (MHCS) with the current PI-controller. The MPPT concept is based on measuring the rectifier output voltage and current respectively to produce the reference current (IMPP). The PI-controller has been used to tune the error signal between IMPP and actual inductance current (I_{dc}) to provide the duty-cycle of the boost converter. A comparison is performed between the fixed step HCS and the proposed MPPT to investigate the performance of the algorithm. The results show the proposed algorithm able to harness the maximum power with 96.32% efficiency.

Abstract

PAPER ID: 46

TITLE: *Overview on Fingerprinting Authentication Technology*

AUTHORS: Nadzril Sulaiman and Qamarul Aiman Tajul Ariffin

AFFILIATION: Faculty of Engineering, International Islamic University Malaysia

ABSTRACT:

This paper addresses the characteristics, technology, and possible future of fingerprints authentication method. Fingerprint physiology makes it an ideal for biometrics authentication, primarily the tiny details located on its surface called minutiae. Fingerprint scanning systems are designed to detect minutiae. Images of detected minutiae are processed through matching algorithms in order to verify a query fingerprint that is identical to a stored fingerprint. However, fingerprint authentication based on minutiae can be easily bypassed and the need for a more secure method is required. With respect to the issue, this work explores the possibility of detecting the thickness of the skin layer within a fingerprint as a method of biometrics authentication. Current thickness measuring methods that are non-invasive for that task are identified as Laser Scanning Microscopy (LSM), Optical Coherence Tomography (OCT) and Near Infrared Spectroscopy (NIR). Of the three listed, only OCT and NIR methodology seems viable for simple yet reliable use and can become as promising methods for authentication based on skin layer thickness.

Abstract

PAPER ID: 49

TITLE: *Position Control of Pneumatic Actuator using Cascade Fuzzy Self-Adaptive PID*

AUTHORS: Mohd Iskandar Putra, Addie Irawan and Raja Mohd Taufika

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Pneumatic systems are widely used in the industrial automation with its advantages in high power ratio, low cost and cleanliness fluid medium. However, the complex nonlinearities of pneumatics system make this system having difficulty to perform precise motion control especially in providing precise steady state tracking error on rod piston and stable pressure control. To overcome this issue, a cascade control technique named Fuzzy Self-Adaptive PID (CFSAPID) control is proposed. The adaptive tuning by Fuzzy Logic Controller (FLC) is designed as tuner for PID controller. The proposed CFSAPID is simulated and verified on the double-acting pneumatic cylinder and pneumatic proportional valve plant model and compared with single FSAPID controller. Four parameters are focused for analysis including steady state error tracking, piston velocity, pressure on cylinder chambers and force friction. The effectiveness of proposed CFSAPID has been successfully demonstrated and proved through simulation studies.

Abstract

PAPER ID: 50

TITLE: *The Classification of Skateboarding Trick Manoeuvres Through the Integration of Image Processing Techniques and Machine Learning*

AUTHORS: Anwar P.P. Abdul Majeed

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

More often than not, the evaluation of skateboarding tricks executions are carried out subjectively based on the judges' experience and hence are susceptible to biasness in not inaccurate judgement. Therefore, an objective and means of evaluating skateboarding tricks particularly in big competitions are non-trivial. This study aims at classifying skateboarding flat ground tricks namely Ollie, Kickflip, Shove-it, Nollie and Frontside 180 through camera vision and machine learning models. An amateur skateboarder (23 years of age \pm 5.0 years' experience) executed five tricks for each type of trick repeatedly on an ORY skateboard from camera distance at 1.26m on a cemented ground. From the images captures, a number of features were engineered via the Inception-V3 image embedder. A number of classification models were evaluated, namely, Support Vector Machine (SVM), k-Nearest Neighbour (kNN), Logistic Regression (LR), Random Forest (RF) and Naïve Bayes (NB) on their ability in classifying the tricks based on the engineered features. It was observed from the preliminary investigation that the SVM model attained the highest classification accuracy with a value of 99.5% followed by LR, k-NN, RF and NB with 98.6%, 95.8%, 82.4% and 78.7% respectively. It could be concluded that the proposed method is able to classify the skateboard tricks well and would eventually assist the judges in providing more objective based judgement.

Abstract

PAPER ID: 51

TITLE: *SCAR-CNN: Secondary-Classification-After-Refinement Convolutional Neural Network for Fine-Grained Categorization*

AUTHORS: Bernard Cheah Jun Kai, Abduljalil Radman and Shahrel Azmin Suandi

AFFILIATION: University Sains Malaysia

ABSTRACT:

The majority of existing approaches for fine-grained image recognition that work on attention-based learning, have their respective Top-K prediction accuracy better than Top-1 prediction. It is to say, there is a significant number of correct class falls in the range of Top-K predictions where $K = 2, 3, \dots, 5$. This is the indirect indication for researchers not to neglect the need to explore the possibility of getting better prediction based on the discriminative feature of Top-K classes. This paper presents Secondary-Classification-After-Refinement Convolutional Neural Network (SCAR-CNN) which have an adaptive secondary classification model built on top of primary classification Top-K classes. Our focus is also on how to maximize the effect of removing unwanted classes in secondary classification, by performing image-enhancement on the input image of primary classification. Experiments show that these approaches achieve 86.9 percent of total accuracy as compared to the current state-of-the-art 86.5 percent



Abstract

PAPER ID: 53

TITLE: *Review and Analysis of Risk Factor of Maternal Health in Remote Area using Internet of Things (IOT)*

AUTHORS: Marzia Ahmed, M. Abul Kashem, Mostafijur Rahman and Sabira Khatun

AFFILIATION: Dhaka University of Engineering and Technology, Department of Software Engineering, Daffodil International University , University Malaysia Pahang

ABSTRACT:

IoT is the greatest ingenious innovation in modern era, which can exploit also in mission critical like healthcare industry for 24/7. This paper demonstrates the efficacious monitoring of pregnant women mostly in rural area of a developing country, with the help of wearable sensing enabled technology, which also notify the pregnant women and her family about her health conditions. We intend to use machine learning algorithms for discovering risk level on the basis of risk factors in pregnancy. Pregnancy related medical data-set can be collected from medical experts. Analyzing this medical data-set of pregnant women and predicting respective risk level is the main challenge, due to incomplete data-set that reduces the accuracy of risk level predictions. Addressing with the difficulty and increase the level of accuracy we compare our real-time data over the decision of medical experts for the same data-set of risk level for pregnant women by the use of data mining algorithm and the result accuracy was approximate. Moreover, we will introduce crowd-sourcing approach to broadcast known risks factor and pregnancy complications to reduce maternal mortality as well as collecting medical data, accumulating the medical expert and pregnant women for further necessary action.



Abstract

PAPER ID: 56

TITLE: *Ultra wide Band (UWB) - Based Early Breast Cancer Detection using Artificial Intelligence*

AUTHORS: Bifta Sama Bari, Sabira Khatun, Kamarul Hawari Bin Ghazali, Md. Moslemuddin Fakir, Mamunur Rashid and Minarul Islam

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Breast cancer is a silent killer disease among women community all over the world. The death rate is increased as it has no symptom at the early stage. As there is no remedy, early detection is crucial. Usually, women do not go to the hospital for regular breast health-check up unless they are sick due to high cost, sometimes painful and so on. Presently, several researchers work on early breast cancer detection using Ultra wide Band (UWB) technology instead of traditional detection methods. Each system has its own limitation such as system complexity, expensive, expert operable in clinic and so on. To overcome these problems, a system is required which should be simple, cost-effective and user-friendly. This paper presents the development of a user friendly and affordable UWB- based system for early breast cancer detection in 3D visualization using Artificial Neural Network (ANN). A feed-forward back propagation Neural Network is utilized to detect the cancer existence, size and location in 3D. The hardware including UWB transceiver and a pair of home-made directional antenna is used to transmit and receive the UWB signal. The extracted features from the received signals have been fed into the NN model to train, validate, and test. The system exhibits that the detection efficiency on cancer existence, size and location (x, y, z) are approximately 100%, 92.43% and 91.31 % (95.22%, 88.98%, 89.74%) respectively. The comparison of the cancer detection performance efficiency of the developed system explores better performance than other existing systems. This may give assurance of early breast cancer detection in low cost, easily operable and domestic use.

Abstract

PAPER ID: 57

TITLE: *Bandwidth and Gain Enhancement of a Modified Ultra-wideband (UWB) Micro-strip Patch Antenna using a Reflecting Layer*

AUTHORS: Bifta Sama Bari, Sabira Khatun, Kamarul Hawari Bin Ghazali, Md. Moslemuddin Fakir, Mohd Hisyam Bin Mohd Ariff, Mohd Faizal Bin Jamlos, Mamunur Rashid and Minarul Islam

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

A novel technique to enhance bandwidth and gain of an Ultra-wideband (UWB) antenna using a reflecting layer is presented in this paper. A Microstrip Patch antenna (MPA) with T-Shaped patch and partially grounded plane is used in this design where a T-slot is inserted to the patch. The proposed low-cost, compact-size antenna is designed and simulated with flame retardant 4 (FR-4) as substrate having a relative permittivity of 4.3 and a thickness of 1.6 mm. The proposed antenna exposes an impedance bandwidth of 119 %, ranging from 3.19 to 12.6 GHz at Voltage Standing Wave Ratio, $VSWR < 2$. The antenna affords a wide range of reflection coefficient (-36dB) that is lower than -10 dB within a range of 3.19 GHz to 12.6. Additionally, it shows 5.78 dB gain, which is 3.68 dB higher than the gain of the antenna without reflecting layer (2.1 dB). Computer Simulation Technology (CST) Microwave Studio software is used to design and simulate the proposed antenna. In comparison with the MPA without the reflecting layer, the bandwidth and gain of the proposed antenna (with reflector) is increased by 119% and 3.68 dB respectively. Thus, the proposed antenna covers the UWB range (3.1-10.6 GHz) for medical application which is the band allocated for medical industry usage.

Abstract

PAPER ID: 58

TITLE: *Hydrophobic sol-gel based self-cleaning coating for photovoltaic panels*

AUTHORS: Siti Nur Nashya Azlika Hamidon and Amirjan Nawabjan

AFFILIATION: Universiti Teknologi Malaysia

ABSTRACT:

Maintaining photovoltaic performance from soiling issues using manual cleaning is costly and tedious which has been a major concern in deploying this technology. Therefore, a soiling mitigation technique with self-cleaning properties such as hydrophobic coating is effective to minimize performance degradation of photovoltaic panels using sol-gel as a low-cost and scalable fabrication method. This study proposes the development and application of hydrophobic sol-gel based coating in the photovoltaic system. The aims include synthesizing a hydrophobic sol-gel based self-cleaning coating for solar panel and characterizing the hydrophobic sol-gel based self-cleaning coating. A solution is prepared using sol-gel process comprises with three different materials including vinyltriethoxysilane (VTES), tetraethoxysilane (TEOS) and tetrabutoxytitanate (TTBU) called VTT (VTES-TEOS-TTBU) sol as the organic-inorganic hybrid sol. Then, this sol is applied onto glass substrates using spin-coating method for laboratory-scale working samples. Coated samples undergone characterizations including water contact angle measurement to obtain hydrophobic properties and surface morphology observation using microscope. The resultant VTT sol samples proven to exhibit self-cleaning ability with contact angle of 99.58° when undergo 150°C of post-bake process. The switchability of sol (hydrophilic-hydrophobic) was achieved and better transparency was observed when the samples undergo different thermal treatment during pre-bake and post-bake processes.

Abstract

PAPER ID: 59

TITLE: *Effect of Graphene Oxide nanoparticles on Thermal Properties of Paraffin Wax*

AUTHORS: Nurul Humaira Muhd Zaimi and Amirjan Nawabjan

AFFILIATION: Universiti Teknologi Malaysia

ABSTRACT:

Whereas previous studies analyzed thermal properties of Pure Paraffin, this paper analyzed thermal properties of Paraffin (P) added with Graphene Oxide (GO) nanoparticles experimentally. The tested samples are Paraffin wax and GO added at various percentages of weight, 1wt, 3wt%, 5wt % which typically used for Photovoltaic panel cooling. The objective is to explore the effect of various weight percentages of GO nanoparticles on the thermal properties of the Paraffin. All the thermal properties were measured by using Thermographic camera, and Differential Scanning Calorimetry (DSC). DSC showed that melting and solidification temperature for Paraffin/ 5wt% GO has highest reduction which is at 45.91°C and 41.85°C, followed by Paraffin/ 3wt% GO with 46.15 °C and 42.02 °C, and then Paraffin/ 1wt% GO with 46.25 °C and 42.02 °C, when compared to 63 °C and 59.5 °C for pure Paraffin. Next, Thermographic camera recorded the melting temperature history of all samples for 600 seconds. From the measurement, it is revealed that Paraffin/ 5wt% GO has largest heat transfer rate. This is shown by the bigger average temperature gradient of Paraffin/ 5wt% GO which is at 2.93 followed by Paraffin/ 3wt% GO at 2.69, Paraffin/ 1wt% GO at 2.52 and Paraffin at 2.03. DSC also revealed that Paraffin/ 5wt% GO has highest improvement in latent heat which is 163.99 kJ/kg, followed by Paraffin/ 1wt% GO, Paraffin/ 3wt% GO and Pure Paraffin each at 155.85 kJ/kg, 155.0813 kJ/kg and 102 kJ/kg. Paraffin/ 5wt% GO also can be seen to have the largest amount of heat stored with 0.62 kJ, followed by Paraffin/3wt% GO, Paraffin/ 1wt% GO and lastly pure Paraffin with 0.44, 0.4 and 0.33 kJ respectively. The results indicate that the rise of GO nanoparticles percentages weight added results in better thermal properties of Paraffin. With better charging and discharging rate, highest latent heat, largest amount of heat can be stored, Paraffin/ 5wt% GO is the most favorable to be used as a Photovoltaic panel coolant.

Abstract

PAPER ID: 60

TITLE: *Analysis of EEG Features for Brain Computer Interface Application*

AUTHORS: Mamunur Rashid, Norizam Sulaiman, Mahfuzah Mustafa, Mohd Shawal Jadin,
Muhammad Sharfi Najib, Bifta Sama Bari and Sabira Khatun

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Brain-Computer Interface (BCI) or Human-Machine Interface (HMI) is now becoming vital engineering and technology field which applies electroencephalography (EEG) signal to provide Assistive Technology (AT) to humans. This paper presents the analysis of EEG signals from various human cognitive or mental states to determine the suitable EEG features that can be employed in BCI field. Here, EEG features in term of power spectral density, log energy entropy and spectral centroid are selected to recognize human mental or cognitive state from 3 different exercises; i) solving math problem, ii) playing game and iii) do nothing (relax). The average power spectral density, average log energy entropy and average spectral centroid of EEG Alpha and Beta band for three mental exercises are calculated in order to determine the best features that can be used for BCI application. The results of the research shows that the EEG features in term of power spectral density, log energy entropy and spectral centroid can be used to indicate the change in cognitive states after exposing human to several cognitive exercises.

Abstract

PAPER ID: 61

TITLE: *Reliability Performance of Low Voltage (LV) Network Configuration*

AUTHORS: Mohd Ikhwan Muhammad Ridzuan, Muhammad Adib Zufar Rusli and
Norhafidzah Mohd Saad

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Networks are typically modelled in single phase diagram especially for medium voltage (MV) and high voltage (HV) networks. For low voltage (LV) networks, it is not suitable to model it in a single phase diagram. The reliability performance of LV network may be overestimated or underestimated if the network is modelled in a single phase diagram. Analytical technique is used to quantify the performance of LV network in single and three phase network diagrams. Three phase LV network diagram illustrates the true reliability performance compared to single phase LV network diagram in term of the best, median and worst location of customers. Accurate network configuration may benefit in minimizing energy core losses and reducing paying penalty to the customer by distribution network operators (DNOs).

Abstract

PAPER ID: 62

TITLE: *A comparative analysis of four classification algorithms for university students performance detection*

AUTHORS: Dipta Das, Prof. Dr. Sabira Khatun, Syamimi Mardiah Shaharum, Norasyikin Binti Fadilah and Khandker M Qaiduzzaman

AFFILIATION: Daffodil International University, University Malaysia Pahang

ABSTRACT:

The student's performance plays an important role in producing the best quality graduate who will responsible for the country's economic growth and social development. Labor market also concern with student's performance because the fresh graduate students are considered as an employee depends on their academic performance. So, identification the reason behind student's performance variation provides a valuable information for planning education and policies. Many researchers try to find out the reason with different types of data mining approaches in different countries. But none of them worked with Bangladeshi students. This paper proposed a model for identifying the key factors of variation Bangladeshi students' academic performance and predicts their results. This paper proposes a model which able to identify the students who need special attention. Different types of feature selection methods were used such as Co-relation, Chi-Square and Euclidean distance to select valuable features. And showing the comparison of feature selections result through decision tree, Naive Bayes, Knearest neighbor and Artificial Neural Network classifiers algorithm. The performance analysis is done by using student SGPA and review on given facilities from a university. From the performance analysis result it is found that, decreasing number of classes in dataset, the Artificial Neural Network(ANN) performs better than Decision Tree(DT), K-Nearest Neighbors (KNN) and Naïve Bayes (NB). However, increasing number of classes in dataset the DT perform better then ANN, KNN, NB.

Abstract

PAPER ID: 63

TITLE: *Hybrid sampling and Random Forest based Machine Learning Approach for Software Defect Prediction*

AUTHORS: Md. Anwar Hossen, Dr. Md Mostafijur Rahman, Prof. Dr. Sabira Khatun,
Nurhafizah Abu Talip Yusof and Mohamad Shaiful Abdul Karim

AFFILIATION: Daffodil International University, University Malaysia Pahang

ABSTRACT:

The software has turn into an imperious part of human's life. In the recent computing era, many large-scale complex network systems and millions of modern technological devices produce a huge amount of data every second. Among these data, the amount of imbalanced data is relatively excessive. The machine learning model is miss leded by these imbalanced data. Software Defect Prediction (SDP) is a standout amongst the most helping exercises during the testing phase. The estimated cost of finding and fixing defects is approximately billions of pounds per year. To reduce this problem, software defect prediction has come forth but need fine tuning to have expected efficiency. In this chapter, we have proposed a new model based on machine learning approach to predict software defect and identify the key factors that may help the software engineer to identify the most defect-prone part of the system. The proposed model works as follows. First, need to remove highly correlated features and turn all the feature in the same scale using the scaling feature approach. Second, we have used Synthetic Minority Over-sampling Technique (SMOTE), Adaptive Synthetic (ADASYN) and Hybrid sampling method to balance highly imbalanced datasets. Third, Random Forest Importance and Chi-square algorithms are chosen to find out the factors which have high effect on software defect. Cross validation is used to remove overriding problem. Scikit-learn library is used for machine learning algorithms. Pandas library is used for data processing. Matplotlib, and PyPlot are used for graph and data visualization respectively. The hybrid sampling method and Random Forest (RF) algorithms achieved the highest prediction accuracy about 93.26% by showing its superiority.



Abstract

PAPER ID: 64

TITLE: *Intelligent Autism Screening Using Fuzzy Agent*

AUTHORS: Nurul Najihah Che Razali, Ngahzaifa Ab. Ghani, Md. Manjur Ahmed and Syifak
Izhar Hisham

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

In many fields, including the diagnosis of Autism, there are barriers which greatly reduce the likelihood of clinicians obtaining an independent second opinion. Barriers include cost and the availability of other specialist clinicians. Nevertheless, having regular independent second opinions for the diagnosis of autism is crucial. Hence, this study proposes an intelligent autism screening using a fuzzy agent, to assist the expert and non-expert in doing the diagnosis. In this study, the fuzzy inputs are assigned based on these five categories, while the final output describes the sequences based on lowest to highest mark of the scores for each category. This output will then relate to the suggestion of activities to autistic children by priority (based on the scores obtained).

Abstract

PAPER ID: 65

TITLE: *Recent Trends and Open Challenges in EEG based Brain-Computer Interface Systems*

AUTHORS: Mamunur Rashid, Norizam Sulaiman, Mahfuzah Mustafa, Sabira Khatun, Bifta Sama Bari and Md Jahid Hasan

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Recent advances in computer hardware and signal processing have made possible the use of electroencephalogram (EEG) for communication between the human brain and computers and this technology is known as brain-computer interface (BCI). Locked-in patients have now a way to communicate with the outside world using BCI technology. Nowadays, BCIs are getting popularity among the researchers to control devices using brainwaves especially in providing good assistance to disabled people. Impressive development and integration of both hardware and software in BCI have been carried out in the last two decades. However, some open challenges and limitations have also been exposed in the previous researches. In this paper, we have tried to mention some critical issues of EEG based BCI system including EEG modalities, EEG acquisition, signal processing algorithm and performance evaluation. These issues need to be solved to develop error-free BCI system. In addition, possible solutions and future directions have also been discussed.



Abstract

PAPER ID: 66

TITLE: *Quantitative Assessment on Remote Code Execution Vulnerability in Web Apps*

AUTHORS: Md. Maruf Hassan, Dr. Md Mostafijur Rahman, Prof. Dr. Sabira Khatun,
Mohamad Shaiful Abdul Karim, Syamimi Mardiah Shaharum, Umam Mustain and Nazia
Nishat

AFFILIATION: Daffodil International University, University Malaysia Pahang

ABSTRACT:

With the exponential increasing use of online tools, applications that are being made for day to day purpose by small and large industries, the threat of exploitation is also increasing. Remote Code Execution (RCE) is one of the top most critical and serious web applications vulnerability of this era and one of the major concerns among cyber threats, which can exploit web servers through their functionalities and using their scripts/files. RCE is an application layer vulnerability caused by careless coding practice which leads to a huge security breach that may bring unwanted resource loss or damages. Attacker may execute malicious code and take complete control of the targeted system with the privileges of an authentic user with this vulnerability. Attackers can attempt to advance their privileges after gaining access to the system. Remote Code Execution can lead to a full compromise of the vulnerable web application as well as the web server. This chapter highlights the concern and risk needed to put under consideration caused by RCE vulnerability of a system. Moreover, this study and its findings will help application developers and its stakeholders to understand the risk of data compromise and unauthorized access of the system. Around 1011 web applications were taken under consideration and experiment was done by following manual double blinded penetration testing strategy. The experiments shows that more than 12% web application were found vulnerable with RCE. This study also explicitly listed down the critical factors of Remote Code Execution vulnerability and improper input handling. The experimental results are promising to motivate developers to focus on security enhancement through proper and safe input handling.



Abstract

PAPER ID: 67

TITLE: *Development of Maximum Power Point Tracking for Doubly-Fed Induction Generators in Wind Energy Conversion Systems*

AUTHORS: Duy Huynh, Hong Nguyen and Matthew Dunnigan

AFFILIATION: Ho Chi Minh City University of Technology, Heriot-Watt University

ABSTRACT:

This paper proposes a novel application of a cuckoo search (CS) algorithm for a maximum power point tracking (MPPT) of a doubly-fed induction generator (DFIG) in wind energy conversion systems (WECS). The wind turbine is required to operate at the maximum power point (MPP) in the WECS under varying wind conditions. The CS algorithm is a stochastic global search algorithm which is proposed to define the optimal output mechanical power of the wind turbine for the MPPT in the WECS with the DFIG. This algorithm is inspired from the breeding strategy of some cuckoo species by laying their eggs in the nest of host birds. The simulation results validate the capabilities of the CS algorithm to track MPPs of the WECS with the DFIG. A comparison with the hill-climb search (HCS) and particle swarm optimization (PSO) algorithms demonstrates the superiority of the CS algorithm and confirms its potential to solve the MPPT issue of the WECS with the DFIG.

Abstract

PAPER ID: 68

TITLE: *Detailed Non-linear Constrained Multi-objective Optimal Operation of Power Systems including Renewable Energy Sources*

AUTHORS: Duy Huynh, Hong Nguyen and Matthew Dunnigan

AFFILIATION: Ho Chi Minh City University of Technology, Heriot-Watt University

ABSTRACT:

This paper presents a novel application of a modified cuckoo search (MCS) algorithm for an optimal operation problem of hybrid power systems including solar and wind energy sources. The optimal operation problem is formulated as a non-linear constrained multi-objective optimization problem. The MCS algorithm is proposed to solve the optimal operation problem of hybrid power systems integrating the solar and wind energy sources. The CS algorithm is modified to increase the convergence rate where the modification is related to the size of the Lévy flight step size. The proposed CS algorithm is applied to the IEEE 10-generator system. The numerical results validate the capabilities of the proposed CS algorithm to generate optimal solutions of the optimal operation problem incorporating the solar and wind energy sources. The comparison with the PSO algorithm demonstrates the superiority of the proposed CS algorithm and confirms its potential to solve the optimal operation problem, especially in power systems integrated renewable energy sources.



Abstract

PAPER ID: 69

TITLE: *Voltage Sag Immunity Testing For AC Contactors in Industrial Environment*

AUTHORS: Hazri Razip and Abu Ahmad

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The voltage sag is one of the prominent power quality issues faced by industrial consumers in Malaysia. Frequent voltage sag incidences have caused sensitive equipment to trip causing significant production losses. One of the identified weak link is the AC contactor. In addition, there are many ageing contactors which are still in service in the industry due to their robust design and long life-time. This paper aims to study the immunity of voltage sag of AC contactors which are installed in a petrochemical plant. New and ageing contactors have been chosen to undergo practical testing. A well-defined test procedures are carried out based on the IEC 61000-4-11 standard. The AC contactors were exposed to rectangular voltage sag with variation in magnitude, duration and point on wave. The results are compared to IEC 61000-4-37 voltage tolerance curve. New contactor's voltage tolerance curve exhibits nearly consistent response and slight deviation between different point on waves. It also recorded minimum sensitivity at voltage sag magnitude of 25%. On the other hand, ageing contactor exhibit mixed conformity to the IEC curve, with minimum sensitivity at 55% of voltage sag magnitude. To summarise, the ageing contactor is more sensitive to voltage sag magnitude and point on wave has little influence to the voltage tolerance curve of new contactors.

Abstract

PAPER ID: 71

TITLE: *Sensitivity Mapping for Electrical Capacitance Tomography Using Finite Element Approach*

AUTHORS: Wan Aizatul Nadiah Ropandi, Nur Amira Zulkifli, Jaysuman Pusppanathan, Fatin Aliah Phang Abdullah, Elmy Johana Mohamad, Nina Diana Nawi and Nor Hasrul Akhmal Ngadiman

AFFILIATION: Universiti Teknologi Malaysia, Universiti Tun Hussein Onn Malaysia

ABSTRACT:

Electrical Capacitance Tomography is part of Electrical Tomography which uses the concept of electrical field distribution and it is widely used due to its advantages such as non-invasive, low-cost, high acquisition speed and relatively easy computation. The ECT system involves two computational problems in its mechanism which Forward Problem and Inverse Problem. Forward problem involves the computation of the potentials done at the voltage pick-up electrodes for a given set of current carrying electrodes. This allows calculation for the distribution of the electrical voltage when the given with condition of known sensor structure and given permittivity distribution. The Forward Problem in this study refers to the sensitivity map which is later use for image reconstruction in Inverse Problem image. In this study, we will explore about sensitivity map generation and preparation which can be accomplished using numerical method, for example Finite Element Method.



Abstract

PAPER ID: 72

TITLE: *Vertical Axis Wind Turbines: An overview*

AUTHORS: Adawati Yusof and Mohd Rusllim Mohamed

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Wind energy is the next significant renewable energy used for power generation in the world after solar. It has been identified as a promising renewable option and one of the cleanest way to generate electricity. This paper provides the brief ideas of vertical axis wind turbine (VAWT) for electrical power generation system. The growth and implementation of wind energy harnessing, wind turbine behavior, related findings and the future trend of VAWTs were reviewed. It was perceived that VAWT plays an important role in handling current world energy issues of global warming and the diminishing of fossil fuels. VAWT seems to be more advantageous compared to HAWT in term of cost basis and simple design, but lag in the performance efficiency. However VAWT demonstrates better execution in complex and low wind speed condition which discussed in this paper. Currently, a lot of researches about the enhancement and augmentation of VAWT to increase the power production efficiency are ongoing. In summary, it can be conclude that further studies is critically needed to establish a greater acceptance of VAWTs as a feasible, reliable and reasonable power generation system especially for the low wind speed countries like Malaysia.

Abstract

PAPER ID: 74

TITLE: *Hyperheuristics Trajectory Based Optimization for Energy Management Strategy (EMS) of Split Plug-In Hybrid Electric Vehicle*

AUTHORS: Muhammad Ikram Mohd Rashid, Hamdan Daniyal and Mohd Ashraf Ahmad

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

With increasing concern over the environment and ever stringent emissions regulations, the electric vehicle has been investigated as an alternative form of transportation. However, the electric vehicle suffers from relatively short range and long charging times and consequently has not become an acceptable solution to the automotive consumer. The challenge is to develop an efficient energy management strategy (EMS) to satisfy the objectives while not having a reduced vehicle performance. This project discusses the Hyperheuristics Trajectory Based Optimization for Energy Management Strategy (EMS) of Split Plug-In Hybrid Electric Vehicle. The Split Plug-in HEV is discussed in a new perspective from the EMS point of view. A thorough discussion is made encompassing the advantages and disadvantages of the concept, its performance compared to conventional HEVs and the way forward. The modelling and simulation capability of existing tools such as free model in Matlab Simulink is demonstrated through application examples. Since power electronics is indispensable in hybrid vehicles, the issue of numerical oscillations in dynamic simulations involving power electronics is briefly addressed. Modelling methods such as physics-based Resistive Companion Form technique and Bond Graph method are presented with powertrain component and system modelling examples.

Abstract

PAPER ID: 75

TITLE: *Investigating the Possibility of Brain Actuated Mobile Robot through Single Channel EEG Headset*

AUTHORS: Mamunur Rashid, Norizam Sulaiman, Mahfuzah Mustafa, Sabira Khatun, Bifta Sama Bari, Md Jahid Hasan and Nawfan Mohammed Mohammed Ahmad Al-Fakih

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Brain-computer interface (BCI) is a fast-growing technology involving hardware and software communication systems that allow to control external assistive devices through Electroencephalogram (EEG). The primary goal of BCI technology is to ensure a potential communication pathway for patients with severe neurologic disabilities. A variety number of BCI application have been presented in the last few decades which indicate that the interest in this field has dramatically increased. In this paper, the possibility of a real-time brain-actuated mobile robot using single-channel EEG headset has been investigated. EEG data has been collected from Neurosky Mindwave EEG headset which consists of a single electrode. EEG feature in terms of power spectral density has been extracted and classified this feature using the support vector machine (SVM). Then the classified signal has been translated into three devices command to control the mobile robot. This mobile robot can be driven in three directions namely forward, right and left direction. Data collection from EEG headset and sending commands to the mobile robot, the entire process has been done wirelessly.

Abstract

PAPER ID: 76

TITLE: *Improvement of Performance and Response Time of Cascaded Five-Level VSC STATCOM Using ANN Controller and SVPWM During Period of Voltage Sag*

AUTHORS: Mohamad Almelian, Izzeldin Ibrahim Mohamed, Abu Zaharin Ahmad, Mohamed Omran, N Elasager and Mohamed Salem

AFFILIATION: Universiti Malaysia Pahang, College of Technical Sciences – Bani-Walid, Libya,
Universiti Sains Malaysia

ABSTRACT:

Power system is an extremely nonlinear system with a number of interconnected loads. When the system is subjected to the faults, the stability of the system will be disturbed. The major problem dealt here is voltage sag. A static synchronous compensator (STATCOM) is one of the FACTS devices which can inject proper reactive current at the point of common coupling (PCC) to compensate voltage sag. A non-linear controller like artificial neural network (ANN) is used with the FACTS devices for better performance. This paper introduces the design of a cascaded 5-level voltage source converter (VSC) STATCOM based on the ANN controller and space vector PWM (SVPWM) technique to nullify the impacts of voltage sag. ANN and SVPWM were employed to enhance the performance and response time (RT) of STATCOM with regard to correction of voltage magnitude and power factor (PF) amplitude during voltage sag period. The performance of STATCOM was analyzed using MATLAB in IEEE 3-bus system with two different types of faults, which are single line to ground (SLG) fault and line to line (LL) fault (both creates voltage sag). The simulation result showed that the ANN-based STATCOM control circuit performed efficiently compared to the PI controller. The ANN controller was able to recover voltage magnitude very quickly (during 0.02 sec) with unity.

Abstract

PAPER ID: 77

TITLE: *Campus Hybrid Intrusion Detection System using SNORT and IPTables*

AUTHORS: Slamet Slamet and Izzeldin Ibrahim Mohamed

AFFILIATION: Institut Bisnis dan Informatika Stikom Surabaya, Universiti Malaysia
Pahang

ABSTRACT:

The rapid development of network technology greatly helps human work. However, the number of information system security incidents has risen sharply, so that in fact the sides of human life are threatened. Detection techniques against attacks on computer networks must be continuously developed so that integrity, availability and confidentiality on a computer network become more secure. In this paper, the authors built Hybrid Intrusion Detecting System using Snort and IPTables. This system works by creating alerts built from an engine that reads the parameters in the attacker's IP address. Then alert instructs the firewall to block access from the IP Address. Webmin is used to simplify rule management. Whereas for analyzing logs (attack history), an ACID (Analysis Console for Intrusion Databases) is used. Attack and detection testing is carried out in the campus network of Institut Bisnis dan Informatika Stikom Surabaya. The system implementation uses a PC Router with the Ubuntu 18.04 Linux as operating system. As a result of implementing this application, the system was able to detect and block access of attacks in the Stikom Surabaya network. Thus internet connection is faster and bandwidth usage is more efficient.

Abstract

PAPER ID: 78

TITLE: *kNN and SVM classification for EEG: A Review*

AUTHORS: Mohd Nurul Al Hafiz Sha'Abani, Norfaiza Fuad, Norezmi Md Jamal and
Muhammad Faizal Ismail

AFFILIATION: Universiti Tun Hussein Onn Malaysia

ABSTRACT:

This paper review the classification method of EEG signal based on k-nearest neighbor (kNN) and support vector machine (SVM) algorithm. For instance, a classifier learn the input features from a dataset with specific approach and tuning parameters, develop a classification model, and use the model to predict the corresponding class of a new input in an unseen dataset. EEG signals contaminated with various noises and artefacts, non-stationary and poor in signal-to-noise ratio (SNR). Moreover, most EEG applications involve high dimensional feature vector. kNN and SVM were used in EEG classification and has been proven successfully in discriminating features in EEG dataset. However, different results were observed between different EEG applications. Hence, this paper review the used of kNN and SVM classifier on various EEG applications, identifying their advantages and disadvantages, and also their overall performances.



Abstract

PAPER ID: 80

TITLE: *Load Estimation of Single-Phase Diode Bridge Rectifier using Kalman Filter*

AUTHORS: Nor Syuhaida Othman and Profesor Madya Ts. Dr. Hamzah Ahmad

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

This paper describes the study and development of a estimation method for the values of the electrical components in most of the electronic equipment available in the market. Through this method, it is possible to identify the values of equivalent capacitance and resistance that connected to the rectifier. The output voltage and output current of the circuit have been estimated using Kalman Filter. Simulation results validate the better accuracy of the proposed method as compared to the measurement-based method. The proposed method using Kalman filter to this rectifier topology allowed the extension for future works to consider their harmonic impact on the power quality (PQ) of power distribution systems.



Abstract

PAPER ID: 81

TITLE: *Utilization Of Filter Harmonic Current Based On Shunt HPF Within The Acceptable IEEE -519 Standard*

AUTHORS: Mohamed Omran, Izzeldin Ibrahim Mohamed, Abu Zaharin Ahmad, Mohamad Almelian, Walid Hasan and Mohamed Salem

AFFILIATION: Universiti Malaysia Pahang, University of Aljabal Algharbi – Ghiryana, Libya, Universiti Sains Malaysia

ABSTRACT:

Harmonic-related problems such as communication noise, malfunctioning of the solid-state control circuit, etc., are often encountered in industrial plants that have a significant amount of rectification. Different techniques to eliminate harmonics current from power systems to the ground have been proposed and one of them is shunt HPF which is an effective and widely-used method for power quality improvement. This paper presents the idea of reusing the HPF harmonic current created based on STF–SRF theory to feed AC load within the limits of IEEE -519 (Less 5%). The circuit has been simulated in the MATLAB Simulink and tested under distorted source voltage with varying loads. The outcomes of the simulations showed the THD at PCC to be less than 5% even when the HPF current was connected to the system (increasing the source current)

Abstract

PAPER ID: 83

TITLE: *Image Segmentation of Women's Salivary Ferning Patterns Using Harmony Frangi Filter*

AUTHORS: Heri Pratikno and Mohd. Zamri Bin Ibrahim

AFFILIATION: Institut Bisnis dan Informatika Stikom Surabaya,Universiti Malaysia Pahang

ABSTRACT:

Medical research proves that entering the fertile period, especially during ovulation, all female body fluids contain ferning patterns in the form of crystallization of salt shaped like a fern tree. Until now, not many research topics have been carried out related to the segmentation process in the salivary ferning pattern, this is due to several problems including first, the unavailability of a database of image salivary ferning pattern online. Second, the salivary ferning pattern has several hidden layers and uneven intensity. The purpose of this study was to detect and determine the line shape of the salivary ferning crystal pattern using the Harmony Frangi Filter method based on the Hessian matrix operation. The results of the segmentation process from this study are a crucial basis in determining the level of accuracy and precision at the next stage of research, namely: the prediction process of a woman's ovulation in each menstrual cycle. The measurement of segmentation results has an average value of PSNR 44.7492285 dB, FSIM 95.11%, accuracy 99.890%, sensitivity 99.9987% and specificity 99.890%.

Abstract

PAPER ID: 85

TITLE: *Infrared Thermal Sensor for a Low Cost and Non-Invasive detection of Skin Cancer*

AUTHORS: Noora Safrin A, Pooja Babu, Hema Karunakarapandian, Padmapriya P,
Vigneswaran Narayanamurthy and Fahmi Samsuri

AFFILIATION: Veltech Multitech Dr. RR & Dr. SR Engineering College, University Malaysia
Pahang

ABSTRACT:

Skin cancer is in a rising trend over the years. Though there are of many conventional approaches for skin cancer diagnosis, there is still a massive demand for the device with features of low cost, compact, portable, less diagnosis time, com-fortable (no biopsy), high sensitivity and accuracy. The proposed system is the implementation of infrared (IR) thermal sensor in a non-contact manner which detects the temperature of the epidermal layer of skin, where the temperature of the skin varies for the subjects if they have cancer. The device receives the signal from the sensor unit, and it is further processed to detect the various level of the skin cancer. The system process optimization was performed, and optimization factors were reported based on the sensor operating distance to detect the values efficiently. This system can also be used as a wearable device by alerting the subject about their condition. This system provides better monitoring with high accuracy through non-invasive technique and early detection can be made to prevent the cancer deaths.

Abstract

PAPER ID: 88

TITLE: *Early Rubeosis Iridis Detection using Feature Extraction Process*

AUTHORS: Rohana Abdul Karim

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Iris analytical studies the relationship between human health and changes in the anatomy of the iris. One of the related to the changes of the anatomy of the iris is diabetic. Diabetic illness can be determine from the iris of human eyes because it's affects the eyes. Latest advance technologies are introduced in the image processing that helps automate detection of diabetic in iris based on the analysis of feature extractions. This analysis not only helps diagnose the disease, besides its helps detect the disease. In this paper, we will look at the extraction and the outcome of important features using image processing. The datasets used for this project is Warsaw Biobase.



Abstract

PAPER ID: 91

TITLE: *Oil Palm Tree Detection in Aerial Images Based on Faster R-CNN*

AUTHORS: Liu Xinni, Kamarul Hawari Ghazali, Fengrong Han, Izzeldin Ibrahim Mohamed and
Yue Zhao

AFFILIATION: Universiti Malaysia Pahang, College of Geography and Environment, Baoji
University of Arts and Sciences

ABSTRACT:

The Malaysian oil palm industry has been one of the key contributors to the Malaysia's Gross Domestic Product (GDP), foreign exchange earnings and creation of employment. Information about the distribution and the number of oil palm trees in a plantation area is important for sustainable management. In this paper, we propose an oil palm tree detection and counting method based on Faster Regions with Convolutional Neural Network (Faster R-CNN). Experiment on the oil palm tree images collected by drone show that the proposed method is able to effectively detect the oil palm trees and counting its number. The proposed approach can be used to predict the scale of the plantation and meets the requirements of real-time detection.



Abstract

PAPER ID: 92

TITLE: *T-way Strategy for Sequence Input Interactions Test Case Generation Adopting Fish Swarm Algorithm*

AUTHORS: Dr. Md Mostafijur Rahman, M. H. Ariff, Nurhafizah Abu Talip Yusof, Khandker M. Qaiduzzaman, Dalia Sultana and Sabira Khatun

AFFILIATION: Daffodil International University, University Malaysia Pahang

ABSTRACT:

Increasing number of input sizes are caused by the exponential growth of test input interaction and create a large input space. The problem examine is needed to do so fast that even the fasted computers require an insufferable amount of time. It limits the ability of computers to solve large input space problems. Only less amount of test case can solve the problem. Since twenty years many useful t-way strategies have been developed to reduce test case size. Deterministic and non-deterministic search strategies are used to design T-way (sequence) strategy such as, Bee Algorithm(BA), Kuhn encoding (K) , ASP with Clasp , CP with Sugar, Erdem (ER) exact encoding, Tarui (TA) Method, U, UR, D and DR, Brain (BR) Method. Sequence strategy indicates the inputs are taken as parameterized. In this research an algorithm is proposed and implemented to enhance the T-way input interaction test strategy (sequence). To check the effectiveness, the proposed algorithm is compared with the other renowned deterministic and non-deterministic search-based T-way strategies. The result helps to show that the strategy (for sequence input interaction) able to generate feasible results and minimize the number of test cases compared with other strategies.

Abstract

PAPER ID: 96

TITLE: *Optimization of Quaternion Based on Hybrid PID and P_ω Control*

AUTHORS: Balya Darohini, Dr Mohammad Fadhil Abas, Mohd Hisyam Mohd Ariff,
Norhafidzah Saad, Dr Dwi Pebrianti, Pm Ts Dr. Hamzah Ahmad and Professor Ir Dr Mohd
Rizal Arshad

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The aim of this article is to present an optimization of full non-linear quaternion based on hybrid control scheme using Genetic Algorithm (GA). A wider objective is used to find novel solutions to design hybrid controller based on PID and P_ω control so that system functionality and performance may be compromised. In the presented approach both the quadrotor's attitude model and the proposed hybrid control algorithm have been implemented in the fully quaternion space without any transformations or conversion and calculations in the Euler's angles. In this paper, the optimized quaternion with fitness function composed of K_P , K_I , K_D and P_ω are proposed, and its effectiveness is shown by simulations using MATLAB

Abstract

PAPER ID: 98

TITLE: *Autonomous Self-Exam Monitoring For Early Diabetes Detection*

AUTHORS: Rohana Abdul Karim

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Diabetes can be prevented by early detection. In Malaysia the diabetes is increasing year by year. It is insufficient of physicians who have to treat a large number of patients and it will increase their burdens and also make them more stress. An autonomous self-exam monitoring is develop in order to assist the physicians in identifying diabetes at the early stage. Iris image is used in to recognise the early detection of diabetes. Based on iridology theory, the image is evaluated by detecting the presence of broken tissues and change in colour pattern. It can be integrated with computer vision for an accurate identification of abnormality of iris image. This paper focus on developing an iris image system that extracts the presence of orange pigmentation which is the sign of diabetes. This project undergoes into three stages which are pre-processing, processing and post processing stage. The designed tool convert an iris image into new picture using image processing algorithms and analyses some change in colour pattern and lastly diagnose whether it diabetes or non-diabetes iris. The experimented images in this project are the iris image that was taken from public database UBIRIS.v1. At the end of this project, shows either this system can detect the presence of broken tissues and change in colour pattern of iris or not. The final result shows the accuracy of 80% for detecting the orange pigmentation as the sign for early diabetes detection

Abstract

PAPER ID: 99

TITLE: *A Diversity-based Adaptive Synchronous-Asynchronous Switching Simulated Kalman Filter Optimizer*

AUTHORS: Nor Azlina Ab Aziz, Nor Hidayati Abdul Aziz, Badaruddin Muhammad, Zuwairie Ibrahim, Marizan Mubin, Mokhtar Norrima and Mohd Saberi Mohamad

AFFILIATION: Multimedia University, Universiti Malaysia Pahang, University of Malaya, Universiti Malaysia Kelantan

ABSTRACT:

The original Simulated Kalman Filter (SKF) is an optimizer that employs synchronous update mechanism. The agents in SKF update their solutions after all fitness calculations, prediction process, and measurement process are completed. An alternative to synchronous update is asynchronous update. In asynchronous update, only one agent does fitness calculation, prediction, measurement, and estimation processes at one time. In this study, synchronous and asynchronous mechanisms are combined in SKF. At first, the SKF starts with synchronous update. If no improved solution is found, the SKF changes its update mechanism. The decision to switch from synchronous to asynchronous or vice versa is made based on the information of the population. In this paper, population's diversity is used as switching indicator. Using the CEC2014 benchmark test suite, experimental results indicate that the proposed diversity-based adaptive switching synchronous-asynchronous SKF outperforms the original SKF significantly



Abstract

PAPER ID: 104

TITLE: *Combinatorial Test Suite Generation Strategy Using Enhanced Sine Cosine Algorithm*

AUTHORS: Kamal Z Zamli, Fakhrud Din, Abdullah B. Nasser and Abdulrahman Alsewari

AFFILIATION: Universiti Malaysia Pahang, University of Malakand

ABSTRACT:

Owing to its simplicity and having no control parameters, the Sine Cosine Algorithm (SCA) has attracted much attention among researchers. Although useful, the SCA algorithm adopts a linear magnitude update to determine its sine or cosine position updates. In the actual searching process, the magnitude update is rarely linear. In fact, the magnitude update is also non-exponential and is highly dependent on the problem domain and its search topology. For this reason, our work proposes a combination of linear and exponential magnitude update for the search displacement. In doing so, we adopt the combinatorial testing problem as our case study. Our evaluation gives promising results on the improved performance over the original SCA algorithm.



Abstract

PAPER ID: 105

TITLE: *A Modified Symbiotic Organism Search Algorithm with Lévy Flight for Software Module Clustering Problem*

AUTHORS: Nurul Asyikin Zainal, Kamal Z Zamli and Fakhrud Din

AFFILIATION: Universiti Malaysia Pahang, University of Malakand

ABSTRACT:

To date, there are much increasing trends on adopting parameter free meta-heuristic algorithms for solving general optimization problems. With parameter free algorithms, there are no parameter controls for tuning. As such, the adoption of parameter free meta-heuristic algorithms is often straightforward. On the negative note, exploration (i.e. roaming the search space thoroughly) and exploitation (i.e. manipulating the current known best neighbor) are pre-set. As the search spaces are problem dependent, any pre-set exploration and exploitation can lead to entrapment in local optima. In this paper, we investigate the use of lévy flight to enhance the exploration of a parameter free meta-heuristic algorithm, called Modified Symbiotic Organ-ism Search Algorithm (MSOS), via its population initialization. Our experimentations involving the software module clustering problems have been encouraging, as MSOS gives competitive results against existing selected parameter free meta-heuristic algorithms.



Abstract

PAPER ID: 106

TITLE: *Investigation of dimensionality reduction on numerical attribute features in a finger vein identification system*

AUTHORS: Mohd Zamri Ibrahim

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

With the large number of people travelling internationally, there is an increasing demand to be able to deal with security clearance rapidly and with a minimum of inconvenience. Using finger vein biometric traits fulfils these requirements. In previously-reported work, the data obtained from finger veins underwent dimensionality reduction using principal components analysis (PCA) followed by linear discriminant analysis (LDA) and this was shown to improve the identification rate compared to the more commonly applied Discrete Wavelet Transform (DWT). Although PCA was found to be effective at reducing the noise residing in the discarded dimension, this work demonstrates that the corresponding eigenvalue may in fact also contain useful local information that is important in identification and so should be retained. To overcome this problem, this paper proposes the use of feature extraction using DWT and local binary patterns (LBPs) to generate the feature vectors, before they undergo dimensionality reduction using PCA. Support Vector Machines (SVMs) are used for classification. The performance of the proposed method was compared with previous work, with the identification rate of the proposed method offering the best accuracy of 95.8%.



Abstract

PAPER ID: 107

TITLE: *Camera Orientation Determination based on Copper Wire Spool Shape*

AUTHORS: Farah Adiba Azman, Mohd Razali Daud, Addie Irawan, Amir Izzani Mohamed, R.

M. Taufika R. Ismail and Mohd Mawardi Saari

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

A simple and inexpensive system but effective in performing required tasks is the most preferable in industry. In this study, a vision system is developed to solve peg-in-hole problem of a robot-like forklift to pick up copper wire spool arranged side by side on a rack, without using any sensors, except a low-cost camera. Inspired by how human perceive an object orientation based on its shape, an algorithm is developed to determine robot orientation based on the shape of a copper wire spool relative to camera position and yaw angle. The center point of the spool (CPS) should be on the center line of camera FOV (CFOV) if the camera is perpendicular or 90° parallel to the spool. Thus, the coordinate of the CPS and the CFOV is same. Instead, when the camera seeing the spool from the angle less or bigger than 90° , the CPS and CFOV will be different, and the difference shows the position and the yaw angle of the camera relative to the spool. A copper wire spool has 3 circles; the outer circle, the tapper part around its center hole and the center hole itself. The proposed system uses Circular Hough Transform (CHT), filtering, binary, morphology and Sobel edge detection of the sampled images from real-time video recording to determine the orientation of the camera related to the copper wire spool shape, in which the center coordinate of the 3 circles were determined. Results from the experiments that had been done show that the system is able to determine the orientation of the camera related to the spool.

Abstract

PAPER ID: 108

TITLE: *Classification of Lubricant Oil Geometrical Odor-Profile using Cased-based Reasoning*

AUTHORS: Suhaimi Mohd Daud, Muhammad Sharfi Najib, Nurdiyana Zahed, Muhamad Faruqi Zahari, Nur Farina Hamidon Majid, Suziyanti Zaib, Mujahid Mohamad, Hadi Manap and Addie Irawan

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The Lubricant oil is one of the petroleum refinery product. The lubricant oil usage is very important in order to makesure the operation of vehicle engine at the high-est performance. The purpose of this study is to classify the lubricant oil degrada-tion level based on odor-pattern that extracted from the odor data that collected using electronic nose. The lubricant oil sample consist of 4 level of lubricant oil adulteration level which are virgin lube oil, 3000KM, 7000KM and 10000KM lubricant oil sample. Pre-processing technique were applied by implementing normalization formulation in order to standardize the odor raw data. Normalized data very beneficial in features extraction process, so that the significant odor-patterns can be established. In this study, geometry average calculation method was applied in order to establish the odor-profile for lubricant oil sample. The odor-pattern then were classified using case-based reasoning classifier. Based on the classification results, it shows that the accuracy of the classification is 100% correct classification.

Abstract

PAPER ID: 109

TITLE: *Development of AC and DC Drive Coils for Magnetic Particle Imaging System*

AUTHORS: Mohd Mawardi Saari, Ahmad Zahir Irsyad Razak, Mohd Aufa Hadi Putera Zaini,
Nurul A'In Nadzri, Mohd Razali Daud and Hamzah Ahmad

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

In-vivo imaging system is an important tool in the medical field because it assists in providing accurate diagnosis and treatment process of diseases. It works as a tool to reveal the internal structure of a body by creating visual representation so that abnormalities occurred in the body tissues can be identified. There are several imaging methods used in the medical field such as X-ray radiography, MRI (Magnetic Resonance Imaging), PET and CT scan systems. Recent development in a new imaging modality called Magnetic Particle Imaging (MPI) technique has attracted much interests from researchers where it is expected to provide a higher spatial and temporal resolutions of images. It is also expected to achieve a higher sensitivity compared to the existing imaging systems. The purpose of this study is to develop compact DC and AC excitation coils for an MPI system. The AC and DC excitation coils are designed to utilize the unique behaviour of iron oxide nanoparticles which has relatively high saturation magnetization, making them a perfect tracer material for imaging purposes. The concept, hardware specification and performance evaluation of the DC and AC excitation coils are presented.

Abstract

PAPER ID: 112

TITLE: *Elimination-Dispersal Sine Cosine Algorithm for a Dynamic Modelling of a Twin Rotor System*

AUTHORS: Ahmad Nor Kasruddin Nasir, Shuhairie Mohammad and Ahmad Azwan Abd Razak

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

This paper presents an improved version of Sine Cosine Algorithm (SCA). The original SCA is a simple algorithm and it offers a good accuracy. However, for some problems and fitness landscapes, the accuracy achievement of the algorithm is not at optimal. Search agents of the algorithm stuck at the local optima. The proposed new algorithm which is called an Elimination-Dispersal Sine-Cosine Algorithm adopts Elimination–Dispersal (ED) strategy from Bacterial Foraging Algorithm. The ED helps search agents to solve the local optima problem. At the same time, an elitism approach is applied in the proposed algorithm. The elitism ensures some agents continue the next search operation from the currently best found solution. The proposed algorithm is tested on CEC2014 benchmark functions that have various fitness landscapes and properties. The accuracy performance is compared with the original SCA and analyzed. It also is applied to acquire and optimize a dynamic model for a Twin Rotor System (TRS). Result of the modelling shows that the proposed algorithm achieves a better accuracy and thus present less modelling error and better dynamic response for the TRS.



Abstract

PAPER ID: 117

TITLE: *Multi-Hop File Transfer in WiFi Direct based Cognitive Radio Network for Cloud Back-up*

AUTHORS: Nusrat Jahan Shoumy, Sabira Khatun, Dm Motiur Rahaman, Minarul Islam, S.N.A Manap, M. N. Morshed and M. H. Ariff

AFFILIATION: School of Computing and Mathematics, Charles Sturt University, Australia, Universiti Malaysia Pahang, UniMAP, Islamic University, Kushtia

ABSTRACT:

In this chapter, an application for Android WiFi Direct communications with log-file generation and cloud-based back-up have been proposed. WiFi Direct technology is used to peer-to-peer files transfer between neighboring devices without going through any access point. Distributed file systems for the cloud is a system that enables users to have access to the same data or file remotely (any-time any-where). The proposed custom WiFi Direct based Cognitive Radio (CR) application is able to create an ad-hoc network for multi-hop file transfer wirelessly using WiFi between two or more devices. Besides, to customize the channel according to the user demand, CR technique is used. An application (apps) is developed to emulate the system performances. This application detects and saves all the network activities information (in terms of log file) to keep track of the user activity and connection details in the network. The generated log files are stored in the cloud for further processing and security purpose. The application has been implemented in Android smartphones using Android Development Tools (ADT). The performance of WiFi Direct based CR discovery service, channel detection, log file generation and WiFi Direct applications were successfully tested with ~ 93% efficiency. This shows, multi-hop file transfer and cloud back-up of log-file are possible through neighbor nodes having WiFi direct connection in a network. This can be helpful for data safety, recovery and connection status monitoring/analysis for possible intrusion detection.



Abstract

PAPER ID: 124

TITLE: *The Investigation of Meat Classification Based on Significant Authentication Features Using Odor-profile Intelligent Signal Processing Approach*

AUTHORS: Nur Farina Hamidon Majid, Muhammad Sharfi Najib, Suhaimi Mohd Daud, Nurdiyana Zahed, Muhamad Faruqi Zahari, Suziyanti Zaib, Mujahid Mohamad, Hadi M

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Meat is the flesh or another edible part of an animal and includes uncooked meat prepared or otherwise but does not include meat products. Meat is the most valuable livestock product and for many people serves as their first choice source of animal protein. Fraud and fraudulent meat products are causing annoyance to consumer's, especially Muslim users. There are many cases that have been brought to the public attention regarding fraud on meat products such as incidences of meat that is labeled, certified or sold as halal may not be so. This project sets out to identify two types of different meat which is beef meat and pork meat. Therefore, the significant authentication features using odor-profile intelligent signal processing approach which is Electronic Nose (E-nose) was used to measure odor-profile from meat. E-nose is one of the chemical-based sensor arrays instruments which have a capability to measure odor-profile based sample data. The data measurement of odor-profile for different meat samples was collected based on the designated experimental procedure. The measure of raw data was stored in Microsoft Excel data and convert into MATLAB Software. Then, the normalized and their unique features were extracted using statistical tools for feature extraction. The input of features will be inserting into CaseBased Reasoning (CBR) library and intelligently classified using CBR method and will be validated based specific performance measure. From the CBR performance measures result, it is observed that the classification of CBR is 100%

Abstract

PAPER ID: 128

TITLE: *Development of PV Module Power Degradation Analyzer*

AUTHORS: Mohd Shawal Jadin, Muhammad Aiman Ibrahim and Norizam Sulaiman

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The aim of this paper is to design and develop a system that can analyze the performance degradation of a PV module based on real operating condition (ROC). In this research, the system will capture voltage and current under the real operating condition in order to get the Standard Test Condition (STC) parameters. Then this system will calculate the power degradation of the tested PV module. The experiment showed that the proposed system can estimate the PV module performance degradation by up to 90% accuracy. The system has been designed so that it can be a portable device which can be easily taken everywhere at any time



Abstract

PAPER ID: 129

TITLE: *The Study of Raw Water Based On Quality Parameter Using Smell-Print Sensing Device*

AUTHORS: Suziyanti Zaib, Muhammad Sharfi Najib, Suhaimi Mohd Daud, Nurdiyana Zahed, Muhamad Faruqi Zahari, Nur Farina Hamidon Majid, Mujahid Mohamad and Hadi Manap

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

Water is one of the natural resources that can renewable and about 70% of earth is covered by water and the balance is land. Safe drinking water is important especially for health of human worldwide thus it is important to know the water body source content so that consumption of it do not give any risk to human body's health. Electronic nose (E-nose) is used in this study for detection of different solution in iron (Fe) and pH that related with water quality parameter. E-nose as an instruments that mimicking human nose in sniffing in advance for the volatile odor and chemically that are colorless and odorless that usually undetectable by normal eyes or noses. The objective highlighted in this study were establishing case library profile and classification of water based on recommended water quality. Case Based Reasoning (CBR) is used in performing the intelligent classification that involved CBR computation, voting and performance measure. The similarity result shows that the technique accomplished to classify with 97.5% accuracy, 88.0% specificity and 92.2% accuracy.

Abstract

PAPER ID: 130

TITLE: *Vehicle-to-Grid as Frequency Regulator in a Micro Grid System*

AUTHORS: Mohd Redzuan Bin Ahmad and Laylatun Qadrina Binti Amrizal

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

This paper evaluated the capability of the Vehicle-to-Grid (V2G) to provide ancillary service for frequency regulation. At first, the impact of sudden increase of residential peak load due to the Electric Vehicle charging load is investigated. Then the PHEV Charging Load Profile (PCLP) is developed based on real the da-ta taken from National Household Travel Survey 2017. In this project, the model of V2G in a micro grid system is developed and analyzed using MATLAB software. The results show that, the integration of PHEV on a micro grid has an impact on peak load and system frequency. Moreover, as the total number of PHEV increases, the impact on system frequency become substantial. The percentage of improvement in system frequency as V2G system implemented increased as the charger power level increased. It can be concluded that, V2G on a micro grid improved and regulated system frequency.

Abstract

PAPER ID: 131

TITLE: *Development of PV Module Hotspot Detector*

AUTHORS: Mohd Shawal Jadin, Kamil Ashman Zamridin and Ahmad Syahiman Mohd Shah

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The aim of this project work is to analyze the most major problem in a photovoltaic module which is the solar hotspot. There are many causes that can lead to this kind of defects towards a photovoltaic module such as shading effect, impurities present on the module surface and many more. In this research, the system will capture infrared images of the PV module using an infrared thermal camera and display the images on the LCD display. Region of the module which having abnormal temperature can be detected. This region needed to be analyzed in order to know if it is a hotspot or not. This system will analyze or check that particular region to automatically determine where is the hotspot had occurred



Abstract

PAPER ID: 132

TITLE: *Classification of agarwood types (Malaccensis and Crassna) between oil and smoke using E-nose with CBR classifier*

AUTHORS: Mujahid Mohamad, Nur Farina Hamidon Majid, Suhaimi Mohd Daud, Suziyanti Zaib, Muhammad Sharfi Najib, Nurdiyana Zahed, Muhamad Faruqi Zahari and Hadi Manap

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The issue of quality of agarwood quality among sellers and buyers is still ongoing due to manual olfactory methods. This study purpose classification of Malaccensis and Crassna agarwood in oil and smoke by electronic nose using Case-based Reasoning classifier. The CBR performance measurement shows that classification of agarwood Malaccensis and Crassna for both oil and smoke using CBR technique can achieve 100% classification success.



Abstract

PAPER ID: 133

TITLE: *Characterization of Positive Porous Electrode Felt For Organic Redox Flow Battery Application*

AUTHORS: Ai Chia Khor, Kwok Feng Chong and Mohd Rusllim Mohamed

AFFILIATION: Universiti Malaysia Pahang

ABSTRACT:

The newly emerging organic redox flow battery (RFB) as one of the most promising technology for energy storage system due to their flexible molecule modification. Nevertheless, there is limited study on treated electrode in electrocatalytic activity for organic chemistry. Most of the conventional studies reported a single treatment for carbon porous electrode and most of the studies focus on vanadium electrochemistry. In order to investigate the effect of sulphonation and oxidation of carbon felt, two stage surface treatment involving acid with thermal treatment was introduced in this study. The electrochemical investigation of acid treated felt and pristine felt were performed using cyclic voltammetry (CV) for selected positive electrolyte benze-1,4-diol in supporting acid – sulfuric acid. The comparison study in term of reversibility and current between both felts was also included as part of the paper. The result undisclosed the potential of acid treated felt to be one of the promising electrode modification in organic flow battery application.



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