

2011 IEEE International Conference on Computer Applications and Industrial Electronics

(ICCAIE 2011)

**Penang, Malaysia
4 – 7 December 2011**



**IEEE Catalog Number: CFP1189L-PRT
ISBN: 978-1-4577-2058-1**

Tutorial 2

Tutorial 2

Implementing IPv6 Networks

Time: 2:40 PM - 5:00 PM

Presenter: Ruhani Abdul Rahman

Room: Lawang

Chair: Oskar Hasdinor Hassan (Universiti Teknologi MARA, Malaysia)

Abstract

This training workshop will provide tutorials for the IPv6 protocol and its operation. During the workshop, participants will get hands-on experience for IPv6 router configurations as well as IPv6 hosts. Topics covered will be IPv6 over IPv4, IPv6 protocol, addressing, routing protocols and basic deployment of IPv6. Participants will be introduced to network simulators to test IPv6 network topology. Target audiences are students, researchers and network engineers who want to get knowledge on IPv6 protocol as well as getting the experience to develop an IPv6 network.

Tutorial 3

Tutorial 3

Image Processing & Computer Vision

Time: 2:40 PM - 5:00 PM

Presenter: Nooritawati Md Tahir

Room: Pala

Chair: Yuslinda Wati Mohamad Yusof (Universiti Teknologi MARA, Malaysia)

Abstract

This tutorial will cover research in computer vision, applied mainly in activity recognition as well as gait recognition. The fundamentals and state of the art specifically for gait recognition, including discussions on each step of a complete gait recognition system that includes feature extraction and description along with current applications and remaining issues in gait recognition will also be discussed. Engineers, postgraduate students and academician who wish to understand the mechanisms behind image processing and computer vision are welcome to join this tutorial.

A11

Applied Science & Engineering Applications

Time: 10:40AM -1:00 PM

Chair: Yih Hwa Ho (Universiti Teknikal Malaysia Melaka, Malaysia), Ihsan M. Yassin (Universiti Teknologi Mara, Malaysia)

10:40 Finite Element Analysis of Characteristic Array SU-8 Based Hair Cell and Cantilever Beam for Artificial Lateral Line Flow Sensor

Mohd Norzaidi Mat Nawi (Universiti Sains Malaysia, Malaysia); Asrulnizam Abd Manaf (Universiti Sains Malaysia, Malaysia); Mohd Rizal Arshad (Universiti Sains Malaysia, Malaysia); Othman Sidek (Universiti Sains Malaysia, Engineering Campus, Malaysia)

This paper presents the analysis of modeling for artificial lateral line flow sensor. An artificial hair cell sensor is the current technology that based on a biological inspiration and widely use in underwater applications including glider, robotic and autonomous surface vehicle (ASV). The structure of the lateral line flow sensor is consisting of cantilever beam and four hair cells attached perpendicular to the cantilever beam at the free end. The lateral line sensor with different height of hair cells are modeled and simulated with water flow rate 0 m/s to 1 m/s. High sensitivity is achieved by increasing a hair cells length and use low young modulus material for a cantilever beam. The maximum stress was analyzed in order to identify the limitation of the sensor.

pp. 1-6

11:00 Effect of Field Dependent Mobility on the Analytical Modeling of Emitter Saturation Current of a Silicon Solar Cell

Sujoy Kumer Saha (United Interenational University, Bangladesh); Syeda Israt Ferdous (United Interenational University, Bangladesh); Ashif Farhan (United Interenational University, Bangladesh); Sahajadee Reba (United Interenational University, Bangladesh); Iqbal Bahar Chowdhury (United International University, Bangladesh)

In this paper an analytical model of emitter saturation current of a silicon solar cell has been developed to show the effects of field dependent carrier mobility and of both doping dependent SRH and Auger recombination mechanisms in a non-uniformly doped emitter. In developing this model the doping dependency of carrier lifetime as well as the band-gap narrowing effect due to heavy emitter doping level is considered. An exponential approximation technique is used to deduce an analytically solvable governing differential equation. The developed model shows that the emitter saturation current has significantly varied due to the field-dependency of carrier mobility for thin emitter as well as simultaneous consideration of both SRH and Auger recombination for wide emitter.

pp. 7-11

11:20 The FPGA Implementation of Multiplicative Inverse Value of $GF(2^8)$ Generator Using Extended Euclid Algorithm (EEA) Method for Advanced Encryption Standard (AES) Algorithm

Siti Zarina Md Naziri (Universiti Malaysia Perlis, Malaysia); Yeong Chee Mei (Universiti Malaysia Perlis, Malaysia)

Extended Euclid Algorithm (EEA) is one of the alternatives in gaining the multiplicative inverse value in finite field $GF(2^8)$. Previously, the look-up table (LUT) approach is widely used for this purpose, especially in hardware cryptographic implementations. In this paper, the EEA method is used to build the multiplicative inverse value generator as an alternative of the commonly used LUT method. The generator is implemented in hardware environment using Verilog HDL. By the aid of Altera QuartusII, the generator design is synthesized with the total of 9,940 logic gates and 5,957 instances, with the propagation delay of 7.63 ns. As a proof of hardware implementation, the design is downloaded into an Altera EPF10K70RC240-4 FPGA. This EEA-based inverse generator is proposed to create an alternative approach in generating the inverse value in Advanced Encryption Standard (AES) for hardware-based implementation.

pp. 12-15

11:40 Investigation of MFCC Feature Representation for Classification of Spoken Letters Using Multi-Layer Perceptrons (MLP)

Ihsan M. Yassin (Universiti Teknologi Mara, Malaysia); Hasliza Abu Hassan (Universiti Industri Selangor, Malaysia); Aiman Johari (Universiti Teknologi Mara, Malaysia); Mohd Khairul Mohd Salleh (Universiti Teknologi MARA (UITM), Malaysia); Azlee Zabidi (Universiti Teknologi MARA, Malaysia); Mohd Zafran Abdul Aziz (Universiti Teknologi MARA, Malaysia)

In this paper, the Mel-Frequency Cepstral Coefficient (MFCC) is demonstrated as an effective feature representation method for spoken letters recognition. The Multi-Layer Perceptron (MLP) was used as a classifier to discriminate between two spoken letters - A and S. The dataset consists of 72 samples (35 and 37 samples of spoken letters A and S, respectively). The samples were represented using the Mel Frequency Cepstral Coefficients (MFCC). Several experiments were conducted to determine the optimal network parameters to yield the best classification results. The results indicate that the optimal network structure was with 2 hidden units, which yielded classification accuracy of 100% (training) and 93% (testing).

pp. 16-20

12:00 Stochastic Model Considering Individual Satellite Signal Quality on GPS Positioning

Yih Hwa Ho (Universiti Teknikal Malaysia Melaka, Malaysia); David Yap (Universiti Teknikal Malaysia Melaka, Malaysia)

Simple stochastic model is normally used in GPS positioning by making assumption that all GPS observables are statistical independent and of the same quality. By the above assumption, similar variance is assigned indiscriminately to all of the measurements. A more detail stochastic model considering specific effects affecting each observable individually may be approached such as the ionospheric effect. These effects relate to phase and amplitude measurements in satellite signals that occur due to diffraction on electron density in the ionosphere. This is particularly relevant to those regions frequent with active ionospheric event such as equatorial and high latitude regions. A modified stochastic model considering individual satellite signal quality has been implemented which based on the computation of weights for each observable. The methodology to account for these effects in the stochastic model are described and results of experiments where GPS data were processed in relative positioning mode is presented and discussed. Two weighting parameters have been used in the experiment: elevation angles and tracking error variance in the GPS receiver. The results have shown improvement of 10.3% using the elevation angles as weighting parameters and 11.5% using the tracking error variance as weighting parameter.

pp. 21-25

12:20 Cache Power and Performance Tradeoffs for Embedded Applications

Mehdi Alipour (Qazvin Islamic Azad University, Iran); Mostafa Salehi (University of tehran, Iran); Kamran Moshari (Qiau, Iran)

As embedded applications have become more complex, design of embedded processors has created a research area for low power and yet high performance architectures. Power consumption is as important as performance in battery-powered embedded systems and in future, embedded processors are to process more computation-intensive applications with limited power budgets. Therefore, power consumption of these processors will become more critical. According to the high contribution of memory access power in total power consumption of embedded systems, memory architecture of embedded systems strongly influences the system design objectives. Cache memories are usually used to improve the performance and power consumption by bridging the gap between the speed and power consumption of the main memory and CPU, therefore, the system performance and power consumption is severely related to the average memory access time and power consumption which makes the cache architecture as a major concern in designing embedded processors. Therefore, the embedded system designer requires a comprehensive design space exploration for memory architecture. In this paper we explore the design space of cache in embedded processors to find out the cache sizes which have the optimum performance/power consumption in embedded applications.

pp. 26-31



Automation, Mechatronics & Robotics

Time: 10:40AM - 1:00PM **Chair: Mohd Zafran Abdul Aziz (Universiti Teknologi MARA, Malaysia), Akin Cellatoglu (European University of Lefke, Turkey), Habibah Hashim (Universiti Teknologi MARA, Malaysia)**
Room: Ballroom 2

10:40 Energy Management in Mobile Robotics System Based on Biologically Inspired Honeybees Behavior

Faisul Arif Ahmad (Universiti Putra Malaysia & Faculty of Engineering, Malaysia); Abd Rahman Bin Ramli (Universiti Putra Malaysia, Malaysia); Khairulmizam Samsudin (Universiti Putra Malaysia, Malaysia); Shaiful Jahari Hashim (Universiti Putra Malaysia, Malaysia)

Operating multiple mobile robots while having finite amount of energy is one of limitation on doing a task in long term. In this work, a decentralized controller system based on inspired of swarm honeybees in foraging food's behavior has been developed and applied on the mobile robot. This system is simulated in Player/Stage. The algorithm is divided by working robot and foraging robot. The change of behaviors are based on remaining energy, which is defined as energy for worker and energy for forager. Mobile robots will be working while energy is enough and then, autonomously looking for energy source when battery in state of energy for forager. The information of position for power source energy that is getting from a forager robot will be shared with other mobile robots by local communication. In the player stage simulator, the communication process is done through TCP/IP socket. This experimental result shows that mobile robot is able to continuously work, forage, recharge and back to work by themselves without having intervention by human.

pp. 32-35

11:00 Design and Development of Wind Tracker

Ata Jahangir Moshayedi (University of Pune, India); Dyamanti Gharpure (University of Pune, India)

this work presents the attempt to design and develop a wind direction sensor base on temperature change by wind. Array of LM 35 temperature sensor with H/W has been used to indicate the wind direction. The proposed array is used on robot vehicle as the initial stage of plume tracking activity. The robot uses casting movement in form of zigzag motion to reach the wind source. In addition to tracking, the array can be used for metrological applications and environmental studies. This paper first describes the wind sensor array and the second part describes the experiments carried examine the stability and accuracy of design. Results obtained with various source distances and orientations are also reported.

pp. 36-40

11:20 Transient Analysis of Ambient Vibration-based Micro-Electro-Mechanical Systems (MEMS) Piezoelectric Energy Harvester Using ANSYS and COVENTORWARE Approaches

Salem Saadon (University of Science Malaysia (USM), Malaysia); Othman Sidek (Universiti Sains Malaysia, Engineering Campus, Malaysia)

The market for wireless sensor networks (WSNs) is rapidly growing, yet limited by batteries with short lifetimes. Providing a green, virtually infinite alternative power source to traditional energy sources will significantly expand the applications for WSNs and other technologies. The use of piezoelectric materials to capitalize on the ambient vibrations surrounding a system is a method that presents dramatic potential for power harvesting. The simplicity associated with piezoelectric micro-generators makes MEMS applications highly attractive. In such applications, mechanical vibrations from environment are harvested and converted into electrical energy. These micro-generators are designed as an alternative to a battery-based solution that is especially intended for remote systems. We propose a comparative study on the obtained results of the energy delivered from the ambient vibration-based MEMS energy harvester using the ANSYS and COVENTORWARE approaches. The improvement reflected in the experimental results for vibration-based MEMS piezoelectric energy harvesters indicates excellent application scope in power MEMS and green energy.
pp. 41-44

11:40 Scheduling Using "Activity-Based Modeling"

Reggie Davidrajuh (University of Stavanger, Norway)

This paper presents an interesting approach known as "activity-based modeling" for scheduling activities or operations in discrete-event based dynamic systems (DEDS). In this paper, firstly, activity-based modeling is introduced. Secondly, a new tool is known as GPenSIM is introduced; GPenSIM is developed for modeling and simulation of DEDS using the activity-based modeling approach; GPenSIM is based on Petri Nets. Thirdly, through a case study, this paper shows the effectiveness of activity-based modeling over the traditional "resource-based modeling" approach. The usefulness and uniqueness of this paper is the introduction of activity-based modeling and its application on the development of GPenSIM, and also the "proof-of-concept" - a scheduling example - presented in the case study.
pp. 45-49

12:00 CUSUM-Variance Ratio Based Markov Chain Monte Carlo Algorithm in Overlapped Vehicle Tracking

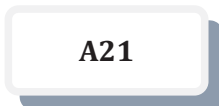
Wei Yeang Kow (Universiti Malaysia Sabah, Malaysia); Wei Leong Khong (Universiti Malaysia Sabah, Malaysia); Yit Kwong Chin (Universiti Malaysia Sabah, Malaysia); Ismail Saad (Universiti Malaysia Sabah, Malaysia); Kenneth Tze Kin Teo (University Malaysia Sabah, Malaysia)

Markov Chain Monte Carlo (MCMC) is one of the algorithms that have been widely implemented in tracking vehicle for traffic surveillance purposes. The sampling efficiency of the algorithm is essential to determine the vehicle position accurately. However, the sample size of the algorithm is still remaining an issue as non-optimal sample size will defect the tracking accuracy, especially when the moving vehicle is overlapped. Adaptive sample size of MCMC has been implemented using CUSUM Path Plot and Variance Ratio algorithms to perform vehicle tracking. CUSUM Path Plot determines the samples convergence rate by calculating the hairiness of the sample size whereas Variance Ratio method computes two sets of MCMC to determine the samples steady state. This paper proposes the fusion of CUSUM-Variance ratio algorithm to enhance the tracking efficiency. Experimental results shows that the CUSUM-Variance Ratio method have a better performance in tracking the overlapping vehicle with higher accuracy and more optimal sample size compared to the standalone CUSUM Path Plot and Variance Ratio approaches.
pp. 50-55

12:20 Simple Schemes of Remote Alerting by Fire and Intruder Detection: A Proposal Favoring Home Security

Akin Cellatoğlu (European University of Lefke, Turkey); Karuppanan Balasubramanian (European University of Lefke, Turkey)

A fire detector circuit kept in home triggers the landline telephone to dial automatically the alternative cellular phone of the resident. If he is inside the home, this alarm alerts him to operate the fire extinguisher manually. If he is away he dials back to the home telephone number with an additional digit to trigger ON the fire extinguisher. By dialling further digits he can switch off selected electrical appliances which might have activated the fire. Also, an intruder detector circuit incorporated with the telephone automatically dials digits to reach a public emergency service and upon receiving the response the attachment unit extends a recorded voice message to the called end informing about the intrusion. As these are simple means of maintaining the home security they can easily be adopted to any environment. Alternatively, with cell phone installed in home for this purpose the above techniques are implemented. This design has more security concerns as a microcontroller checks password and allows the switching process of appliances to take place. As public emergency service is reachable confidently by telephone this method is preferred amongst other possible approaches.
pp. 56-60



Time: 8:40AM - 10:40AM Chair: Nina Madzhi (Universiti Teknologi MARA, Shah Alam, Malaysia), Mohd Tafir Mustaffa (Universiti Sains Malaysia, Malaysia)
Room: BALLROOM 1

8:40 Logical Circuit Gate Sizing Using PSO Guided by Logical Effort - an Examination of the 12 - Stage Ripple Carry Adder Circuit

Aiman Johari (Universiti Teknologi Mara, Malaysia); Syazilawati Mohamed (Universiti Teknologi MARA, Malaysia); Abdul Karimi Halim (Universiti Teknologi MARA, Malaysia); Ihsan M. Yassin (Universiti Teknologi Mara, Malaysia); Hasliza Abu Hassan (Universiti Industri Selangor, Malaysia)

Automated Complementary Metal Oxide Semiconductor (CMOS) logic circuit design leads to the reduction in costs associated with manpower and manufacturing time. Conventional methods use repetitive manual testing guided by Logical Effort (LE). LE provides an easy way to compare and select circuit topologies, choose the best number of stages for path and estimate path delay. In this paper, we propose the Particle Swarm Optimization (PSO) algorithm as a method to automate the process of CMOS circuit design by approaching the design process as an optimization problem. In our work, we choose gate widths inside the circuit as parameters to be optimized in order to achieve the target delay, and its fitness is guided by the LE method. Various parameters, such as swarm size and iterations were tested under different initialization conditions to verify PSO's performance on a 12-stage ripple carry adder circuit. Results have indicated that the PSO algorithm was an effective method to apply to the circuit design problem, with high convergence rates observed. pp. 61-66

9:00 Flexible Integration Testing of Automotive ECUs by Combining AUTOSAR and XCP

Philipp Caliebe (Friedrich-Alexander-University Erlangen/Nuremberg, Germany); Christoph Lauer (University of Erlangen-Nuremberg, Germany); Reinhard German (University of Erlangen, Germany)

Increasing functionality and complexity of current automotive ECUs raise demands on development and testing its software. The more software components being included, the more effort on integration these components into one ECU has to be spend. Additionally, new standards like the ISO/DIS 26262 raise the requirements of testing safety critical components like an airbag-ECU due to functional safety. Trying to retain test coverage on rising functionality of new ECUs compared to older one will lead to longer test periods. The complexity of the integration phase will be intensified, if more then one supplier is integrating software into one ECU. In this paper we present our way to extend the scope of testing software of an ECU using the XCP in combination with an AUTOSAR compliant software basis. This enables flexible instrumentation and testing of an ECU during the whole process from software development at the beginning to acceptance testing at the end. The provided techniques help to simplify instrumenting an ECU for debugging and testing purposes during the whole lifetime. The on-the-fly configuration of XCP is additionally reducing the overhead of preparing an ECU to special test-cases and thus saving valuable time. pp. 67-72

9:20 A Switchable Multi-Standard LNA for Mobile Communications

Jas Min Khoo (USM, Malaysia); Mohd Tafir Mustaffa (Universiti Sains Malaysia, Malaysia); Norlaili Mohd. Noh (Universiti Sains Malaysia, Malaysia); Asrulnizam Abd Manaf (Universiti Sains Malaysia, Malaysia); Othman Sidek (Universiti Sains Malaysia, Engineering Campus, Malaysia)

This paper presents the design of a multi-standard low noise amplifier (LNA) with the capability to switch between 1.9-GHz W-CDMA standard and 0.9-GHz GSM standard. Frequency band selection of the multi-standard LNA is implemented by using inductive, capacitive and resistive switching. The design is implemented by using Silterra 0.18- μm CMOS technology process with the supply voltage of 1.8V. The post-layout simulations of the multi-standard LNA at WCDMA 1.9 GHz for the input matching S11 is -9.74 dB, reverse isolation S12 is -53.01 dB, power gain S21 is 12.18 dB, and output matching S22 is -12.41 dB. On the other hand, the postlayout simulations at GSM 0.9 GHz for the input matching S11 is -10.45 dB, reverse isolation S12 is -63.13 dB, power gain S21 is 10.24 dB, and output matching S22 is -13.64 dB. The noise figure of the multi-standard LNA at W-CDMA 1.9 GHz is 2.62 dB and GSM 0.9 GHz is 3.56 dB. The total power consumption is 33.1 mW when the multi-standard LNA is operating at 1.9- GHz W-CDMA standard 0.9-GHz GSM standard. The voltage supplied to the CMOS switches is 3 V. The die size is 1.65 mm \times 1.80 mm. pp. 73-77

9:40 An Intelligent Controller for Optimal Vector Control of Induction Motor

Mohammad Reza Khalghani (Department of Electrical Engineering, University of Birjand, Iran); Mohammad Ali Shamsi-Nejad (Department of Electrical Engineering, University of Birjand, Iran); Karim Beyki (Sadjad Institute of Higher Education, Iran)

To increase the compactness of the embarked actuators, asynchronous machines are usually preferred. Adjusting of PI controller coefficients is one of the most important parts in vector control of asynchronous machines. Experimental method is more popular to calculate this parameters, but it is difficult and don't give us the optimum point. In this paper we introduce an intelligent PI controller to adjust motor's speed at its desired reference point

using vector control laws. Particles Swarm Optimization (PSO) algorithm is a simple and powerful method to adjusting this parameters. Simulation results indicate that the selected method is good with high accuracy.
pp. 78-81

10:00 A New PWM Regulator to Minimize the Inverter Losses

Mohammad Ali Shamsi-Nejad (Department of Electrical Engineering, University of Birjand, Iran); Serge Pierfederici (INPL-GREEN CNRS UMR 7037, Vandoeuvre lès Nancy France, France); Farid Meibody-Tabar (INPL-GREEN CNRS UMR 7037, France)

The losses in electric drives are an important factors to determinate the rating of inverter switches. In this study we develop a new PWM to decrease the inverter losses. This new PWM method gives less inverter commutation losses than classical PWM, especially in high carrier frequency. The new method decrease the volume and price of drive. To simulate the conduction and commutation switches losses in inverter, we have developed a method using datasheet of switches.
pp. 82-86



Bioinformatics & Computational Intelligence

Time: 8:40AM - 10:40AM **Chair: Syed Saad Azhar Ali (Iqra University, Pakistan), Syed Farid Room: BALLROOM 2** **Syed Adnan (UiTM Shah Alam, Selangor & FKE, Malaysia)**

8:40 Improving of Colon Cancer Cells Detection Based on Haralick's Features on Segmented Histopathological Images

Ahmad Chaddad (Uni Paul Verlaine et Uni Libanaise, Canada); Abbas Dandache (Université Paul Verlaine, France); Camel Tanougast (University Paul Verlaine - Metz, France); Ali Al Housseini (Lebanese University-Liban, Lebanon); Ahmed Bouridane (Northumbria University, United Kingdom)

Image analysis in cancer pathology applications has evolved considerably in the last years [1]. The areas concerned were particularly those in which the diagnosis was based on the medical image processing and analysis. Few studies have successfully investigated the automatic classification of colonic pathology images if they contain healthy cells or cancerous cells. The objective of this work is the multispectral images classification of healthy and cancerous cells in order to accelerate the operations of classification between different types of cancerous cells. Our detection approach was derived from the "Snake" method but using a progressive division of the dimensions of the image to achieve faster segmentation. The time consumed during segmentation was decreased to more than 50%. We extract several Haralick's coefficients to detect the type of cells were made segmentation are applied to the multispectral image. The experimental results obtained on several multispectral images show that the method is efficient for the classification of cancer cells of type Carcinoma (Ca), Intraepithelial Neoplasia (IN) and Benign Hyperplasia (BH).
pp. 87-90

9:00 Nurse Scheduling with Fairness Criteria for Public Hospital

Mohd Hakimi Aiman Ibrahim (Universiti Teknologi Malaysia, Malaysia)

Nurses are the main players in healthcare organization who provide services to the community round the clock. Thus, nurse duty roster is one of the most important components in healthcare to make sure a hospital or clinic provides satisfaction to their patient. In usual practice, the duty roster is built manually or partly-automated, and the fairness criteria are often neglected. These situations may lead to dissatisfaction among nurses. In this paper, we report the results of our investigation upon the process of nurse scheduling done in few Malaysian public hospitals. We also conducted a survey to collect a list of the most desired fairness criteria in building the schedule. Results of survey are presented and discussed.
pp. 91-95

9:20 Comparative Studies Between Various Power Tracing Techniques for Reactive Power Allocation

Zulkiffli Abdul Hamid (Universiti Teknologi Mara Malaysia, Malaysia); Ismail Musirin (UiTM, Malaysia); Muhammad Murtadha Othman (UiTM, Malaysia); Mohd Nur Azam Rahim (Universiti Teknologi Mara Malaysia, Malaysia)

The inability of traditional methods in providing fair and non-discriminatory transmission service pricing has attracted many researchers to streamline the existing methods, or invent some methods that can improve the weakness. Transaction based allocation like MW mile, contract path, and postage stamp allocation are the examples of traditional technique applied by many transmission service providers (TRANSCO) for allocating transmission usage cost among consumers; the generation (GENCO) and distribution (DISCO) companies. Unfortunately, such methods ignore the physical power system constraints such as flow, sink and source constraints that should be taken into account when performing the cost allocation. Thus, a method that can accurately determine the cost of utilizing transmission service while satisfying those constraints has been developed, known as power tracing. This paper tries to conduct an investigation on various power tracing techniques that are based on Artificial Intelligence (AI) based optimization, proportional sharing principle (PSP), and circuit theory. Validation has been performed on IEEE 14 bus reliability test system (RTS) and it is revealed that different power tracing techniques provide different reactive power allocation on consumers.

pp. 96-101

9:40 Offline Handwritten Character Recognition Using Neural Network

Chitralekha Mahanta (Indian Institute of Technology Guwahati, India)

Character Recognition (CR) has been an active area of research in the past and due to its diverse applications it continues to be a challenging research topic. In this paper, we focus especially on offline recognition of handwritten English words by first detecting individual characters. The main approaches for offline cursive word recognition can be divided into segmentation-based and holistic one. The holistic approach is used in recognition of limited size vocabulary where global features extracted from the entire word image are considered. As the size of the vocabulary increases, the complexity of holistic based algorithms also increases and correspondingly the recognition rate decreases rapidly. The segmentation based strategies, on the other hand, employ bottom-up approaches, starting from stroke or character level and going towards producing a meaningful word. After segmentation the problem gets reduced to the recognition of simple isolated characters or strokes and hence the system can be employed for unlimited vocabulary. We here adopt segmentation based handwritten word recognition where neural networks are used to identify individual characters. A number of techniques are available for feature extraction and training of CR systems in the literature, each with its own superiorities and weaknesses. We explore these techniques to design an optimal offline handwritten English word recognition system based on character recognition. Post processing technique that uses lexicon is employed to improve the overall recognition accuracy.

pp. 102-107

10:00 PSO Ingrained Artificial Bee Colony Algorithm for Solving Continuous Optimization Problems

Tarun Kumar Sharma (IIT Roorkee, India); Millie Pant (Indian Institute of Technology Roorkee, India); Tushar Bhardwaj (BIT, Muzaffarnagar, Mahamaya Technical University, India)

Artificial Bee Colony (ABC) algorithm is one approach that has been used to find an optimal solution in numerical optimization problems. This algorithm is inspired by the foraging behavior of honey bees when seeking a quality food source. ABC can sometimes trap into local optimum and also slow to converge. In ABC, the employed bees and onlooker bees carry out exploration and exploitation use the same equation. Obviously, the performance of ABC greatly depends on single equation. To enrich the searching behavior and to avoid being trapped into local optimum, PSO is incorporated into the ABC. In order to improve the algorithm performance, we present a modified method for solution update of the employed as well as onlooker bees in this paper. The proposed variants are termed as EABC-PSO and OABC-PSO. To show the performance of our proposed variants, experiments are carried out on a set of well-known benchmark problems. Simulation results and comparisons with the standard ABC and PSO show that the proposed variants can effectively enhance the searching efficiency and greatly improve the searching quality.

pp. 108-112

10:20 Implementation of MIDlet Application on Probability of Alzheimer's Disease

Syed Farid Syed Adnan (UiTM Shah Alam, Selangor & FKE, Malaysia); Habibah Hashim (Universiti Teknologi MARA, Malaysia); Idrin Pasya (University Teknologi MARA, Malaysia)

Ease of use, cost-effective, faster and effective method to transfer information was the elements that exist in most of mobile phone nowadays. These elements might attain the need to gather information easily and affordably for the mobile phone application on health service. This paper intends to describe the implementation of the MIDlet application on probability of Alzheimer's disease on mobile phone. The MIDlet application was developed using the Java Micro Edition (J2ME) application platform and implemented on a mobile phone. The application obtains and displays the probability of Alzheimer's disease from the database on the phone. Since this application were developed for normal mobile phone, the compactness of the application were considered to make sure the display capabilities and memory were enough to run on a regular mobile phone.

pp. 113-116

A22

Industrial Electronics 1 (cont)

Time: 11:00AM - 1:00PM **Chair: Mohd Tafir Mustaffa (Universiti Sains Malaysia, Malaysia),**
Room: BALLROOM 1 **Nina Madzhi (Universiti Teknologi MARA, Shah Alam, Malaysia)**

11:00 A Switchable CMOS LNA Using Capacitor Switching

Chiao Ling Kok (USM, Malaysia); Mohd Tafir Mustaffa (Universiti Sains Malaysia, Malaysia); Norlaili Mohd. Noh (Universiti Sains Malaysia, Malaysia); Asrulnizam Abd Manaf (Universiti Sains Malaysia, Malaysia); Othman Sidek (Universiti Sains Malaysia, Engineering Campus, Malaysia)

This paper discusses a design of single path low noise amplifier (LNA) architecture with variable capacitor switching, which can switch between standards of GSM 850 MHz and GSM 1.8 GHz. The LNA is designed using Silterra 0.18 μm CMOS technology process. The inductively degenerated cascode low noise amplifier topology has been adopted to develop this switchable LNA architecture. The post-layout simulations of the multi-standard LNA at 850 MHz for the input matching S11 is -12.74 dB, reverse isolation S12 is -55 dB, power gain S21 is 10.67 dB, and output matching S22 is -15.2 dB. On the other hand, the post-layout simulations at 1.8 GHz for the input matching S11 is -6.9 dB, reverse isolation S12 is -43.94 dB, power gain S21 is 14.13 dB, and output matching S22 is -11.36 dB. The noise figure of the multi-standard LNA at 1.8 GHz is 2.64 dB and 850 MHz is 3.92 dB. The total power consumption for both frequencies is 41.6 mW.

pp. 117-120

11:20 Design of Proportional Integral Derivative (PID) Controller for Impedance-Source Inverter

Budi Y Husodo (Universiti Teknologi Malaysia & Univeraitas Mercu Buana, Jakarta, Malaysia); Shahrin Md. Ayob (Universiti Teknologi Malaysia, Malaysia)

This paper presents the design of voltage mode control for impedance-source inverter using Proportional Integral Derivative (PID) controller. The proposed controller controls the output ac voltage by regulating the dc-link voltage at the input side. Mathematical model of the inverter is developed and the control parameters are design via Bode plot. Simulation under source and load disturbances is carried out to validate the design. From the results, it was shown that the proposed controller is capable to regulate the ac output voltage well.

pp. 121-125

11:40 Power System Security Improvement with Optimal Placement of FACTS Devices Using Genetic Algorithms

Omid Ghanaati (Islamic Azad University, Abadeh Branch, Abadeh, IRAN, Iran); Vahid Reza Seirafian (Islamic Azad University, Meymeh Branch, Isfahan, Iran); Iman Naderpour (Islamic Azad University, Meymeh Branch, Isfahan, IRAN, Iran); Jalal Teymouri (Islamic Azad University, Meymeh Branch, Meymeh, Iran)

The role of the FACTS device in power system security enhancement is very important. But type and location of this device must be defining. This paper presents a novel algorithm for allocation of multi-type FACTS devices based on Genetic Algorithm (GA) using a multi-objective optimization function. Proposed algorithm is tested on IEEE 5&6test system and WSCC 9-bus power system and enhancement security index to more of the double and decrease the loss of system about 25%. With shown the comparison of this paper results and result in a recent paper, indicate the ability of proposed method to enhancement of power system security.

pp. 126-131

12:00 Reusable On-chip Communication Architecture of Modular Hardware Accelerator (HA)

Chin Ho Goh (Universiti Sains Malaysia, Malaysia); Mohd Ain (Universiti Sains Malaysia, Malaysia); Chee Hak Teh (Intel Microelectronics (M) Sdn. Bhd., Malaysia); Weng Li Leow (Intel Microelectronics (M) Sdn. Bhd., Malaysia)

Modular Hardware Accelerator (HA) is designed for acceleration purpose which assists CPU (Central Processing Unit) in handling specific task. Modular HA capable to manage multiple engine and communicate them with core processor and main memory through the standard system on-chip (SoC) fabric architecture. The modules of modular HA are Scheduler, Storage, Workload Generator, On-Chip Communication Adapter (OCCA) and Power Management Unit (PMU). OCCA designed to be compliant to the SoC fabric architecture standard and plays an important role in the transaction and handshaking protocol with the Fabric. It responsible for communication behavior such as interface instantiation, arbitration, flow control, address and command signal decode capability, error handling, and power management function. In order to reduce the time of architecture design future usage, OCCA module has the block of reusable architecture. Furthermore, OCCA has a simple parameterize capability let the designer easy work with the different bits of control signal, command signal and data. With all the functionality of

OCCA, some debug tool such as VCS and Assertion Based Verification (ABV) use for verification and simulation purpose to ensure get a correct result. The testbench of OCCA is writing in verilog code and system verilog code.
pp. 132-137

12:20 Design of Workload Generator for Modular Hardware Accelerator

Hanum Syahida Hussin (Universiti Sains Malaysia, Malaysia)

Modular hardware accelerator is designed to provide a platform to interface with any computation algorithm (engine). The main blocks in modular hardware accelerator includes hardware accelerator adapter unit, scheduler unit, storage unit, power management unit and workload generator (WG) unit. The function of WG unit is to keep sequence of task that will be executed by engine. WG unit implements 64-bit address bus, 128-bit data bus and maximum request data length of 1024DW to main memory with processing speed of 100 MHz.
pp. 138-143

12:40 Studies on Control Electronics Implementation of Single-Phase Single Switch Active Power Filter

Rahimi Baharom (Universiti Teknologi MARA, Malaysia); Nik Fasdi Nik Ismail (Universiti Teknologi Mara (UiTM), Malaysia)

This paper is concerned with control electronics for rectifier circuit topologies that control the rectifier input current waveshape to achieve unity power factor operation and very low current distortion levels. The control electronics uses discrete integrate circuits (ICs) for analogue control whilst the Peripheral Interface Controller (PIC) for digital control implementation. Comparisons are made on the performance of these control techniques. Selected simulation and experimental results were presented to verify proposed operation.
pp. 144-149



Bioinformatics & Computational Intelligence (cont)

Time: 11:00AM - 1:00PM **Chair: Syed Saad Azhar Ali (Iqra University, Pakistan), Syed Farid Room: BALLROOM 2** **Syed Adnan (UiTM Shah Alam, Selangor & FKE, Malaysia)**

11:00 An Economical Wireless Network Monitored Scheme for Camera Based Intrusion Detection At Unattended Sites

Ramachandran Hariprakash (University of Madras- (A C Tech Campus), Tamilnadu, India); S Ananthi (University of MAdras, India); Padmanabhan K (A.C.College of Technology & Anna University, India)

Unattended locations today require detection of any mal-intentional intrusion. Sensors of the Pyroelectric (PIR) or Microwave reflecting (MW) types are commonly available for detecting intrusion by a human. In this paper, a digital video camera is interfaced to a computer, say a simple laptop, which has provision for wireless USB based Ethernet connection. The program developed monitors a site in view of the camera and positively detects an intrusion by video frame based evaluation. A novel and sensitive algorithm for detection of motion from video frames is based on integrating the pixel intensities in successive finite difference method over a set of circular and way contour paths in the field of view of the camera. The proposed method is very fast compared to area pixel methods thus far available. The detected intrusion and its location within the scene is instantly messaged through the wireless cellular network adaptor, such as the "Tata Photon" using a simple "Compaq" laptop. The image itself follows the detection. Thus, this method is cheaper than the expensive sensing devices based on MW or PIR.
pp. 150-155

11:20 Advanced Differential Evolution Algorithm for Global Numerical Optimization

Ali Wagdy (King AbdelAziz University-North Jeddah Branch & Faculty of Science, Saudi Arabia); Hegazy Zaher (Institute of Statistical Studies and Research, Egypt); Adel Farhat (King Abdel-Aziz University, Saudi Arabia) in this paper, we present an advanced differential evolution (ADE) algorithm for solving global unconstrained optimization problems. In the new algorithm, a new directed mutation rule is introduced based on the weighted difference vector between the best and the worst individuals at a particular generation. The mutation rule is combined with the basic mutation strategy through a linear decreasing probability rule. This modification is shown to enhance the local search ability of the basic DE and to increase the convergence rate. Two new scaling factors are introduced as uniform random variables to improve the diversity of the population and to bias the search direction.

Additionally, a dynamic non-linear increased crossover probability scheme is utilized to balance the global exploration and local exploitation. Furthermore, a random mutation scheme and a modified Breeder Genetic Algorithm (BGA) mutation scheme are merged to avoid stagnation and/or premature convergence. Numerical experiments and comparisons on a set of well-known high dimensional benchmark functions indicate that the improved algorithm outperforms and is superior to other existing algorithms in terms of final solution quality, success rate, convergence rate, and robustness.

pp. 156-161

11:40 Genetic Algorithm Based PID Optimization in Batch Process Control

Min Keng Tan (University Malaysia Sabah & Modelling, Simulation and Computing Laboratory, Malaysia); Yit Kwong Chin (Universiti Malaysia Sabah, Malaysia); Heng Jin Tham (Universiti Malaysia Sabah, Malaysia); Kenneth Tze Kin Teo (University Malaysia Sabah, Malaysia)

The primary aim in batch process is to enhance the process operation in order to achieve high quality and purity product while minimising the production of undesired by-product. However, due to the difficulties to perform online measurement, batch process supervision is based on the direct measurable quantities, such as temperature. During the process, a large amount of exothermic heat is released when the reactants are mixed together. The exothermic behaviour causes the reaction to become unstable and consequently the quality and purity of the final product will be affected. Therefore, it is important to have a control scheme which is able to balance the needs of process safety with the product quality and purity. Since the chemical industries are still applying PI and PID to control the batch process, researchers are keen to optimize PID parameters using artificial intelligence (AI) techniques. However, most of these PID optimization techniques need online process model to predetermine the optimizer parameters. However in practice, the dynamic model of the batch process is poorly known. As a result, majority of the studies focused on acceptable performance instead of optimum performance of the batch process control. This paper proposes a new genetic algorithm (GA) optimizer which consists of additional information of the online estimated model parameters in addition to the PID parameters as the string of the GA. The simulation results show that the proposed GA auto-tuning method is a better candidate than the regular GA where the estimated model parameters in fitness function is capable to control the process temperature while avoiding model mismatch and disturbance condition.

pp. 162-167

12:00 A New Variable Step-Size Normalized PBS_LMS Algorithm

Reza Seifi Majdar (Islamic Azad University, Ardabil Branch, Iran); Mohammad Eshghi (Shahid Beheshti University, Iran)

This paper presents a novel variable step-size normalized PBS_LMS algorithm for adaptive filters. The fixed step-size PBS_LMS algorithm, which significantly decreases the number of calculations for updating tap-weight vector and increases the speedup of convergence rate in comparison with conventional LMS algorithm, has proposed previously. However, the fixed step-size PBS_LMS algorithm as fixed step-size LMS algorithm usually results in a trade-off between the residual error and the convergence speed of the algorithm. Now in this paper we firstly used the properties of Normalized LMS algorithm in the conventional PBS_LMS algorithm to approach the Normalized PBS_LMS algorithm with fast convergence rate. Then the variable step-size is used parallel with the Normalized PBS_LMS algorithm to minimize the steady state mean square error. The novel logarithmic function of mean square error variation is used to detecting the rate of convergence for increasing the step-size parameter to approach this goal. The computer simulations validate that the Normalized PBS_LMS algorithm can approach the faster convergence rate than the PBS_LMS algorithm. In addition, these simulations show the lower mean square error and tracking ability in Variable Step-Size Normalized PBS_LMS algorithm in comparison with the Normalized PBS_LMS algorithm.

pp. 168-171

12:20 Design of Optimal Power Swing Damping and Fuzzy Logic Controller for SVC Using Improved Particle Swarm Optimization Algorithm

Hamed Hasanvand (Islamic Azad University, Iran); Bashir Bakhshideh Zad (Science and Research Branch of Islamic Azad University, Iran); Babak Mozafari (Islamic Azad University, Iran); Soodabeh Soleymani (Science and Research Branch, Islamic Azad University, Iran)

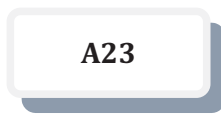
In this paper, the problem of optimal tuning of power swing damping controller (PSDC) parameters based Static VAR Compensator (SVC) is considered. This problem is formulated as an optimization problem which is solved using Improved Particle Swarm Optimization (IPSO) algorithm. Furthermore, in this paper, optimal design of fuzzy logic controller based SVC is investigated and IPSO is used to optimize the scaling factors and membership functions of FLC based SVC. The proposed controllers coordinated with SVC are applied to single-machine infinite bus system (SIBS). Simulation results show the effectiveness of the proposed controllers to damp out low frequency oscillations under different loading and fault conditions. Also, the results indicate that the control performance and robustness of FLC is superior to that of PSDC under different disturbances and loading conditions.

pp. 172-177

12:40 Simulated Annealing Based Fixed Order Controller Design and System Simulations

Faizullah Mahar (Balochistan University of Engineering and Technology, Pakistan); Syed Saad Azhar Ali (Iqra University, Pakistan)

Controllers obtained from popular H^∞ loop shaping techniques have higher order than that of the plant and are difficult to put into practice for industrial applications. To overcome this difficulty the H^∞ control under fixed order controller has been proposed. Firstly, the H^∞ optimal controller has been designed by applying the McFarlane and Glover procedure to obtain the corresponding cost function. Secondly, the controller structure has been specified with few parameters. Finally, the simulated annealing algorithm is used to optimize the cost function and specified controller parameters. The H^∞ norm is minimized by using simulated annealing algorithm. The resulting optimal controller stabilizes the system and guarantees for the specific performance. To check the effectiveness of proposed techniques, resulting controller parameters are evaluated for performance via system simulations. Simulations results demonstrate the efficiency of proposed technique
pp. 178-183



Industrial Electronics 2

Time: 02:00PM - 3:40PM **Chair: Nor Farahaida Abdul Rahman (Universiti Teknologi MARA, Malaysia), Rahimi Baharom (Universiti Teknologi MARA, Malaysia)**
Room: BALLROOM 1

2:00 Controlling the Speed of Induction Motor Using Imperialist Competitive Algorithm (ICA) Based on FLC Farzad Razavi (Azad University of Qazvin, Iran); Bitollah Ghadiri (Azad University of Qazvin, Iran)

This paper presents a method for optimizing Fuzzy Logic Controller (FLC) using Imperialist Competitive Algorithm (ICA) in order to control the speed of an induction motor (IM) in the Indirect Field-Oriented Control (IFOC) method. So as to achieve a better control performance, the ICA optimizes the parameters of the FLC, which are input membership functions (MFs) and normalization factors. The ICA-optimized FLC discussed in this study has only a few rules and consequently requires less computation. This makes the FLC more suitable for real-time implementation, particularly at high speeds. Simulation results show that optimizing the fuzzy logic speed controller of IM through ICA is the best performance compared to FLC-based drive.
pp. 184-188

2:20 A Comparative Study of PI, Fuzzy and Hybrid PI-Fuzzy Controller for Speed Control of Brushless DC Motor Drive

Muhammad Firdaus Zainal Abidin (Universiti Sains Malaysia, Malaysia); Dahaman Ishak (Universiti Sains Malaysia, Malaysia); Anwar Hasni Abu Hassan (Universiti Sains Malaysia, Malaysia)

This paper presents the comparative study between PI, fuzzy and hybrid PI-Fuzzy controller for speed control of brushless dc (BLDC) motor. The control structure of the proposed drive system is described. The simulation results of the drive system for different operation modes are evaluated and compared. A fuzzy controller offers better speed response for start-up while PI controller has good compliance over variation of load torque but has slow settling response. Hybrid controller has an advantage of integrating a superiority of these two controllers for better control performances. Matlab/Simulink is used to carry out the simulation.
pp. 189-194

2:40 Synchronous Design of 8259 Programmable Interrupt Controller

Chee Yap Sia (Universiti Sains Malaysia & Intel Malaysia, Malaysia)

This paper presents the design of a synchronous 8259 Programmable Interrupt Controller (PIC) that is functionally compatible with the existing asynchronous design of 8259 PIC, with the main objective of reducing the design review efforts along the process technology migration. It also serves as the solutions for the disadvantages and potential hazards inherited in the legacy asynchronous 8259 PIC such as timing loops, race conditions, undetectable signal pulse width and glitches. It features a clock gated synchronous design with only flip flops as the memory elements in it. The synchronous 8259 PIC is implemented using a standard-cell based 32 nm CMOS process. Pre-layout simulation results demonstrate an equivalent interrupt handling mechanism with approximate increase of 0.3% in total gate count and 12.2% increase in total area compared to the asynchronous counterpart. The considerably large

difference of 4.7uW in total dynamic power consumption is expected due to the higher switching activity of the gated clock signal in the synchronous 8259 PIC compared to the handshaking signal in the asynchronous 8259 PIC.
pp. 195-200

3:00 Bee Colony Algorithm Application for Manipulating Metalcastings in SME

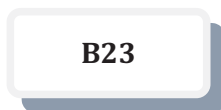
Rhythm Wadhwa (NTNU, Norway)

The paper presents an application of Bee Colony Algorithm (BCA) for template matching that could be used as an input for automated handling of ferrous metalcasted parts. It is a work in progress in its initial stages and presents a novel application of a BCA to robot pick and place operations in manufacturing assembly automation. To enable robust pick and place activity of metalcasted parts by a six axis industrial robot manipulator, it is important that the correct orientation of the parts is input to the manipulator, by the vision system, for orienting the robot gripper. The algorithm is inspired by the collective behavior of honey bees to find food sources around the hive, which is one of the Swarm Intelligence (SI) techniques. The Normalized cross-correlation (NCC) function is used as an objection function in the BCA optimization procedure. The results of the BCA computer simulations are shown for different number of food sources.
pp. 201-207

3:20 Modeling and Simulation of a Single-Phase Boost AC-AC Converter Using Single-Phase Matrix Converter Topology

Siti Zaliha Mohammad Noor (Universiti Teknologi Mara, Malaysia); Nor Farahaida Abdul Rahman (Universiti Teknologi MARA, Malaysia); Aisyah Mohamad Aris (Universiti Teknologi Mara, Malaysia)

This paper presents the operation of Single-Phase Matrix Converter (SPMC) that could synthesize a greater AC output voltage from a given AC supply voltage. Insulated Gate Bipolar Transistors (IGBTs) are used to implement the SPMC topology while the well-known Sinusoidal Pulse Width Modulation (SPWM) scheme is used as the switching technique to synthesize the output waveform. Simulation model was developed using SimPowerSystem block set (PSB) within MATLAB/Simulink environment to study the behavior of the proposed converter. Results obtained from PSB simulation are compared with PSPICE simulation to verify the results.
pp. 208-213



Human Factors & Medical Applications

Time: 2:00PM - 3:40PM
Room: BALLROOM 2

Chair: Rugayah Hashim (Universiti Teknologi MARA & UiTM, Malaysia), Moi Hoon Yap (University of Bradford, United Kingdom)

2:00 Workplace Built Environment: Underpinning the Incentive Structure for K-workers in the Public Sector

Siti Korota Aini Omar (Universiti Teknologi Mara, Malaysia); Rugayah Hashim (Universiti Teknologi MARA & UiTM, Malaysia)

This paper is not on the human responses and interactions with the natural system, which is what biophilia is all about; but on the psychological attachments of his built environment of the workplace. The super-ordinate goals, in which stakeholders win, would be achievable if people are not taken for granted, but recognized as sovereign, living in sovereign state. By the same token, reinventing a governing concept to overlap existing workable culture is a waste of resources. Unfortunately today, the market forces, which aspires to enhance state-business collaboration has instead, re-enforced an alarming growth of elitist individuals among the decision-makers. There exists a danger of infiltration by monopolistic corporate bodies represented by the business elites masquerading as interest groups or by the power elites propagating their own ideology. It would be an economic catastrophe if those running the government support these minorities
pp. 214-219

2:20 Gender Differences in the Usage of Information and Communication Technologies (ICT): The Case for Entrepreneurs in Bangladesh

Ruba Rummana (Ahsanullah University of Science and Technology, Bangladesh); Sirajuddaula Shaheen (Ahsanullah University of Science & Technology, Bangladesh); Naznin Chaity (Ahsanullah University of Science and Technology, Bangladesh); Rifat Bokhari (Ahsanullah University of Science and Technology, Bangladesh); Liana

Anwar (Ahsanullah University of Science and Technology, Bangladesh); Ifte Khyrul Amin Abbas (Ahsanullah University of Science and Technology, Bangladesh); Nusrat Wahid (Ahsanullah University of Science and Technology, Bangladesh); Rizwana Subhani (Asian Institute of Technology, Bangladesh); Rumana Rashid (Universiti Teknologi Malaysia, Malaysia); Iqbal Bahar Chowdhury (United International University, Bangladesh)

The paper attempts to investigate the gender differences in ICT usage, professed system attributes, and entrepreneurial traits among entrepreneurs of Bangladesh. Conducted on 200 entrepreneurs through structured questionnaire, the Technology Acceptance Model (TAM) was adapted in this study to examine the differences in professed usefulness, professed user friendliness, and ICT usage between male and female entrepreneurs in Bangladesh. Results show that male entrepreneurs are more flexible and persevering as compared to female entrepreneurs. Mean perceptions of system's usefulness and user friendliness are significantly higher for female entrepreneurs than for males. Risk-taking propensity is an important technology usage determinant among female entrepreneurs but not among males. Innovativeness is associated with usage by both entrepreneurs. There is a strong impact of professed usefulness on system usage by male and female entrepreneurs. There is no significant association between professed user friendliness and usage. Overall ICT usage, usage of basic and advanced systems, and systems usage for administrative, planning, and control purposes do not differ based on gender. Such findings led to some implications on the basis of which lastly several recommendations are made.

pp. 220-223

2:40 Digital Inclusion Among the Indigenous People (Orang Asli Semai) of Perak, Malaysia

Rugayah Hashim (Universiti Teknologi MARA & UiTM, Malaysia); Kartika Idris (Universiti Teknologi Mara, Malaysia); Zulkifli Baharud-din (Universiti Teknologi MARA, Malaysia); Yus Ustad (Universiti Teknologi Mara, Malaysia)

The government's transformation plan to have connected citizens through broadband access was the motivation for this research. Native minorities or orang asli in Perak, Malaysia formed the sample size for this cross-sectional study. The findings evidenced that 30.8% of the respondents are illiterate and only 5.2% are computer literate thus, substantiating the myth of digital inclusion among the minorities. The policy implication of the research provides justification for revamping social and technology inclusion among the natives. also, political will would retard the myth and rhetoric in promoting access for social inclusion and citizen development.

pp. 224-228

3:00 Neighborhood Networking and One Malaysia (1Malaysia) Concept

Rugayah Hashim (Universiti Teknologi MARA & UiTM, Malaysia); Mohd Anuar Mazuki (Universiti Teknologi MARA, Malaysia); Tajuddin Jahi (Universiti Teknologi Mara, Malaysia); Norazah Abd. Rahman (Universiti Teknologi Mara, Malaysia)

The research project was inspired in tandem with the government's motto of "People First, Performance Now", the One Malaysia (1Malaysia) concept, and the 10th Malaysia Plan. Neighborhood network is realized through information and communication technology (ICT) access and usage. This in turn provides the common ground for communication, public access to government services and best of all, social networking. Therefore, the purpose of this research is to assess the readiness for setting up a neighborhood network in a sub-rural residential area of Klang, Selangor. The results showed that the residents are not socio-economically ready to have a neighborhood network because of computer illiteracy, lack of education and income disparities. Other implications include local social and weak political representation. The backlash from this societal exclusion is that the 1Malaysia concept on citizen integration will remain a myth.

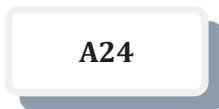
pp. 229-233

3:20 A Modular System of Deep Level Transient Spectroscopy

Nazreen Rusli (International Islamic University Malaysia, Malaysia); Didier Debuf (The University of Sydney, Australia)

Deep Level Transient Spectroscopy (DLTS) is a technique to determine the electrical characteristics of a defect in a semiconductor. Its concept is relied upon in order to develop a measurement test system in a LabVIEW environment. The system is designed to detect electrically active defects in a semiconductor.

pp. 234-239



Industrial Electronics 2 (cont)

Time: 4:00PM - 5:40PM
Room: BALLROOM 1

Chair: Rahimi Baharom (Universiti Teknologi MARA, Malaysia), Nor Farahaida Abdul Rahman (Universiti Teknologi MARA, Malaysia)

4:00 Optimization of Circuitry for Power and Area Efficiency by Using Combination Between Latch and Register
Nik Azman Nik Hassan (Universiti Sains Malaysia, Malaysia)

The benefits of level sensitive latch-based circuit have been known for some time. Latches offer improvement in power, area and even speed compared to flip-flops. Therefore this paper describes flip-flops replacement by latches to improve power and area of a circuit. Here the straightforward replacement method is used where a flip-flop is replaced by a latch without changing the functionality of the circuit. The method was implemented in Netlist using the core processor by Opencores, OpenRisc 1200 Hyper Pipelined (ORisc1200), as the test case. Experimental results show that reduction in power consumption and circuit area has been achieved.
pp. 240-244

4:20 A 0.5 V Quasi-Floating-Gate (QFG) Inverter-Based Class-AB Gain-Bandwidth Independent Amplifier

Apirak Suadet (School of Electronics King Mongkut's Institute of Technology Ladkrabang, Thailand); Varakorn Kasemsuan (, Thailand)

This paper presents a 0.5 V QFG inverter-based class-AB gain-bandwidth independent amplifier. The circuit employs positive feedback to enhance the input impedance, and feed-forward technique to suppress the common-mode gain. The circuit is designed using 0.18 μm CMOS technology under 0.5 V supply. The simulation results show nearly constant bandwidth for various gain, rail-to-rail input/output swing, suppressed common-mode response, and good linearity. The power dissipation is 275 μW .
pp. 245-249

4:40 A Noise and Signal Integrity Verification Flow for Hierarchical Design

Shamsul Anuar Mohamed (University Sains Malaysia, Malaysia); Asrulnizam Abd Manaf (Universiti Sains Malaysia, Malaysia); Chih Chiang Teh (Intel Microelectronic Sdn Bhd, Malaysia)

Hierarchical design spans the complete framework of a design flow from RTL, synthesis, place and route, timing closure and various other analyses before signoff. Finer geometries and increasing interconnect density however have resulted signal integrity becoming the key issue for Deep Sub-Micron design. This paper discusses how to analyze, avoid and suggest a proper solution to deal with signal integrity effect in a hierarchical design. The intention is to ensure that a complex design can be delivered to the market with accurate, fast and trusted analysis and sign-off solution. Main proposed approach is to analyze a 45nm process technology hierarchical design using Primetime-SI. Signal integrity effects in the design are explored thoroughly to guarantee any recommendation made to reduce and repair the signal integrity effects is suitable and appropriate. Case study presented demonstrates the proposed methodology has provided valuable and useful perimeter to overcome signal integrity caveats in hierarchical design.
pp. 250-255

5:00 Inter-turn Stator Winding Fault Detection in PMSM Using Magnitude of Reactive Power

Mehran Taghipour (University of Birjand, Iran); Seyed Mohammad Razavi (Department of Electrical Engineering, University of Birjand, Iran); Mohammad Ali Shamsi-Nejad (Department of Electrical Engineering, University of Birjand, Iran); Ali Darzi (Birjand, Iran)

Electrical machines are one of the main equipments in industry. Permanent Magnet Synchronous Motors (PMSM) is a useful electrical machine in industry, high power density of such motors is one of their important advantages in comparison with other kind of electrical machines. Like other electrical equipments, varieties of fault are unavoidable in such motors. Among expected faults, electrical fault and especially inter-turn stator winding fault is a harmful faults, in PMSM and other electrical motors. So far, different methods and patterns have been presented to detect this fault, in literature. Choosing proper and effective patterns can lead to better illustration of motor's behavior under fault condition. In this paper, magnitude of reactive power has been introduced to detect inter-turn fault in stator's windings. Obtained results show that introduced pattern can show behavior of PMSM under inter-turn fault, perfectly and can be an excellent choice for detecting such faults.
pp. 256-261

5:20 Safe Commutation Switching Sequence for Controlled Rectifier Operation Using SPMC with Reduced Switch Count

Rahimi Baharom (Universiti Teknologi MARA, Malaysia)

This paper describes computer simulation of safe- commutation switching sequence for controlled rectifier operation using single-phase matrix converter (SPMC) with reduced switch count. Pulse width modulation (PWM) technique was used to calculate the switch duty ratio to synthesize the output. The switching sequence is arranged by

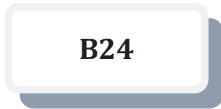
providing a continuous path for current flow during switch transition to avoid voltage spikes due to the use of inductive load. A computer simulation model was developed to investigate the behaviour using MATLAB/Simulink (MLS). Selected simulation results are presented to verify operation.
pp. 262-267

5:40 Effects of the Field Dependent Mobility on the High Frequency Performance of BJT Under Base Pushout Condition

Syeda Israt Ferdaus (United Interenational University, Bangladesh); Sujoy Kumer Saha (United Interenational University, Bangladesh); Muhammad Yeazul (United Interenational University, Bangladesh); Kabir Hossain (United Interenational University, Bangladesh); Md. Hossain (United Interenational University, Bangladesh); Iqbal Bahar Chowdhury (United International University, Bangladesh)

Base pushout due to current-induced perturbation is one of the dominant factors for the degraded speed performance of the modern bipolar junction transistors (BJT). With the scaling down of the feature size of the modern BJT's, the degrading effects due to base pushout becomes increasingly prominent. Therefore, an accurate modeling of base transit time, which is the most significant component in determining the speed performance of BJT's under base pushout condition, is required. However, the present day BJT's use heavy base doping in order to improve its performance. But use of such high doping introduces various non-ideal effects such as bandgap narrowing effects, doping and field dependency of carrier mobility etc. Inclusion of these effects makes the analytical modeling of base transit time, especially under base pushout condition, a formidable task. Therefore, conventional models ignore the field-dependency of the carrier mobility. In this work the complexity due to the inclusion of this field-dependency is addressed and an analytical model has been developed by resolving this problem. The energy bandgap- narrowing effects due to heavy doping is also considered in the proposed model. The developed model shows that the field dependent mobility has significant effects on the base transit time and hence, on the high frequency performance of BJTs with heavily doped base under base pushout condition.

pp. 268-273



Human Factors & Medical Applications (cont)

Time: 4:00PM - 5:40PM
Room: BALLROOM 2

**Chair: Moi Hoon Yap (University of Bradford, United Kingdom),
Rugayah Hashim (Universiti Teknologi MARA & UiTM, Malaysia)**

4:00 Improved Retinal Photography Method and Visualization of Multiple Retinal Images

Hao Hao (RMIT University, Australia); Dinesh K. Kumar (RMIT, Australia); Behzad Aliahmad (RMIT University, Australia); Mohd Zulfaezal Che Azemin (RMIT University, Australia)

The current instantaneous retinal photography method has large variations in the retinal vessel diameter measurement due to retinal vessel pulsation which has been reported associated to the cardiac cycle. The previous limited studies show limitation on their methodologies. To better understand and analyze the variation in the cardiac cycle, we developed an Electrocardiogram (ECG) synchronized retinal photography method which overcomes the previous limitations. Our method is able to detect ECG signal and calculate R-R interval in real time. The retinal camera can be triggered electronically and automatically at the designated time delays based on the real-time calculated R-R interval. Our results demonstrate this method is able to provide the visualization of the retinal vessel pulsations. It will be helpful for studying the relation of ophthalmology and cardiology. It also provides a possible solution to eliminate the cardiac cycle related photography variation in the retinal images analysis.

pp. 274-277

4:20 Power Spectra Based Classification of Cancerous Nevoscope Skin Images

Nikhil Dhinagar (Ohio University, USA); Mehmet Celenk (Ohio University, USA)

This paper describes a new method to discriminate between benign and malignant skin cancer samples obtained from the nevoscope which is one of the most commonly used skin imaging apparatus amidst an array of others including the electron microscope and the spectrometer. Although there have been various approaches in the literature proposed for skin cancer detection, they lack from not being very robust to noise and variations in the input images and the effective computational cost. In particular, the work done in [22] makes use of basic feature extraction and an expert system to help in differentiating the skin samples. It involves extraction of many different features and human intervention. In this paper we propose a new approach to skin cancer classification problem based on power spectrum estimation in the frequency domain and demonstrates that significant changes between the two classes can be derived. The periodogram is a means for the spectrum estimation and effectively utilized

here in. In the implementation, periodograms of sampled windows of the two classes, benign and malignant skin lesions, are compared to classify them in their respective classes. This is achieved by observing the variations in different window sizes for sampling and determining the most discriminative window size, respectively. The experimental results show that power spectra based classification of cancerous nevoscope skin images is an effective means of non-invasively detecting skin cancer with potential applications in biomedical imaging and related technologies (eg. preventive health care, biopsy, dermatology, etc.).
pp. 278-283

4:40 Testbed Design for Wireless Biomedical Sensor Network (WBSN) Application

Mohd. Rozaini Abd. Rahim (Universiti Teknologi Malaysia, Malaysia); Rozeza A. Rashid (Universiti Teknologi Malaysia, Malaysia); Sharifah Hafizah Syed Ariffin (Universiti Teknologi Malaysia, Malaysia); Norsheila Faisal (Universiti Teknologi Malaysia & Faculty of Electrical Engineering, Malaysia); Mohd Adib Sarijari (Universiti teknologi Malaysia, Malaysia); Abdul Hadi Fikri Abdul hamid (Universiti Teknologi Malaysia, Malaysia)

In wireless sensor network (WSN), a collection of nodes interacts with each other to gather information from the surveillance area. Some of the applications that WSN are currently being used are habitat monitoring, health care system and building automation, to name a few. Wireless Biomedical Sensor Network (WBSN) allows capturing of physiological signals, continuous monitoring and updating of a patient's medical status remotely. This paper focuses on the development of a wireless sensor node testbed for WBSN application which complies with IEEE 802.15.4 standard and operates in 2.4 GHz ISM (industrial, scientific and medical) band. The initial state of WBSN development is the design of the wireless sensor node called TelG. The main features of TelG include low power consumption, wearable, flexible and small size. It is then embedded with a self-built operating system called WiseOS to support customized operations. A pulse oximeter is then integrated with TelG for the purpose of experimentation. The testbed performance is analyzed in terms of packet reception rate (PRR) and end-to-end delay. The results exhibit a decrease in PRR as distance increases and increasing network delay with increasing number of hops. It is also observed that received signal using the testbed is satisfactory for distances less than 10 meters per hop.
pp. 284-289

5:00 Three-dimensional Particle Swarm Optimisation of Mel-Frequency Cepstrum Coefficient Computation and Multilayer Perceptron Neural Network for Classifying Asphyxiated Infant Cry

Azlee Zabidi (Universiti Teknologi MARA, Malaysia); Wahidah Mansor (Universiti Teknologi MARA, Malaysia); Lee Yoot Khuan (Universiti Teknologi MARA, Malaysia); Ihsan M. Yassin (Universiti Teknologi Mara, Malaysia); Rohilah Sahak (Universiti Teknologi MARA, Malaysia)

The performance Mel Frequency Cepstrum Coefficient (MFCC) in extracting significant feature is influence by several important parameter settings, namely the number of filter banks, and the number of coefficients used in the final representation. These settings affect the way the features are represented, and in turn, effect the performance of the classifier for diagnosis of the disease. Particle Swarm Optimization (PSO) algorithm is used in this work to adjust the parameters of the MFCC feature extraction method, together with the Multi-Layer Perceptron (MLP) classifier structure for diagnosis of infants with asphyxia. The extracted MFCC features were then used to train several MLP classifiers over different initialization values. The simultaneous optimization of MFCC parameters and MLP structure using PSO yielded 93.9% of classification accuracy.
pp. 290-293

5:20 Visual Cues of Facial Behaviour in Deception Detection

Moi Hoon Yap (University of Bradford, United Kingdom); Bashar Rajoub (Aberystwyth University, United Kingdom); Hassan Ugail (University of Bradford, United Kingdom); Reyer Zwiggelaar (Aberystwyth University, United Kingdom)

Facial behaviour of deception has emerged as an important topic in surveillance research. In this paper, we evaluate the facial behaviour of deception based on some of the cues identified in the literature. First, we present a short review of deception cues in facial behaviour. Then, we run a pilot study, using a rapport style one-to-one interview scenario, under controlled and experimental conditions. Following the standard practice, the experiment has been designed to incorporate three stages. Stage one: facilitation session, in which the baselines are established for each participant. Stage two: interrogation session, in which the participants are required to answer questions on two topics - one truthfully and one falsely. Stage three: self-reporting session, in which the participants are required to report the ground truth for stage two. Once the data regarding visible images of facial behaviour was collected, it was analysed and compared to the facial behaviour cues identified in literature. For statistical analysis, a non-parametric sign-test was selected. The results indicated that there is potential in applying facial behaviour as the cues in predicting deception. Finally, a discussion on future work introduce more subtle facial actions analysis is presented.
pp. 294-299

5:40 A Study on the Effects of the Cognitive Workload on the Driver's Blood Pulse Wave

Ahmad Khushairy Makhtar ,Mohd Nor Azmi Bin Ab Patar, Mohd Hanif Mohd Ramli, M Mazwan Mahat,

Ahmad Faiz Zubair, Hafizi Lukman;(University Teknologi MARA, Malaysia)

Distracted driving has emerged as a factor of road accidents. Hence, the detection increase of drivers' cognitive workload has been a vital issue for establishing safety support systems. Studies on the estimation of driver's mental workload have been performed using various devices. However, an applicable and a sensitive device is still vague. One of the promising devices available is using blood pulse wave. The purpose of this study is to develop a driver's distraction detection method through blood pulse wave analysis. This paper focus on how to determine the threshold of drivers' distraction. Based on the experiments that were conducted on driving simulator, we did some suggestions regarding the effects of cognitive workload that been imposed to drivers to driver's blood pulse wave
pp. 300-302



Network & Communications Technology 1

Time: 8:40AM - 10:40PM **Chair: Mohd Dani Baba (Universiti Teknologi MARA, Malaysia), Raja Suzana Raja Kasim (Universiti Teknologi Mara Puncak Alam Campus, Malaysia)**
Room: JINTAN

8:40 Deployment of MICAz Mote for Wireless Sensor Network Applications

Nurul Amirah Ali (Universiti Teknologi PETRONAS, Malaysia); [Micheal Drieberg](#) (Universiti Teknologi PETRONAS, Malaysia); Patrick Sebastian (Universiti Teknologi PETRONAS, Malaysia)

Wireless Sensor Network (WSN) is a new technology that enables remote monitoring and data gathering to be realized in many applications such as traffic control, health monitoring, disaster management and many others. WSN is built by connecting a group of nodes together to perform the required tasks. These nodes cooperate and automatically create a network among themselves. One of the most common wireless sensor node, also commonly known as mote, used is the MICAz mote. MICAz is easy to implement and can be used to build WSN for various applications. This paper demonstrates the deployment of MICAz motes using a test case of soil moisture sensor for environment monitoring applications. A detailed description of hardware and software requirements, sensor calibrations, mote firmware, testing, debugging and verifications is given. This will enable researchers and engineers to quickly obtain a working knowledge in implementation of various WSN applications.
pp. 303-308

9:00 A Dual Wide Band CPW-fed Slot Antenna with Modified Coupling Slots

[Prakasit Tunti-a-longkarn](#) (King Mongkut's University of Technology North Bangkok, Thailand)

This paper presents a dual wide band CPW-fed slot antenna with modified coupling slots. The operating frequency of the proposed antenna includes the DCS (1710-1880 MHz), PCS (1850-1990 MHz), IMT-2000 (1920-2170 MHz), and IEEE 802.11 WLAN standards in the 2.4 GHz (2400-2484 MHz), 5.2 GHz (5150-5350 MHz) bands, mobile worldwide interoperability for microwave access (Mobile WiMAX), and WiMAX, which operate in the 2.3/2.5 GHz (2.305 - 2.360 GHz/2.5-2.69 GHz) and 5.5 GHz (5.25-5.85 GHz) bands. The antenna appears uncomplicated in design and undemanding for investigation. The lower operating band of the proposed antennas can be controlled by varying the perimeters of the radiating slot and the upper operating band depended on the perimeter of the modified coupling slots. The results of the experiment proposed antennas show the impedance bandwidths of the two operating bands, determined from 10 dB return loss, which are larger than 60% and 30% of the center frequencies. All simulation processes in this paper applied IE3D program to analyze and optimized the antennas.
pp. 309-314

9:20 A PAPR Reduction Method Based on the Selection Scheme of Zadoff-Chu Matrix and SCAFBD

[Xiaolu Chen](#) (Xidian University, P.R. China); Gang Yang (Xidian University, P.R. China); Xiaoyang Wang (XiDian University, P.R. China)

OFDM technology is widely used in communication systems for its advantages such as high spectral efficiency and anti-multipath effect. However, the drawback of high PAPR greatly limits its own development. Many techniques have been proposed to reduce PAPR, but none of them is widely used because of the poor performance and complexity. The proposed method exploits a selection scheme based on Zadoff-Chu matrix and SCAFBD(simplified clipping with bounded distortion). In order to maximize the reduction of PAPR, the proposed method is the one in line with the minimum PAPR of the largest PAPRs per frame generated by Zadoff-Chu matrix and SCAFBD

according to their characteristics. Simulation results show that the proposed scheme achieves quite good performance.
pp. 315-318

9:40 Cell Drop Threshold Architecture for Multi-Class Shared Buffer with Finite Memory Size

Abdul Aziz Abdul Rahman (Telekom Research & Development, Malaysia); Kamaruzzaman Seman (Universiti Sains Islam, Malaysia); Kamarudin Saadan (Universiti Sains Islam Malaysia, Malaysia); Ahmad Samingan (Telekom Research & Development, Malaysia); Azreen Azman (Universiti Putra Malaysia, Malaysia)

Shared buffer is commonly used to utilize the buffer in the switch. In order to minimize the cell lost of high class traffic in multi-class switch, the threshold is set to drop the low class cells in the shared buffer. This will give more space to accommodate the high class traffic cells. In this paper, we analyse the performance of shared buffer with different threshold setting. The architecture of the multi-class shared buffer is developed for 16x16 ports switch that is targeted for Xilinx FPGA. The performance of the multi-class shared buffer switch is analysed in term of the achievable throughput and the drop probability. Based on the simulation with different threshold setting, it is observed that the optimum selection of cell drop threshold depends on the size of the shared buffer that triggers the RAM threshold.

pp. 319-324

10:00 New MAC Protocol for Multimedia Traffic Routing in Optical Networks

Deepalakshmi R (Velammal College of Engineering and Technology Madurai, India); C Shailesh Kumar (Velammal College of Engineering and Technology, India)

Traditional Medium Access control (MAC) Protocol achieves better performance for the traffic type actually they have been assigned for but inadequate for other traffic types. The prevailing multimedia applications need that the MAC protocol should execute all traffic types unvaryingly. To ensure efficient transmission, an optical network should make use of a MAC protocol to arbitrate access to the shared medium in order to avoid data collisions and at the same time efficiently share the transmission bandwidth among different traffic classes to guarantee the quality of service (QoS). However, the performance of all these schemes is significantly degraded when the round-trip times (RTTs) of the optical network units (ONUs) are dissimilar, due to the large number of gaps in the transmission schedule. Unfortunately, in real networks, RTTs are usually dissimilar. In this paper we propose a new MAC protocol which accommodates a range of multimedia traffic with dissimilar characteristics and QoS demands. The new MAC protocol employs a new algorithm to exploits the RTTs' resemblance and restructures the ONUs service order to support the requests that cause the minimum scheduling latency.

pp. 325-330

10:20 SINR Based Media Independent Handover in WiMAX and WLAN Networks

Mohd Dani Baba (Universiti Teknologi MARA, Malaysia)

Subscribers are becoming more demanding regarding roaming capabilities across different networking technologies such as WLAN, WiMAX, and CDMA as they claim service continuity with QoS requirement and good security features. To achieve seamless handover between different access technologies is a great challenge as it needs to obey different performance of QoS and security constraints. Heterogeneous handover requires collecting network information from different entities that are not necessarily interoperable and then applying optimized policies to execute the appropriate handover decision and processing them. In this paper, a QoS based vertical handover mechanism between WiMAX and WLAN networks is proposed by applying the Signal to Interference and Noise Ratio SINR. The Media Independent Handover MIH (IEEE 802.21) protocol is adopted to assist in the handover decisions by providing a suitable platform for vertical handovers.

pp. 331-334



Signal & Image Processing 1

Time: 8:40AM - 10:40AM
Room: LAWANG

**Chair: Nor'aini Abdul Jalil (Universiti Teknologi MARA, Malaysia),
Othman Sidek (Universiti Sains Malaysia, Engineering Campus,
Malaysia)**

8:40 Ruled-Based and Stroke Composition Technique for Efficient License Plate Recognition

Samsul Setumin (Universiti Teknologi MARA, Malaysia); Mohd Ikmal Fitri Marzuki (Universiti Teknologi MARA, Malaysia); Shahrul Nizam Ishak (Universiti Teknologi MARA, Malaysia)

In this paper, we address the issue of recognizing standard car license plate. We propose to have only two stages of recognition process that are localization and recognition. For localization, instead of searching the region for the plate, we directly locate the alphanumeric characters of the car plate to remove issues such as plate size or shape variations, broken plate as well as plates on black colored vehicles. We use ruled-based technique to locate and detect the characters of the car plates. In the second stage, we propose stroke composition technique to recognize the characters. The proposed technique first extract the stroke of the character and then stroke composition technique is used for classification. Our main goal is to avoid using a lot of training samples to handle various font sizes. The advantage of this method is that the system requires no training. From the experiment performed, the method has a correct recognition accuracy of 95%.

pp. 335-340

9:00 Detection of Asphyxia From Infant Cry by Linear Kernel Support Vector Machine Enhanced with Features From Orthogonal Least Square

Rohilah Sahak (Universiti Teknologi MARA, Malaysia); Lee Yoot Khuan (Universiti Teknologi MARA, Malaysia); Wahidah Mansor (Universiti Teknologi MARA, Malaysia); Azlee Zabidi (Universiti Teknologi MARA, Malaysia); Ihsan M. Yassin (Universiti Teknologi Mara, Malaysia)

An investigation into the performance of SVM with linear kernel and features ranked by OLS, to discriminate infants with asphyxia from their cries, is presented in this paper. The features of the cry signal were first transformed into MFC coefficients. The input feature set was then used for classification by SVM with linear kernel. The number of coefficients and filter banks were tuned to acquire the optimal input feature set. This is uniquely different from previous works, where empirical values were simply adopted without proof. However, it is found that the performance of the classifier can be improved further by using selective coefficients from the optimal feature set. Hence, the MFC feature coefficients were then ranked in accordance to its error reduction ratio using OLS before submission to the classification stage. From experimental works, it was found that the optimal input feature set for DS-SVM approach is obtained with 20 coefficients, 21 filter banks and regularization parameter of 0.001 while the OLS-SVM approach reduced the MFC coefficients to 14. From performance comparison of both, it can be concluded that the OLS-SVM excelled the DS-SVM approach at classifying infant cry with asphyxia. This is because the OLS-SVM approach yields comparable classification accuracy (92.5%) with lesser support vector number (252.5) and lesser MFC coefficients (14) than the DS-SVM approach, which implicates much reduced computation effort and load.

pp. 341-345

9:20 Hybrid Spatial Scalable Video Codec for HDTV Video Images

Vahid Reza Seirafian (Islamic Azad University, Meymeh Branch, Isfahan, Iran); Iman Naderpour (Islamic Azad University, Meymeh Branch, Isfahan, IRAN, Iran); Omid Ghanaati (Islamic Azad University, Abadeh Branch, Abadeh, IRAN, Iran); Jalal Teymouri (Islamic Azad University, Meymeh Branch, Meymeh, Iran)

In this paper, a scalable hybrid video codec has been developed for HDTV video signals. The intra frame pictures are coded based on wavelet transform and inter frame pictures are coded with a standard MPEG-2 codec. By scalable coding of HDTV, channels transmit with various speeds and capacities; In addition, receivers can work at different resolutions. Base layer and enhancement layer of the frame picture are coded with same codec. This paper compares scalable hybrid coding with scalable MPEG-2 codec and scalable DWT2 method for HDTV video signals. It is showed that the quality of intra frame improves by using the proposed codec in comparison with two other methods. By this improvement, the quality of sequence increases.

pp. 346-349

9:40 A Novel Approach to Iris Recognition for Personal Authentication

G K Viju (Karary University, Sudan); Nadir K Salih (Harbin Institute of Technology, P.R. China); T Zang (Harbin Institute of Technology, P.R. China)

This paper examines automated iris recognition as a biometrically based technology for personal identification and verification. Although numerous iris recognition algorithms have been proposed, this paper define the texture of irises have not been extensively studied. In this paper, to localize the iris we used canny edge detection algorithm and circular hough transform. After Localization, we counter clockwise unwrapped the circular iris to get a rectangular texture block with a fixed size called Normalization.

pp. 350-354

10:00 Simulation of Surface Roughness and Topography in Finish Turning Using Digital Image Subtraction

Aun Naa Sung (University Sains Malaysia, Malaysia); Mani Maran Ratnam (Universiti of Science Malaysia, Malaysia); Wei Ping Loh (University Sains Malaysia, Malaysia)

Most surface roughness prediction models based on mathematical approach assume a geometrically well-defined nose profile, i.e. either circular or elliptical. Such simple models cannot be applied in cases where the tool nose develops different wear patterns or have non-geometric arbitrary profile, such as those caused by manufacturing tolerances in the nose radii. In this study, a digital simulation method using binary image subtraction is used to generate the work piece surface topography, and from which the common roughness parameters of the work piece are determined. Comparison of the digital simulation method with the mathematical models using ideal nose shape shows a maximum difference of 4.7% in the average roughness value.
pp. 355-360

10:20 Image Reconstruction Using Moment and Non-Moment Based Techniques

Nor'aini Abdul Jalil (Universiti Teknologi MARA, Malaysia); Ahmad Faris Mohd Hasnan (Universiti Teknologi MARA, Malaysia); Haryanti Norhazman (University Teknologi MARA, Malaysia)

This paper presents Image Reconstruction using Moment and Non-moment based Techniques. The moment based technique used is Zernike Moments (ZMs) while Fast Fourier Transform (FFT) is the non-moment based technique. Considering the inverse process of these two techniques will allow the reconstruction of the image. Two types of images are considered namely gray scales and binary and the original images are corrupted with three different noises that are Salt and Pepper, Gaussian and Random. The performance of each algorithm against original and corrupted images is measured by evaluating Peak Signal to Noise Ratio (PSNR) for each reconstructed gray scale image of pixel size 64x64 and binary image of pixel size 30x30. The PSNR for each type of images will be observed in terms of the effectiveness of both Inverse Fast Fourier Transform (IFFT) and Inverse Zernike Moment (IZM) as reconstruction algorithms. The results show that between the two techniques, ZM is less sensitive to noise compared to FFT even though FFT is able to reconstruct a reasonably quality image.
pp. 361-366



Computer Applications & Software Engineering

Time: 8:40PM - 10:40PM **Chair: Itaza Afiani Mohtar (Universiti Teknologi Mara Perak, Malaysia), Ihsan M. Yassin (Universiti Teknologi Mara, Malaysia)**
Room: PALA

8:40 GngD9A. 'Dfcdcg]b['5 '7 c\ YfYbhAcXY': cf'GngHya g'9b[]bYYf]b['DfcWggYg
0EaE q~ aEa E: a^ { E: aE aE aE aE } E: aE aE |
pp. 367-372

9:00 EKF Implementation on S3CEV40 for InnoSAT Attitude Determination System

Adam Ain Mohd Poin Keui (Universiti Sains Malaysia, Malaysia); Muhammad Fadly (CEDEC, Malaysia); Othman Sidek (Universiti Sains Malaysia, Engineering Campus, Malaysia); Md Azlin Md Said (Universiti Sains Malaysia Engineering Campus, Malaysia)

Extended Kalman Filter (EKF) has been successfully utilized in a number of satellites. However, compared to other attitude determination methods developed, it is one of the most computationally burdening algorithm and with the new trend of using nano-satellites which have limited electrical power, mass, space and usually budget, it is essential to design an ADS which conforms to this limitation. Therefore, in this paper, as a further improvement on the InnoSAT project which incorrectly runs the EKF algorithm on the RCM3400, we will determine whether the ARM7TDMI is able to successfully perform attitude determination of InnoSAT using the EKF. The ARM7TDMI has been chosen since it is one of the well-known microprocessor used in various electronic equipments because it is low power and robust. It is also off the shelf which means it is easily available thus making it a cheaper solution than a space grade component. Analysis on the ARM7TDMI was done based on attitude data accuracy and execution time.

pp. 373-378

9:20 A Technical Insight Into Community Geographic Information Systems for Smartphones

Dileepa Jayathilake (University of Moratuwa & Eurocenter DDC, Sri Lanka); Shamila Perera (Eurocenter DDC & Eurocenter DDC, Sri Lanka); Sameera Bandara (Eurocenter DDC & University of Moratuwa, Sri Lanka); Helani Wanniarachchi (Eurocenter DDC, Sri Lanka); Lakshitha Herath (Eurocenter DDC, Sri Lanka)

Geographic Information Systems (GIS) provide inventory, analysis and visualization of geographic data to users of various levels. Users range from GIS experts who build models to analyze geographic patterns in data to general users such as travelers who need information on interesting places to visit and paths to follow. Popularity of social networks and ubiquitous use of hand held devices such as smartphones have brought the usage of GIS into the next level. With the Geo-location detection capabilities of hand held devices, users can share their current location and paths traversed along with useful metadata. An example would be a pedestrian taking a photograph of a badly conditioned place in the road and uploading it with Geo-location information for the consideration of authorities. As of today, a number of map data sources from different providers exist. Proprietary providers build their own maps and annotations and give it for a fee. Communities built map services, on the other hand, make the infrastructure available for a community to voluntarily contribute map data and consume them. This seems to be a promising approach given the convenience of getting networked and sharing geo-tagged information with the new technologies. This work focuses on the feasibility of implementing software infrastructure for a Community GIS driven by smartphone users with the current technology. Both smartphone native apps and mobile optimized web apps are explored and proof-of-concept apps are developed to demonstrate opportunities and challenges in each avenue.

pp. 379-384

9:40 A Hybrid Framework of Digital Business Ecosystem for Malaysian Small and Medium Enterprises (SMEs)

Muhammad Tawab Khalil (Universiti Teknologi Petronas, Malaysia); Dhanapal Durai Dominic (Universiti Teknologi Petronas, Malaysia); Mohd Fadzil Hassan (Universiti Teknologi PETRONAS, Malaysia); Arif Mushtaq (, Malaysia)

Digital Business Ecosystem (DBE), as it sounds, is a digitized form of business ecosystem amalgamating ICT (Information and Communication Technology) with business networks. Malaysian small and medium enterprises (SME) can be tuned into a collaborative and interdependent socio-economic business environment when they are jacketed with ecosystem. In a DBE, small and medium enterprises are provided with the freedom to integrate their services across organization and turn them into offerings. This helps them in many ways resulting in improved performance of employees and customer satisfaction. Surveys have shown that Perceived Usefulness (PU) and Perceived Ease of Use of SME employees are some of the key variables which are amplified. In Malaysian context, small and medium enterprises are very important to regional economy which is largely dependent open state market. DBE links the small and medium enterprises in a way to create a win-win situation for all the stake holders. The paper provides an evolutionary framework for small and medium enterprises which is hoped to achieve the long standing goal of a true collaborated network. It should help small and medium enterprises climb up the ladder of E-adoption by taking a step further ahead of ecommerce and ebusiness.

pp. 385-389

10:00 A Scalable Product Quality Verifier Framework for a Outsourcing Supplier

Dileepa Jayathilake (University of Moratuwa & Eurocenter DDC, Sri Lanka); Hasith Yaggahavita (Eurocenter DDC Ltd, Sri Lanka); Upul Senanayake (University of Peradeniya & Eurocenter DDC, Sri Lanka); Charitha Elvitigala (Sri Lanka & Eurocenter DDC, Sri Lanka); Dhammika Sriyananda (Eurocenter ddc pvt Ltd, Sri Lanka)

Outsourced software development is a growing business model that has proven to bring cost-effective and efficient solutions for varying demands of a software product company. Though it has proven its capability in bringing increased market value to stay ahead of competition, there are few inherent problems commonly identified in practice. A prominent issue is how to verify the quality of the code/applications delivered to the customer. Given the fact that a critical bug leaking in to production can bring disastrous results, it is vital to ensure that the deliverables from the supplier conforms to a defined set of quality guidelines. The work described in this paper is the design and implementation of a scalable software quality verification framework targeted towards an outsourcing supplier. The framework enables the supplier to build an industrial grade automated quality verification system, on top of which they may validate and ensure the quality of their deliverables before it reaches the customer. The framework is

capable of evaluating both at software code and software application levels. Code level evaluation is done in two phases; first is when the developer tries to add code to the repository (interactive commit stage) and secondly a deeper analysis covering a wide range of problems offline (non-interactive backend analysis). It is important that the rules used for evaluation, actions on results and alerting can be customized to suit the project context. When it comes to the application level, the framework provides a programming interface and a set of tools to verify the artifacts. A case study quality verification system built using this framework proved to add a significant value to the deliverables of a commercial software project. An experiment done with the programming interface showed that powerful and complex analysis systems could be built to evaluate deliverables and even to aid in software due-diligence process.

pp. 390-395

10:20 Intelligent Higher Institution Student Selection System

Itaza Afiani Mohtar (Universiti Teknologi Mara Perak, Malaysia); Nurul Adila Zulkifli (Universiti Teknologi MARA Perak, Malaysia); Siti Salihah Shaffie (Lecturer, Malaysia)

Higher education institutions admission faces the need for a precise and effective method to evaluate and select the most qualified applicants to be in their institution. Currently, admission officers have to manually evaluate every applicant's data against the set of admission requirements before selecting the few successful ones. The manual process contributes many problems such as inaccurate decision resulting from human error, needs a lot of effort and is time consuming. The objectives of the paper is to identify and suggest an intelligent selection method using fuzzy system to assist higher institutions to select the most suitable applicants and also suggest suitable course based on their high school certificate result. There are two phases involved in this project. The first phase requires user to input the data which will be processed in the fuzzy inference system. If the applicant qualifies, the system will proceed to the second phase which is course suggestion phase. The result shows whether the applicant qualify and if so, will be suggested a course. This project uses Sugeno-Style Fuzzy Inference technique to select the suitable applicants. A prototype was developed and tested with thirty sample data. From the analysis, this prototype achieved 83% accuracy. As a conclusion, this technique is suitable to be applied to automatically suggest suitable applicants for intake into higher institutions.

pp. 396-401



Network & Communications Technology 1 (cont)

Time: 11:00AM - 1:00PM **Chair: Raja Suzana Raja Kasim (Universiti Teknologi Mara Puncak Alam Campus, Malaysia), Mohd Dani Baba (Universiti Teknologi MARA, Malaysia)**
Room: JINTAN

11:00 Full Survey on SPIT and Prediction of How VoIP Providers Compete in Presence of SPITTERS Using Game-Theory

Amirhossein Baradaran Shahroudi (Islamic Azad University, Mashhad Branch, Iran); Hossein Khosravi R. (Ferdowsi University of Mashhad, Iran); Habib Rajabi Mashhadi (Ferdowsi University of Mashhad, Iran); Masoud Ghorbanian (Universiti Teknologi Malaysia, Malaysia)

VoIP (Voice over Internet Protocol), is becoming increasingly popular nowadays. Spam over Internet Telephony (SPIT), as one of the main vulnerabilities of VoIP systems, is becoming an interesting source of annoyance for spammers. Transmitting bulk unsolicited messages and calls in a VoIP system could be facilitated with the use of an automated procedure (i.e., bot). As the effectiveness of legal actions in preventing these attacks is limited, various ANTI-SPIT technologies have been developed. Some approaches try to detect a sender as a spammer while he is attempting to generate calls and messages, and some others try to establish an infrastructure which makes the system unlikely for a spammer, so they prevent SPIT. Selecting one of these two approaches, (Detection or Prevention) could certainly move large volume of market share between companies. In this paper, after surveying different ANTI-SPIT solutions, a competition between two VoIP providers is proposed. Game Theory method is used to simulate this competition. Results illustrate that apart from the scientific efforts made to prevent SPIT, the VoIP providers trying to maximize their profit, prefer to use detective approaches instead.

pp. 402-406

11:20 Ubiquitous Bus Mapping System on Mobile Phone Via Web Architecture

Chakchai So-In (Khon Kaen University, Thailand); Sarayut Poolsanguan (Khon Kaen University, Thailand); Chartchai Poonriboon (Khon Kaen University, Thailand); Natnicha Veeramongkonleod (Khon Kaen University, Thailand)

This paper introduces a new bus mapping system, especially for mobile usage. Web architecture is purposely used so as not to limit the system into a particular organization. Once a local map is given, an automated map will be ready to use in the mobile device to interact with Global Positioning System (GPS) and mapping service API (Bing Map) features. The paper describes the instrument and component of the key design of the system. The feasibility of the architecture has been evaluated with Window Phone 7 (HTC HD7) within the campus. A well-known optimal shortest path algorithm, Dijkstra, is used to find the local route. In addition, especially for a large number of nodes or bus-stops, a heuristic method based on Dijkstra is proposed when a particular route needs to be recalculated, and the performance evaluation results comparatively show the substantial reduction of computational time with a slight increase of path cost.

pp. 407-411

11:40 Performance Enhancement of SAC-OCDMA System Using Modified-AND Subtraction Detection

Hamza Mohammed Ridha Al-Khafaji (University Malaysia Perlis & School of Computer and Communication Engineering, Malaysia); Syed Alwee Aljunid (Universiti Malaysia Perlis, Malaysia); Hilal A. Fadhil (University Malaysia Perlis, Malaysia)

Technology is already on the move towards exploiting the limits of the fiber's physical properties and more sophisticated techniques will be needed to increase the throughput and counteract the transmission impairments. In this paper, we present a new detection technique called the modified-AND subtraction detection for spectral-amplitude coding optical code-division multiple access (SAC-OCDMA) systems. This detection technique is based upon decreasing the received signal strength to the decoder's branches by dividing the weight of the utilized code sequence. The new technique is capable of mitigating the intensity and shot noise impacts, as well as eliminating the multiple access interference (MAI) influence. We simulate the system performance of the proposed detection technique using OptiSystem 9.0 software. The entire practical effects of fiber nonlinearities, dispersion and attenuation were considered in the simulation of SAC-OCDMA system. Based on modified double-weight (MDW) code, the simulation results revealed that the modified-AND subtraction detection improves SAC-OCDMA system performance significantly compared to the conventional AND subtraction detection.

pp. 412-415

12:00 Web-based Automatic Network Discovery/Map Systems

Chakchai So-In (Khon Kaen University, Thailand); Chinnakorn Netphakdee (Khon Kaen University, Thailand); Kasidit Wijitsopon (Khon Kaen University, Thailand); Chavalit Panichayanubal (Khon Kaen University, Thailand); Pusadee Seresangtakul (Khon Kaen University, Thailand)

This paper introduces a new automatic network discovery/map system via Web architecture, the so-called Web-based Automatic Network discovery/Map Systems (WANMS). The system functions as a plug-in for a well-known network management system, Cacti. Enriched features, especially the automatic networking discovery and map module, have been added in order to enhance the efficiency of Cacti embedded with a weather map plug-in. With user defined-pattern functions, the discovery process recognizes a proper type of networking devices. The discovery process generates XML-based information so that a graph visualization using jQuery via HTML5 can generate a simplified network map using a force-directed layout technique. WANMS is easy-to-use and less complicated, and so lessening the discovery time. In particular, for performance comparison with OpenMMS and DNMA, WANMS outperforms others in several perspectives, i.e., faster convergence, better coverage, and more details of types of networking devices. The system is presently used at the department of Information Technology, Provincial Police Region 4, Thailand.

pp. 416-421

12:20 Weighted QoS Admission Control for IEEE802.16j WiMAX Network

Mohd Dani Baba (Universiti Teknologi MARA, Malaysia); Rohaiza Yusoff (Universiti Teknologi MARA, Malaysia)

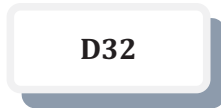
Scheduler is one of the most crucial key factors in delivering best quality in WiMAX (Worldwide Interoperability for Microwave Access). While the technology advances to meet the demand, Mobile Multi-hop Relay (MMR) WiMAX was introduced. This paper discusses the scheduler technique specifically for admission control for real-time Polling Service (rtPS). Simulation studies was done using NCTUns module with weighted QoS method. The result shows the proposed algorithm is capable to increase the number of subscriber being served and minimize radio resources wastage.

pp. 422-426

12:40 The Effects of Cognitive Styles on Web Portal Acceptance

Raja Suzana Raja Kasim (Universiti Teknologi Mara Puncak Alam Campus, Malaysia); Annurizal Anuar (Universiti Teknologi MARA, Malaysia)

This paper attempts to bring forward the idea of the role of cognitive styles in Universiti Teknologi MARA (UiTM) I-Staff portal acceptance and usage. The study examines the role of cognitive styles and the latest technology acceptance model (Unified Theory of acceptance and Use of Technology, UTAUT) variables and predicts the role of cognitive styles in influencing the usage of I-Staff portal. A stratified random sampling method was used in this study and 100 respondents who participated were the academician and non-academician staff in UiTM Pahang. An integrated theoretical framework from information system (UTAUT), and psychology (Cognitive Styles) was used as basis for this study. Besides, findings from this study helped to identify several salient categories that affect the UTAUT variables.
pp. 427-431



Signal & Image Processing 1 (cont)

Time: 11:00AM - 1:00PM **Chair: Othman Sidek (Universiti Sains Malaysia, Engineering Campus, Malaysia), Nor'aini Abdul Jalil (Universiti Teknologi MARA, Malaysia)**
Room: LAWANG

11:00 Intermediate Layer Optimization of HMAX Model for Face Recognition

Morteza Eliasi (Islamic Azad University, Qaemshahr Branch, Iran); Zohreh Yaghoubi (Islamic Azad University, Qazvin Branch, Iran); Ardalan Eliasi (Islamic Azad University, Qaemshahr Branch, Iran)

In this paper, we describe a quantitative model that accounts for the circuits and computations of the feed-forward path of the ventral stream of visual cortex. This model is consistent with a general theory of visual processing that extends the hierarchical model from primary to extrastriate visual areas. We implemented the Modified HMAX method, which has learning ability from C1 to S2 layer, and in order to S2 layer features optimization, we applied two clustering methods such as K-Means and Sequential Backward feature selection. After feature extraction, we used the K-nearest neighbor (KNN) and support vector machine (SVM) as classifiers. Experimental results have shown that applying the Sequential Backward feature selection in learning stage obtain higher recognition rate. The ORL database is exploited to test our approach. The experimental results showed the effectiveness of the system in terms of the recognition rate.
pp. 432-436

11:20 Gradient-based Space Filling Curves: Application to Lossless Image Compression

Tarek Ouni (National Ingeneering School of Sfax (Tunisia), Tunisia)

Most conventional lossless image compression schemes such as GIF and PNG use entropic coding to reduce redundancies that results in adjacent pixels correlation. In such schemes, images are scanned line by line, and so, only horizontal patterns are effectively compressed. The proposed approach attempts to more explore image correlation in different direction by adopting a context based scanning process. An image is scanned along a space filling curve (SFC) so as to exploit inherent coherence in the image. The used SFC is determined by a gradient based method allowing the detection pixel's change direction. The resulting one-dimensional representation of the image should have improved auto-correlation compared with universal scans. Combined with conventional lossless image compression techniques such as GIF and PNG, the proposed scan shows significant compression efficiency improvement. The new algorithm used for SFC determination is presented and it is used as an input to conventional coding scheme.
pp. 437-442

11:40 UAV-Based Stereo Vision for Photogrammetric Survey in Aerial Terrain Mapping

Khairul Nizam Tahar (Universiti Teknologi Malaysia & Faculty of Geoinformation & Real Estate, Malaysia); Anuar Ahmad (Universiti Teknologi Malaysia, Malaysia); Wan Abdul Aziz Wan Mohd Akib (Universiti Teknologi Malaysia, Malaysia)

Recently, Unmanned Aerial Vehicle (UAV) technology is become more useful to solve problems in many applications. The aim of this study is to investigate the use of light weight rotary-wing UAV for mapping simulation model. The objective of this study is to determine the accuracy of the photogrammetric output produced from this study. Rotor-wing units unlike fixed-wing units, it is because rotor-wing units are more stable and able to capture images easily. It is allowing remote control UAV to be practice in environment and urban mapping. In the simulation model, ground control points (GCP) and checked point (CP) were established using total station. The GCP is used in the photogrammetric processes to produce photogrammetric output while the CP is used for accuracy assessment. A Nikon Coolpix consumer digital camera was used in image acquisition of the simulation model, and two methods were used. In the first method, the camera was mounted vertically in a rotary-wing UAV and captured the images at an altitude. In the second method, the camera is mounted vertically at a fixed height. The acquired images will be processed using image processing photogrammetric software for production of orthophoto and digital

elevation model of the simulation model. From this study, it was found that root mean square errors for fixed platform are +0.0022, +0.0014, +0.2144 for coordinate x, y and z respectively while the root mean square errors for mobile platform are +0.0022, +0.0015, +0.2227 for coordinate x, y and z respectively. It can be concluded that the differences between the mobile and fixed platforms are small. In conclusion, UAV system can be used for large scale mapping for aerial terrain mapping.

pp. 443-447

12:00 Robust Biometric Authentication Based on Feature Extracted From Visual Ventral Stream

Zohreh Yaghoubi (Islamic Azad University, Qazvin Branch, Iran); Morteza Eliasi (Islamic Azad University, Qaemshahr Branch, Iran); Ardalan Eliasi (Islamic Azad University, Qaemshahr Branch, Iran)

In this Paper, We use a set of the applicability features inspired by the visual Cortex. Each element of this set is a complex feature obtained by combining position- and scale-tolerant edge-detectors over neighboring positions and multiple orientations. Two standard classifiers KNN and SVM are then trained over a training set and then compared over a separate test set. A multimodal biometric system consolidates the evidence presented by multiple biometric sources and typically provides better recognition performance compared to systems based on a single biometric modality. So we use combination of Face, Ear and Palm characteristic to individual's authentication. In fusion stage we use matching-score level. Experimental results showed 96% accuracy rate on ORL Face database and 94% accuracy rate on USTB Ear database and 96.6% accuracy rate on POLYU Palm database; however we achieve 100% accuracy rate on multimodal biometric.

pp. 448-452

12:20 Digital Images Watermarking Robust to Print & Scan for Electronic Evidence

Ardalan Eliasi (Islamic Azad University, Qaemshahr Branch, Iran); Zohreh Yaghoubi (Islamic Azad University, Qazvin Branch, Iran); Morteza Eliasi (Islamic Azad University, Qaemshahr Branch, Iran)

In this paper, we explore the property of pixel value distortion and present a watermarking scheme robust to this distortion. From the investigation on the noise property of the print-and-scan process, we find that the smooth blocks get less distorted during this process. Watermark embedded in these blocks is probably more robust to the print-and-scan distortion. However, protecting the texture blocks from distortion is also necessary because the watermark extractor within this blind watermarking scheme also uses these texture blocks. For this reason, we design the noise adding operation to compensate the print-and-scan distortion to the texture blocks. In addition, the watermark extractor also affects the whole system performance, so we use the multiple-vote operation to enhance the robustness of water extractor. The rules of the multiple-vote operation are specially designed based on the property of the print-and-scan distortion.

pp. 453-458

12:40 Implementation of IEEE 802.15.4-Based OQPSK-Pulse-Shaping Block on FPGA

Rafidah Ahmad (Universiti Sains Malaysia & Collaborative MicroElectronic Design Excellence Centre (CEDEC), Malaysia); Othman Sidek (Universiti Sains Malaysia, Engineering Campus, Malaysia); Wan Mohd Hafizi Wan Hassin (Universiti Sains Malaysia, Malaysia); Shukri B. Korakkottil Kunhi Mohd (Universiti Sains Malaysia, Malaysia)

This paper describes implementation of an offset quadrature phase shift keying (OQPSK)-pulse-shaping block as a part of digital transmitter. The implementation is based on 2.4 GHz-band IEEE 802.15.4 standard. In this paper, the implementation results are compared to the results of OQPSK modulator and pulse-shaping block in terms of simulation waveform, design size, and synthesis run time. These blocks were designed using Verilog code through Xilinx ISE as a new design method and been implemented on Spartan3E XC3S500E field programmable gate array (FPGA). Current review shows that configurations for the implementation of OQPSK-pulse-shaping block, require 26.4% slices, 22.9% sliced flip-flops, and 15.5% look-up tables (LUTs), which is much better than the results of OQPSK modulator and pulse-shaping block. At clock frequency of 2 MHz and 25 MHz, the synthesis run time for OQPSK-pulse-shaping block shows substantial improvement with 48 ns faster than the two blocks.

pp. 459-464



E32

Computer Applications & Software Engineering (cont)

Time: 11:00AM - 1:00PM
Room: PALA

Chair: Ihsan M. Yassin (Universiti Teknologi Mara, Malaysia), Itaza Afiani Mohtar (Universiti Teknologi Mara Perak, Malaysia)

11:00 Evaluating Documenting Techniques on Frameworks of Object-Oriented Code

Sin-Ban Ho (Multimedia University, Malaysia); Ian Chai (Multimedia University, Malaysia); Chui-Hong Tan (Multimedia University, Malaysia)

This research work empirically investigated different documentation philosophies for effective transfer of knowledge in teaching new framework users. Six controlled experiments were set up to compare the various documentation philosophies, namely patterns-style, minimalist and extended javadoc (Jdoc) documentation. These knowledge transfer strategies and tests were evaluated within two different frameworks. Subjects' exercises were used to gather data, the results from which were used to formulate guidelines for effective framework documentation. The discoveries in this paper were two fold. First, the statistical analyses such as univariate analyses of variance show that the effect and impact of the various documentation strategies are different. Second, different effectiveness of the patterns-style when applied to different frameworks was discovered. The formulated guidelines will be used to serve as an important roadmap for instructors who wish to integrate framework documentation into their teaching and learning environments. Different documentation philosophies are better for different goals. For a simple task, use minimalist documentation. For a much more complex problem, the empirical results suggest using patterns-style documentation.

pp. 465-470

11:24 SynchSPEM: A Synchronization Metamodel Between Activities and Products Within a SPEM-based Software Development Process

Amal Rochd (University of Cadi Ayyad, Morocco); Maria Zrikem (Cadi Ayyad University, Morocco); Abderrahmane Ayadi (Cadi Ayyad University, Morocco); Millan Thierry (Institut de Recherche en Informatique de Toulouse, Université de Toulouse, France); Christian Percebois (Institut de Recherche en Informatique de Toulouse, Université de Toulouse, France); Claude Baron (LAAS-CNRS, France)

The Software Process Engineering Metamodel (SPEM) is used to define and describe software development processes and their components. This metamodel contains three main entities: roles, activities and products. Our goal is to ensure synchronization between activities and products of a software development process in order that one of the two entities will be notified and adapted in accordance with the changes of the other. This paper presents an overview of SPEM, and reviews its implementations. A metamodel based on SPEM 2.0 is then proposed to synchronize activities and products within a software development process.

pp. 471-476

11:48 Towards a Synchronization Model Between Activities and Products Within a Software Development Process

Amal Rochd (University of Cadi Ayyad, Morocco); Maria Zrikem (Cadi Ayyad University, Morocco); Abderrahmane Ayadi (Cadi Ayyad University, Morocco); Christian Percebois (Institut de Recherche en Informatique de Toulouse, Université de Toulouse, France); Millan Thierry (Institut de Recherche en Informatique de Toulouse, Université de Toulouse, France); Claude Baron (LAAS-CNRS, France)

Mastering the development processes is a major challenge for companies, given the increasing complexity of systems and technological development of this field. Besides roles, a development process consists of a set of activities and products which are interdependent. This mutual dependency between the two entities implies that if one of them undergoes a change or an evolution, the other must also be adjusted in accordance. Our objective is then to study the impact of a change, that occurs on the product side, on the activity side, and vice-versa, so that these two entities are in synchronization, and overall consistency in case of evolution. For that purpose, we propose a synchronization model between objects whose states evolve separately and share data. The model is based on the paradigm Publish/Subscribe coupled to an event driven architecture.

pp. 477-482

12:12 Approach of a UML Profile for Berkeley Open Infrastructure for Network Computing (BOINC)

Christian Benjamin Ries (University of Applied Sciences Bielefeld, Germany); Christian Schröder (University of Applied Sciences Bielefeld, Germany); Vic Grout (Glyndwr University, Wales, United Kingdom)

Despite the current enormous hype and popularity of Grid Computing environments like Amazons EC2 or Microsoft's Windows Azure, there exist open-source and free of cost software frameworks which allow to create high performance computing installation by means of Public Resource Computing (PRC). One PRC framework is BOINC (Berkeley Open Infrastructure for Network Computing) for solving large scale and complex computational problems. Each computer works on its own workunits independently from each other and sends back its result to a project server. Installing, configuring, and maintaining a BOINC based project however is a highly sophisticated task. Scientists and developers need a lot of experience regarding the underlying communication and operating system technologies, even if only a handful of BOINC related functions are actually needed for most applications. In this paper we present a Unified Modeling Language (UML) profile for BOINC called Visu@IGrid profile (VGP). A BOINC project installation for one or more hosts, a role-based access control, and modeling of scientific application is feasible by use of VGP. Based on our approach we provide a specification that allows the creation of BOINC projects with less development and implementation effort.

pp. 483-488

12:36 Extracting Specific Categories of Text Documents Using Ontology

Hamideh Hajiabadi (Birjand University of Technology, Iran); Moin Hajiabadi (Birjand University, Iran); Amir Tabaraie (Islamic Azad University, Iran)

Extracting category of web application is important in sharing and organizing information and also is valuable in some search engines. There are numerous resources available on the web that are needed to be categorized efficiently for more practices. But the number of tools which automatically extract the categories of web applications are limited. This paper proposes a novel technique to automatically extract categories of web applications using ontology, then a case study is developed and the results are explained.
pp. 489-491

12:50 Bandwidth Widening Strategies for Piezoelectric Based Energy Harvesting From Ambient Vibration Sources

Swee Leong Kok (Universiti Teknikal Malaysia Melaka, Malaysia)

Due to the fact that the ambient vibration sources are random and unpredictable, therefore a vibration based energy harvesting device is desirable to be able to operate at wider bandwidth in an envelop of frequency range to generate maximum electrical output. In this paper, various ambient vibration from household appliances, machineries, vehicle and moving vehicle were measured and investigated. The second part of the paper will discuss the strategies to harvest these ambient vibration sources. An array of piezoelectric multi-cantilever is proposed to address the issue of single piezoelectric cantilever with high Q-factor. Two configurations of multi-cantilever were fabricated in a form that elevated from the substrate as free-standing structures. One having six cantilevers of constant width but different lengths and another having five cantilevers of constant length but different widths. The measurement and experimental results show a frequency band of 200 Hz to 300 Hz as a common bandwidth between the vibration sources and the capability of miniature piezoelectric energy harvester in harvesting maximum electrical energy.
pp. 492-496



Communications & Computers

Time: 2:00PM - 3:40PM
Room: JINTAN

**Chair: Ruhani Ab. Rahman (Universiti Teknologi MARA, Malaysia),
Norakmar Arbain @ Sulaiman (Universiti Teknologi MARA & Faculty
of Electrical Engineering, Malaysia)**

2:00 Throughput Enhancement of the Prioritized Flow in Self Aware MANET Based on Neighborhood Node Distances

Kiran Manjappa (National Institute of Technology - Karnataka, India); Ram Mohana Reddy Guddeti (NITK, Surathkal, India)

Mobility causes frequent link failures in ad hoc network resulting in packet losses. Another cause of packet loss is collision which MANET misinterprets as link failure and triggers route maintenance phase. Triggering of this unnecessary route maintenance phase adds extra overhead to the network resulting in low throughput. In this paper a QoS aware cross layer model is proposed to improve the throughput of the prioritized flow in Self Aware MANET. According to the distance of the target node from the sending node, which is found using received signal strength, packets are treated differently in lower layers by dynamically adjusting the RTS retry limit based on the priority of the flow. Changes are made in the routing and MAC layer protocol to achieve the desired goal. The simulation is done in ns-2 and the proposed model is compared with the traditional protocols. The results show that the prioritized flow achieves higher throughput than the unprioritized flow when compared to traditional protocols. Further the proposed method also avoids unnecessary route re-discovery attempts by finding the root cause of the packet drop based on the distance between the nodes thereby reducing the network load.
pp. 497-502

2:20 Designing A Hybrid System Model for Information Dissemination in Vehicular Ad Hoc Networks

Masood Rehman (UTP, Pakistan); Halabi Hasbullah (Universiti Teknologi PETRONAS, Malaysia); Irshad Sumra (Universiti Teknologi Petronas, Malaysia)

From industrial applied research perspective, Data Routing in wireless vehicular communications is attaining increased attention. One of the emerging challenges in vehicular communications is robust message dissemination as this is the indispensable requirement for various VANET applications. Message delivery ratio, transmission delay, and packet communication overhead are some key factors which are affected by the message dissemination. This paper presents a conceptual model for information dissemination in VANETs. The main goal of our work is to optimize the routing performances by calculating the most stable link and by optimally adjusting the weight of three key selection parameters. The consideration of higher value of weight function for each vehicle, link stability and life time of sending link will be helpful in improving the performance of this model. The simulations for this model confirm our assumptions in terms of better delivery ratio and reduction of end to end delay.
pp. 503-508

2:40 Enhanced Fast DOA Algorithm Through Shrinking Signal Subspace and Noise Pseudo Eigenvector Using Forward-backward Method

Ferdousul A.S.M. Haque (North South University, Bangladesh); Khan Reaz (North South University, Bangladesh); Mohammad A Matin (North South University, Bangladesh)

The efficiency of the smart antennas greatly relies on the correctness and quickness of direction of arrival (DOA) estimation. This paper provides an enhanced approach for estimating direction of arrival through shrinking signal subspace and noise pseudo eigenvector using forward-backward method for real-time applications in non-stationary environment. Our proposed algorithm gives enhanced performance than Kim's method in terms of resolution by detecting uncorrelated and coherent signal simultaneously. The proposed algorithm does not require prior knowledge of incoming signal and formation of covariance matrix. Thus it reduces computational complexity in comparison to other algorithms. The simulation shows that our proposed technique has improved the performance in terms of single snap shot and can be applied in real-time application for non-stationary sources.
pp. 509-513

3:00 Dynamic Vehicle Navigation: An 'A*' Algorithm Based Approach Using Traffic and Road Information

Adnan Shahzada (University of Central Punjab, Pakistan); Kalid Askar (Webperfect, Pakistan)

In this paper a navigation system for mobile phones is proposed that optimizes vehicle routing using road and traffic information to avoid traffic congestion. Congestion causes inefficiency of transportation infrastructure and increase the total travel time. It also raises the level of air pollution, and fuel consumption and hence damages the environment. The current location of the car or the user is tracked by GPS enabled phone and the system then checks the database for any road constructions, car accidents or other incidents that driver should avoid in his vicinity. The proposed system also suggests a possible re-route to the destination by calculating the shortest path through A* algorithm excluding the point of traffic jams. Apart from facilitating the user, this location based personalized service will also increase the data usage of the mobile user and hence, lends a great support to the telecom operators.
pp. 514-518

3:20 An Analysis of Uplink Transmit Power for Indoor and Outdoor Locations in WCDMA

Muhammad Ibrahim (Universiti Teknologi MARA, Malaysia); Murizah Kassim (Universiti Teknologi MARA, Malaysia); Ruhani Ab. Rahman (Universiti Teknologi MARA, Malaysia); Mohd Zafran Abdul Aziz (Universiti Teknologi MARA, Malaysia)

This paper presents an empirical investigation into Wideband Code Division Multiple Access (WCDMA) uplink transmits power for indoor and outdoor locations. This research has specifically measured and analyzed the uplink transmit power in different locations and specific time and locations based on current network data. The transmit power will analyze for each locations. TEMS Investigation which is the industry-leading tool for wireless network troubleshooting is used for the measurement and analyzing steps. The scope of this research is divided into 2 sections. Firstly, get the data from the drive test. Then the data is analyzed according to the measurement result. Data also is compared with the theoretical data. The results present in this research can be used to optimize a WCDMA handset design for the Universal Mobile Telecommunications System (UMTS) network and also predicting battery life and examining WCDMA coverage.
pp. 519-528



Time: 2:00PM - 3:40PM **Chair: Shuria Saaidin (Universiti Teknologi MARA, Malaysia),**
Room: LAWANG **Wahidah Mansor (Universiti Teknologi MARA, Malaysia)**

2:00 Quantitative Analysis of the Effects Queuing Has on a CCID3 Controlled DCCP Flow

Daniel Wilson (Murdoch University, Australia); Michael Dixon (Murdoch University, Australia); Terry Koziniec (Murdoch University, Australia)

While the Data Congestion Control Protocol (DCCP) shows much promise at becoming a protocol of choice for real-time applications in the future, there are relatively speaking, only a small number of academic papers purporting to its performance and its various nuances. This paper will describe the effects queuing and in particular queue sizes have on DCCP when CCID3 is selected as the congestion control mechanism. From results obtained through the experimentation described in this paper, a clear trade-off between packet loss rates and packet latency values was found to occur when different queue sizes were employed on the experimental network. It was found that employing small fixed sized queues on the network led to lower packet latencies but higher volumes of packet loss as a result of the queue size reaching its maximum threshold more frequently. Alternatively when large queue sizes were used, the number of packet loss events reduced significantly however, packet latency values increased. In addition to showing this impending trade-off empirically, this paper describes ways in which this phenomenon could potentially be exploited to allow DCCP to offer applications with a more tailored form of transportation protocol based on their particular needs
pp. 529-534

2:20 An Analysis of EEG Signal Generated From Grasping and Writing

Che Wan Nurul Fatimah Che Wan Fadzal (Universiti Teknologi Mara, Malaysia); Wahidah Mansor (Universiti Teknologi MARA, Malaysia); Lee Yoot Khuan (Universiti Teknologi MARA, Malaysia)

Electroencephalogram consists of hand movement information that can be extracted using suitable digital signal processing techniques. In this study, the EEG signals generated from hand grasping and writing were recorded from 4 channels; C3, C4, P3 and P4 and filtered using band pass filter with frequency range of 8 Hz until 30 Hz. The signal was then analysed using Fast Fourier Transform. Analysis of EEG signals showed that both hand grasping and writing produced signals with beta frequency.
pp. 535-537

2:40 Some Remarks on Selected Image Analysis Problems Using Multivariate Statistical Methods

Norliza Mohd Noor (Universiti Teknologi Malaysia, Malaysia); Omar M Rijal (University of Malaya, Malaysia)

The task of making inferences from a digital image frequently revolves around the ability to use multi-dimensional data or feature vectors optimally. This paper proposes directions in the handling of feature vectors with multivariate statistical methods with illustrations from three areas of applications. Experience shows that wherever possible, the lowest dimension of the feature vector is preferred since this increases the chance of deriving appropriate probability distributions for optimal inference. When the dimension of the feature vector is large, dimension reducing techniques should be considered. This paper shows that optimal statistical inference may be achieved if dimensions, probability distributions, relationship between variables and possibly outliers are simultaneously considered.
pp. 538-542

3:00 An Online System to Support Collaborative Knowledge Acquisition for Ontology Development

Norliza Zaini (Universiti Teknologi Mara, Malaysia); Hasmila Akmar Omar (Universiti Teknologi Mara, Malaysia)

Ontology development is an important practice required in any knowledge engineering process. Before knowledge can be integrated and put into good use by computer applications, knowledge acquisition and modeling has to be done. This signifies the adoption of ontology; which is defined as conceptualization or formal specifications of a domain; as the core framework for a knowledge-based system. For faster ontology development process, it is normally done in a collaborative manner and the challenge of having an environment that supports collaborative work is manifold. This includes the challenge of forming a collaborative procedure in acquiring and modeling the knowledge, allocating a platform that is accessible to geographical distributed parties and to handle update conflicts during the development. This paper presents a system in supporting initial collaborative ontology development works between ontology developers without requiring the presence of domain experts, aiming at accelerating the ontology development process. This system is designed in such a way that it incorporates and formalizes a novel collaborative knowledge acquisition and modeling procedure.
pp. 543-548

3:20 Performance Analysis of MSK and MSK-OFDM in Nakagami-m Channel

Chempaka Mohd Din (Universiti Teknologi MARA, Malaysia); Roslina Mohamad (University Teknologi Mara, Malaysia); Wahidah Mansor (Universiti Teknologi MARA, Malaysia)

This paper discusses the BER performance of MSK-OFDM in Nakagami-m channel model by considering ideal MSK. The performance comparison between MSK and MSK-OFDM has also been evaluated. FFT size of 512 and 256 sub-carriers is used with zero padded is chosen as a guard band at the shape factor $m=1$. From the simulation results, the BER performance for MSK and MSK-OFDM in Nakagami-m channel for both FFT size follow the same trends as in theory but there are some fluctuations caused by interference in MSK-OFDM.
pp. 549-552



Software Engineering & Secure Systems

Time: 2:00PM - 3:40PM
Room: PALA

Chair: Norliza Zaini (Universiti Teknologi Mara, Malaysia), Yusrani Mohd Yussoff (University Teknologi MARA, Malaysia)

2:00 Dynamic Load Balancing of Large-Scale Distributed Association Rule Mining

Raja Tlili (Faculty of Sciences of Tunisia, Tunisia); Yahya Slimani (University of Tunis, Tunisia)

The focus of this paper is to propose a dynamic load balancing strategy for parallel association rule mining algorithms in the context of a Grid computing environment. This strategy is built upon a distributed model which necessitates small overheads in the communication costs for load updates and for both data and work transfers. It also supports the heterogeneity of the system and it is fault tolerant.
pp. 553-558

2:20 Integrated Soft Computing for Intrusion Detection on Computer Network Security

Sirikanjana Pilabutr (Nakhon Ratchasima College, Thailand); Preecha Somwang (Mahanakorn University of Technology, Thailand)

Computer network security is very importance for all business sectors. The Intrusion Detection Systems (IDS) is one technique that prevents an information system from a computer networks attacker. The IDS is able to detect behavior of new attacker which is indicated both correct Detection Rate and False Alarm Rate. This paper presents the new intrusion detection technique that applied hybrid of unsupervised/supervised learning scheme. To combine between the Independent Component Analyses (ICA) and the Support Vector Machine (SVM) are the advantage of these new IDS. The benefit of the ICA is to separate these independent components from the monitored variables. And the SVM is able to classify a different groups of data such as normal or anomalous. As the results, the new IDS are able to improve the performance of anomaly intrusion detection and intrusion detection.
pp. 559-563

2:40 An Anomaly-based Botnet Detection Approach for Identifying Stealthy Botnets

Sajjad Arshad (Shahid Beheshti University, Iran); Maghsoud Abbaspour (Shahid Beheshti University, Iran); Mehdi Kharrazi (Sharif, Iran); Hooman Sanatkar (Shahid Beheshti University, Iran)

Botnets (networks of compromised computers) are often used for malicious activities such as spam, click fraud, identity theft, phishing, and distributed denial of service (DDoS) attacks. Most of previous researches have introduced fully or partially signature-based botnet detection approaches. In this paper, we propose a fully anomaly-based approach that requires no a priori knowledge of bot signatures, botnet C&C protocols, and C&C server addresses. We start from inherent characteristics of botnets. Bots connect to the C&C channel and execute the received commands. Bots belonging to the same botnet receive the same commands that causes them having similar netflows characteristics and performing same attacks. Our method clusters bots with similar netflows and attacks in different time windows and perform correlation to identify bot infected hosts. We have developed a prototype system and evaluated it with real-world traces including normal traffic and several real-world botnet traces. The results show that our approach has high detection accuracy and low false positive.
pp. 564-569

3:00 Attestation with Trusted Configuration Machine

Mazalan Lucyantie (Universiti Teknologi MARA, Malaysia)

Remote attestation of system integrity is an important part of trusted computing for building and improving trustworthiness in network environment. There are many attestation techniques was introduced in order to vouch the accuracy of the information and protecting the privacy of the host platform. Due to that, we propose an enhanced integrity measurement approach based on white list foundation which can generate integrity proof for remote parties. Since existing implementation of remote attestation is not focusing on Endorsement Key certificate, we proposed the mechanism to handle the generation and verification of this certificate. These approaches we realize by proposing the framework in trusted environment, hence gain the high confidence in client-server system integrity.
pp. 570-573

3:20 Semantic-based Bayesian Network to Determine Correlation Between Binaural-beats Features and Entrainment Effects

Norliza Zaini (Universiti Teknologi Mara, Malaysia); Hasmila Akmar Omar (Universiti Teknologi Mara, Malaysia); Mohd Fuad Abdul Latip (Universiti Teknologi MARA, Malaysia)

In coping with hectic everyday lives, people have tried many different ways to reduce stress and depression. Such effort has also lead to meditation practice, which is believed and proven able to help. While meditation is beneficial, for some people, meditation is just hard to perform. These people may switch to other alternatives that give the same effects as meditation, such as through binaural beats entrainment. Many studies on brainwave entrainment have demonstrated that the brain responds by synchronizing its own electrical cycles to the same rhythm of the stimulating binaural-beats audio. The results of binaural beats entrainment towards the brainwave can be determined by monitoring the EEG readings, which can be analyzed to capture the altered brainwave patterns and qualities they exhibit. In relation to the monitoring process, our work focuses on capturing and analyzing the correlations between different binaural beats features to resulting EEG and perceived mental states. A general methodology is presented while detailing further on the proposed Semantic-based Bayesian Network Engine, which is the core mechanism employed in capturing the correlations. This novel approach is proposed firstly due to the well-known capability of Bayesian Network in modeling the elements of causal and effects. Secondly, with the introduction of semantic notion, the engine is enhanced even more for allowing dynamic-construction of Bayesian Network based on its semantics.
pp. 574-579



Communications & Computers (cont)

Time: 4:00pM - 5:40PM Chair:
Room: JINTAN

4:00 Calculation the Dissipation Factor of Power Transformors Insulation System Using Genetic Algorithm

Amidedin Mousavi (Sama Technical and Vocational Training College, Islamic Azad University, Zanjan Branch, Iran); Samane Hajilu (Payam Nour Zanjan, Iran); Homeira Kaboudvand (Payam Nour Zanjan, Iran); Sanaz Sabaifard (Payam nour Zanjan, Iran); Narges Amini (Payam Nour Zanjan, Iran); Elham Hasani (Payam Nour Zanjan, Iran)

Dielectric properties of power transformer system change during its operation. Therefore, transformers should necessarily be measured to detect their aging. Nowadays there are some experiments for identifying status of paper-oil insulation in transformers and they are done in time and frequency domains. This article investigates relationship between time and frequency domain experiments and shows these two experiments are well correlated. Using polarization and depolarization current method (PDC) which it belongs to time domain and estimating parameters of insulation model by genetic algorithm leads to plot dissipation factor in term of frequency.
pp. 580-584

4:24 Malaysian Internet Surfing Addiction (MISA): Factors Affecting the Internet Use and Its Consequences

Siow Ling Choo (Universiti Sains Malaysia, Malaysia); Sureswaran Ramadass (, Malaysia); Altyeb Altaher (Universiti Sains Malaysia & National Advanced IPv6 Center, Malaysia); Navaneethan C. Arjuman (Universiti Sains Malaysia, Malaysia)

Internet addiction provoked as a serious mental health issue in the recent decade. In the recent times, Internet addiction had become a global concern to the human society. As the electronic world has become more and more common to the young, younger generations are alleged to be susceptible to the risk of Internet addiction. This

research outlines a method to examine the addictive level to the Malaysians Internet surfing. The purpose of our study is to identify the Internet use among Malaysians and the relation of excessive use to the addictive level. We propose and devise an online survey to study the Internet use among the younger generations. The questionnaire consists of five subsections; such as the relevant demographic questions, the diagnosis of the Internet addiction level, related questions on the Internet surfing behavior, the reasons of excessive Internet usage, and the consequences of the addictive behavior. Participants of the online survey were selected randomly from Malaysia, ranging from the age of 7-year old to the age of 30-year old. We found that the Internet use of the younger generations was susceptible to the Internet addiction. The findings reflect that younger generations are vulnerable to the fantasized world.

pp. 585-590

4:48 CRS: Registration Extension of the OpenConfTM Conference Management System

Ihsan M. Yassin (Universiti Teknologi Mara, Malaysia); Aiman Johari (Universiti Teknologi Mara, Malaysia); Hasliza Abu Hassan (Universiti Industri Selangor, Malaysia); Azlee Zabidi (Universiti Teknologi MARA, Malaysia); Yuslinda Wati Mohamad Yusof (Universiti Teknologi MARA, Malaysia)

Academic conferences provide a social platform for participants to present, learn and discuss about new and interesting findings of their research. Management of these conferences typically utilizes Conference Management Systems (CMSs) to simplify its management. However, most CMSs lack the registration function, which is a key component apart from the submission and review process. We describe modifications of the popular OpenConfTM CMS to include participant registrations and payment acceptance. The process involves adding several new tables to the existing database structure, as well as to develop the new interface for the added functionality. The modifications are detailed in this paper.

pp. 591-596

5:12 Comparison Between GVF Snake and ED Snake in Segmenting Microcalcifications

Siti Salmah Yasiran (Universiti Teknologi Mara, Malaysia); Mazani Manaf (University Teknologi MARA, Malaysia); Arsmah Ibrahim (University Teknologi MARA, Malaysia); Wan Eny Zarina W.A. Rahman (University Teknologi MARA, Malaysia); Rozi Mahmud (Universiti Putra Malaysia, Malaysia); Abdul Kadir Jumaat (University Teknologi MARA, Malaysia); Aminah Malek (UiTM, Malaysia)

Snake, active contour or deformable active contour has been widely used in medical image segmentation area. In this paper, comparison between Gradient Vector Flow (GVF) snake and Enhanced Distance (ED) snake in segmenting microcalcifications is carried out. The performance is measured based on actual area of the average percentage area difference traced by expert radiologists. Results obtained shows that the values of average percentage difference for the GVF and ED snake are 4.3% and 6.68% respectively. These results indicate that the GVF snake has better performance with 95.7%.

pp. 597-601

5:36 Biometric Authentication for Securing Life Cycle Management of Electronic Patient Records

Mohd Idzwan Mohd Salleh (Universiti Teknologi MARA, Malaysia); Mohamad Rahimi Mohamad Rosman (Universiti Teknologi MARA, Malaysia); Raja Abdullah Raja Yaacob (MARA University of Technology Malaysia, Malaysia)

Biometrics has been increasingly utilized in the present situation by the numerous industries for strengthening the security access to any form of information system. From the benefits offered despite reducing the problems of security breaches those in network, theft or fraud, there is a necessity for embedding biometric authentication into traditional medical records systems. As a new approach of converting paper-based to electronic, more secure authentication and verification functions provided by biometrics may permit the medical practitioners to access, consult and update patients' medical information via their desktop, laptop or palmtop PCs from multiple locations simultaneously. With a minimum cost, the paper highlighted the analysis and design of a system prototype equipped with fingerprint and online signature biometrics to secure life cycle management of electronic patient records toward attaining trusted records management and transparency of medical services.

pp. 602-606



Signal & Image Processing 2 (cont)

Time: 4:00PM - 5:40PM
Room: LAWANG

Chair: Norakmar Arbain @ Sulaiman (Universiti Teknologi MARA & Faculty of Electrical Engineering, Malaysia), Ruhani Ab. Rahman (Universiti Teknologi MARA, Malaysia)

4:00 Representation of *Elaeis Guineensis* Nutrition Deficiency Based on Image Processing Approach

Muhammad Asraf Hairuddin (Universiti Teknoogi Mara, Malaysia); Nooritawati Md Tahir (Universiti Teknologi MARA, Malaysia); Shah Rizam Mohd shah baki (Universiti Teknologi MARA, Malaysia)

Nutrient deficiencies are one of the common issues faced by *Elaeis Guineensis* or widely known as oil palm. Hence, in this paper, image processing technique is utilized to develop method that is able to represent symptoms of nutrient disease such as nitrogen, potassium and magnesium. Hence, algorithm is developed to process the captured images of the diseased leaves through image segmentation and feature extraction based on nonlinear spatial filtering, YCbCr colour and gray scale morphology method. Experimental results demonstrated that the developed algorithm is capable to represent nutrient deficiencies as visualized by expert vision.

pp. 607-611

4:20 Performance of Iris Recognition Using Low Resolution Iris Image for Attendance Monitoring

Teh Wei Hsiung (KDU College Penang, Malaysia); Shahrizat Shaik Mohamed (KDU College Penang, Malaysia)

The biometric identification system is one of the technology used in the recognition system. Iris recognition system is the most reliable system for an individual identification. Nowadays, many applications have been implemented with this feature such as the time attendance system for high security environment, hospitals, airports, government agencies, educational facilities, and etc. The conventional method applied on the security is not reliable such as the passwords may be forgotten or hacked and ID cards may be lost or forged. The main purpose of this project is to achieve good quality performance of iris recognition using low resolution image for attendance monitoring system. This project apply two existing methods which are Hough Transform and Daugman's Integro Differential Operator to identify the best technique of iris detection using low resolution image as input. The results show that these techniques capable to recognize the low resolution iris with the accuracy of 100% when applied Hough transform compared to the Daugman's Integro Differential Operator with only 86.88%.

pp. 612-617

4:40 Comparative Statistical-based and Color-related Pan Sharpening Algorithms for ASTER and RADARSAT SAR Satellite Data

Komeil Rokni (Universiti Teknologi Malaysia (UTM), Malaysia); Maged Marghany (Universiti Teknologi Malaysia, Malaysia); Mazlan Hashim (Prof, Malaysia); Sharifeh Hazini (Universiti Teknologi Malaysia (UTM), Malaysia)

In computer vision, multi-sensor image fusion is the process of combining relevant information from two or more images of a scene into a single composite image. The resulting image will be more informative than any of input images. In this study, the efficiency of different pixel-based Pan sharpening techniques for merging RADARSAT-1 SAR and ASTER-L1B data is investigated and compared. In doing so, two statistical-based techniques including the Gram-Schmidt and Principal Component transforms, and two color-related techniques including the Brovey and HSV transforms are applied to merge the satellite images. One of the major problems associated with data fusion techniques is how to assess the quality of the fused images. In this regard, several indicators such as the Relative Mean Difference (RMD), Relative Variation Difference (RVD), Root Mean Square Error (RMSE) and Spectral Quality Indices (SQI) are used to evaluate the performance of the fused images. Then the fusion techniques are ranked according to the conclusion of each indicator. The achieved results from the relative mean difference analysis indicated advantage of the PC and GS than the Brovey and HSV transform techniques. The results based on relative variation difference and root mean square error indicated superiority of the PC transform while the results of spectral quality indices showed advantage of the GS transform technique. The output of HSV transform indicated the worst result and disadvantage of this technique in all indicators. In conclusion, it can be said that the PC is the best, the GS is better, the Brovey is bad and the HSV is the worst technique for multi-sensor data fusion. Finally, all indicators indicated advantage of the statistical-based fusion techniques than the color-based to fuse the ASTER-L1B and RADARSAT-1 SAR data.

pp. 618-622

5:00 Anomalous Gait Detection Based on Support Vector Machine

Hany Hazfiza Manap (MARA University of Technology, Malaysia); Nooritawati Md Tahir (Universiti Teknologi MARA, Malaysia); Ihsan M. Yassin (Universiti Teknologi Mara, Malaysia)

Support Vector Machine is amongst the popular machine classifier due to its rigorous theory background and remarkable generalization performance. Hence, in this paper, the performance of SVM is evaluated to classify gait abnormalities due to Parkinson disease based on three kernels namely radial basis function, polynomial as well as linear. In addition, two types of normalization is applied to these gait data namely intra group norm and inter group norm. Initial findings showed that basic spatiotemporal parameters found to be the most significant features. Results also proven that intra group norm and RBF kernel are capable to be used in detecting anomaly gait pattern between normal and PD patients based on the accuracy rate attained.

pp. 623-626

5:20 Implementation of M-ary Phase Shift Keying (PSK) Baseband Modem on Texas Digital Signal Processor TMS320C6713

Norakmar Arbain @ Sulaiman (Universiti Teknologi MARA & Faculty of Electrical Engineering, Malaysia); Roslina Mohamad (University Teknologi Mara, Malaysia); Suul Nufus Ramlan (Universiti Teknologi MARA, Malaysia)

This paper presents the implementation of Phase Shift Keying (PSK) baseband modem on Digital Signal Processor (DSP). Different level of PSK modulation schemes are being used which are 16-psk, 32-psk, 64-psk, 128-psk and 256-psk. MATLAB simulink software is used in this project to simulate the system. The system model consists of modulator, demodulator, noise channel and channel coding. Noise channel that is used in the system is Additive White Gaussian Noise (AWGN). After the simulation, a Matlab file was created to get the Bit Error Rate (BER) graph for all 6 level of modulation scheme. Then, the system is implemented on the DSP TMS320C6713 board. From the simulation, the result that is obtained is constellation point for all M-ary PSK before and after adding channel coding and AWGN. The BER graph that is obtained also follows the theory.
pp. 627-632

5:23 Grayscale Medical Image Compression Using Feedforward Neural Networks

David Yap (Universiti Teknikal Malaysia Melaka, Malaysia)

In this paper, feedforward neural network trained with backpropagation algorithm is proposed to compress grayscale medical images. In this new method, a three hidden layer feedforward network (FFN) is applied directly as the main compression algorithm to compress an MRI image. After training with sufficient sample images, the compression process will be carried out on the target image. The coupling weights and activation values of each neuron in the hidden layer will be stored after training. Compression is then achieved by using smaller number of hidden neurons as compare to the number of image pixels due to lesser information being stored. Experimental results show that the FFN is able to achieve comparable compression performance to popular existing medical image compression schemes such as JPEG2000 and JPEG-LS.
pp. 633-638



Software Engineering & Secure Systems (cont)

Time: 4:00PM - 5:40PM
Room: PALA

**Chair: Yusnani Mohd Yusoff (University Teknologi MARA, Malaysia),
Norliza Zaini (Universiti Teknologi Mara, Malaysia)**

4:00 Cost-Aware Network Immunization Framework for Intrusion Prevention

Marjan Keramati (Iran University of Science and Technology, Iran); Hassan Asgharian (Iran University of Science and Technology, Iran); Ahmad Akbari (Iran University of Science and Technology, Iran)

In this paper, a cost-aware framework for intrusion prevention has been presented. The inputs of this framework are the attack graph of the specified network and also the important assets of it (target of attacker). We have defined some graph based security metrics and aggregated their effects for prioritizing attack scenarios. The scenarios are ordered based on the attacker's knowledge, attacker's endurance, and scenario's ease of exploitability and also impact of the attack scenario. The impact and exploitability of each attack scenario were computed based on the extracted CVSS values. Based on the output of the prioritizing algorithm, some of the most important scenarios are selected for elimination. A subset of the initial conditions and vulnerabilities of the selected scenarios is carefully chosen to harden the network with the lowest possible cost in terms of the time and removal costs. For evaluating our framework, we have also presented a risk factor. This factor indicates the likelihood of the attack path which is multiplied by its impact on the security factors (confidentiality, integrity and availability). The results of applying our framework on one well-known network example have been presented for displaying its performance
pp. 639-644

4:20 Forming a Virtualized Test Bed for Trusted Platforms in the Windows Environment

Mohd Ameer Yuslan Razmi (Universiti Teknologi MARA, Malaysia); Habibah Hashim (Universiti Teknologi MARA, Malaysia)

The remarkable growth in usage of Trusted Platform Module (TPM) nowadays leads researchers to build various test bed to perform the emulation of TPM hardware which can reduce physical devices needed to perform research involving TPM implementation. Current test bed formations are more focusing on using UNIX-based operating systems such as Linux as the platform. This is due to the flexibility and openness of the UNIX based platform itself.

Even though UNIX is flexible, Microsoft Windows is still the preferred Operating System (OS) in the world. Due to its popularity, there is a rapid shift in security threats towards Windows platform every day. In this paper, we explore an approach to form a virtualized test bed for TPM implementation using TPM Emulator in Windows. This paper mainly focuses on forming an improved virtualized test bed in Windows while providing required components to present a working test bed for TPM implementations.

pp. 645-650

4:40 Next Generation Protocol for P2P SIP Communication

Muhammad Farhan Khan (Aalto University School of Science and Technology, Pakistan); Muhammad I Khan (Ryerson University, Canada)

Session initiation protocol (SIP) is a well-known protocol that is used to provide voice over IP (VoIP) signaling and multimedia services in today's evolving Internet. With the popularity of peer-to-peer (P2P) system, it is envisioned to use SIP in P2P networks, to increase the communication flexibility without a centralized organization and control. The REsource LOcation And Discovery (RELOAD) protocol is used to facilitate SIP signaling in the P2P overlay network. RELOAD with interactive connectivity establishment (ICE) functionality in P2P SIP is used to improve the performance of the SIP under varying network conditions. The aim of this paper is to examine the ICE working mechanism in P2P SIP and explain the operational functionality of ICE in a P2P SIP overlay networking environment. Also, this paper discusses different working methods, challenges and problems that are used by the RELOAD protocol for establishing peer-to-peer SIP connections.

pp. 651-655

5:00 Grain and Trivium Ciphers Implementation Algorithm In FPGA Chip and AVR Micro Controller

Ahad Jafarpour (Ihu, Iran); Abdollah Mahdlo (Imam Hossein University, Iran); Amir Akbari (IHU, Iran); Kaveh Kianfar (IHU University, Iran)

Trivium and Grain stream cipher was developed for hardware application with high performance and limited gate, memory and power in eSTREAM project. The main propose of this project is designing high secure stream cipher in secure hardware and software application. In this paper Grain and Trivium ciphers implementation in FPGA chip and Trivium ciphers algorithm in AVR microcontroller was studied and its results (such as required memory of chip and microcontroller and speed) was compared.

pp. 656-658

5:20 Low Energy Identity-based Trusted Access Control Scheme for Wireless Sensor Network

Yusnani Mohd Yussoff (University Teknologi MARA, Malaysia); Habibah Hashim (Universiti Teknologi MARA, Malaysia); Ezril Hisham Mat Saat (Universiti Teknologi MARA, Malaysia)

In this paper, a framework of a trusted identity-based authentication scheme named as IBE-Trust is presented. IBE-Trust is an authentication scheme for new nodes to join the networks with the objective to confirm the trustworthiness of the nodes. IBE-Trust provides basic primitives of security by providing confidentiality, message integrity and authentication between new node and base station. The proposed scheme incorporates ideas from Trusted Computing Group (TCG) and Identity-based cryptosystem developed by Boneh Franklin. Analysis on the energy utilization of the proposed trusted authentication protocol running on the ARM11 processor is also presented at the end of the paper. We conclude that the energy utilization needed to establish trust on such a platform is a worthwhile trade-off.

pp. 659-664

5:40 Application of Software Reuse Concept in Case Based Reasoning for Time Tabling Problem

Siaw Theng Hong (University Putra Malaysia, Malaysia); Abu Bakar Md Sultan (Universiti Putra Malaysia, Malaysia)

This paper demonstrates the application of software reuse concept together with case-based reasoning to solve time-tabling problem. The combination of both concept was induce through the similarity solution pattern which is both revise to previous cases as reference to solve current problem. A brief process flow is explained in this paper to show the possibility of combining case-based reasoning and software reuse to bring a new solution method.

pp. 665-668