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TECHNICAL PROGRAM / ABSTRACT

D1

Bioinformatics & Computational Biology
Cloud Computing
Medical Electronics
Network & Communication Technologies
Computer Applications

Time: 8:40 -13:00
Room: Hall Of Fame 2

Chairs: Geogiana Buja (Universiti Teknologi MARA Malaysia, Malaysia) , Aimi Ghazali (International Islamic University Malaysia, Malaysia)

08:40 Non-Invasive, Non-Contact Based Affective State Identification
Aimi Ghazali (International Islamic University Malaysia, Malaysia); Shahrul Naim Sidek (International Islamic University Malaysia, Malaysia)

This paper discusses a study on detecting affective states of human subjects from their body's electromagnetic (EM) wave. In particular, the affective states under investigation are happy, nervous, and sad which play important roles in Human-Robot Interaction (HRI) applications. A structured experimental setup was designed to invoke the desired affective states. These states are induced by exposing the subject to a specific set of audiovisual stimulations upon which the EM waves are captured from ten different regions of the subject's body by using a handheld device called Resonant Field Imaging (RFITM). Nine subjects are randomly chosen and the collected data are then preprocessed and trained by Bayesian Network (BN) to map the EM wave to the corresponding affective states. Preliminary results demonstrate the ability of the BN to predict human affective state with 80.6% precision, and 90% accuracy.
pp. 1-5

09:00 Computer Based Characterisation of Pteropus Vampyrus Endogenous Betaretrovirus (PvEB) From Bat Genome Project Database
Nur Fatin Aman Razlan (Universiti Teknologi MARA, Malaysia); Roziah Kambol (Universiti Teknologi MARA, Malaysia)

Retroviruses have been associated with numerous chronic diseases such as leukemias and immunodeficiencies which harbored by diverse host range of animals. Recently, one member of bat endogenous retrovirus has been reported as the basal of gammaretrovirus. Later, a study discovered that betaretrovirus also present in diverse micro and megabats. From these recent studies, we gain our interest to further analyze one of the discoveries of betaretrovirus in Pteropus vampyrus in which we called it as Pteropus vampyrus endogenous betaretrovirus (PvEB). The size of nucleotide sequence is 8.7kb which was obtained during screening and characterization of bat genome from large flying fox (Pteropus vampyrus) database genome project. It has a typical genomic organization of a retrovirus possessing all the major conserved motifs and LTR flanking the viral genes:5'-LTR-gag-dUTPase-pol-env-LTR-3'plus the presence of dUTPase which is common in all betaretrovirus. Therefore, this discovery strengthens the current studies which extend the endogenous retrovirus from bats into betaretrovirus group.
pp. 6-11

09:20 A Comprehensive Analysis for Improving the QoS of IMM Traffic for High Speed Wireless Campus Network
Jameel Yalli (International Islamic University Malaysia, Malaysia); Suhaimi Latif (International Islamic University Malaysia, Malaysia); Mosharrof Hussain Masud (International Islamic University Malaysia & Electrical and Computer Engineering, Malaysia); Md. Alam (International Islamic University Malaysia, Malaysia)

Interactive Multimedia (IMM) applications such as voice and video conferencing are very important in our learning environment. They offer useful services that benefit its users. But these services suffers performance degradation from today's high speed Wireless Local Area Network (WLAN). However, guaranteed Quality of Service (QoS) remains the bottleneck in the network which becomes a great challenge in attempting to improve its performance. This work reviewed many approaches and considers mapping QoS class parameters such as Quality of Service Class Identifier (QCI), Maximum Bit Rate (MBR) and Allocation and Retention Priority (ARP) to the upstream and downstream data flowing in the network as an attempt to improve its performance. Priority is then given to the QoS bearer packets by associating Differentiated Services Code Point (DSCP). A comprehensive analysis of QoS in different protocols in wireless networks has been studied. Open issues and research directions have been addressed with a proposed mechanism to enhance the QoS of the wireless network.
pp. 12-17

09:40 Danger Theory Based Node Replication Attacks Detection in Mobile Wireless Sensor Network
Haafizah Rameeza Shaukat (UPM Malaysia, Malaysia); Fazirulhisyam Hashim (Universiti Putra Malaysia, Malaysia)

Mobile wireless sensor networks (MWSNs) are commonly deployed in a harsh climate, notably unattended without any tamper-resistant tools; thereby an attacker can easily capture the sensor nodes in a very limited time. Once captured, the attacker can duplicate the sensor and subsequently deploys numerous clone nodes into the network in minimum time duration. This new breed of attack is called node replication attack, and while several solutions have been proposed to address such a security threat, they are mainly centralized and somewhat limited to static WSN. In this paper, we propose a hybrid (centralized and distributed) node replication attack detection method for MWSN, which operates based on Danger Theory in human immune system. As depicted in Danger Theory, the proposed method consists of two main security approaches, namely attack detection and security control. These approaches perform a multi-level detection, which is not only responsible to identify but also to verify the existence of clone nodes in the network. Performance evaluation demonstrates the efficiency (in terms of true and false positives) of the proposed detection method in detecting clone nodes in MWSN environment.
pp. 18-23

10:00 Effect of Partition Length Variability on the Performance of Adjacent Partitioning PTS in PAPR Reduction of OFDM Systems
Zeyid Ibraheem (University Malaysia Perlis, Malaysia)

Peak-to-Average Power Ratio (PAPR) reduction is an attractive research topic among the OFDM transmission research communities. Partial Transmit Sequence (PTS) has been a promising candidate out of the proposed PAPR reduction techniques without any distortion. In any PTS system, partitioning of the OFDM frame into disjoint sub-blocks is a crucial step. Adjacent partitioning (AP) is a rather simple partitioning scheme achieving attractive PAPR reduction performance. In this paper, we investigate effects of the length variability of disjoint sub-blocks on AP based PTS systems. In order to compare performance of variable length adjacent partitioning with the ordinary PTS scheme, we simulated other partitioning schemes, namely, interleaved, pseudorandom and fixed length adjacent partitioning for various types of modulation. Simulation results showed that the variable length adjacent partitioning is better than interleaved partitioning. However, it has worse PAPR reduction performance compared to the traditional adjacent and pseudorandom techniques.
pp. 24-28

10:20 Development of a MOS Estimation Model for G.729 Using Listening-Opinion Tests with Thai Speech Referring to Packet Loss Effects
Pongpisit Wuttidittachotti (Faculty of Information Technology, King Mongkut's University of Technology North Bangkok & Faculty of Information Technology, Thailand); Phisit Khaoduang (Faculty of Information Technology, King Mongkut's University of Technology North Bangkok, Thailand); Therdpong Daengsi (Faculty of Information Technology, King Mongkut's University of Technology North Bangkok & JADS Comm Ltd., Thailand)

This paper presents a proposed mathematical model of VoIP quality estimation from G.729. This model is based on native Thai users. The subjective Mean Opinion Score (MOS) were obtained from listening-opinion tests with totally 102 subjects that covered five conditions of packet loss effects (0%, 3%, 5%, 10% and 20%). Then the model has been created using a simple function in Microsoft Excel, before evaluating with the test set data that obtained from four test conditions (0%, 4%, 8% and 12%) with totally 30 subjects. From the evaluated result, it has been found that the Mean Absolute Percent Error (MAPE) of the model is 16.29%. That means this model is accepted as a good model for MOS estimation from G.729 for Thai users, referring to packet loss effects (0-10% = excellent, whereas about 10-20% = good).
pp. 29-32

10:40 Tea Break

11:00 SUAS: Scalable User Authentication Scheme for Secure Accessing to Cloud-Based Environments
Faraz Fatemi Moghaddam (UPM University, Malaysia); Rama Roshan Ravan (Universiti Teknologi Malaysia, Malaysia); Touraj Khodadadi (Universiti Teknologi Malaysia, Malaysia); Yashar Javadianasl (Universiti Teknologi Malaysia, Malaysia); Abbasali Halalzadeh (Universiti Teknologi Malaysia, Malaysia)

Cloud computing is an emerging technology that uses the concepts of virtualization, storage, and sharing to store and share resources between users and enterprises. This newfound technology is still unclear to many security problems and one of the most challenging issues in these environments is the reliability of the user authentication process. Therefore, this paper offers an efficient and scalable user authentication scheme for cloud-based environments. The proposed model uses the concepts of agents, cryptography, and key exchanging to enhance and improve the performance of the user authentication and the rate of scalability in cloud-based environments respectively. For achieving to this purpose, the proposed model has been presented based on three main agents: first user authentication agent, second user authentication agent and key manager agent. These agents have divided the process of user authentication and managing keys into several parts to improve the rate of efficiency in this process. Furthermore, the suggested model tries to resist against possible attacks. SUAS, as the suggested

model was introduced and simulated in this paper for evaluating the performance and security of the scheme. In overall, the results show that the proposed model have considerable advantages for using in cloud-based environment to increase the salacity, reliability and efficiency of cloud computing models as an emerging technology.
pp. 33-38

11:20 GD2SA: Geo Detection and Digital Signature Authorization for Secure Accessing to Cloud Computing Environments
Faraz Fatemi Moghaddam (UPM University, Malaysia); Shirin Dabbaghi Varnosfaderani (UPM University, Malaysia); Soroush Mobedi (UPM University, Malaysia); Iman Ghavam (UPM University, Malaysia); Reza Khaleghparast (Universiti Teknologi Malaysia (UTM), Malaysia)

Cloud computing is a new paradigm and emerged technology for hosting and delivering resources over a network such as internet by using concepts of virtualization, processing power and storage. However, many challenging issues are still unclear in cloud-based environments and decrease the rate of reliability and efficiency for service providers and users. User Authentication is one of the most challenging issues in cloud-based environments and according to this issue this paper proposes an efficient user authentication model that involves both of defined phases during registration and accessing processes. Geo Detection and Digital Signature Authorization (GD2SA) is a user authentication tool for provisional access permission in cloud computing environments. The main aim of GD2SA is to compare the location of an un-registered device with the location of the user by using his belonging devices (e.g. smart phone). In addition, this authentication algorithm uses the digital signature of account owner to verify the identity of applicant. This model has been evaluated in this paper according to three main parameters: efficiency, scalability, and security. In overall, the theoretical analysis of the proposed model showed that it can increase the rate of efficiency and reliability in cloud computing as an emerging technology.
pp. 39-42

11:40 A Theoretical Cloud-Based Model for Establishment of United Caring Framework
Faraz Fatemi Moghaddam (UPM University, Malaysia); Soroush Mobedi (UPM University, Malaysia); Iman Ghavam (UPM University, Malaysia); Shirin Dabbaghi Varnosfaderani (UPM University, Malaysia); Touraj Khodadadi (Universiti Teknologi Malaysia, Malaysia)

The rapid growth of using cloud-based technologies in different industries and environment is an impossible fact to be denied as it has increased the efficiency and reliability especially in recent years. Accordingly, this paper proposed an efficient health care framework based on cloud computing concepts. Cloud-Based Medical Framework (CBMF) as the suggested framework has been presented in this paper and various algorithms, tools, and techniques have been described according to the main aim of this research which is to design a cloud-based medical framework for increasing the efficiency and performance of health care processes with using benefits of cloud computing concepts. Furthermore, the performance and security of the suggested model has been analyzed and the specifications of the framework have been evaluated by appropriate tools and techniques to investigate the effects of developing and establishing this cloud-based framework on an efficient health care industry and sub-industries in three main areas: development, infrastructure, and ease of use. The theoretical analysis of the proposed model shows that this framework could be effective in health care industry and meet all of defined objectives about this research.
pp. 43-48

12:00 Barebone Cloud IaaS: Revitalization Disruptive Technology
JosephNg PohSoon (SEGi University & University Technology Petronas, Malaysia); Wong See Wan (University Tunku Abdul Rahman, Malaysia); Phan Koo Yuen (Universiti Tunku Abdul Rahman, Malaysia); Lim Ean Heng (Universiti Tunku Abdul Rahman, Malaysia); Lim Jit Theam (University Tunku Abdul Rahman, Malaysia); Lee Siok Wei (University Tunku Abdul Rahman, Malaysia)

With today's Internet of Hype-Things, technology innovation is no longer a strategic weapon to gain competitiveness or even sustainability at SME. Legacy frameworks are biased towards larger computing during happy day environment. This paper presents a new framework for SME to embrace IaaS with confidence to move up the value chain despite facing volatile economic turbulence. While disruptive BareBone cloud technology maybe inferior to large enterprises, holds potential opportunities to the smaller enterprise where base cost does matter. The use of three instruments (mass survey, interview and focus group) for collecting primary data has ensured consistent information validation. The findings from the directional correlation hypothesis affirm the negative correlation between infancy stage of technology innovation and the measurable organizational values expected by the small enterprise. This contribution can be applied during dilemma decision making stage for migrating into the next cloud computing infrastructure.
pp. 49-54

D2

Industrial Electronics & Applications

Time: 14:00 - 17:00
Room: Hall Of Fame 2

Chair: Siti Nur Syuhadah Baharudin (Universiti Malaysia Perlis, Malaysia), Hasliadi Guliga (University of Technology MARA, Malaysia)

14:00 Design of Configurable, Network Based Interconnection Modules for Communication Centric System-On-Chip Applications
Prabhakar Mishra (PES Institute of Technology, Bangalore & PES Centre for Intelligent Systems, India); Nidhi Anantharajaiah (PES Institute of Technology, India); J K Kishore (Indian Space Resaerch Organization, India); Chetan Kottursheттar (Texas Instruments, India)

In recent years, System-on-Chip design architectures have increasingly become communication centric. To support such designs, a configurable and scalable interconnect backbone is required. Intellectual Property cores for on chip communication, provided by major field programmable gate array vendors are limited to shared bus or point to point interconnect protocols. To provide network oriented interconnect fabric, we propose a configurable and scalable, network based interconnect module. The interconnections can be configured to four popular on-chip network topologies: mesh, torus, ring and fat-tree. A parameterized and customizable wormhole router is designed, with variable number of ports and link width to support the four networks. A hardware simulator has been designed for in-situ testing of the interconnect module. Two state of art implementation platforms viz Virtex-6 Field programmable gate array and a full custom implementation using 32nm CMOS process has been used to characterize the module. We report area and power dissipation of the module configured to the four topologies, in the two platforms.
pp. 70-75

14:20 Modeling and Speed Estimation of A Faulty 3-Phase Induction Motor by Using Extended Kalman Filter
Mohammad Jannati (Universiti Teknologi Malaysia, Malaysia); Seyed Hesam Asgari (University Teknologi Malaysia, Malaysia); Dana Dehghani (Universiti Technologi Malaysia, Malaysia); Ali Monadi (Universiti Teknologi Malaysia, Malaysia); Nik Rumzi Nik Idris (Universiti Teknologi Malaysia, Malaysia); Mohd Junaidi Abd Aziz (Universiti Teknologi Malaysia, Malaysia); Ahmad `Athif Mohd Faudzi (Universiti Teknologi Malaysia, Malaysia)

This paper presents a modeling technique for a faulty 3-phase Induction Motor (3-phase Induction Motor IM under open-phase fault). The developed model has the same structure of equations as the balanced 3-phase model. It is shown that the model can be utilized to estimate the speed of a faulty IM based on an Extended Kalman Filter (EKF) estimation technique, which was developed for a balanced 3-phase IM. Simulation and experimental results are presented to show the validity of the proposed techniques.
pp. 76-81

14:40 Light Effect Characterization of ISFET Based pH Sensor with Si3N4 Gate Insulator
Nurul Izzati Mohammad Noh (Universiti Teknologi MARA, Malaysia); Khairul Aimi Yusof (Universiti Teknologi MARA, UiTM, Malaysia); Ali Zaini Abdullah (MIMOS BHD, Malaysia); Sukreen Hana Herman (Universiti Teknologi MARA, Malaysia); Wan Fazlida Hanim Abdullah (Universiti Teknologi MARA, Malaysia)

The performance of ISFET based pH sensor device in testing and characterization process of light effect has been successfully done. The experimental setup was carried out by Agilent Technologies B1500A Semiconductor Device Analyzer with an additional readout interfacing circuit (ROIC). This paper reports the electrical characterization test i.e. current-voltage (I-V) measurement and sensitivity, drift and hysteresis test of the fabricated sensor. The I-V measurement was done in light and dark conditions but the drift and hysteresis characterizations were done in dark condition to avoid the influence of light. This experiment used the standard buffer solution to observe the characteristic of the device. From the experimental result, it found that the sensor performance has a light effect due to the light exposure. Drift and hysteresis test using the ROIC showed a good performance in term of the durability, reliability and accuracy of the sensor. The discussion of the light effect on the sensor performance is presented.
pp. 82-87

15:00 Design and Analysis of a Two-Stage OTA for Sensor Interface Circuit
Siti Nur Syuhadah Baharudin (Universiti Malaysia Perlis, Malaysia); Asral Bahari Jambek (Universiti Malaysia Perlis, Malaysia); Rizalafande Che Ismail (Universiti Malaysia Perlis, Malaysia)

This aim of this paper is design of Operational Transconductance Amplifier (OTA) circuit for capacitive interface circuit that support multi sensor interface circuit for bio-analyzer. In this paper, these designs were designed using 0.13µm Silterra CMOS Technology and simulated in Mentor Graphic DA-IC. OTA is an amplifier which it can convert differential input voltage to current output where it was very important for capacitive interface circuit. There are three kinds of OTA topology such as two stages OTA, telescopic OTA and folded cascade OTA. In this paper, two- stage OTA was proposed which it has higher gain, highest output swing and lower noise. The result shows Two-Stage OTA has 67-dB with 3.3V power supply and low power consumed. All the result such as phase margin, gain, slew rate and power consumed are compared with other researches to show relative performance of this design.
pp. 88-92

15:20 CMOS Integrated Readout Circuit Technique for EGFET Based on Biosensor Application
Hasliadi Guliga (University of Technology MARA, Malaysia)

This paper presents the CMOS readout technique for extended gate field effect transistor (EGFET) based on the voltage divider circuit technique and indirect feedback readout interfacing circuit(ROIC). These circuits were design using mentor graphic tools with 0.13um silterra technology file. The investigation of this project focuses on the size ratio of EFGET, temperature compensation, and sweeping power supply. The simulation result shows the indirect feedback ROIC was better than the voltage divider circuit technique in term of temperature compensation and controlling the power supply.
pp. 93-96

15:40 Tea Break

16:00 Electrical Property and Surface Morphology of Nanostructured TiO2 Film Prepared At Different Number of Coatings
Irma Hidayanti Binti Halim Affendi (Universiti Teknologi MARA, Malaysia); Puteri Sarah Mohamad Saad (Universiti Teknologi MARA, Malaysia); Najwa Ezira Ahmed Azhar (Universiti Teknologi MARA, Malaysia); Mohamad Rusop (Universiti Teknologi MARA - UiTM & NANO-SciTech Centre / NANO-ElecTronic Centre, Malaysia)

Sol-gel method is used to deposit each of the Titanium Dioxide (TiO2) film coating layers to indicate the porosity and to see the thickness by each coating layers. The electrical properties were studied on the thickness variance. The surface morphologies of the prepared TiO2 film were observed by using Field Emission Scanning Electron Microscopy (FESEM) to investigate the evolution of TiO2 grains and surface morphology. The electrical properties were investigated by using current-voltage (I-V) measurement to study the electrical resistivity behavior hence the conductivity of the film. From this study, it is known that the coating layer affects the porosity and the thickness of TiO2 film. Porosity of film was found to increase but the I-V was decreasing as the coating layer increase.
pp. 97-101

16:20 Electrical Properties of Tetrapod Zinc Oxide Thin Films Deposited by Thermal-CVD Method
Najwa Ezira Ahmed Azhar (Universiti Teknologi MARA, Malaysia); Shafinaz Sobihana Shariffudin (Universiti Teknologi Mara, Malaysia); Irma Hidayanti Binti Halim Affendi (Universiti Teknologi MARA, Malaysia); Mohamad Rusop (Universiti Teknologi MARA - UiTM & NANO-SciTech Centre / NANO-ElecTronic Centre, Malaysia)

Zinc oxide (ZnO) thin films were deposited by thermal chemical vapor deposition (TCVD) method. Thermal chemical vapor deposition is preferable to be used due to simple crystal growth technology and give high performance solid material. Aurum (Au) metal was used as a catalyst to improve the growth of tetrapod ZnO structures. The substrates were deposited at 750 to 800 degree celcius to study the temperature effect of tetrapod ZnO thin films. The surface morphology of ZnO thin films were characterized using field emission scanning electron microscope (FE-SEM), photoluminescence (PL) and energy dispersive X-ray (EDX) to identify element composition of ZnO thin films. The EDX spectrum shows that the grown product contains Zn and O only. The morphology of tetrapod ZnO is depends on the evaporation time, evaporation temperature and substrate temperature From I-V curve, the resistivity of ZnO thin films decreases, the films become more conductive as deposition temperature increased. The PL peak intensity is decrease because of defect due to oxygen vacancy and crystallization of ZnO tetrapods.
pp. 102-105

D3

Signal & Image Processing
Automation,Mechatronics & Robotics
Software Engineering

Time: 8:40 - 13:00 **Chair: Zubair Khalid (Universiti Teknologi Malaysia (UTM), Malaysia)**
Room: Hall Of Fame 2

08:40 Backhaul and Performance Optimality of Joint Processing Schemes Over the Cluster Area
Mohammad Kousha (Universiti Putra Malaysia & UPM, Malaysia); Fazirulhisyam Hashim (Universiti Putra Malaysia, Malaysia)

In this paper, four joint processing schemes have been discussed and evaluated over a cluster of eNBs. The purpose of this study is developing a cooperative LTE scenario in a fixed cluster of 3 evolved Node B (eNB) in order to evaluate and compare the performance of these schemes. It would give us a good insight about choosing the optimum scheme which provides desired performance while putting reasonable amount of burden on the backhaul of the system. Moreover, we will show that performance of each scheme is location dependent. as a final goal, in real-world networks, exploiting a dynamic joint processing scheme selection strategy would lead to the best performance. Its been proved through Simulations that, assuming coherent joint transmission, both centralized joint transmission and dynamic point selection outperform the partial joint processing schemes. Also, Dynamic point selection schemes follow the performance trend of both centralized and partial joint transmission scenarios with less performance and lower data sharing.
pp. 121-125

09:00 Time Delay Estimation for Strain Imaging Using the Phase of the Complex Envelope of RF Signal
Safayat Bin Hakim (Islamic University of Technology, Bangladesh); Kazi Islam (Islamic University of Technology, Bangladesh)

Time Delay Estimation is a basic technique used for locating and tracking radiating acoustic source. TDE process is common for studying signal-to-noise ratio, input signals and systems that are common in process industry. The delay estimate is acquired using the generalized cross-correlation function applied between the original and the time-lagged filtered version of the received signal. In recent years ultrasound elastography proved as a successful alternative of the invasive biopsy. The fundamental necessity lies in estimating the strain for which time delay estimation is a pre-requisite step. Taking the phase of the complex envelope of the pre and post compression RF echo signals it is possible to successfully compute the time delay between them. The ultimate target of an Elastographic process is the noiseless Elastogram which is used to identify the suspected nodules embedded into the deep of tissue column. In this paper the strain information acquired from the phase of complex envelope and the same is used to analyze the quality of Elastograms studying mainly two parameters strain and sampling frequency.
pp. 126-130

09:20 Template Matching Using Multiple Templates Weighted Normalised Cross Correlation
Ze-Hao Wong (Universiti Sains Malaysia, Malaysia); Khiruddin Abdullah (Universiti Sains Malaysia, Malaysia); Chow Jeng Wong (Universiti Sains Malaysia, Malaysia)

Template matching is an image comparison technique which played an important role in machine vision. In this research, a different approach to multi-template matching technique with more robust and intuitive similarity measure is described. In many studies, a numerous templates are presented to handle pattern variation while Normalised Cross Correlation (NCC) remains as the popular similarity measure. A new approach using the idea of generalised template with Weighted Normalised Cross Correlation (WNCC) based on the pixel standard deviations of templates is proposed. This approach is tested using real electronic component and similarity measure is compared with NCC in term of quality. The proposed method is found to be effective, robust and intuitive comparatively.
pp. 131-135

09:40 A New Approach for High Performance RNS-FIR Filter Using the Moduli Set {2 ^k-1, 2^k,2^{k-1}-1}
Kotha Srinivasa Reddy (Birla Institute of Technology and Science, Pilani, India); Akshit Singhvi (BITS-PILANI, India); Subhendu Kumar Sahoo (B. I. T. S. Pilani, India)

This work proposes two finite impulse response (FIR) filters using Residue Number Systems (RNS) technique.The moduli set adopted is {2^k-1, 2^k,2^{k-1}-1}. The proposed method uses Pre-loaded product (PLP) to compute the multiplication of input with the filter coefficient. The two proposed filters, RNS_P1 and RNS_P2, are compared with the RNS-FIR filter (RNS_C) which uses the moduli set {2 ^k-1, 2^k,2^{k}+1} . The filters are implemented with VerilogHDL and are synthesized using Cadence RTL compiler in UMC 90nm technology. The performance of the filters are compared in terms of Area (A), Power (P), Delay (D) and Power-Delay Product (PDP). In comparison to RNS_C , the filter RNS_P1 improves gain in area by 75% and power by 72% , whereas RNS_P2 provides gain of 67% in area and 67.5% in power. However, the gain in delay and PDP for RNS_P2 are 31% and 71% respectively, as compared to 17% and 76% of the filter RNS_P1.
pp. 136-140

10:00 A New Speaker Change Detection Method in a Speaker Identification System for Two-Speakers Segmentation
Mohsen Bazyar (University Teknologi Malaysia, Malaysia); Rubita Sudirman (Universiti Teknologi Malaysia, Malaysia)

Speaker change detection is done in many speaker and speech identification applications that the speech is from two speakers. However, the standard metric-based methods performance is not suitable and stable owing to the amid window distance calculation stability. Therefore, a new method is proposed to improve the stability and enhance the performance of the system according to speakers' characteristics using between window correlations. Moreover, reference speaker models set that shows the space of the entire speaker model are trained in this approach. A metric is defined as the between window correlation of scores likelihood vectors versus the reference models. The Peak and Valley information and gender information are also used. In this paper, we look at telephone conversations where it is known a priori that there are two speakers, but the identity of the speakers is not known. Experiments over Farsdat Database show better performance In comparison with the GLR and the BIC approaches. This new approach has more effect rather than the GLR and the BIC approaches in the broader value of defined thresholds.
pp. 141-145

10:20 Local Contrast Hole Filling Algorithm for Neural Slices Membrane Detection
Rajeswari Raju (University of Nottingham Malaysia Campus & UniversityTechnology MARA, Malaysia)

Local Contrast Hole Fill (LCHF) algorithm is non-learning, simple, easily adopted, and undependable on ground-truth; and it can recognize membrane and eliminates organelles, using a very simple algorithm that consist of short sequences of basic processing steps yet can be relatively competitive. Here, we would like to show the simple processing stages, and the effectiveness of the LCHF algorithm, with other similar neuronal datasets. LCHF generously allowed to classify pixels into membrane/non-membrane for these datasets, and just took matters of seconds to produce the comparable best result.
pp. 146-151

10:40 Tea Break

11:00 Non-standard Malaysian Car License Plate Recognition
Yan Chai Hum (Mimos Berhad, Malaysia); Liang Kim Meng (MIMOS Berhad, Malaysia); Hon Hock Woon Hon (MIMOS Bhd, Malaysia); Yuen Li (Mimos Berhad, Malaysia)

Automated car license plate recognition systems are developed and applied for purpose of facilitating the surveillance, law enforcement, access control and intelligent transportation monitoring with least human intervention. The challenging part of this system lies in accurately recognizing a non-standard plate that consists of various character fonts, character sizes, plate size, orientations, plate and character colors, materials, positions of numeric characters and alphabetic characters. The objective of the paper is to present our developed algorithms that cope with these practical variations in the context of non-standard Malaysian plate from image scene acquisition to optical character recognition. In each standard step of license plate recognition, we consider the processing of the plates under various environmental condition and non-standard formation of characters in real scene. The algorithm is tested with 500 Malaysian car plates in real-time and the result shown that the algorithm remains relatively robust) under different conditions and car plate standard.
pp. 152-157

12:40 0.5-V Bulk-Driven Second-Generation Current Conveyor
Montree Kumngern (King Mongkut's Institute of Technology Ladkrabang, Thailand)
This paper presents a new bulk-driven second-generation current conveyor that is capable of ultra-low voltage signal processing applications. The proposed circuit operates under supply voltage of 0.5 V and also offers rail-to-rail input voltage swing. To confirm the operation of the proposed building active block, floating and grounded inductance simulations using the proposed circuits as active elements are presented. The performances of the proposed circuit are demonstrated using PSPICE simulators. The simulation result shows that the power consumption of the proposed circuit is only 4.7 µW.
pp. 180-183

13:00 0.5-V Bulk-Driven Fully Differential Current Conveyor
Montree Kumngern (King Mongkut's Institute of Technology Ladkrabang, Thailand)
This paper presents a new low-voltage supply and low-power consumption bulk-driven fully differential current conveyor (BD-FDCCII) which is suitable for low-voltage signal processing applications. The bulk-driven MOS technique is used to achieve a low-voltage supply as low as a 0.5V, also, a rail-to-rail input voltage swing. As an example application, a voltage-mode biquadratic filter using BD-FDCCII is presented. The proposed BD-FDCCII is simulated by PSPICE simulators using TSMC 0.18 µm n-well CMOS technology.
pp. 184-188

D4

Signal & Image Processing
Automation,Mechatronics & Robotics
Software Engineering II

Time: 14:00 - 16:00
Room: Hall Of Fame 2

Chair: Meisam Eslahi (Universiti Teknologi MARA, Malaysia)

14:00 BYOD: The Current State and Security Challenges
Meisam Eslahi (Universiti Teknologi MARA, Malaysia); Maryam Var Naseri (Asia Pacific University (APU), Malaysia); Habibah Hashim (Universiti Teknologi MARA, Malaysia); Nooritawati Md Tahir (Universiti Teknologi MARA, Malaysia)

Recently, BYOD or Bring Your own Device has become one of the most popular models for enterprises to provide mobility and flexibility in workplaces. The emergence of new technologies and features of mobile devices makes them integral part of every aspect of daily business activities. Besides, mobile networks are now well integrated with the Internet (e.g. 3G, 4G and LTE technologies), therefore, In BYOD, the personal devices (i.e. mobile devices) are allowed to be used at work to increase the employees' satisfaction and reduce the device costs of an organization. In the other hand, mobile devices are not well protected compared to computer and computer networks and the users pay less attention to security updates and solutions, thus, mobile security has become a crucial issue in BOYD as the employees use their own mobile devices to access an organization data and systems. Therefore, in this paper we present an overview of current state of BYOD security and future challenges.
pp. 189-192

14:20 A Low Computational Method of Secure Video Streaming in Mobile System
Mohamed Saleh (Universiti Teknologi Mara, Malaysia); Habibah Hashim (Universiti Teknologi MARA, Malaysia); Nooritawati Md Tahir (Universiti Teknologi MARA, Malaysia)

Huge revolution in mobile systems opens the field toward exploit of video streaming, enabling broadcasting a real time video through the network, also live event can be seen from anywhere, the video data has to be compressed before transmitting, in addition to that, the encryption process is compulsory in order to secure a transmitted data stream. This leads to increase the resource consumption requirements such as computational overhead. Hence, in this paper, we will present a new method for secure video streaming in limited resource devices. In the proposed method, we will focus on: The data structure of video streaming, explaining the encryption and decryption process that performed in a video transmitting, and to exploit the structure of the H.264/AVC standard for encrypting a specific syntaxes. The method will be performed in two phases; (1) encoding video streaming and (2) decode video bitstream, in the first phase, the encryption for a specific part of encoded video data will be performed using AES algorithm, in the second phase, the encrypted syntaxes of the bitstream will be decrypted. By applying this method; the technique for securing the video stream in a limited resource device will be enhanced, mitigate the effects of compression and encryption process on the computational overhead during real-time multimedia transmission. This method is capable to prevent attacks on video streaming data, as well as the compliance format between the encoder and decoder will be maintained. Our method and the previous related researches are explained in detail in this paper.
pp. 193-197

14:40 Compression and Encryption Technique on Securing TFTP Packet
Nur Nabila Binti Mohamed (Universiti Teknologi MARA, Malaysia); Habibah Hashim (Universiti Teknologi MARA, Malaysia); Yusnani Mohd Yussoff (University Technology Mara, Malaysia); Mohd Anuar Mat Isa (Universiti Teknologi MARA & UITM Shah Alam, Malaysia); Syed Farid Syed Adnan (UiTM Shah Alam, Selangor & FKE, Malaysia)

Data compression technique such as Huffman coding, arithmetic coding, Lempel-Ziv-Welch (LZW) method and others has been playing a vital role in the area of data transmission for reducing time usage during retrieving and transmitting data. However, this technique does not prevent data which contain secret information from being tampered or hacked by malicious attacks even in limited area network environment. Apart from the need of reducing data volume, an implementation of encryption is an important concern in order to transmit data over perfect security. This paper presents feasible approach in minimizing quantity of data and ensuring its security; data is compressed using a lossless algorithm, i.e. Huffman coding and then the compressed data is encrypted using symmetric encryption, AES algorithm. In this work, key exchange concept is also proposed based on Diffie Hellman Key Exchange (DHKE) which is used to exchange secret key for data encryption and decryption. The data is transferred in a local network between two computers through simple file transfer protocol known as Trivial File Transfer Protocol (TFTP). This protocol has been used widely for updating and transferring files especially to embedded devices and it would provide more benefit if security features were incorporated into this protocol. Thus, a lightweight security strategy which includes compression and encryption is an efficient solution to the security issue and to reducing file sizes in this type of environment. Experimental results based on proposed methodology are provided to analyze execution time of transmitting compressed-encrypted data and percentage reduction of file space.
pp. 198-202

15:00 Analysis on Parallelism Between Cpu and Gpgpu Processing on Cluster Computing
Mohd Noor Ikhwan Abdul Rahim (Universiti Teknologi MARA, Malaysia); Lucyantie Mazalan (Universiti Teknologi MARA, Malaysia); Syed Farid Syed Adnan (UiTM Shah Alam, Selangor & FKE, Malaysia)

Computer cluster is a collection of multiple computers connected together so that it can be viewed and perform as a single computer using an interconnected device. Graphical Processing Unit is a specialized hardware used to accelerate the creation of an image by manipulating and altering the memory to help CPU to produce an image. Previously, only CPU is used to perform the task execution in a cluster, however since the advancement of technology in cluster computing, GPU's can now be used as alternative processor to perform execution of a task or job. Due to its relatively cheap in Flops/price ratio, GPGPU cluster system has gained a lot of popularity, however, the real world performance for both CPU cluster system and GPGPU cluster system has not been widely tested. In this paper, the performance between CPU cluster system and GPGPU cluster system simulating proteins using GROMACS 4.6.5 will be measured and analyzed, and how the parallelism between the two will be evaluate by comparing two set of tasks. The cluster's protein folding performance is measured in ns/day, average CPU utilization, average memory usage, and average network bandwidth will be taken into account in this simulation.
pp. 203-207

15:20 A Novel Face Detection Algorithm Using Thermal Imaging
Yuen Kiat Cheong (Universiti Tunku Abdul Rahman, Malaysia); Vooi Voon Yap (University Tunku Abdul Rahman, Malaysia); Humaira Nisar (University Tunku Abdul Rahman, Malaysia)

Face detection is an important step for successful face recognition system. The variation in lighting conditions result in degradation in performance of face detection. In this paper, we have proposed a novel face detection algorithm by using thermal imaging. Thermal images are not affected by variation in illumination. In our proposed algorithm, thermal images converted into the gray scale image and it is binarized using Otsu's thresholding method. Horizontal projection of the image is calculated to identify the global minimum. The height and width of the head region is identified using the global minimum point. We have developed a UTAR-YK Thermal database to verify the performance of the proposed algorithm. The proposed algorithm is verified using the UTAR-YK thermal database. Experimental results show that our proposed algorithm has an average accuracy 92.16%, that is measured by finding the overlapping ratio between the automatically-detected face region and manually drawn face region. In addition, our proposed algorithm has achieved an average 1.13 bounding box ratio, which is the comparison of the size of the box between the automatically-detected face region and manually drawn face region.
pp. 208-213

15:40 Tea Break