The Concept of Sustainable Agriculture: Challenges and Prospects

ID 2002

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ABSTRACT

Agriculture has changed dramatically, especially since the end of World War II. Food and fiber productivity soared due to new technologies, mechanization, increased chemical use, specialization and government policies that favored maximizing production. Sustainable agriculture is a subject of great interest and lively debate in many segments of the world. Most agriculturalists agree that the concept of sustainable agriculture is of paramount importance to the sustainability of our biosphere and its ever increasing human population. This paper is an effort to identify the ideas, practices and policies that constitute concept of sustainable agriculture.

Modelling the Surface Roughness Behaviour of an EDMed Workpiece with Different Tool Electrodes using DoE

ID 2003

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ABSTRACT

The roughness of machined surface expresses the degree of irregularities of it texture. In most production processes finer irregularities of the surface texture are desired. In electro-discharge machining (EDM), many factors contribute to the level of surface roughness attained by the workpiece during machining. These include the machining input parameters, the dielectric fluid and the tool electrode. It is possible to optimize the EDM process input parameters to obtain better surface roughness. Dielectric fluids have been manipulated by adding conductive powders to give smoother and shining (mirror-like) surfaces. Such powder-mixed electrical discharge machining (PMEDM) were reported to have resulted in better surface roughness. Furthermore, improved micro-hardness of the EDMed surfaces were also obtained through this means. OBJECTIVE: In this work, the surface roughness trends of mild steel machined with powder metallurgy (PM) compacted Cu-TaC electrode is modelled with EDM process variables. In addition, its behaviour was compared with the EDM carried out with metallic copper (Cu) electrode under the same conditions. The lowest Ra obtained with the Cu-TaC electrode is over 110% higher than the lowest Ra with metallic electrode.

CAUCHY INTEGRAL FORMULA

ID 2004

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ABSTRACT

ABSTRACT Cauchy-Goursat Integral Theorem is pivotal, fundamentally important, and well celebrated result in complex integral calculus. It requires analyticity of the function inside and on the boundary of the simple closed curve. In this study we will investigate the condition(s) under which $\oint f(z)dz=0$ even though the function is not analytic at a point inside C. Consequently, we will give an easy and simple proof of unquestionably the most important, significant and pivotal result known as Cauchy Integral Formula.

Automate Locate and Search the Fiducial Marks of LED Wafer Image

ID 2006

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ABSTRACT

Automatic detection and location are proposed for the fiducial marks (FM) and reference fiducial marks (RFM) for the LED wafer image in this paper. The LED wafer image has two FMs, where the obvious FM is in the upper layer and the obscure FM is in the lower layer. The upper RFM is automatically detected and the lower RFM is determined after using an image enhancement technique. The automated search FMs of LED wafer images are divided into four steps: rough search, FM matching, fine search and trimming for sub-pixel images. FM matching includes the sum of absolute differences (SAD) and boundary feature matching (BFM). To validate the effect of the proposed method, the proposed results are compared with the results of manual image matching in the study to achieve the testing goal.

Analysis of Shot Boundary Based on Color and Texture Features of Frame

ID 2007

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ABSTRACT
This study proposed a color and texture based frame feature, and used the relation between frames to create a shot boundary detection method, so as to analyze the video shot boundary. This study used universally calculated and simple color and texture features, and then calculated the distance between frames. An adaptive measuring method was proposed for the threshold of distance as the basis of identifying shot change. The color and texture features in this paper are Traditional Color Histogram (TCH) and Histogram of Gradient Directions (HGD), respectively. The adaptive distance threshold in this paper considers the adaptive region between videos. In order to validate the shot boundary detection method proposed in this paper, the video database provided by Carleton University website was used for the experiment. The experimental and comparison results of shot boundary detection were validated, and the experimental results were analyzed. Afterwards, a video database was downloaded from YouTube, and the shot boundary detection was analyzed using the proposed method. This study carried out a series of comparison and analyses for the above video database, and proved that the shot boundary detection method proposed in this paper could detect the boundary of shot effectively.

Energy Optimization of Brushless DC Motor in Electric Power Assisted Steering

ID 2008

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ABSTRACT
In an electric power-assisted steering (EPS) an electric motor is controlled to provide assistance in vehicle steering and to enable various steering feels. To optimize energy consumed by a column-type EPS equipped with a brushless dc(BLDC) motor the authors design two controllers as needed. Firstly a controller to generate driver torque is developed based on nonlinear adaptive regulation method using the mathematical model of EPS. The second controller is a PID motor controller that is applied to produce assistance torque for desired energy saving. The trade-off between driver's comfort and energy consumption is demonstrated using Matlab simulation results. In electric vehicles (EVs) where electrical energy is limited the control scheme introduced here is expected to fit perfectly.

ROBUST CONTROL OF NONLINEAR SYSTEM USING MIXED PID WITH GRAVITATIONAL SEARCH ALGORITHM

ID 2014

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ABSTRACT
Proportional Derivative Integral (PID) is the most used commonly feedback controller which involves three separate constant parameters; the proportional, the integral and derivative values, denoted P, I, and D. These parameters need to be chosen carefully in order to obtain the required performance specifications. This research work focused on designing PID controller for nonlinear system such that the system output tracked the reference input given. Gravitational Search Algorithm (GSA) technique is used as optimization technique in order to search the suitable values for these parameters so that PID produced good tracking performance. Simulation results show that good tracking performance with smaller tracking error could be achieved by integration PID with GSA.

A NURBS interpolator based on axis dynamics of machine tools

ID 2015

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ABSTRACT
Moving along the feedrate sensitive corners are challenging for machine tools as the physical limits of the drives may be violated. An algorithm has been developed in the present study that allows the feedrate sensitive corners to be detected offline and the tool path is then segmented. Real-time interpolation of the curve is performed using the second order Taylor expansion method. Simulation and experimental results illustrate that the proposed algorithm provides a smooth motion along the feedrate sensitive corners and the physical limits of the drives are not violated.

Application of NURBS weight tuning algorithm to CNC machining of blended successive short line segments

ID 2016

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ABSTRACT

Most commercial CAD/CAM systems provide the CNC machines with a combination of linear and circular toolpaths. At the junction of each adjacent segment, linear segments are discontinuous in curvature, acceleration and jerk, which provides a non-smooth transition. If the machine stops at the junction to avoid non-smooth transition and the resulting shocks, the machining time and efficiency would be deteriorated. In this study, NURBS is fitted into a combination of linear segments to provide smoother toolpath. To fit the curve which lies inside a tolerance, weight decoupling and weight tuning algorithm is proposed in this paper.

Time Domain Feature Extraction Technique for earth's electric field signal prior to the Earthquake

ID 2017

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ABSTRACT

As one of the most destructive natural disaster, a giant earthquake can kill many people and destroyed a lot of properties. By considering these catastrophic effects, it is highly important of knowing ahead of earthquakes in order to reduce the number of victims and material losses. Earth's electric field is one of the features that can be used to predict earthquakes (EQs), since it has significant changes in the amplitude of the signal prior to the earthquake. This paper presents a detailed analysis of the earth's electric field due to earthquakes which occurred in Greece, between January 1, 2008 to June 30, 2008. In that period of time, there are 13 earthquakes had occurred. 6 of them were recorded with magnitudes greater than Ms=5R (5R), while 7 of them were recorded with magnitudes greater than Ms=6R (6R). Time domain feature extraction technique is applied to analyze the 1st significant changes in the earth's electric field prior to the earthquake. Two different time domain feature extraction techniques are applied in this work, namely Simple Square Integral (SSI) and Root Mean Square (RMS). The 1st significant change of the earth's electric field signal in each of monitoring sites is extracted using those 2 techniques. The feature extraction result can be used as input parameter for an earthquake prediction system.

Wavelet Analysis of the earth's electric field signal prior to the Earthquake

ID 2018

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ABSTRACT

The earth's electric field is one of the features used for predicting earthquakes (EQs) due to its significant changes in the amplitude of the signal prior to the earthquake. This paper presents a detailed analysis of the earth's electric field recorded prior to the earthquake that occurred in Greece in the period from January 1, 2008 to June 30, 2008. During this period of time, five (5) earthquakes were recorded with magnitudes greater than 6R (Richter scale). In this paper, Discrete Wavelet Transform (DWT) with five wavelet filter families and three different levels, namely, Daubechies (DB2), Daubechies (DB4), Haar, Symlet and Coiflet are applied. The result is compared to evaluate the performance in analysis earth's electric field. The comparison shows that Coiflet mother wavelet function with a level-1 has good result apply for ATH and HIO monitoring site and Daubechies and Haar are good for the PYR monitoring site.

ARTIFICIAL INTELLIGENCE BASED TECHNIQUE FOR BTS PLACEMENT

ID 2019

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ABSTRACT

The increase of the base transceiver station (BTS) in most urban areas can be traced to the drive by network providers to meet demand for coverage and capacity. In traditional network planning, the final decision of BTS placement is taken by a team of radio planners; this decision is not fool proof against regulatory requirements. In this paper, an intelligent based algorithm for optimal BTS site placement has been proposed. The proposed technique takes into consideration neighbour and regulation considerations objectively while determining cell site. The application will lead to a quantitatively unbiased evaluated decision making process in BTS placement. An experimental data of a 2km by 3km territory was simulated for testing the new algorithm; results obtained show a 100% performance of the neighbour constrained algorithm in BTS placement optimization. Results on the application of GA with neighbourhood constraint indicate that the choices of location can be unbiased and optimization of facility placement for network design can be carried out.

Design of Two-Stage CMOS Amplifier for MEMS Resonator

ID 2023

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ABSTRACT
The future integrated circuit would demand a combination of micromechanical components and traditional electronics. Micro Electro Mechanical System (MEMS) resonator is the one of future integrated circuit. MEMS resonators can provide Complementary Metal-Oxide Semiconductor (CMOS) compatibility and multifrequency operation on a single chip. In this paper, Two-Stage CMOS op amp for a MEMS-based oscillator is presented. The design of two-stage CMOS op amp is critically discussed. The op amp achieves a gain of 21 dB at VDD of 1.8 V and VSS of -1.8 V. The two-stage CMOS op amp is combined with 10 Mhz CC-beam resonator to create an oscillator at the frequency of ~10MHz with gain of 16dB. The oscillator is simulated using Cadence.

Fuzzy Modelling of Synchronous Machine via Takagi Sugeno Fuzzy Model.

ID 2024

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ABSTRACT
This paper presents the results of a Takagi Sugeno (T-S) fuzzy model based of synchronous machine utilized the concept of sector nonlinearity. This sector of nonlinearity approach divides each nonlinearity into local sector nonlinearity. Therefore the overall T-S fuzzy model of the system is obtained by blending all the local linear system models by parallel distribution compensation (PDC). The system modelled by T-S fuzzy model can exactly represent the nonlinear characteristic accurately.

Observer Design Via Takagi Sugeno Fuzzy Model of A Cart Ball System: LMI Approach

ID 2025

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ABSTRACT
This paper present the design of Takagi Sugeno (T-S) fuzzy model based observer for cart-ball via LMIs approach and developed based on parallel distribution compensation (PDC). The system is modeled by T-S fuzzy model which can exactly represent a nonlinear mathematical model for the cart-ball system. Then, the regulator and observer gain is obtained by solving set of linear matrix inequality (LMIs). This observer scheme gives the estimated states converging to the real states exponentially. Finally, numerical simulation is carried out to verify the theoretical result is presented.

PROTOTYPING OF A SITUATION AWARENESS SYSTEM IN MARITIME SURVEILLANCE

ID 2026

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ABSTRACT
This paper discusses about the design of a Situation Awareness (SA) system to support vessel crews and control room operators in improving the decision making process. The architecture of the system is ontology based. The vessel crews and control room operators may face a loss of SA. They may have limited cognitive abilities which make it difficult to make a decision in a high stress level, short time availability and continuously evolving situation with incomplete information. In this work, we describe the application of Semantic Web Rule Language to represent corresponding knowledge in the maritime surveillance domain. The result of this research will demonstrate that an ontology based system can be used to remodel the information into a meaningful and valuable form to predict the future states of SA and improve the decision making process.

Effect of Vibrational Parameters on the Stability of Vibration Turning Process in Time Domain

ID 2027

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ABSTRACT

Vibration turning has found extensive applications due to its advantages such as low cutting forces, high surface quality and machining stability.Chatter vibration is generated in a variety of machining processes and causes instability in the process. Chatter in machine tool leads to loss of surface finish, reduced tool life and damage to work-piece and even to the machine. In this paper, a method is proposed to examine the chatter phenomenon in vibration turning and predict the stability boundary of the process.

DESIGN OF THE SUSTAINING CIRCUIT FOR MEMS BASED OSCILLATOR

ID 2028

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ABSTRACT

A pierce oscillator circuit topology has been designed and fabricated. This circuit has been tested for its functionality with quartz crystal resonator. The circuit is design and fabricated using Silterra 0.18µm CMOS technology. The signal power measured is -81dBm at 9.99MHz frequency. The most important part in transceiver and other electronic applications is the oscillator. The oscillator will provide reference signal or clock signal to facilitate the system synchronization, signal modulation and timing. It is important for the oscillator to produce the clean, smooth and stable output signal with clear frequency spectrum without any input. There are three types of oscillator found in the literature namely; i) quartz crystal oscillator, ii) LC integrated oscillator and iii) MEMS based oscillator. LC and MEMS oscillators still do not meet the high requirements set by the communication systems, thus quartz crystal oscillators are still widely used today. The demand for quartz crystal oscillator keep increasing steadily between 4 ~ 10% annually [1]. Pierce circuit topology was chosen for its simplicity and straightforward biasing, thus it's consume less power and provide excellent phase noise performance. Moreover, the topology must be able to overcome the insertion losses of the resonator. Figure 1(a) shows the pierce circuit topology. To ensure the oscillation is started and sustained, the oscillator circuit also has to have a unity loop gain and zero phase shift, as stated by Barkhausean critirea. $|\beta(j\omega) A_v (j\omega)|=1$ $\angle\beta(j\omega) A_v (j\omega)=\pm 360°$ n=0,1,2,3,…….. This paper presents the design, simulation and fabrication of pierce oscillator circuit topology for MEMS resonator. The resonator generates resonance frequency of 10MHz. The simulation was done using Silterra 0.18µm technology. (b) Figure 1: (a) Schematic of pierce oscillator circuit topology, (b) simulation gain and phase Simulation result for gain and phase without 50Ω matching circuit of this topology is shown in Figure 1(b). RESULT AND DISCUSSION Figure 1, shows the simulation and measure power spectrum for 10MHz oscillator. The result obtained is -81dBm and -7dBm for measured and simulation

respectively. Figure 2 shows the sustaining circuit chip and the measurement setup. (b) Figure 1: (a) Simulation result of power spectrum and phase noise, (b) Measured result of Power spectrum (b) Figure 2: (a) The chip for sustaining circuit, (b) The measurement setup REFERENCES [1] C. S. Lam, "A Review of the Recent Development of MEMS and Crystal Oscillators and Their Impacts on the Frequency Control Products Industry," in Ultrasonics Symposium, 2008. IUS 2008. IEEE, 2008, pp. 694-704.

Design and Development of Mopping Robot-'Hotbot'

ID 2029

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ABSTRACT

To have a healthy, comfortable, and fresh civilized life we need to do some unhealthy households. Cleaning the dirty floor with a mop is one of the most disgusting and scary house hold jobs. Some people may like doing household errands, even they are also irritated with mopping, late alone those who hate household chores. Technology is to make life easy and to get us escaped from all those stuff that we are scared of. 'Hotbot' is a mopping robot that can clean dirty floor with nice efficiency leaving no sticky dirt. Hot water can be used for heavy stains or normal water for usual situation and economy. It needs neither to be monitored during mopping nor to be wiped after it. HotBot has sensors to detect obstacles and a control mechanism to avoid those. Moreover, it cleans sequentially and equipped with several accident-protection-systems. Moreover, it is also cost effective and affordable for average people. Thus, HotBot is a robust mopping servant of us.

Development of Wearable Pulse Oximetry for Telehealth Monitoring System

ID 2030

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ABSTRACT

In recent years there has been increasing interest in wearable/mobile health monitoring devices, both in research and industry. These devices are particularly important to the world's increasingly aging population, whose health has to be assessed regularly or monitored continuously. One of these devices is Pulse oximeter which indirectly measures the oxygen saturation of a patient's blood (as opposed to measuring oxygen saturation directly through a blood sample) and changes in blood volume in the skin, producing a photoplethysmograph (PPG). The main goal of the paper is to develop a cost-effective user-friendly Pulse Oximetry for Telehealth Monitoring System.

Enhanced Distribution Channel Access in IEEE801.11E for Video Transmission Over WLAN

ID 2031

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ABSTRACT

This paper introduces a simulation study of an Enhanced Distributed Channel Access method (EDCA) in the IEEE802.11e standard and enhanced protocol. The protocol is evaluated under different network loads for real-time applications using MPEG-4 video traffic, and then compared with the earlier legacy IEEE802.11 DCF access method. A Simulation using Network Simulator 2 (NS-2) & Evalvid were carried out using different performance metrics and applied various QoS parameters such as average end-to-end delay, throughput and packet loss ratio. Simulation results of throughput, decidable frame rate, PSNR, and packet loss, show good quality with lower packet loss and higher throughput.

Fuzzy Modeling and Control of Rotary Inverted Pendulum System using LQR Technique

ID 2032

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ABSTRACT

Rotary Inverted Pendulum (RIP) is a nonlinear, non-minimum phase, unstable and under actuated system. Controlling such system can be a challenge and considered a benchmark in control theory problem. Prior to designing a controller, equations that represent the behaviour of the RIP must be developed as accurate as possible without compromising the complexity of the equations. Through Takagi-Sugeno (T-S) fuzzy modeling technique, the nonlinear state space representation is then transformed into several local linear state equations which is then blended together to reproduce, or approximates, the nonlinear system within local region. The developed fuzzy model is then validate through experiment by using the LQR based state feedback controllers via parallel distributed compensation (PDC) to stabilize the system.

DESIGN AND SIMULATION OF CLAMPED-CLAMPED AND CLAMPED FREE RESONATORS

ID 2033

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ABSTRACT

Recently, there has been interest to design the microelectromechanical system (MEMS) integrated with complementary metal-oxide semiconductor (CMOS) resonator for RF integrated circuits. This work presents the designs of clamped-clamped and clamped-free beam resonators. These resonators will be fabricated using commercial CMOS technology and intends to replace current off- chip resonators. These resonators which are an on-chip solution provide devices which have low area, are low cost and have reduced insertion losses due to external bond wires. They can be integrated with amplifiers to form oscillators which generate 20 MHz clocks. The resonators require approximately 70 V DC and 10 mV AC to electrostatically actuate the resonator's beams. The actuation is simulated and measured using Finite modeling software such as COMSOL Multiphysics 4.2 and Cadence to obtain optimum design parameters. The device performance is discussed in terms of resonance frequency, total capacitance, S-parameters, and displacement. Apart from that, different models of MEMS resonators are compared to obtain the optimized device. METHODOLOGY Resonators Setup Figure 1 shows the electrical measurement of Clamped-Clamped beam resonator whereas the both anchors are fixed while figure 2 displays the Clamped-Free beam which only has clamped one anchor at the end of the beams. Both electrodes beside the beam will be grounded. The AC signal is applied at the anchor and directly conduct the beam to produce electrostatic actuation to the beams. This actuation will produce the highest resonance frequency which highlights the highest displacement of beam oscillation. Equivalent Circuit of Resonators Result: Simulation RESULTS AND DISCUSSION 1. Resonance Frequency and Total Displacement Figure 6 show the result of total displacement and resonance frequency of the both resonators. Clamped-clamped beam show the highest first mode resonance frequency at 19.20MHz and the displacement at 13.25um. The second mode of highest frequency is at 23.60MHz and displacement shows at 5.86um. While the clamped free beam shows that the lower resonance frequency compare to clamped- clamped beam resonator. The first mode of highest resonance frequency for clamped free beam is 2.99MHz and the displacement is 0.23mm. The second mode of highest resonance frequency is at 3.72MHz and the displacement is 27.20um. Table 1 and figure 7 state that the result of total capacitance of both resonators. Clamped-free beam shows the highest capacitance is produced when the DC voltage is applied to the resonators. Around 2fF-2.4fF is produced by clamped free beam during oscillation. The clamped-clamped beam shows lower result of capacitance at 57fF-58fF. The clamped-clamped beam produces high resonance frequency which can be used to the higher resonance frequency application compare to clamped-free beam resonator. The resonators will integrate with the amplifier to form an oscillator and compatible to be used as filter in integrated chip devices. REFERENCES [1] Leach, R., Cui, Z., and Flack, D (Eds): 'Microsystems technology standardization roadmap'. 'Project IST-2001-37682 funded by the EU IST program, 2001

Assessment of Tracking Performance of Cascade P/PI, n-PID and n-Cascade Controller for Precise Positioning of XY Table Ballscrew Drive System

ID 2034

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ABSTRACT

Today, positioning systems in machine tools aim for high accuracy and robustness characteristics in order to accommodate against various disturbance forces. The objective of this paper is to evaluate the tracking performance of Cascade P/PI, NPID and Ncascade controller with the existence of disturbance forces in the form of cutting forces. Cutting force characteristics at different cutting parameters; such as spindle speed rotations is analysed using Fast Fourier Transform. The tracking performance of a classical cascade controller in presence of these cutting forces is compared to the PID controller and gain scheduling PID controller. Robustness of these controllers in compensating different cutting characteristics is compared based on reduction in the amplitudes of cutting force harmonics using Fast Fourier Transform. It is found that the Ncascade controller performs better than both NPID controller and Cascade P/PI controller. The average percentage error reduction between Ncascade controller and Cascade P/PI controller is about 88 % whereas the average percentage error reduction between cascade controller and NPID controller is about 84 % at spindle speed of 1000 rpm spindle speed rotation. The finalized design of cascade controller could be utilized further for machining application such as milling process. The implementation of Ncascade in machine tools applications will increase the quality of the end product and the productivity in industry by saving the machining time. It is suggested that the range of the spindle speed could be made wider to accommodate the needs for high speed machining

Optimal Performance of a Nonlinear Gantry Crane System via Priority-Based Fitness Scheme in Binary PSO Algorithm

ID 2037

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ABSTRACT

This paper presents development of an optimal PID controller for controlling the nonlinear gantry crane system. The proposed Binary Particle Swarm Optimization (BPSO) algorithm that uses Priority-based Fitness Scheme is adopted in obtaining optimal controller gains. The optimal gains are tested on a control structure that combines PID and PD controllers to examine system responses including trolley displacement and payload oscillation. The dynamic model of gantry crane system is derived using Lagrange equation. Simulation is conducted within Matlab environment to verify the performance of system in terms of settling time, steady state error and overshoot. This proposed technique demonstrates that implementation of Priority-based Fitness Scheme in BPSO is effective and able to move the trolley as fast as possible to the desired position with low payload oscillation.

Development of a Novel Locomotion Algorithm for Snake Robot

ID 2039

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ABSTRACT
A novel algorithm for snake robot locomotion is developed and analyzed in this paper. Serpentine is one of the renowned locomotion for snake robot in disaster recovery mission to overcome narrow space navigation. Several locomotion for snake navigation, such as concertina or rectilinear may be suitable for narrow spaces, but is highly inefficient if the same type of locomotion is used even in open spaces resulting friction reduction which make difficulties for snake movement. A novel locomotion algorithm has been proposed based on the modification of the multi-link snake robot, the modifications include alterations to the snake segments as well elements that mimic scales on the underside of the snake body. Snake robot can be able to navigate in the narrow space using this developed locomotion algorithm. The developed algorithm surmount the others locomotion limitation in narrow space navigation.

Principal Component Analysis for The Classification of Finger Movement Data Using Dataglove "GloveMAP"

ID 2043

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ABSTRACT
Nowadays, many classifier methods have been used to classify or categorize human body motions of human posture including the classification of fingers movement. Principal Component Analysis (PCA) is one of classical method that capable to be used to reduce the dimensional dataset of hand motion as well as to measure the capacity of the fingers movement of the hand grasping. The objective of this paper is to analyze the human grasping feature between thumbs, index and middle fingers while grasping an object using PCA-based techniques. The finger movement data are measured using a low cost DataGlove "GloveMAP" which is based on fingers adapted postural movement (or EigenFingers) of the principal component. The fingers movement is estimated from the bending representative of proximal and intermediate phalanges of thumb, index and middle fingers. The effectiveness of the propose assessment analysis is shown through the experimental study of three fingers motions. The experimental results showed that the use of the first and the second principal components allows for distinguishing between three fingers grasping and represent the features for an appropriate manipulation of the object grasping.

Design and Development of a Simulator for Modelling Carbon Nanotube

ID 2044

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ABSTRACT

This paper presents a phenomenological predictions Quantum modeling of CNT for the cutoff frequency of carbon nanotube transistors as single-wall zigzag semiconducting carbon nanotubes (CNTs) in the channel. Investigations show that CNTs have high low-field mobilities. Proposed analysis indicates that by forming high mobility regions in the channel, to determine the band-structure of the CNTs. This paper also presents predictions of the effects the intrinsic concentrations of different tubes diameter performance. The influence of quantum CNT Bandstructure and Electron Affinity is required for FET modeling. CNT Mobility Model, CNT Intrinsic Carrier Concentration and ballistic transport on the high-frequency properties of nanotube transistors is analyzed. Our calculations show that carbon nano-electronics may be faster than conventional Si, SiGe, GaAs, or InP semiconductor technologies.

Review of Fruit and Vegetables Intelligent grading system Using Magnetic Resonance Imaging (MRI) Technology

ID 2045

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ABSTRACT

Considering nonlinear and complex characteristic of wet scrubbing process and increasing demands for high precision environmental protection measures regarding particulate matter (PM) emissions from industrial productions, an intelligent control approach was employed in this study to adequately deal with these problems. The intelligent controller includes a feed forward neural network model for predicting the performance of wet scrubber system for the control and removal of PM10 and PM2.5 emission from industrial sources. The controller consists of a subsystem for the input signals and two models based neural network controllers developed using differential evolution optimization algorithm. The two controllers provides desired droplet size and gas velocity at a given particle size and wet scrubber efficiency. The control process was implemented using MATLAB Simulink and the effectiveness of the controllers was demonstrated for different operating condition of the wet scrubber system.

NEUTRON RADIATION EFFECT ON NTE123 AND 2N2222 NPN SILICON BIPOLAR JUNCTION TRANSISTORS

ID 2047

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ABSTRACT
ABSTRACT This paper examines neutron radiation effect on silicon NPN bipolar junction transistors and analysis of those BJTs in terms of electrical characterization such as current gain after neutron radiation. Experiment results show that the current gain degradation of NPN transistors (NTE123 and 2N2222) is very sensitive to neutron radiation. We believe that the current degradation after neutron radiation is governed by increasing recombination current occurred between the base and emitter depletion region

Simplified heat generation model use in Electric Vehicle

ID 2048

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ABSTRACT
It is known that temperature variations inside a battery may greatly affect its performance, life, and reliability. In an effort to gain a better understanding of the heat generation in Lithium ion batteries, a simple heat generation models were constructed in order to predict the thermal behavior of a battery pack. The Li-ion battery presents in this paper is Lithium Iron Phosphate (LiFePO4). The results show that the model can be viewed as an acceptable approximation for the variation of the battery pack temperature at a continuous discharge current from data provided by the manufacturer and literature.

Model Building of Thermoelectric Generator Exposed to Dynamic Transient Sources

ID 2049

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ABSTRACT
This paper present the modeling of thermal and power generation behavior of a thermoelectric generator (TEG) exposed to transient sources. Most of the previous research did the analysis for steady-state behavior which only involves the constant temperature value. But in the real situation, the temperature of the TEG input is fluctuating with time. Therefore this research will look into a focal point on transient heat sources that is being supplied to the hot junction with natural convection cooling process at the cold junction for single and multiple configuration of TEG. The model obtained the data from existing

experiments with predicted various conditions of temperature, heat gradient, internal resistance and current attribute of TEG. Simulation model is done using available TEG with the use of given parameter by the supplier. The results show that the prediction various input parameter able to determine the output power characteristics of a TEG.

1 Cascaded Kalman Filters for Inertial Navigation System Error Estimation Fusing Optical and Inertial Sensors

ID 2050

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ABSTRACT

In this paper, cascaded error estimation and compensation using the fusion of vision and Inertial Navigation System (INS) information in Inertial Measurement Unit (IMU) is presented. Kalman Filters (KFs) are employed to estimate the errors which have been modeled by state space model. -General Cascaded Architecture: Computational strapdown system can be represented as cascaded and observable subsystems, which are less complex than the original system. Therefore, we propose the decomposition of a strapdown IMU system model into subsystems in a cascaded way and the design of separate estimators for the subsystems. The separate observers (KFs) are designed for the linearized subsystems. The advantage of this architecture is that it makes the tuning easier, debugging more precise and verifying more possible. Additionally, the computation time of each observer is noticeably less than the traditional central observers. Besides, the proposed architecture is so appropriate to be implemented by multi processors. - Cascaded Architecture Related to Strapdown INS: In Inertial Navigation System and in order to keep track of orientation, the signals from the rate gyroscopes are integrated. For Psosition tracking, the three accelerometer signals are resolved into global coordinates using the known orientation, as determined by the integration of the gyro signals. The global acceleration signals are then integrated in the stable platform algorithm. Considering the aforementioned INS architecture and assuming that all signals and models are in the body frame and no need to consider transformation matrix, we propose a cascaded architecture for our estimation procedure. The experimental results are provided to show the efficiency of the proposed method. To this end, the real data are gathered from our MedicRunner system which is equipped with K600 camera system and Crista Inertial Measurement Unit (IMU). All of the measurements are provided in 3 Dimensions. The data have gathered in movement free situation. So, only noises and biases are measuring. The following figure depicts the estimations of acceleration bias, speed and position deviations in x-axis respectively in comparison with real signals (measured) in both centralized and cascaded structures. Another criteria used to evaluate the results is Mean Square Error (MSE). Discussion about results has been provided in details in the full paper.

Speech Analysis Based on Image Information from Lip Movements

ID 2053

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ABSTRACT

Deaf and hard of hearing people often have problems being able to understand and lip read other people. Usually deaf and hard of hearing people feel left out of conversation and sometimes they are actually ignored by other people. There are a variety of ways hearing-impaired person can communicate and gain accsss to the information. Communication support includes both technical and human aids. Human aids include interpreters, lip-readers and note-takers. Interpreters translate the Sign Language and must therefore be qualified. In this paper, vision system is used to track movements of the lip. In the experiment, the proposed system succesfully can differentiate 11 type of phonemes and then classified it to the respective viseme group. By using the proposed system the hearing-impaired persons could practise pronaunciatios by themselve without support from the instructor.

Performance analysis of robust road sign identification

ID 2054

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ABSTRACT

In recent years, automatic road sign identification system has attracted many researchers to be used in autonomous driver assistance system (ADAS) or driver assistance system. There are many automotive companies has integrated such system so that it may be used as self-driving cars. For instance, Ford Focus has developed friendly user interface of road sign identification system at the instrument board inside the car. This system able to help driver that may be distracted, asleep or not alert as such accidents can be easily reduced. In contrast, Google implemented road sign detection camera in radar, laser range finder sensors that are mounted on the car shown that the driving car without driver is possible. Developing a robust road sign identification system is a must such as in case of detecting and classifying road signs using large database. Many existing techniques up to now developed algorithm with the existence of occlusions produce inaccuracy that need to be improved. Even though the occurrences of road sign with presence of occlusion are small, yet it stills a problem that needs to be resolved. To solve the problems, an intelligent system for road sign identification that incorporated differences algorithms is proposed in the research. The algorithms consist of proposed HSV and RGB colors in detection part and ANN and PCA techniques in recognition part. These algorithms are then compared on each other to evaluate their performance. The hypothesis of the research is that the feature of road sign able to detect and identify signs that are taken at night and day time and involved with existence of occlusions. Each sign features are then extracted using global feature extraction technique as the vertical and dimension size of sign are fixed to a standard size. These input features are used to be feed into neural network according to feed forward neural network technique using backpropagation training function. PCA is known as

feature extraction technique that reduced dimensional size. As such, sign image can be easily identified by the PCA methods. Based on the experimental result, it shows that the HSV is robust in roads sign detection with minimum of 92% and 77% successful for non-partial and partial occlusions images rather RGB color segmentation. For successful recognition rates using ANN can be achieved that is started from 75-92% whereas PCA is in the range of 94-98%. The occurrences of all classes are recognized successfully is between 5% and 10% level of occlusions using PCA, whereas only 5% level of occlusions successful recognized using ANN.

Hierarchical Self Organizing Map for Novelty Detection using Mobile Robot with Robust Sensor

ID 2055

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ABSTRACT

This paper presents a novelty detection method based on Self Organizing Map neural network using a mobile robot. Based on hierarchical neural network, the network is divided into three networks; position, orientation and sensor measurement network. The networks are linked together by its priority. A simulation is done to demonstrate and validate the proposed method using MobileSim. Three cases of abnormalities event; new, missing and shifted object are employed for performance test. The result of detection is then filtered for false positive rejection. The result shows that the inspection producing 0.5% false positive at high sensitivity setting.

Robust Features of Surface Electromyography Signal

ID 2056

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ABSTRACT

Nowadays, application of robotics in human life has been explored widely. Robotics exoskeleton system are one of drastically areas in recent robotic research that shows mimic impact in human life. These system have been developed significantly to be used for human power augmentation, robotics rehabilitation, human power assist, and haptic interaction in virtual reality. On August 2012, articles with the theme of “Grand Challenges of Robotics” were published in the IEEE Robotics and Automation Magazine[1].One of the five challenges falls under the umbrella of exoskeleton robots. The goal in this field is to develop robots that will amplify the speed, strength and endurance of people. In order to meet the goal, three technical challenges must be resolved [2] : (1) electromechanical implementation, (2) the use of neural control signals and extraction of intent and (3) ergonomics, aesthetics and safety aspect. In this paper focus on to solve challenge the use of neural signals and extract of intent. Commonly surface electromyography (sEMG) are used in order to control exoskeleton robot[1, 3-6]. But the problem lies on difficulty of pattern recognition based-EMG signal because of existing high noises. The main objective in this paper is to study the best features of electromyography in term of time domain and

frequency domain. Next, map the relationship between torque and best features of muscle unit activation potential (MaxPS and RMS) of biceps brachii. The scope of this paper are using two male sample subject which using same dominant hand (right handed), age between 20- 23 years old, muscle diameter 32cm to 35cm and using single channel muscle (biceps brachii muscle). The experiment shows that Fast Fourier Transform maximum power spectrum (MaxPS) has less error than mean value of reading compare to root mean square (RMS) value. Thus, Fast Fourier Transform maximum power spectrum (MaxPS) show the linear relationship against torque experience by elbow joint to lift different load. As the conclusion, the best features is MaxPS because it has the lowest error than other features and show the linear relationship with torque experience by elbow joint to lift different load.

An Investigation of Interference Coordination in Heterogeneous Network for LTE-Advanced Systems

ID 2057

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ABSTRACT

The novel "femtocell" in Heterogeneous network (HetNet) for LTE-Advanced (LTE-A) set-up will allow Malaysian wireless telecommunication operators (Maxis, Celcom, Digi, U-Mobile, P1, YTL and etc2.) to extend connectivity coverage where access would otherwise be limited or unavailable, particularly indoors of large building complexes. A femtocell is a nano-sized cellular base station that encompasses all the functionality of a typical station. It therefore allows a simpler and self-contained deployment including private residences. For the Malaysian service providers, the main attractions of femtocell usage are the improvements to both coverage and capacity. The operators can provide a better service to end-users in turn reduces much of the agitations and complaints. There will be opportunity for new services at reduced cost. In addition, the operator not only benefits from the improved capacity and coverage but also can reduce both capital expenditure and operating expense i.e. alternative to brand new base station or macrocell installation. Interference is a key issue associated with femtocell development. There are a large number of issues associated with interference all of which need to be investigated, identified, quantified and solved. This is to ensure that the deployment of any femtocells will take place successfully. Among the most critical challenges in femtocell deployment is the interference between femtocell-to-macrocell and femtocell-to-femtocell in HetNets. In this paper, all proposed methods and algorithms will be investigated in OFDMA femtocell system considering HetNet scenarios for LTE-A, concurrently a methodology will be propose which will be designed and evaluated in consultation with Malaysian Communication and Multimedia Commission (MCMC).

Investigation of Three Dimensional Empirical Indoor Path Loss Models for Femtocell Networks

ID 2058

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ABSTRACT

Femtocell which is a home access point is an important parameter in future wireless networks. Many researches are conducting annually around the world to study and investigate the challenges of deployment femtocell in the real environment. To figure out and reduce the effects and the cost of femotcell deployment in existing wireless networks, system level simulator is necessary. In order to build a more realistic system level simulator, it is important to include the third dimension in the calculations. Three dimensional simulator is more accurate and more realistic. The first requirement of building a system level simulator is the path loss model. It plays an important role in interference calculation. Since femtocell is installed indoor, it is again gained the attention to the indoor propagation models. However many propagation models were proposed in the literature. All of these models are for macro and microcellular networks. Propagation models that are used in microcellular are not accurate enough to be applied in femtocell propagation calculations. An accurate model that considers more specific details in addition to the direct path is required. Adding the number of floors and walls between the transmitter and the receiver is more accurate and less errors than using only the direct path. In this paper different propagation model will be compared and simulated for five story building. Then real measurement for LTE femtocell operating at 2.6 GHz will be conducted and compared with the simulation results. Finally, three dimensional empirical propagation model will be proposed.

A Comparative Signaling Cost Analysis of Macro Mobility Scheme in NEMO (MM-NEMO) With Mobility Management Protocol

ID 2059

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ABSTRACT

NEMO BSP is an upgraded addition to Mobile IPv6 (MIPv6). As MIPv6 and its enhancements (i.e. HMIPv6) possess some limitations like higher handoff latency, packet loss, NEMO BSP also faces all these shortcomings by inheritance. Network Mobility (NEMO) is involved to handle the movement of Mobile Router (MR) and it's Mobile Network Nodes (MNNs) during handoff. Hence it is essential to upgrade the performance of mobility management protocol to obtain continuous session connectivity with lower delay and packet loss in NEMO environment. The completion of handoff process in NEMO BSP usually takes longer periodsince MR needs toregister its single primary care of address (CoA) with home network that may cause performance degradation of the applications running on Mobile Network Nodes. Moreover, when a change in point of attachment of the

mobile network is accompanied by a sudden burst of signaling messages, "Signaling Storm" occurs which eventually results in temporary congestion, packet delays or even packet loss. This effect is particularly significant for wireless environment where a wireless link is not as steady as a wired link since bandwidth is relatively limited in wireless link. Hence providing continuous Internet connection without any interruption throughapplying multihoming technique and route optimization mechanism in NEMO are becoming the centerof attention to the current researchers. In this paper, we propose a handoff cost model to compare the signaling cost of MM-NEMO with NEMO Basic Support Protocol (NEMO BSP) and HMIPv6.The numerical results shows that the signaling cost for the MM-NEMO scheme is about 69.6 % less than the NEMO-BSP and HMIPv6.

Classification of Body Structure Base on Gestural Motion Using PCA

ID 2060

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ABSTRACT

Lately, study of human capabilities with the aim to be integrated into machine is the famous topic to be discussed. Moreover, human are bless with special abilities that they can hear, see, sense, speak, think and understand each other. Giving such abilities to machine for improvement of human life is researcher's aim for better quality of life in the future. This research was concentrating on human gesture, specifically arm motions for differencing the individuality which lead to the development of hand gesture database. We try to differentiate the human physical characteristic based on gesture representation represented by arm trajectories. Subjects of experiment were selected from different type of body size, and then the data gathered undergo resampling process. Analysis of data using Principle Component Analysis (PCA) approach produced three difference group of pattern.

Review of Fruit and Vegetables Intelligent grading system Using Magnetic Resonance Imaging (MRI) Technology

ID 2061

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ABSTRACT

This review deals with various research methods using Magnetic Resonance Imaging (MRI) with intelligent methods that have shown to be useful and have being adopted to determine the internal qualities of the fruits and vegetables over the past ten years. Stated in this review are various non-destructive techniques such as Near infrared imaging NIR, capacitance, X-ray, ultraviolet and sensor used to assess quality of the farm produce. The potential of MRI technique for food quality evaluation is proven. MRI has shown to be innovative automated created to quantify the information inherent in images in a way applicable to health sector. The power of MRI techniques allow non-destructive study of water concentration and proton relaxation characteristics of water in fruit and vegetables and revealed hidden defects or contamination for quality control. The current status of MRI

and intelligent techniques with respect to fruit and vegetable quality were analysed in this article and finally shows that images acquired from MRI system can be effectively and efficiently utilized to design and construct an MRI based intelligent grading machine

DC-DC Boost Converter Inductance as a Boosting Element

ID 2062

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ABSTRACT

DC-DC converters are commonly used in onboard electronic circuits for translating DC levels. It has been under extensive investigation for power applications over the recent past years. Used primarily to step-up/down DC voltage levels, DC-DC inverters are employed to stabilize DC level of supplied obtained from ambient energy sources of solar and wind power. In such inverters, an inductor is fluxed first to be magnetized to a constant level before is de-fluxed through a switching device. The de-fluxing of inductor makes it to release its energy with a voltage of opposite polarity across the coil. The switching time, frequency and inductance value are optimized such the resulting voltage produced is higher/lower than the voltage used to magnetize the coil. In the former case the converter is said to be operating in boosting mode while is referred to be functioning in buck mode in the later case. This paper explores the effect of changing inductance variations on the magnitude of resulting output voltage in boosting mode. The results are normalized to a range of inductance typical of a coil of given geometrical dimensions. The working and theoretical details of the circuits are explained and discussed, also results for each inductance level against voltage output and its effect on circuit are shown to be having a comparative with recently reported work. The results of this work can prove of fundamental importance for venturing into research issues related to zero-crossing, well-defined frequency and the synchronization in the case of grid-tied inverters.

ON THE ISSUE OF SMALL VOLTAGE RECTIFICATION FOR IMPLANTED DEVICES; A Review of Contemporary Reported Research

ID 2063

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ABSTRACT

Conception of biomedical implants is an enthralling development in the recent years as they are being employed for the instantaneous and unceasing monitoring of intended parameters. Continuous energy availability to these devices without relying on battery dependent sources necessitates the alternative sources such as energy harvesting from the surroundings. Harvested output needs to be processed before using it for powering purposes due to its small value. It needs to be made robust against the contiguous hazards so that maximum power is transferred to the load. A rectifier block is employed to make this harvested energy usable and amplify to an operational DC level. This paper compares the

rectifier circuits and their simulation output in terms of regulation, stability and power transferred. The problem of rectification of small voltage signals becomes an issue of concern in small voltage applications, as quite a sizable portion of it goes to threshold voltage drops, affecting badly the power transfer efficiency, reducing it to a minimum. The effect of using a capacitor is indicated in terms of addressing the ripples problem besides showing the effect of load changes. The issues of ripples reduction are highlighted for various rectifier circuits reported in recent literature. The bootstrap capacitor circuit is elaborated showing its efficiency in reducing the ripples considerably. The load effect is indicated to show that larger becomes the load, worse becomes the issue of ripples in supplies. Though, the problem of random spike is intended to be presented in a future publication of same project; however the effect of a periodic spike is provided to show how the circuit functions to effectively reduce the unwanted spike.

A Fusion of Sensors Information for Autonomous Driving Control of an Electric Vehicle.

ID 2064

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ABSTRACT

The study uses the environment of the road as input variables for the main system to control steering wheel, break and acceleration pedals. A camera is installed on the roof of the Electric Vehicles (EV), and is used to obtain image information of the road. On the other hand, users or drivers do not have to directly contact with the main system because it will autonomously control the devices by using fuzzy information of the road conditions. A fuzzy information means in the preliminary experiments, reasoning of the various environment will be done by using fuzzy approach. At the end of the study, several existing algorithms for controlling motors and image processing technique could be combined into a algorithm that could be used to move EV without assist from human.

Optimization of wireless power transmission for two-port and three-port Inductive Link

ID 2065

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ABSTRACT

Recent developments have shown that the non-invasive means of powering the low power implants has become popular. Such devices are normally powered up by the technique of inductive coupling. Inductive coupling is used to power up electronic devices for gathering sensed data in return for power sent. This paper addresses the comparisons between the performance of two-port network circuit and three-port network circuit of an inductive coupling circuit system. Analytical as well as simulations have been conducted to plot all the design parameters. Simulation results have been compared with the analytical plots, proving the utility of the derivations made. Power transfer efficiency for the inductive coupling system has been studied in detail and it has been found that it the efficiency

depends mainly on the mutual coupling between the coils. Comparative results for the different values of mutual coupling have been plotted and results show that by increasing the mutual coupling power efficiency will be improved correspondingly.

High Quality Acquisition of Surface Electromyography – Conditioning Circuit Design

ID 2066

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ABSTRACT

The acquisition of Surface Electromyography (SEMG) signals is used for many applications including the diagnosis of neuromuscular diseases, and prosthesis control. The diagnostic quality of the SEMG signal is highly dependent on the conditioning circuit of the SEMG acquisition system. This paper presents the design of an SEMG conditioning circuit that can guarantee to collect high quality signal with high SNR such that it is immune to environmental noise. The conditioning circuit consists of four stages; consisting of an instrumentation amplifier that is used with a gain of around 250; 4th order band pass filter in the 20-500Hz frequency range as the two initial stages. The third stage is an amplifier with adjustable gain using a variable resistance; the gain could be changed from 1000 to 50000. In the final stage the signal is translated to meet the input requirements of data acquisition device or the ADC. Acquisition of accurate signals allows it to be analyzed for extracting the required characteristic features for medical and clinical applications. According to the experimental results, the value of SNR for collected signal is 52.4 dB which is higher than the commercial system, the power spectrum density (PSD) graph is also presented and it shows that the filter has eliminated the noise below 20 Hz.

Performance characterization of inductive coupling system

ID 2067

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ABSTRACT

The use of buried devices or undoubtedly those of bio implants have been on the rise over the recent past years; this use is to increase exponential over the comings years. Such devices are becoming the most feasible interfaces to monitor the betrothed parameters. Such low power devices are powered using inductive coupling as a source. Inductive coupling not only solves the powering issue but also helps to collect the data through non-invasive means. Power transfer efficiency of an inductive link-based system depends upon factors like mutual coupling, separation between the coils and most importantly the shape of the input voltage are being researched these days. The power transferred or signal received as a result of coil separation under optimum size conditions are reported in contemporary works. This paper comes with a novel approach for testing the effect of different shaped input voltages on the performance of inductive coupling system in terms of power transfer efficiency. Circuits have been tested for three different types of input waveforms of sine, square and ramp. Comparison of plots shows that the shape of input

plays a major role on the entire performance of inductive coupling system.

Electrical Performances of Commercial GaN and GaAs Based Optoelectronics Under Neutron Irradiation

ID 2069

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ABSTRACT

This paper aims to demonstrate the effects of displacement damage caused by high energetic neutron particle towards the electrical performances of gallium nitride (GaN) and gallium arsenide (GaAs) based diodes. The investigations are carried out through current-voltage (I-V) and capacitance-voltage (C-V) measurements using Keithley 4200 SCS. Two different commercial optoelectronics diodes; GaN on SiC light emitting diode (LED) and GaAs infrared emitting diode (IRED) were radiated with neutron using pneumatic transfer system (PTS) in the PUSPATI TRIGA Mark II research reactor under total neutron flux 1×1012 neutron/cm2.s. Following the neutron exposure for 1 ,3 and 5 minutes, the I-V forward bias and reverse bias leakage current increase for GaAs IREDs, but minimal changes were observed in the GaN LEDs. The C-V measurements revealed that the capacitance and carrier concentration of GaAs IREDs decrease with increasing radiation flux.

A Qualitative Review for Wireless Health Monitoring System

ID 2070

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ABSTRACT

There has been an increasing interest over the past years in the development of an accurate wireless system for monitoring continuously human activities in health care centres. Moreover due to the increasing number of elderly population and the limited availability of qualified staff for nursing homes there is a high market demand ambulatory services reducing the pressure on attending hospitals. For human detection application utilizing various techniques, researchers have been reporting using approaches such as Near Field Identification technique, Visual Sensor Network, radar detection, and e-mobile techniques. This paper has made an extensive review of the recent developments of human detection application via the non-contact means focusing on few noteworthy issues in depth. Among the techniques used in such reported research, the use of inductive links for human detection application has been explored extensively. This is most commonly in devices in places to accessibility through wiring has become impractical or inconvenient from a personnel safety view point. However, such link shave been proving more effective in providing stabilized voltage supplies, though less power transfer efficiency. Bearing in mind its limitations, an Inductive Intelligent Sensor (IIS) has proposed as a novel human monitoring system for implementation. The proposed sensor aims at exploring obtaining

signature signals of human body movement and size. The sensor used consists of an inductive loop, employed or installed in such a way that a passing human brings about a change in its inductance. The change in inductance leads to producing an output signal of a shape representative of the human body size.

Transforming Human Gait for Signature Signals Characterization

ID 2071

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ABSTRACT

An integrated wireless inductive sensor is reported based on a system for monitoring human movement and body size. The system proposed senses the presence of human beings using electromagnetic field by making use of basic inductive coupling approach, hence analysing the performance of human monitoring. On the whole, multiple loop shaped coils have been developed as inductive bio-sensory system which is able to generate wave shapes indicating target body's conditions. The individual signature waveforms are marked by different human size or postures. The design of an overall detection system includes loops of appropriate dimensions buried under the mattress and applied on the surrounding walls for a human enclosure in such a way that when there is a change in human movement a change in inductance is brought about. This particular change in inductance is then processed or conditioned by a processor/conditioner circuit. The conditioning circuit in this work proposed is a resonant circuit showing no output signal. The amalgamation of the integrated system proposed will help in providing better services to the elderly people resided in healthcare centres. The developed sensing system is of low cost, flexible, robust, and easily implantable and capable of inductive sensing through marking signature waveforms as a result of human movements.

Evaluation of QoS Supported in Network Mobility NEMO Environments

ID 2072

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ABSTRACT

Network mobility basic support (NEMO BS) protocol is an entire network, roaming as a unit which changes its point of attachment to the Internet and consequently its reachability in the network topology. NEMO BS doesn't provide QoS guarantees to its users same as traditional Internet IP and Mobile IPv6 as well. Typically, all the users will have same level of services without considering about their application requirements. This poses a problem to real-time applications that required QoS guarantees. To gain more effective control of the network, incorporated QoS is needed. Within QoS-enabled network the traffic flow can be distributed to various priorities. Also, the network bandwidth and resources can be allocated to different applications and users. Internet Engineering Task Force (IETF) working group has proposed several QoS solutions for static network such as IntServ,

DiffServ and MPLS. These QoS solutions are designed in the context of a static environment (i.e. fixed hosts and networks). However, they are not fully adapted to mobile environments. They essentially demands to be extended and adjusted to meet up various challenges involved in mobile environments. With existing QoS mechanisms many proposals have been developed to provide QoS for individual mobile nodes (i.e. host mobility). In contrary, research based on the movement of the whole mobile network in IPv6 is still undertaking by the IETF working groups (i.e. network mobility). Few researches have been done in the area of providing QoS for roaming networks. Therefore, this paper aims to review and investigate (the current /and previous) works that have been developed to provide QoS to mobile network. Accordingly, their strengths and the weaknesses will be highlighted. Eventually, a new proposed scheme will be introduced to improve QoS guarantee within NEMO environment.

Inductive Loops For Sensing Position As Signature Signals

ID 2073

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ABSTRACT

In this paper, an inductive loop based sensing technique is proposed, this new proposed system consists of a special shaped non-conventional inductive loop. The inductive loop has an inner loop inside the bigger loop of 100µH of initial value. This loop is conditioned using three capacitance values of 0.068 µF each. A sinusoidal voltage source of 5Vs peak to peak is then injected to the described system. The variation of the relative permeability of the inductance of the inductive loop (ΔL) results In a variation of the overall inductance value (L+ΔL), that causes the output signal to change in term of shape and amplitude value for every specific variation (ΔL). As a result of a change of (ΔL=1µH) a change of 300mV results at the output making this technique more sensitive than works reported so far. Analytical model based on derivation of the transfer function is presented to validate the simulation plots obtained through using Multisim software. Moreover Matlab plots and Laplace inverse function are used as second proof of validation. Experimental results obtained are used for verifying the theory of this technique.

Experimental Evaluation of Agricultural Biomass Flow Sensing Behaviour Using Capacitive Technique

ID 2075

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ABSTRACT

Precise biomass flow is critically important for enhancing industry control quality control as well for entrepreneurial economic benefits. This precise flow sensing has generated major research interests among researchers worldwide. Keeping in mind the shortcomings of existing sensing technologies, this paper has developed a capacitive sensing method by making use of a modified bridge circuit along with particularly designed sensing electrodes. The objective of this work is fulfilled via experimental evaluation through a prototype

hardware implementation of a flow sensing set up. The experimental results have specified in the measurement system which is able to sense flow variations as a change of dielectric permittivity representing flow of different biomass materials under room conditions. Moreover, the results have revealed distinctive features distinguishing the air-biomass phase distribution, dependent on and clearly signifying the shapes and physical characteristics of electrodes, locations of the mounted electrodes on test pipe wall and dielectric permittivity of test biomass materials

A Study of Pneumatic Conveying of Gas-Solid Flow for Industrial Application

ID 2076

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ABSTRACT

The complicated nature of gas-solids' physical properties have challenged the researchers over past decades who have led their efforts in developing its' flow sensing and measurement methods. The term 'gas-solid flow' signifies dilute- or dense-phase flow with a very little concentration of solids. For conducting such flow measurement, generally velocity profile and volumetric concentration of the flow particles being conveyed are needed to be measured. An important application of gas-solid flow has taken root in the form of biomass flow in pneumatic conveying systems, and its' online measurement has proven to be an exigent research pursuit. Additionally the other applications have been explored in power plants, food, chemical and automobiles industries as well. This paper aims at exploring the evolution of flow measurement methods along with a brief explanation on existing fundamental sensing techniques. Furthermore, the most recent patents developed for such measurements in pneumatic conveying pipelines are scrutinized along with their concomitant pros and cons.

Securing Data by Pseudo Random Noise Generator Using Direct Sequence Spread Spectrum

ID 2077

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ABSTRACT

Secure data transmission techniques have been a desirable accomplishment over the years and becoming more important these days. For making sure the security of data a secret codes or keys must be generated and the same key is being used by transmitter for encryption during the time when it is sent and decryption of data at the receiver when it is received. Pseudo random noise generator circuit which employs a linear feedback shift register (LFSR) is using for the key source in cryptographic application. LFSR is able to produce binary sequences with n-bit shift register which pseudo-randomly scrolls between 2n-1 values. The simulated circuit of pseudo random noise key generator using three eight-bit shift registers which equal to 24 bits shifted requires (224-1) = 1, 67, 77, 215 clock pulses before it repeats. In this paper, the direct sequence spread spectrum (DSSS) principle

is employed as a data modulation and transmission technique. The data stream is then multiplied (using X-OR gate) with pseudo random noise in order to spread the pseudo code bandwidth. One bit of data is signal spreading about 8 bits (in practice it would be much higher) of pseudo code. The resulting signal of the multiplication process is called data stream locked with code signal. The power spectral density (PSD) of the resulting signal (spreading bandwidth) is compared with the data stream alone which more like narrowband. The DSSS receiver which contains the same pseudo random noise generator which matching the pseudo codes to an X-OR gate to reproduce the original data stream (unlocked). The pseudo code timing needs to be adjusted to produce minimal error signal. As with conventional receiver operation, an error voltage at the output of the LPF provides necessary correction to the pseudo random noise generator. The spectral density of the recovered data and original data is observed. The concept of locked and unlocked data stream by pseudo random noise code using DSSS technique is easy to understand. However, the mismatch of the transmitted locked data signal and the recovered data signal does exist due to clock timing of the code generator. The mismatch is observed by its magnitude of power spectral density at the typical frequency.

How To Model Wireless Mesh Networks Topology

ID 2082

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ABSTRACT

ABSTRACT The specification of the network connectivity model or topology is the beginning of either the development and/or analysis of networks in Computer Network researches. WMN is an autonomic network that is dynamically self-organised, self-configured as the mesh nodes establish automatic connectivity with the adjacent nodes while other nodes are linked by relay network of wireless backbone routers. Researches in WMN ranges from node deployment, channel assignment, routing to mobility management and internetworking issues with sensor networks, cellular and Internet. These researches require modelling of relationships and interactions among network nodes including the technical characteristics of the links while satisfying the architectural requirements of the physical network. However, the existing topology generators model geographic topologies and are based on the Internet which constitutes different architectures, thus may not to be suitable in WMN design. The existing methods of topology generation are explored, analysed and parameters for the characterisation of WMN topology are identified. Furthermore, MATLAB algorithm for the design and generation of WMN topology based on square grid model is proposed in this paper. The performance of the topology generated is also evaluated. This research is particularly important to obtain topology generation of a close to real WMN topology for ensuring relevance of design to the intended network and validity of results obtained in WMN researches. INTRODUCTION WMN researches are motivated by applications that are ordinarily not efficiently supported by the conventional networks. WMN provides internetworking to cellular networks, sensors and the Internet (Akyildiz et al 2005). Node connectivity in WMN is typically ensured among adjacent nodes especially if the nodes are within the transmission radius of one another. Apart from 1-hop connectivity, nodes also connect via intermediate relay network, however, with a bound on the number of hop possible without signal level degeneration. Topology generation is a representation of the network connectivity model which is an important

basic research task to be accomplished in development and/or analysis of networks. Graph theory is the basic tool used in modelling the relationships and interactions among nodes. An important parameter in selecting or designing topology generators is the quantification of its adherence or conformity to the technical characteristics of nodes and links while satisfying the architecture requirements of the physical network. The importance of generating close to real network topology is identified (Calvert et al, 1997; Kojic et al, 2012). Pure random and Waxman algorithm are usually implemented at the core to generate the random connected nodes in synthetic topology generators such as GT-ITM, Inet, BRITE and Tiers. METHODOLOGY An algorithm written in MATLAB for WMN topology generation is developed. RESULTS AND DISCUSSION Thus a plain grid is generated based on the assurance that both the block size and number of random nodes generated are functions of the domain area and the transmission characteristics of WMN nodes and links.

A Path Follower with Smooth Actuation

ID 2083

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ABSTRACT

Path following is an important and one of the oldest branches of motion control and mobile robotics. However, despite the maturity of the field new approaches are still being researched. Due to the specific locomotion characteristics, path following is treated differently for different kinds of mobile robots the typical examples of which are wheeled robots (eg: unisycle, omnidrive), legged robots and also other exotic designs (eg: snake-like robots). In spite of such diversity, motion control is usually handled by controlling two variables which are the angular velocity and the translational velocity of the robot. In the literature, there is a wide variety of techniques to handle the path following problem such as fuzzy logic, sliding mode control, Lyapunov function based control laws and neural networks. However, even Lyapunov-based control laws sometimes may not always guarantee stability for both of the variables simultaneously. While following a path, generation of smooth actuator commands is essential for many reasons. The examples from literature mostly justify smooth motion requirement by the sensitive payloads on the robot, such as in an autonomous wheelchair example. Another important reason for the graceful motion is to extend of the motors' lifetime by refraining from abrupt torque requirements. Moreover, recent works stress the importance of considering the curvature constraints of the path. It is especially notable that the primary condition for smooth motion is a properly defined path what makes the performance of a motion controller dependent on the motion planner. The motion planner may deliver the path data as a sequence of points, vectors, lines and circles or splines. Only in the case of properly combined splines a really smooth path following motion control can be achieved, unless some higher level smooth behavior fusion mechanisms, like Dual Dynamics, are used. In this work, a smooth path following control law for a unicycle type mobile robot is presented. The controller uses a combination of regulation and servo control approaches while smoothly fusing 'converge to the path' and 'follow the path' behaviors. The behaviors are fused within the exponentially convergent error function, so the classical control methods like even a simple P-control are still successfully applicable to it. The translational velocity control law is chosen inversely proportional to the magnitude of the angular velocity. The simulation results indicate that

the controller is indeed capable of generating smooth angular and translational velocity commands if the path is also smoothly defined. It can also be modified to follow points and vector sequences, however in such case smooth motion cannot be guaranteed. The stability of the controller is demonstrated via showing bounded and differential output for all possible input combinations. This work is based on the experiments conducted on actual robots in Fraunhofer IAIS, Sankt Augustin, Germany.

Lower - Limbs Rehabilitation Robot Design

ID 2084

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ABSTRACT

It is a general assumption that robotics will play an important role in therapy activities within rehabilitation treatment. In the last decade, the interest in the field has grown exponentially mainly due to the initial success of the early systems and the growing demand caused by increasing numbers of stroke patients and their associate rehabilitation costs. As a result, robot therapy systems have been developed worldwide for training of both the upper and lower extremities. This paper investigates and proposes a lower-limb rehabilitation robot that is used to help patients with lower-limb paralysis to improve and resume physical functions. The proposed rehabilitation robot has the feature that three rotary joints forced by Electric motors provide linear motions. The paper covers mechanism design and optimization, kinematics analysis, trajectory planning, and wearable sensors, and the control system design. The design and control system demonstrate that the proposed rehabilitation robot is safe and reliable with the effective design and better kinematic performance.

Routing Cost in a New Route Optimization Solution for Nested Mobile Networks

ID 2085

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ABSTRACT

As the challenge for ubiquitous Internet access and the current IP communications keep growing, the need of providing mobility management highly increases. Mobile Network (NEMO) which is an extension of Mobile IPv6, proposed by the Internet Engineering Task Force (IETF) to provide efficient network that roams without interruption in communication. This paper goal is to study the routing cost of a new route optimization solution for nested mobile networks and compare it with that in the standard protocol (NEMO). The results of the performance evaluation conducted in this paper shows that the proposed solution has less routing cost compared to NEMO protocol.

Hybrid PID And Pso-Based Control for Electric Power Assist Steering System for Electric Vehicle

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ABSTRACT

Electric power assist steering (EPAS) system provides an important significance in enhancing the driving performance of a vehicle with its energy-conserving feature. This paper presents a hybrid PID (Proportional-Integral-Derivative) and particle swarm optimization (PSO) based control scheme to minimize energy consumption for EPAS. This single objective optimization scheme is realized using PSO technique in search for best gain parameters of the PID controller. The fast tuning features of an optimum PID controller is proved to produce high-quality solutions. Simulation results show accurate performance and effectiveness of the hybrid PID-PSO based controller as opposed to the conventional PID controller.

Towards an Ethical Online Payment System

ID 2089

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ABSTRACT

The Internet has brought tremendous and unprecedented opportunities to new and established businesses; in the business models that uses the internet as a main channel, the operational cost is reduced, as well as time- to- market for new products and services. Also, those businesses have reached people and places they would have never dreamt about reaching them before the internet era. Unfortunately, widely used online payment systems that has enabled such a revolutionary business model, like the credit and debit cards, embrace the corrupt, immoral, conventional financial system that has been generating catastrophic disasters to humanity; from the great depression in the mid-1930s to the world war II, from the dot com bubble at the beginning of this millennium to the recent global financial crisis, and who knows what will it bring to us in the near future if we keep trusting it. This paper investigates the new fledging online payment system termed or called "Bitcoin" which is in principle inline with Islamic financial procedures compared to the conventional financial system which is based on ribba.

A Cross-Layer Decision for Mobile IP Handover

ID 2090

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ABSTRACT
Network layer indications are not readily available upon a link change; therefore, general dependence on the network layer may introduce unnecessary delays due to network layer signaling for a simple link layer handover. If information could be gathered at link layer to determine the need for network layer signaling, then both the delay and signaling load could be really improved over the current standards of Mobile IP. This paper presents a Cross-layer decision on two layer network and link layers to improve the performance of Enhanced Mobile IP (E-Mobile IP) handover in which reducing packet loss and latency during handover process.

Nonlinear Control with Extended Kalman Filter Design for Vehicle Trajectory Tracking

ID 2091

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ABSTRACT
This article describes the control design strategies for vehicle path following. Considering the noise from GPS sensor, robust control strategies is needed to ensure the vehicle is able to track the predefined path for autonomous vehicle. GPS sensor is known for errors that affect the position reading of the vehicle. Thus, Extended Kalman filter is used in this research to overcome the problem to obtain a smooth data reading. The Extended Kalman Filter is fused with non-linear tracking controller to achieve and solve the vehicle navigation problem. This article explained the GPS coordinate transformation to the cartesian coordinate system that is used in this research. The cartesian coordinate converted can be used to track the crosstrack error using Haversine formula. The crosstrack error is used in non-linear control computation. In this paper, the new controller algorithm is proposed for vehicle path tracking. The stability of the controller is shown by simulation.

Testing of Lightweight Fuel Cell Vehicles System at Low Speeds with Energy Efficiency Analysis

ID 2092

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ABSTRACT
In this paper fuel cell vehicle (FCV) power train has been developed. The test result is presented and discussed. Test bench developed based on the lightweight single seated fuel cell vehicles which conclude integration of electric motor, wheel, gearing system, electric

converter, and vehicle control system (VCS) and fuel cell system. The efficiency was around 77 percent considering the system line from fuel cell to electric drive, while 187 watt power was produced by the fuel cell during that time. This test bench is feasible to evaluate an actual performance of each component in fuel cell vehicles. Therefore the system is applicable to discover any design problem before being mounted into vehicles.

Edge Detection Techniques for Iris Recognition System

ID 2094

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ABSTRACT

Security and authentication is major part of our daily life. Iris is one of the most reliable forms of identification. To develop an iris authentication algorithm for personal identification, this paper examines different edge detection techniques for iris recognition system. The experimental result shows that the algorithm has better ability to detect points in a digital image where image brightness changes sharply.

Mechanical Design and simulation of two-wheeled Wheelchair using SolidWorks

ID 2095

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ABSTRACT

Digital prototyping using SolidWorks is a very useful tool to build and simulate the mechanics design before building the real hardware; it saves time and the effort of designers. In this paper a new mechanism of two-wheeled wheelchair has been designed using 3D software environment, SolidWorks. The new design is according the benchmarked standard wheelchairs that have achieved the ISO-standards with regard to turning radius and dimensions of the design. The design is aimed to fulfill the objective of working in confine area, i.e. inside domestic space or library. Furthermore the function of this designed wheelchair has been improved by integrating the ability of the wheelchair to reach higher level of height while on two wheels. Motion analysis has been conducted using SolidWorks motion study and results obtained could help in motors' rating for future reference.

A Framework for Developing Real-Time OLAP algorithm using Multi-core processing and GPU: Heterogeneous Computing

ID 2096

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ABSTRACT

The overwhelmingly increasing amount of stored data has spurred researchers seeking different methods in order to optimally take advantage of it which mostly have faced a response time problem as a result of this enormous size of data. Most of solutions have suggested materialization as a favourite solution. However, such a solution cannot attain Real-Time answers anyhow. In this paper we propose a framework illustrating the barriers and suggested solutions in the way of achieving Real-Time OLAP answers that are significantly used in decision support systems and data warehouses. The Online analytical processing (OLAP) is a category of software technology that enables analysts, managers and executives to gain insight into data through fast, consistent, interactive access to a wide variety of possible views of information that has been transformed from raw data to reflect the real dimensionality of the enterprise as understood by the user. OLAP functionality is characterized by dynamic multidimensional analysis of consolidated enterprise data supporting end user analytical and navigational activities including calculations and modelling applied across dimensions, through hierarchies and/or across members, trend analysis over sequential time periods, slicing subsets for on-screen viewing, drill-down to deeper levels of consolidation, rotation to new dimensional comparisons in the viewing area …etc. OLAP works with data warehouses that have sizes of not only terabytes but also petabytes which results in slower response time to answer queries. Consequently, processors have to tackle billions of rows. The issue has been intensively addressed and the most of solutions have relentlessly gone to materialization direction. Materialization by definition means pre-fetching data and pre-computing prospective queries – which are usually expected – load these answers with their features into the main memory. Subsequently, any coming query will find the answer awaiting. This technique has been widely used and despite its shortcomings such as the main memory occupation and excluding latest data. The latter issue has caused a significant debate, that is, by materializing result the system will present static answers that often do not take into account the latest updates of the warehouse. Warehouse usually is being updated periodically (e.g. daily, weekly, monthly … etc.). Therefore, pre-fetching and pre-computing are performed periodically either, which would necessarily entail some answers that do not include current time interval updates (non Real-Time answers). Thus, the Real-Time OLAP answers issues is about if the latest updates are included in the answers or not, rather than the absolute answer's time values – which varies dramatically according to several factors (e.g. query size, answer size, processing capabilities, distribution issues … etc.). However, all the materialization solutions cannot meet the Real-Time requirements which motivated other researchers to focus on different direction recently; how to optimally exploit processing facilities in order to attain instantaneous answer queries. Such an approach, of course, needs powerful processing capabilities to process millions, and sometimes billions, of rows in few seconds. Recent suggestions included multi-core processing, distributed processing as well as GPU utilizing. Our goal is to develop an

algorithm that utilizes the GPU to process queries.

Performance Analysis of Multi-Radio Routing Protocol in Cognitive Radio Ad Hoc Networks Under Different Path Failure Rate

ID 2097

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ABSTRACT
In recent years, Cognitive Radio (CR) technology has largely attracted significant studies and research. Cognitive Radio Ad Hoc Network (CRAHN) is an emerging self-organized, multi-hop, wireless network which allows unlicensed users to opportunistically access available licensed spectrum bands for data communication under an intelligent and cautious manner. However, in CRAHNs, a lot of failures can easily occur during data transmission caused by PU (Primary User) activity, topology change, node fault, or link degradation. In this paper, an attempt has been made to analyze the performance of the Multi-Radio Link-Quality Source Routing (MR-LQSR) protocol in CRAHNs by varying path failure rate. In the MR-LQSR protocol, the Weighted Cumulative Expected Transmission Time (WCETT) is used as the routing metric. The simulations are carried out using the NS-2 simulator. The protocol performance is evaluated with respect to performance metrics like average throughput, packet loss and average jitter. From the simulation results, it is observed that the number of path failures depends on the number of PUs and mobility rate of SUs (Secondary Users). Moreover, the protocol performance is greatly affected in the network with high path failure rate, leading to major service outages.

Rain Attenuation Analysis using Synthetic Storm Technique in Malaysia

ID 2099

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ABSTRACT
In satellite communications which operate at frequencies above 10 GHz, the signal will be subjected to various propagation impairments such as rain attenuation, cloud attenuation, tropospheric scintillation, ionospheric scintillation, water vapour attenuation, and rain and ice depolarization. Rain attenuation is the most significant and serious parameter among propagation impairments [1-3]. It is one of the most fundamental limitations to the performance of satellite communication links in the microwave region, causing large variations in the received signal power, with little predictability and many sudden changes. In tropical areas, where the problem is very severe [4]. Lack of real data especially in higher frequencies makes the generation of rain attenuation time series a requirement for investigating the rain fade characteristics. A suitable conversion technique can be applied to rain rate time series to produce rain attenuation data and be utilized to understand the rain fade characteristics the problem. This paper focused on applicability of synthetic storm

technique (SST) to convert available data to rain attenuation time series [5-7]. Its performance is assessed for time series generation over Kuala Lumpur, a tropical location in Malaysia. Measured rain attenuation was collected over it (3.25˚N, 101.7˚E) where located in heavy rain zone by receiving signal at 10.982 GHz (Ku-band) from MEASAT3 (91.5_E) on 77.4o elevation angle. The measurement has been carried out for six months. Rain rate time series is obtained from a collocated tipping bucket rain gauge data which is time-synchronized with attenuation data logging system. From the analysis, it is found that SST gives satisfactory results to estimate the rain attenuation time series from the rain rate measurements in this region.

Mini Cost-Saving Water Treatment Plant for River Inlets

ID 2100

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ABSTRACT

Water has been one of the most important resources to human beings and getting properly treated water is very vital for ensuring safeguarded health. Water treatment technologies have undergone years of enhancement to achieve its objectives but nevertheless, high energy consumption is an issue in water treatment plants (WTP). Based on this research motivation, the flow of water in the WTP will be utilized to generate energy based on the gravity law. Thus, this study is to explain about saving cost by means of using the flow of water which naturally flows vertically downwards to generate energy for some mechanisms in the WTP. The energy generated is converted into feasible source of energy to operate the WTP. Renewable energy such as wind power, solar power and hydropower are also very suitable sources for reducing energy cost because these energy sources are abundant and free. In this study, the focus will be on utilizing hydropower to generate energy for the mini WTP. The explanations are further elaborated in the full paper. River has been a very important source for getting water to accommodate the daily usage. This has therefore, created the need for river water quality monitoring because water pollution which causes changes in the water physically, chemically or biologically poses serious threat to health and public safety. According to the statistics of Department of Environment, Malaysia (DOE), out of 1063 monitored river basins in 2008, only 612 river basins were clean. 412 river basins were found to be slightly polluted and 39 river basins were polluted. The statistics have further shown that there were lesser clean river basins in 2008 as compared to 2007. Thus, it is clearly shown that WTP has a very important role in feasible water supply. The issue of high energy consumption by WTP therefore cannot be resolved by simply reducing the number plants because it will create water supply disruption. Therefore, treating the source of water from all the river inlets using low energy Mini WTP is the best idea and conceptually presented in this paper.

Performance Analysis of IIUM Wireless Campus Network

ID 2101

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ABSTRACT

The Internet is one of the most powerful, cost effective and easy resource in the educational institutions especially at tertiary level for state-of-the-art research activities. Good connectivity with the Internet is not luxury to a university, in fact is a basic necessity of today's modern education. Internet Provides vast amount of information to the users to enhance research activities by the students and lecturers. Therefore, a university needs to be connected with high speed connections to provide satisfactory services to its users. However, educational institutions face budgetary restraints and limited resource that makes a complicated decision to allot bandwidth in proper way to the campus users. The demand for bandwidth is increasing every year due to rising number of new student's enrolment with multiple devices like, laptops, smart phones, etc. Hence, it is important to allocate bandwidth in proper way among campus users. International Islamic University Malaysia (IIUM) is one of the leading universities in the world in terms of quality of education that has been achieved due to providing numerous facilities including wireless services to every enrolled student. The quality of this wireless service is controlled and monitored by Information Technology Division (ITD), an ISO standardized organization under the university. This paper aims to investigate the constraints of wireless campus network of IIUM. It evaluates the performance of the campus users' satisfaction when real-time applications are transmitted in terms of throughput, delay, packet loss and jitter. A network simulator (NS-2) tool has employed to measure these performances of IIUM campus network. The observation from the simulation result could be one of the influencing factors in improving wireless services for ITD.

Investigation of gateway selection schemes for Mobile Ad-hoc Network Mobility (MANEMO)

ID 2102

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ABSTRACT

The fast growing of the Internet applications brought new challenges for researchers to provide new solutions those guarantee the Internet access for mobile hosts and networks. The globally reachable, Home-Agent based, and infrastructure Network Mobility (NEMO) and the local, multi-hop, and infrastructure-less Mobile Ad hoc Network (MANET) developed by Internet Engineering Task Force (IETF) are supporting different topologies of the mobile networks. A new architecture was proposed by combining both topologies to obtain Mobile Ad Hoc NEMO (MANEMO). However, the integration of NEMO and MANET introduces many challenges such as the network loops, sub-optimal route, redundant tunnel problem, absence of communication without Home Agent reachability, and exit router selection when multiple Exit Routers to the Internet exist. This paper aims to investigate the different solutions proposed to solve some of the challenges especially the

gateway selection mechanism and highlights the strengths and the limitations of these approaches.

Novel modeling of a self power generation and self sensing Magneto-rheological (MR) damper

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ABSTRACT

Magneto-rheological (MR) dampers are semi-active control devices that use MR fluids to produce controllable dampers. Magneto-rheological (MR) dampers have successful applications in mechatronics engineering, civil engineering and numerous areas of engineering. At present, in the conventional MR damper systems, a separate power supply and dynamic sensor are required. In this paper we propose and investigate a self-sensing MR damper with power generation, which accumulate energy harvesting, dynamic sensing and MR damping technologies into one device. This MR damper has self power generation and velocity sensing abilities, and is applicable to various dynamic systems. This multifunctional integration would bring great benefits such as energy saving, size and weight reduction, lower cost, high reliability, and less maintenance for the MR damper systems. Theoretical analyses and experimental studies on power generation were performed. A velocity-sensing method was proposed and experimentally validated. The magnetic-field interference among three functions was prohibited by a combined magnetic-field separation method. Modeling, analysis, and experimental results on damping forces are also presented. Challenges in Designing the Smart MR Damper: There are four key design challenges regarding the three-function integration. 1. The first challenge is the size limitation. 2. The second issue concerns the power generation part. 3. The third is the interaction issue; that is, the performances of the three functions should not affect or influence one another, especially when different functions share common space. 4. The fourth issue is how to extract the velocity information from the generated voltage of the power generator.

Design and Development of A Simulator for Modeling Carbon Nanotube

ID 2104

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ABSTRACT

In this paper, a Matlab simulator is developed for modeling of carbon nanotubes (CNTs). First a calculation is done for electron energy dispersion relations for single-wall zigzag CNTs with different tube indexes. Then the scattering matrix elements are derived using Zone Folding (ZF). From the results, it is derived a analytical models for CNT parameters such as the mobility and the intrinsic carrier concentration. Once obtain the CNT parameters, and then import them to the developed simulator. The simulator is based on the semiconductor equations and quantum effects. Finally the simulator produces the result for

optimum modeling of CNT for electronic device application.

Micro-Patterning of carbon nanotube (CNT) forest for MEMS application

ID 2105

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ABSTRACT

Vertically aligned Carbon Nanotubes (CNTs) forest has many potential engineering applications for its attractive mechanical, electrical, optical, and thermal properties [1-5]. This paper proposes two new approaches for micro patterning of CNT forest in order to make it useful for MEMS based applications. m-Electro-discharge Machining (m-EDM) is one of the techniques first proposed by Takahata group [6, 7] to create 3-D m- structures on bare CNT forest. In conventional m-EDM a tool with negative polarity (Cathode) approaches to the bare CNT forest with positive polarity (Anode) to generate controllable repeated spark that will create the pattern eventually. The biggest problem associated with m-EDM is the spark gap which limits the structural resolution of the fabricated pattern. CNTs are known to be very good electron emitters. CNT cathodes were reported to reduce gas breakdown voltage while increasing the discharge current compared to tungsten cathodes [8]. This paper discusses the result of reverse m-EDMing of CNT forest where the CNTs are used as cathode instead of tungsten tool. Reverse EDMing of CNT forest dramatically reduces discharge voltage and hence, the spark gap. Fig. 1 shows the reduction in spark gap for reverse polarity EDMing of CNT forest as compared to conventional polarity. Air is the gaseous dielectric medium that is used for EDMing CNT forest. However, Sulphur Hexafluoride (SF6) has three times higher dielectric strength than air, which means the tool electrode needs to approach closer to the CNT forest to initiate the breakdown if SF6 is used as dielectric instead of air. In other word, SF6 should reduce the spark gap further if it is used as the dielectric medium. This paper also discusses the experimental results when SF6 was used as dielectric medium for reverse EDMing of CNT forest. It was observed that at too low voltage (~10V), air gives lower spark gap than SF6, while at moderately high voltage (~25V) SF6 performs better as shown in Fig. 2. The other approach for patterning CNT forest described in this paper is mechanical bending of CNTs. Patterning of CNT forest is carried out by moving a rotating cylindrical m-tool (3000RPM) in X,Y and Z direction. The Z movement of the tool is controlled in step mode to provide the overall depth of the m-structures with 1mm/step. In XY plane the tool moves continuously at 1mm/min speed. The movement of the tool on the CNT forest causes the CNTs to be bent and flattened in the direction of the tool motion hence the patterns are formed on bare CNT forest. The most significant observation made from the processed CNT forest is the visible optical reflection from bent and flattened area. Typically, CNT forest is known to be the darkest material on earth. However, this new processing technique causes the CNT surface to reflect light like mirror as shown in Fig. 3. A detail comparison between two proposed techniques (mechanical and reverse m-EDM) for patterning CNT forest is also included in this paper.

Fuzzy Logic Controller Design for A Robot Grasping System With Different Membership Functions

ID 2106

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ABSTRACT

This paper investigates the effects of the membership function to the object grasping for a three fingered gripper system. The performance of three famously used membership functions is compared to identify their behavior in lifting a defined object shape. MATLAB Simulink and SimMechanics toolboxes are used to examine the performance. Our preliminary results proposed that the Gaussian membership function surpassed the two other membership functions; triangular and trapezoid memberships especially in the context of firmer grasping and less time consumption during operations. Therefore, Gaussian membership function could be the best solution when time consumption and firmer grasp are considered.

Parameter Estimation of a Closed Loop Coupled-Tank Time Varying System using Recursive Methods

ID 2107

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ABSTRACT

This project investigates the direct identification of closed loop plant using discrete-time approach. The uses of Recursive Least Squares (RLS), Recursive Instrumental Variable (RIV) and Recursive Instrumental Variable with Centre-Of-Triangle (RIV + COT) in the parameter estimation of closed loop time varying system have been considered. The algorithms were applied in a coupled tank system that employs covariance resetting technique where the time of parameter changes occur is unknown. The performances of all the parameter estimation methods, RLS, RIV and RIV + COT were compared. The estimation of the system whose output was corrupted with white and coloured noises were investigated. Covariance resetting technique successfully executed when the parameters change. RIV + COT gives better estimates than RLS and RIV in terms of convergence and maximum overshoot.

Analysis of Rain Fade Duration Models for Earth-To-Satellite Path Based on Data Measured In Malaysia

ID 2108

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ABSTRACT

Scorpion image segmentation system

ID 2110

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ABSTRACT

Death as a result of scorpion sting has been a major public health problem in developing countries. Despite the high rate of death as a result of scorpion sting, there has not been report in literature of intelligent device and system for automatic detection of scorpion. In this work, Digital image processing approach based on the floresencing characteristics of Scorpion under Ultra-violet (UV) light has been proposed for automatic detection and identification of scorpion. The acquired UV-based images undergo pre-processing to equalize uneven illumination and colour space channel separation. It has been observed that simple thresholding of the green channel of the acquired UV-based image is sufficient for segmenting Scorpion from other background components in the image. Thus the segmentation stage has been used to clusters the image into two distinct classes while the scorpion detection stage was used to distinguish between candidate scorpion of interest and other information contained in the acquired image. A warning sound is emitted on identification of scorpion is an acquired image. The algorithm has been tested on over 40 U-V scorpion images obtained from different part of the world and results obtained shows an accuracy of 100%. The proposed system will eliminate the problem associated with the ultraviolet touch detection methods and the pitfall trap methods presently in used for detecting scorpion. It is expected that this system will serve as a better detection method and can be easily deployed.

New Method of LMS Variable Step-Size Formulation for Adaptive Noise Cancellation

ID 2111

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ABSTRACT

Least mean square LMS is a widely used steepest descent algorithm and is known with efficient tracking ability of small mean square error (MSE) but with low convergence speed. In contract to the fixed step size, variable step size had been introduced to improve the convergence speed while maintaining the minimal MSE. In this work, a new method was formulated to determine the variable step size of the LMS algorithm. Simulation results are presented to support the experimental analysis for the performance evaluation and comparison. Result reveals that the performance the of new formulated variable step size algorithm is better compare to the conventional LMS algorithm.

Artificial intelligence based technique for BTS placement

ID 2112

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ABSTRACT

Model for simulating scorpion substrate vibration and detection system

ID 2113

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ABSTRACT
Scorpion like other arthropods have a specific kind of movement pattern called substrate vibration signal usually exhibited in recognition and locating their mates. This paper therefore focuses on developing an intelligent scorpion detection system using vibration pattern. The proposed system capable of generating signal of the same frequency to which scorpion respond to, and is driven by an algorithm that will automatically detect and identify scorpion. The proposed system performs better than the Rock rolling, location burrowing detection, and peeling loose back of tree detection methods, which are crude, unreliable, and dangerous.

Development of Novel Dirham Coins Detection System

ID 2115

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ABSTRACT
In this paper, a novel Dirham coins detection system has been proposed. The proposed coin detection system used non destructive technique to discriminate between five set of Dirham coin. A novel technique for coin detection through utilization of Colpitts oscillator has been introduced in this paper. A Colpitts oscillator is used as an eddy current sensor to test material content and physical properties of the test coins. This system is particularly is developed to recognize all five set of Kelantan State Dirham coins. The round shaped coins from various countries are used as counterfeit coins in order to evaluate the capability of the system to discriminate among Dirham and non Dirham coins (counterfeit coin). The experiment results show the developed Colpitts oscillator based eddy current sensor successfully discriminates the entire test coins base on its' material content and physical properties (diameter and thickness of the coin).

Human Identification at a Distance Using Body Shape Information

ID 2117

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ABSTRACT
Shape of human body is unique from one person to another. This paper presents an intelligent system approach for human identification at a distance using the shape information of body features. The body features used are the head, shoulder, and trunk. Image processing techniques for detection of these body features were developed in this work. Then, the features can be recognized using fuzzy logic (FL) approach and used as inputs to a recognition system based on a multilayer neural network (MNN). The developed system is applicable to recognize a person based from its frontal view and specifically constraint to male gender to simplify the algorithm. In this research, the accuracy for human identification using the proposed method is 77.5%. Thus, it is proved that human can be identified at a distance using body shape information.

Optimizing POF/PCF Based Optical Switch for Indoor LAN

ID 2118

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ABSTRACT
Polymer optical fiber (POF) is suitable for indoor local area network (LAN), because of its flexibility and its ease of connection due to its relatively large core diameter. A 1×2 optical switch for indoor LAN using POF and a shape memory alloy (SMA) coil actuator with magnetic latches was successfully fabricated and tested. To achieve switching by the movement of a POF, large displacement is necessary because the core diameter is large (e.g., 0.486mm). A SMA coil actuator is used for large displacement and a magnetic latching system is used for fixing the position of the shifted POF. The insertion loss is 0.40 to 0.50dB and crosstalk is more than 50dB without index-matching oil. Switching speed is less than 0.5s at a driving current of 80mA. A cycling test was performed 1.4 million times. Polymer clad fiber optical (PCF) switch also fabricated and tasted.

Design and Fabrication Stable LNF Contact for Future IC Application

ID 2119

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ABSTRACT
Enable the design of a small contact spring for applications requiring high density, high speed and high durability. A low normal force (LNF) contact spring with high performance is fabricated using a unique combined MEMS photo resist lithography and electro fine forming (EFF) technology. Reducing a total contact material cost of a connector, a high-Hertz stress with LNF contact will be a key technology in the future. Only radius r5mm tip with 0.1N force contact provides an excellent electrical performance which is much sharper than conventional contact. 0.30million cycle's durability test was passed at 300mm displacement and the contact resistance was ≦50mΩ.

A Cooperative and Competitive Workshop in Mechatronics Education

ID 2126

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ABSTRACT
Mechatronics engineers are essential joints within modern product development processes. They closely interact with the classical domains of mechanical, electrical and software engineering in order to support the design of customer oriented products of high integral functionality. Due to this, their day-to-day business in practice is strongly characterized by intensive personal cooperation including a high amount of discussion, negotiation and decision-making regarding present design issues. The impartation of these crucial skills is achieved by a workshop in which the mechatronics students can experience mechatronic development processes in an industry-oriented environment. Furthermore, the training of soft-skills is supported by splitting an overall task into two subtasks to be done by two teams. This provokes the usual communication in industry during a decision-making process. Another important issue to achieve industry-orientation is the utilization of commonly used tools. In this context, the students are going to work with 3D printers as well as with modern techniques of model-based software development with Matlab/Simulink.

New Consumer Load Prototype for Electricity Theft Monitoring and Detection System

ID 2127

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ABSTRACT

Illegal connection which is direct connection to the distribution feeder and tampering of energy meter has been identified as major process through which nefarious consumers used in stealing electricity on low voltage distribution system. This process has contributed enormously to the revenue losses incurred by the power and energy providers. A Consumer Load Consumption Prototype (CLCP) is constructed and proposed in this study in order to study the best possible pattern through which the stealing process is affected in real life power consumption. The construction of consumer load prototype will facilitate real time simulation and data collection for the monitoring and detection of electricity theft on low voltage distribution system. The prototype involves electrical design and construction of consumer load prototype with application of various standard regulations from Institution of Engineering and Technology (IET), formerly known as Institution of Electrical Engineers (IEE). The ability to generate and simulate electricity theft in real time monitoring is seen as one of the contributions of this prototype. The prototype will assist the researchers and power utilities alike who are facing difficulties in getting real time data for the study and monitoring of electricity theft. Similarly, the power and energy community including students will appreciate the practical approach from which the prototype provides real time information rather than software simulation which has hitherto used in the study of electricity theft.

MEMS and EFF Technology based Micro Connector for Future Miniature Devices

ID 2129

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ABSTRACT

The development of a miniature; size, light and high performance electronic devices; has been accelerated for further development. In commercial stamping method Resistance (R) should be more than 300μm due to its size limitation. Therefore, the stamped contact hertz stress becomes lower and less suitable for fine pitch connector. To overcome this problem a narrow pitch Board-to-Board (BtoB) interface connectors are in demand for the current commercial design. Therefore this study describes a fork type micro connector design with high Hertz-Stress using MEMS and Electro Fine Forming (EFF) fabrication techniques. The connector is designed high aspect ratio and high-density packaging using UV thick resist and electroforming. In this study a newly fabricated micro connector's maximum aspect ratio is 50μm and pitch is 80μm is designed successfully which is most compact fork-type connector in the world. When these connectors are connected, a contact resistance of less than 50mΩ has been obtained by using four-point probe method.

A Qualitative Approach to Mobile Robot Navigation Using RFID

ID 2130

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ABSTRACT
Radio Frequency Identification (RFID) allows automatic identification of items using radio-waves. Recently it's been vastly used in mobile robot navigation, localization and mapping in both indoor and outdoor. This paper will describe a novel approach of autonomous navigation of omni-directional mobile robot using passive RFID. Conventional approaches use landmark or dead-reckoning as well as excessive numbers of sensors for navigation and measurement of its location. The proposed method uses less complexity and it not only estimates the position of the robot but also its orientation using a simple Passive RFID system. Polar coordinates system would be used to reach its target position using various tag displacement on the floors. Comparison of the various tag architecture would also be shown through simulation to provide us a better solution to navigation.

Optimized Neural Network Model for a Potato Storage System

ID 2131

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ABSTRACT
The postharvest storage process is a highly nonlinear one involving heat and mass transfer. The need to capture these non-linearities demands the use of intelligent models. In this study, a neural network model based on the min-max normalization technique is developed through an optimization process involving different combinations of the neural network structural parameters. The optimum model developed has a mean squared value of 0.9058 and a coefficient of determination (R2) value of 0.7328. The proposed model would be useful in simulation processes involving intelligent controllers.

Two Dimensional Array Based Overlay Network for Delay Minimization of Peer-To-Peer Live Video Streaming

ID 2132

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ABSTRACT
Live video streaming or broadcasting is very expensive through satellite or terrestrial system. On the other hand the huge bandwidth requirement puts lots of load on the video streaming server for streaming video in a server to client network. Peer to peer overlay

network can reduce load of the video streaming server by utilizing upload bandwidth of peers to stream video to peers, which is called peer-to-peer video streaming. Any one, who is connected to internet, can provide live video content to anyone, who is also connected to internet, at very low cost by peer-to-peer video streaming. Peer-to-Peer video streaming is providing scalability and it is also providing very low cost solution for live video streaming. To ensure optimized utilization of peers upload bandwidth and to ensure a very effective, efficient and stable performance, a very reliable overlay network, which creates virtual link between servers and peers, is needed. In this model, the upload bandwidth capacity, which is excluding the upload bandwidth capacity required for uploading the video stream to one peer, is denoted as additional upload bandwidth of a peer. Proposed overlay network distributes chunks to the peers by preferring the peers with higher additional upload bandwidth.

Development of Portable Automatic Number Plate Recognition System on Android Mobile Phone

ID 2135

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ABSTRACT

The Automatic Number Plate Recognition (ANPR) System leads the role in utilizing of various access control and security, such as: tracking of stolen vehicles, traffic violations (speed trap) and parking. In this paper, we present the portable ANPR which is implemented on android mobile phone. Since the main challenges in mobile application are higher coding efficiency, reduced computational complexity, and improved flexibility. Thus, the significance efforts are to find suitable and adaptive algorithm for number plate recognition under mobile phone. Namely, optimizing the ANPR system for mobile phone that has limited CPU and memory resources, geo-tagging of the image using GPS coordinates and online database in order to store the vehicle's information. Here also we discuss the minimum hardware requirement which is android mobile phone that portable ANPR will be implemented. We proposed the following design for portable ANPR on android mobile phone. First, the graphical user interface (GUI) for capturing image using built-in camera was developed to acquire vehicle plate number in Malaysia. Second, the preprocessing of raw image was done using contrast enhancement and gray scaling. Next, character segmentation using fixed pitch and an optical character recognition (OCR) using neural network were utilized to extract texts and numbers. Both character segmentation and OCR are using Tesseract library from Google Inc. The proposed portable ANPR algorithm was implemented and simulated using Android SDK on a computer. Based on the experimental results, the proposed system can effectively recognize the license number at 90.86%. The needed processing time to recognize a license plate is only 2 second. The result is consider good in comparison with the results gained from previous system that processed in desktop PC with the result of range 91.59% to 98% and for recognition accuracy and 0.284 second to 1.5 second.

An Investigation of Fatigue Phenomenon in the Upper Limb Muscle Due to Short Duration Pulses of an FES System

ID 2136

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ABSTRACT

Functional Electrical Stimulation (FES) is a method of artificially stimulating muscles ornerves in order to result in contraction or relaxationofmuscles. Many studies have shown that FES system has helped patients to live a better livesespecially those who are suffering from physical mobility. Unfortunately, one of the main limitations of an FES system besides of its high cost is largely due to muscle fatigue. Muscle fatigue will affect the training duration which could delay patients' recovery rate. In this paper, we analyzed the occurrence of this fatigue phenomenon in terms of stimulator parameters such as amplitude, frequency, pulse width and pulse shape. The objective of this investigation is to identify other key features of the FES system parameters in order to prolong the training duration among patients. The experiment has been done on a healthy person for the duration of three minutes and later the muscles response will be observed. Resultant muscle response is recorded as force using force resistive sensor.

Development of a High Hertz-Stress Contact for Conventional Batch Production Using a Unique Scribing Technology

ID 2137

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ABSTRACT

Gradually the device is getting more compact dimension with respect to the width and thickness. Therefore, the contacts are becoming less strong which leads to loose and unstable contact. In commercial stamping method connector tip diameter should be more than 300µm due to its size limitation. Therefore, the connector contact resistance is becoming higher due to lose contact force. To overcome this problem there were few more basic research using MEMS and Electro Fine Forming (EFF) technology to make high Hertz-Stress Contact (5µm) due to the limitation in the commercial stamping process and the result was in satisfactory level. However, since the MEMS and EFF fabrication is costly therefore, a new method is introduced in this paper using the commercial Phosphor Bronze stamping method to reduce the production cost. Moreover, scribing method is used to make tip on the contact. Accordingly, more compact fine pitch contact is successfully fabricated and tested with 5um High Hertz Stress without using the MEMS and EFF technology. Thus the contact resistance is less than 20mΩ ±5mΩ.

Human Gait Recognition And Classification Using Similarity Index for various conditions

ID 2138

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ABSTRACT

Gait recognition is usually referred to signify the human identification by the style/way people walk in image sequences. Our aim is to implement the traditional gait recognition algorithm and to show the variation in gait recognition when subject is observed parallel to camera under three conditions- walking normal, carrying a bag and wearing a coat. However in this case, the work devises a novel method for the purpose of similarity computation rather than the traditional recognition.

Two Degrees of Freedom Control of A Ball and Beam System

ID 2139

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ABSTRACT

In this paper, a two-degree of freedom (2DOF) controller is designed for a ball and beam system. The controller is developed based on algebraic method. The ball and beam system is one of the most popular laboratory experiments for control education. The controller is designed such that the ball can track a square wave with certain design specifications. The advantages of 2DOF controller are the feedback controller takes care of the uncertainty and the feed forward filter ensures the tracking of the reference command. Though the control method is not new, the application of the technique on such unstable system is of interest. Controlling the ball on the beam is a challenging task because of the instability of the system and the fact that the output i.e. the ball position increases almost without limit for a fixed input beam angle). The controller needs to regulate the position of the ball by changing the angle of the beam at the pivot point. It is a difficult control task as the ball moves with an acceleration which is proportional to the tilt angle of the beam. Two types of 2DOF controllers are considered; based on dominant pole design and based on integral time absolute error (ITAE) design. The performance of the resulting controllers is compared with that of a controller designed based on pole placement. Simulations were run over various frequencies. The results indicate the effectiveness of the designed 2DOF controllers.

Estimation of Raid Fade link budget for C-Band and Ku-Band on the perspective of Bangladesh

ID 2140

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ABSTRACT

Rain attenuation is foremost propagation impairment for microwave frequencies. It is undermine the deployment of microwave radiation in the communication link between satellite and earth station. Bangladesh is perspective country who's are intended to launch there satellite to the space. Though they are using INTELSAT 904 for broadcasting and satisfied other needs. This country is situated in a tropical region though the rain is a one of the most divesting impairment for earth to satellite microwave downlinks. In this paper, we are covering the rain fade attenuation estimation in respect of two frequency band C and Ku. We also consider these estimations according to the Polar, Vertical and Circular Polarization. Link budget for these two band frequencies might help to understand the current situation of rain impairments for the country's next satellite launching program.

Development of Real-Time Ground Control Station for Unmanned Aerial Vehicles

ID 2141

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ABSTRACT

Unmanned Aerial Vehicle (UAV) performs various kinds of missions such as mobile tactical reconnaissance, surveillance, law enforcement, search and rescue, land management, environmental monitoring, and disaster management. UAV is a complex and challenging system to develop and control. It operates autonomously in unknown and dynamically changing environment. This requires different types of subsystems to cooperate. In order to realize all functionalities of the UAV, the software part becomes very complex as the real-time system is expected to execute real-time tasks concurrently. This report proposes system architecture for real-time Ground Control Station (GCS) for lightweight UAV developed for medium-scale reconnaissance and surveillance missions in civil area. The overall design methodology has been to keep things cheap and simple. The software that will be developed will allow for the design to be quick and simple. The main data that will be displayed on the flight data screen comes from sensors on the aircraft such as IMU and GPS. These data will be inserted into the main programming language that is LabVIEW – a graphical programming language. A graphical user interface (GUI) will be built to show the information on the UAV location on Google map. GCS is designed to monitor the UAV. The system consists of onboard system in the UAV; wireless transceiver; and the software system.

Development of a Tentacle Propulsion Technique of Underwater Application

ID 2143

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ABSTRACT
As robotic technology matures and more platforms are fielded in unstructured real-world situations, the more new areas of applications are being thought for robotic deployment. After successes in industrial robots, researchers are now trying to explore new robots with biological features of different biological creatures like, snake, bird, and spider for their stunning advantages. Underwater exploration using robots is a new avenue. Research on the tentacle robot for underwater application is a new field of research besides the other research in this arena. There are few researches on this topic are explored and mostly are on biological robot. Besides those researches this paper aims to propose and demonstrate another technique to build a tentacle for propulsion purposes. Therefore, in this paper will discuss more on mathematical development for the propulsion technique and its software verification technique in considering the environmental constrains.

Towards a Sign Language Synthesizer: a Bridge to Communication Gap of the Hearing/Speech Impaired Community

ID 2146

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ABSTRACT
Sign language synthesizer is a method to visualize the sign language movement from the spoken language. The sign language (SL) is one of means used by HSI people to communicate to normal people. But, unfortunately the number of people, including the HSI people, who are familiar with sign language is very limited. These cause difficulties in the communication between the normal people and the HSI people. The sign language is not only hand movement but also the face expression. Those two elements have complimentary aspect each other. The hand movement will show the meaning of each signing and the face expression will show the emotion of a person. Generally, Sign language synthesizer will recognize the spoken language by using speech recognition, the grammatical process will involve context free grammar, and 3D synthesizer will take part by involving recorded avatar. This paper will analyze and compare the existing techniques of developing a sign language synthesizer, which leads to IIUM Sign Language Synthesizer.

Effect of tuber skin on thermal properties of whole tubers of potato and sweet potato

ID 2147

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ABSTRACT

Mathematical models are expected to adequately represent an engineering process. One way to ensure this is through the use of appropriate model coefficients. This study investigates the thermal properties of whole tubers of potato and sweet potato with respect to food storage. Literature search reveals that the thermal properties are generally associated with peeled tubers. For the purposes of postharvest whole tuber storage, the effect of the tuber skin on thermal properties of potato and sweet potato at varying temperatures was found to be an increase of the terml properties.

Port-Hamiltonian Approach for Modeling and Control of Two-Wheeled Wheelchair

ID 2148

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ABSTRACT

This paper presents modelling and control design of a two-wheeled wheelchair based on structure-preserving port-Hamiltonian system. The two-wheeled wheelchair (TWW) features space-saving, four to two-wheel transformation, adjustable seat height, increased mobility feature. The nonlinearity of the system is preserved and modelled mathematically using port-Hamiltonian system. This model is then compared to Euler-Lagrange-based model. A new control strategy was also developed to control the TWW for balancing, steering and during transformation from four to two-wheel configuration. The controller was then simulated on computer and on a prototype built from LEGO.

Preliminary Analysis of Dust Effects on Microwave Propagation Measured in Sudan

ID 2149

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ABSTRACT

Dust storms are meteorological phenomena occur for a percentage of time in arid and semi arid areas especially at African Sahara and Middle East. Measurements at existing microwave links have showed dust storms can potentially result in serious attenuation in signal level especially at Ku band and higher frequencies with direct impact on telecommunications system performance. However, only a limited amount of research has been carried out and the available data was very scarce. Few prediction models have been developed to estimate microwave signal attenuation during the dust storm based on on scattering theory and approximation of dust properties [1-4]. However, real dust storm is a complex phenomena which is difficult to be described by theoretical physical or mathematical models [5-6]. In this paper, an evaluation of the existing attenuation prediction models has been done based on the measured dust storm properties and measured attenuation in Sudan. Four microwave links at 12GHz-13GHz and different lengths have been installed in Khartoum as shown in Table 1,Fig. 1 and 2. All terrestrial links have been monitored and the transmitted and received signal levels have been recorded for one year. This paper will present the analysis of measured visibility data and corresponding dust induced attenuation measured at four microwave links in Khartoum.

Speech Enhancement Base on Compressive Sensing Algorithm

ID 2150

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ABSTRACT

Making meaningful to the performance of speech enhancement, various methods have been proposed over the years. The accurate method for the speech enhancement design mainly focuses on quality and intelligibility. The method proposed with high performance level. A novel speech enhancement by using compressive sensing (CS) is a new paradigm of acquiring signals, fundamentally different from uniform rate digitization followed by compression, often used for transmission or storage. Using CS can reduce the number of degrees of freedom of a sparse/compressible signal by permitting only certain configurations of the large and zero/small coefficients, and structured sparsity models. Therefore, CS is significantly provides a way of reconstructing a compressed version of the speech in the original signal by taking only a small amount of linear and non-adaptive measurement. The precise number of required measurements is comparable to the compressed size of the speech signal with suitable design. All provable good measurement with random matrics in CS theory will enhanced speech signal to system.

Feasibility of using a Humanoid Robot to Elicit Communicational Response in Children with Mild Autism

ID 2153

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ABSTRACT

Research evidences are accumulating with regards to the potential use of robots for the rehabilitation of children with autism. The purpose of this paper is to elaborate on the results of communicational response in two children with autism during interaction with the humanoid robot NAO. Both autistic subjects in this study have been diagnosed with mild autism. Following the outcome from our first pilot study; the aim of this current experiment is to explore the application of NAO robot to engage with a child and further teach about emotions through a game-centered and song-based approach. The experiment procedure involved interaction between humanoid robot NAO with each child through a series of four different modules. The observation items are based on ten items selected and referenced to GARS-2 (Gilliam Autism Rating Scale-second edition) and also input from clinicians and therapists. The results clearly indicated that both of the children showed optimistic response through the interaction. Negative responses such as feeling scared or shying away from the robot were not detected. Two-way communication between the child and robot in real time significantly gives positive impact in the responses towards the robot. To conclude, it is feasible to include robot-based interaction specifically to elicit communicational response as a part of the rehabilitation intervention of children with autism.

Evaluation of Mobility Management Protocol in NEMO

ID 2155

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ABSTRACT

The frequent change of Mobile Node (MN) location is going to increase rapidly as everything is a mobile presently. It is essential to focus on the current problem of mobility management protocol such as the latency of Mobile IPv6 (MIPv6) should be minimized with registration time. In Mobile IPv6 (MIPv6) environment, Mobility Anchor Point (MAP) is introduced in macro mobility environment to reduce handover delay. But it is faced extra overhead problem at the time of Mobile Node (MN) movement in Inter-domain mobility. However Network Mobility (NEMO) is the solution to overcome the problem of MIPV6 are mainly handover delay and extra overhead during registration time of MN with its home network. NEMO is consists of Mobile Network Nodes (MNNs) and Mobile Routers (MRs). The MR provides Internet connectivity on behalf of MNNs. There are number of researches which concentrate on the problem of MR extra signalling overhead to enhance handover delay in NEMO network. This paper evaluates mobility management protocol in NEMO based on the different mobility management parameter and it is compared with the standard NEMO Basic Support Protocol (NEMO BSP). Furthermore, it is measured the strengths and weakness of different mobility management's schemes as well.

Performance Analysis of NEMO Route Optimization Protocols

ID 2157

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ABSTRACT

Seamless mobility, which is refer to smooth handoff with less packet lost for Network Mobility (NEMO). NEMO Basic Support Protocols (NEMO BSP) was proposed by Internet Engineering Task Force (IETF). NEMO BSP is defining several ways of solving NEMO routing problems. The data packet coming from Correspondent Node (CN) must be reachable to certain Mobile Node (MN) while it's Internet reachability point is changed due to the mobility of MN or the SUB-NEMO that belong to. Recently several schemes as proposed to enhance Route Optimization (RO) techniques or to provide a novel approach. To compare several techniques, it is observed that still required a strong methodology with analytical scheme to overcome the above stated problem. This paper will proposed analytical methodology technique that investigate several routing techniques and there results, weakness and strength using measurable factors and provide several assessment for development and enhancement.

Mobile Multicast in Hierarchical Proxy Mobile IPV6

ID 2158

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ABSTRACT

Seamless mobility, which is refer to smooth handoff with less packet lost for Network Mobility (NEMO). NEMO Basic Support Protocols (NEMO BSP) was proposed by Internet Engineering Task Force (IETF). NEMO BSP is defining several ways of solving NEMO routing problems. The data packet coming from Correspondent Node (CN) must be reachable to certain Mobile Node (MN) while it's Internet reachability point is changed due to the mobility of MN or the SUB-NEMO that belong to. Recently several schemes as proposed to enhance Route Optimization (RO) techniques or to provide a novel approach. To compare several techniques, it is observed that still required a strong methodology with analytical scheme to overcome the above stated problem. This paper will proposed analytical methodology technique that investigate several routing techniques and there results, weakness and strength using measurable factors and provide several assessment for development and enhancement.

RFID Approach in VANet Environment

ID 2159

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ABSTRACT

Localization is an important issue in Vehicular Ad hoc Network (VANet), because of the most rapid technological advancement. VANET applications such as safe driving and emergency rescue often demand high position accuracy. On the other hand, a conventional localization system, which is GPS, hardly meets new accuracy requirements. Therefore, one of the key challenges is how to develop a new accuracy position mechanism or protocol. The main aim in this paper is to design new localization system using cellular infrastructure of mobile communication system with GPS assisted in vehicles. RFID technology depend on propagation properties to calculate accuracy position, so the non-RFID vehicles will be able to calculate their positions depend on GPS and cellular tower, that they come around the RFID vehicles signals.

Performance Evaluation To Enhance NEMO-Based Scheme Using Satellite

ID 2160

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ABSTRACT

To provide mobility in mobile networks a bidirectional tunnelling between the Mobile Router (MR) and the Home Agent (HA) will be needed. Therefore, once using nested network mobility multiple levels of bi-directional tunnels will be occur then each added level requires an additional tunnel. This multiple tunnel encapsulation increases the packet size which lead to delay, high handoff- latency, disconnection, increase bandwidth utilizations , packet losses and consume nodes power. In order to performs tunnelling operations all these parameters at the end of time lead to bad performance in network mobility which known as pinball problem. The aim of this paper is to analyse the algorithms performances in order to avoid the pinball problem. Additionally, existing NEMO-based schemes/algorithms which perform to deduce tunnelling overhead and route optimization will be investigated as well.

CoG Analysis on the Dynamics of Extendable Double-Link Two-Wheeled Mobile Robot

ID 2161

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ABSTRACT

This paper discusses about the analysis on centre of gravity (CoG) in affecting the motion control of the extendable double-link of two-wheeled mobile robot. The proposed system mimics double inverted pendulum, where the first link (Link1) is to be varied depending the value of the angle of the second link (Link2) and the elongation of the extendable-link that is attached to Link2. The two-wheeled mobile robot together with the extendable link on the Link2 makes that system become more flexible but yet, the system has become more unstable. The inclination of extendable link (Link2) at any interest angle will affect the CoG of the system especially when the payload is having significant weight. This two-wheeled mobile robot can be balanced on the condition that the system's center of gravity must be located on an identical imaginary vertical line of the wheels. The modular hybrid control system was used to analyse the CoG of the system. Therefore, this paper focused on the analysis on the centre of gravity while the payload is attached to the system in order to determine the suitable value of the Link1 angular position to be controlled. Preliminary results show that the angular position of Link1 can be set at suitable degree just to complement the CoG position when there is payload at the end of the extendable link.

A Maximum Power Point Tracking Controller for Traffic Light System Powered by Photovoltaic

ID 2162

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ABSTRACT

Photovoltaic traffic light system is a significant application of renewable energy source. The develop the system use solar energy as an alternative effort of local authority to reduce expenditure for paying fees to power supplier which the power comes from conventional energy source. Since photovoltaic modules still have relatively low conversion efficiency, An alternative control of maximum power point tracking (MPPT) method applied to the traffic light system. MPPT is intended to catch up the maximum power at daytime in order to charge the battery at the maximum rate in which the power from the battery is intended to be used at night time or cloudy day. MPPT is actually a dc-dc converter that can step up or down of voltage in order to achieve the maximum power using Pulse Width Modulation (PWM) control. Based on experiment, we obtained the voltage of operation use MPPT is at 16.454 V, this value had error 2.6%, if we compared with Maximum power point voltage of PV module that is 16.9V, based on this result then this MPPT control work successful to deliver the power from PV module to battery maximally.

Development of a Web based application to operate a Financial System

ID 2163

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ABSTRACT

This paper describes a project to make a Web based Financial System, following latest technology and business needs. In most of the cases development of web based application follows clients' needs and technology. But the development process is very important. In this paper current markets need, latest technology and development technique all three are discussed. Agile development technique is used here. It highlights the critical situation of development, which will help to develop quality products.

Comparative Data Compression Techniques and Multi-Compression Results

ID 2165

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ABSTRACT

Data compression is the very necessary in business data processing, because of the cost savings it offers and because of the large volume of data manipulated in many business applications. A method and system for transmitting a digital image (i.e., an array of pixels) from a digital data source to a digital data receiver. More the size of the data be smaller, it provides better transmission speed and saves time. In this communication we always want to transmit data efficiently and noise free. This paper will provide some compression techniques and comparative result of multiple and single compression, that will help to find out better compression output and develop compression algorithms.

Optimized Real Time PID Control for Steam Distillation Based Induction Heating System of Essential Oil Extraction Process

ID 2166

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ABSTRACT

Steam temperature denoted as parameter that influence the quality and quantity of essential oil. In this study, induction heating system was applied as a heating source to the plant because of their good characteristic. However, by introducing over heating to botanical materials during extraction time can reduce the quality of essential oil. Conventional technique shows the steam temperature not really control. In this work, PID with two

tuning methods ware designed to regulate the steam temperatures by control the heating from induction heating system based on PWM switching. PID controller was developed to monitor and control the output steam temperature to improvise the quantity and quality of essential oil. Performance of PID controller with different tuning method which is Ziegler Nichols(ZN) and Gradient Descent(GD) technique will summarize in term of process rise time, settling time, percent overshoot and using performance index of root mean square error(RMSE). Initially, the steam temperature was modelled to represent the dynamic and behaviour of the steam by using ARX structure. The performance of the proposed controller is validated based on robustness test which is set point tracking and load disturbance. The proposed tuning method for PID shows that GD produces the best response compare to Ziegler Nichols tuning method

Simulation and Experimental Analysis of DC Motor Acceleration Performance on Prototype Fuel Cell Vehicle Based on Current Control Method

ID 2169

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ABSTRACT

This paper reports a simulation and experimental analysis of performance lightweight fuel cell vehicle focus on dc motor acceleration performance. The vehicle power train system equips with a proton exchange membrane (PEM) fuel cell system, brush DC motor, DC-DC converter, and continuous variable transmission (CVT). This prototype vehicle is a three wheels type of car and has a streamline body shape that designed for energy-efficient races where the objectives is to archive furthest distance with less amount of fuel. In the design process, the car's energy demand was specified by developing a computer simulation on DC motor and vehicle dynamic modeling. An actual test was conducted to verify, compare and analyze the performance of a DC motor acceleration for certain current limitation. The result of this study revealed the efficiency variation of difference operating conditions of vehicle acceleration. This acceleration analysis is part of energy efficiency study for electric vehicle. It forms the basis knowledge for next detailed energy efficiency analysis.

Development of quadruped walking locomotion gait generator using a hybrid method

ID 2172

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ABSTRACT

Single Sample Face Recognition Using Illumination-Invariant Local Sub-Blocks

ID 2173

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ABSTRACT

To design a robust face recognition system, careful attention has to be given to illuminations variations that span globally or locally across the facial surface. The illuminations variations due to changes in lighting conditions could produce different shape of shading on the face thus deforming the facial features useful for face recognition. The effect of these variations is simply more severe in the presence of single-sample constraint since there would be many variables with very limited observations. Illumination variations have been modeled in literature as a series of undetermined multiplicative and additive noise, hence it is more convenient to eliminate or reduce the effect rather than computing them. In this paper, we present an illumination-invariant method where we use local features as basis for face classification which are obtained from partitioning histogram-equalized faces into smaller overlapping local sub-blocks (LSBs). We can achieve illumination-invariance for these LSBs by subtracting the vectors with local average illumination and then these vectors are logarithmically normalized to enhance the local contrast. The degree of invariance is controlled by a weight connected to the average illumination's component. We have tested this method in single sample face recognition settings on AR Database and Extended YALE B Database. Recognition results show that the proposed method is suitable for robust face recognition since it achieve good performance in both even illumination and uneven illumination cases.

Development of real time experimental system for investigating photochromic response to UV irradiation

ID 2174

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ABSTRACT

Photochemistry is a field of chemistry that deals with the chemical effects of light such as ultraviolet (UV), visible (Vis) or infrared (IR) radiation. Among many types of photochromic molecules, particular attentions have been given on spiropyrans because of their potential applications in industrial fields. Spiropyrans have the ability to change their chemical structure after exposed to a certain appropriate wavelength of light. However, spiropyrans are very sensitive dyes. For these reasons, an UV irradiation chamber was developed to control the surrounding environment which governs the external light intervention during photochromic work and when direct absorption measurement was performed. The chamber was then exploited to investigate the substituent effect on the absorption spectra of 6-nitro BIPS and 8-ethoxy-6-nitro BIPS dyes. Thus, our results suggest that the developed chamber was successfully utilized for photochromic system since it can protect the dyes from environmental intervention.

A Discontinuous exponential stabilization of chained form system for an X4-AUV

ID 2175

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ABSTRACT

Abstract. In this paper, an underactuated control method is considered for an X4-AUV with four thrusters and 6-DOFs. A second-order chained form transformation is introduced to the dynamical model by separating a system into three parts of controller model. Then, the Astolfi's discontinuous control method is applied to realize an underactuated control method to stabilize the system. This approach is motivated by the fact that the discontinuous dynamic model without using a chained form transformation assures only a local stability (or controllability) of the dynamic based control system, instead of guaranteeing a global stability of the system. A computer simulation is presented to demonstrate the effectiveness of our approach.

Improved 3D limit-cycle navigation method for path planning quad-rotor

ID 2176

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ABSTRACT
Quad rotor as a type of rotary wing aerial vehicle must planned their flight path effectively and avoid any disturbance to complete their mission. The extension of 2D limit-cycle navigation into 3D, made it possible to apply for aerial vehicle. The extended limit-cycle have been introduced, but it generate unsuitable path in certain condition. In this research, rendering the obstacle into a cylinder will generate the efficient path and provide the best way in avoiding stationary obstacle. By defining obstacle position, a simulation and performance study is done using limit-cycle characteristic method. The simulations results illustrated the path generation using improved 3D limit cycle with different obstacle condition.

Fuzzy Logic based Handoff Latency Reduction Mechanism in Layer 2 of Heterogeneous Mobile IPv6 Networks

ID 2177

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ABSTRACT
Mobile IPv6 (MIPv6) is one of the pioneer standards that support mobility in IPv6 environment. It has been designed to support different types of technologies for providing seamless communications in next generation network. However, MIPv6 and subsequent standards have some limitations due to its handoff latency. In this paper, a fuzzy logic based mechanism is proposed to reduce the handoff latency of MIPv6 for Layer 2 (L2) by scanning the Access Points (APs) while the Mobile Node (MN) is moving among different APs. Handoff latency occurs when the MN switches from one AP to another in L2. Heterogeneous network is considered in this research in order to reduce the delays in L2. Received Signal Strength Indicator (RSSI) and velocity of the MN are considered as the input of fuzzy logic technique. This technique helps the MN to measure optimum signal quality from APs for the speedy mobile node based on fuzzy logic input rules and makes a list of interfaces. A suitable interface from the list of available interfaces can be selected like WiFi, WiMAX or GSM. Simulation results show 55% handoff latency reduction and 50% packet loss improvement in L2 compared to standard to MIPv6.

Colour-based Object Detection and Tracking for Autonomous Quadrotor UAV

ID 2178

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ABSTRACT
With robotics becoming a fundamental aspect of modern society, further research and consequent application is ever increasing. Aerial robotics, in particular, covers applications such as surveillance in hostile military zones or search and rescue operations in disaster stricken areas, where ground navigation is impossible. The increased visual capacity of UAV's (Unmanned Air Vehicles) is also applicable in the support of ground vehicles to provide supplies for emergency assistance, for scouting purposes or to extend communication beyond insurmountable land or water barriers. The Quadrotor, which is a small UAV has its lift generated by four rotors and can be controlled by altering the speeds of its motors relative to each other. The four rotors allow for a higher payload than single or dual rotor UAVs, which makes it safer and more suitable to carry camera and transmitter equipment. An onboard camera is used to capture and transmit images of the Quadrotor's First Person View (FPV) while in flight, in real time, wirelessly to a base station. The aim of this research is to develop an autonomous quadrotor platform capable of transmitting real time video signals to a base station for processing. The result from the image analysis will be used as a feedback in the quadrotor positioning control. To validate the system, the algorithm should have the capacity to make the quadrotor identify, track or hover above stationary or moving objects.

ANFIS -Based Navigation for HVAC Service Robot with Image Processing

ID 2179

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ABSTRACT
In this paper, we present an ongoing work on the autonomous navigation of a mobile service robot for Heat, Ventilation and Air Condition (HVAC) ducting. CCD camera mounted on the front-end of our robot is used to analyze the ducts openings (blob analysis) in order to differentiate them from other landmarks (blower fan, air outlets and etc). Distance between the robot and duct openings is measured using ultrasonic sensor. Controller chosen is ANFIS where its architecture accepts three inputs; recognition of duct openings, robot positions and distance while the outputs is maneuver direction (left or right).45 membership functions are created from which produces 46 training epochs. In order to demonstrate the functionality of the system, a working prototype is developed and tested inside HVAC ducting in ROBOCON Lab, IIUM.

Flank wears Simulation by using back propagation neural network when cutting hardened H-13 steel in CNC End Milling

ID 2180

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ABSTRACT

Abstract. High speed milling has many advantages such as higher removal rate and productivity. However, higher cutting speed increase the flank wear rate and thus reducing the cutting tool life. Therefore estimating and predicting the flank wear length in early stages reduces the risk of unaccepted tooling cost. This research presents a neural network model for predicting and simulating the flank wear in the CNC end milling process. A set of sparse experimental data for finish end milling on AISI H13 at hardness of 48 HRC have been conducted to measure the flank wear length. Then the measured data have been used to train the developed neural network model. Artificial neural network (ANN) was applied to predict the flank wear length. The neural network contains twenty hidden layer with feed forward back propagation hierarchical. The neural network has been designed with Matlab Neural Network Toolbox. The results show a high correlation between the predicted and the observed flank wear which indicates the validity of the models.

Surface Roughness modeling for CNC End Milling using Artificial Neural

ID 2181

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ABSTRACT

This research presents the development of new model to predict and simulate the surface roughness in the end milling process by considering the Artificial Neural Network (ANN) as an effective technique for simulating the surface roughness. An experimental investigation was conducted to measure the surface roughness for end milling. A set of sparse experimental data for finish end milling on AISI H13 at hardness of 48 HRC have been conducted. The artificial neural network (ANN) was applied to predict the surface roughness. Twenty hidden layer has been used with feed forward back propagation hierarchical neural networks were designed with Matlab2009b Neural Network Toolbox. The abilities and limitations of the ANN technique for predicting surface roughness are also highlighted.

Investigation of surface roughness in micro-electro discharge machining of nonconductive ZrO2 for MEMS application

ID 2182

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ABSTRACT

Micro-electro discharge machining technique, a noncontact machining process, is applied for drilling blind hole on nonconductive ZrO2 ceramic for MEMS application. A conductive layer of adhesive copper is applied on the workpiece surface to initiate the sparks. Kerosene is used as dielectric for creation of continuous conductive pyrolytic carbon layer on the machined surface. Experiments are conducted by varying the voltage (V), capacitance (C) and rotational speed (N). Correlating these variables a mathematical model for surface roughness (SR) is developed using Taguchi method. The results showed that the V and C are the significant parameters of SR in micro-EDM for nonconductive ZrO2 ceramic. The model also showed that SR increases with the increase of V and C.

Application of Electrical Capacitance Tomography on single- plane sensor measurement

ID 2183

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ABSTRACT

Efficient Implementation of Real-Time Face Detection Algorithm in MATLAB

ID 2184

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ABSTRACT
A colour image may be defined as a three-dimensional function (R,G,B) where R,G and B are three planes for Red, Blue and Green respectively. The field of colour image (CI) processing is on-going research area in image detection. CI has the pixel values of 0 to 255 which represent different colour combinations. CI processing encompasses processes whose inputs and outputs are images. It encompasses processes that extract attributes from images where different functions can be applied. This paper reviews published colour analysis algorithms and implement an efficient technique to detect the human face. There are many techniques used to detect human face in CI however, this paper focuses on colour analysis which is a simple and easy to implement in MATLAB.

Time domain analysis of flutter-based microgenerators

ID 2185

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ABSTRACT
Flutter-based micro generators harvest energy from wind sources using non-conventional methods of converting wind to vibration. These vibrations are of small scale enough to power a remote monitoring device. In this paper we demonstrate a cantilever plate embedded with coils near the tip placed in a wind flow, which causes instability and aerodynamic loading on the plate due to vortex shedding phenomenon. Coils placed at the tip of the plate vibrate in the magnetic field inducing an electric voltage. A SIMULINK model is also presented in this work to predict the time response of the plate placed in a flow, which includes parametric study of voltage and power generated with varied wind speed, coils, magnetic field, cantilever plate dimensions and load resistance.

Optimal Throughput and Self-adaptability of Robust Real-Time IEEE 802.15.4 MAC for AMI Mesh Network

ID 2186

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ABSTRACT

A smart grid refers to a modernization of the electricity system that brings intelligence, reliability, efficiency and optimality to the power grid. To provide an automated and widely distributed energy delivery, the smart grid will be branded by a two-way flow of electricity and information system between energy suppliers and their customers. Thus, the smart grid is a power grid that integrates data communication networks which provide the collected and analysed data at all levels in real time. Therefore, the performance of communication systems is so vital for the success of smart grid. Merit to the ZigBee/IEEE802.15.4std low cost, low power, low data rate, short range, simplicity and free licensed spectrum that makes wireless sensor networks (WSNs) the most suitable wireless technology for smart grid applications. Unfortunately, almost all ZigBee channels overlap with wireless local area network (WLAN) channels, resulting in severe performance degradation due to interference. In order to improve the performance of communication systems, this paper proposes an optimal throughput and self-adaptability of ZigBee/IEEE802.15.4std for smart grid.

Challenges of Integrating Unmanned Aerial Vehicles In Civil Application

ID 2187

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ABSTRACT

Unmanned Aerial Vehicle (UAV) has evolved rapidly over the past decade. There have been an increased number of studies aiming at improving UAV and in its use for different civil applications. This paper highlights the fundamentals of UAV system and examines the challenges related with the major components such as motors, drives, power systems, communication systems and image processing tools and equipment.

Enhancing the Reliability of Spectral Correlation Function with Distributed Computing

ID 2188

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ABSTRACT
Many random time series used in signal processing systems are cyclostationary due to the sinusoidal carriers, pulse trains, periodic motion, or physical phenomenon. The cyclostationarity of the signal could be analysed by using the spectral correlation function (SCF). However, it is considered high complex due to the 2-D functionality and the required long observation time. The SCF could be computed in various methods however, there are two methods used in practice such as FFT accumulation method (FAM) and strip spectral correlation algorithm (SSCA). This paper investigates the advantage on the complexity and the reliability by distributing the workload of one processor on different cooperated processors. The paper found that with increasing the reliability of the SCF, the number of the cooperated processors to achieve the half of the maximum complexity will reduce

Design field controller for level, flow, temperature and networking using YOKOGAWA DCS

ID 2189

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ABSTRACT
The application of field controller is an emerging area on most engineering field. The digital field controller has been widely used in the industry since ages ago. In this project, the main objective is to design distributed field controller to measure temperature, level and flow of the system used in Industrial Automation using YOKOGAWA DCS. YOKOGAWA ELECTRIC Sdn Bhd is a Japanese electrical engineering and software company with businesses based on its technologies in measurement, control, and information. In this project, there is some data acquisition from analog to digital for input and output. It is to change the plant local controller into Distributed Control System by using Yokogawa CENTUM CS 3000. The field controller was designed based on the construction of field plant. Apart from that, a networking was done through Ethernet, which work in dual redundancy. There are five computers used in this project which are one engineering workstation and four Human Interface System (HIS).