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Volume 11, Issue 9, 10 May 2016, Pages 5644-5649

On the performance of segment averaging of Discrete Cosine Transform coefficients on musical instruments tone recognition

(Article)

Sumarno, L.

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Abstract

In the Discrete Cosine Transform (DCT) domain, the tones of musical instruments can be divided into two groups. The first one with the single significant local peaks and the second one with the multiple significant local peaks. The second one can be divided into two sub groups, which have many and a few significant local peaks. This research deal with multiple significant local peaks. In this research, segment averaging was used to reduce the number of DCT coefficients, in the DCT domain. In this case, the reduced number of DCT coefficients called feature extraction coefficients. Based on the experiment, when the segment averaging of DCT coefficients was used optimally for the tones which had many (i.e. thirteen) and a few (i.e. three) significant local peaks, it could give 8 and 16 feature extraction coefficients respectively. So, in order that segment averaging of DCT coefficients could be used optimally, either for the tones which have many or a few significant local peaks in the DCT domain, it could use segment length 4 points and DCT length 64 points. By using it, it could give 16 feature extraction coefficients. © 2006-2016 Asian Research Publishing Network (ARPN). All rights reserved.

Author keywords

DCT

Feature extraction

Segment averaging

Tone recognition

ISSN: 18196608

Source Type: Journal

Original language: English

Document Type: Article

Publisher: Asian Research Publishing Network

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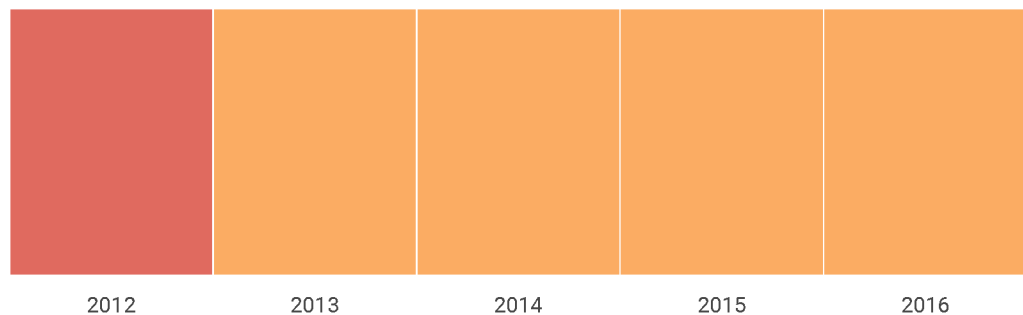
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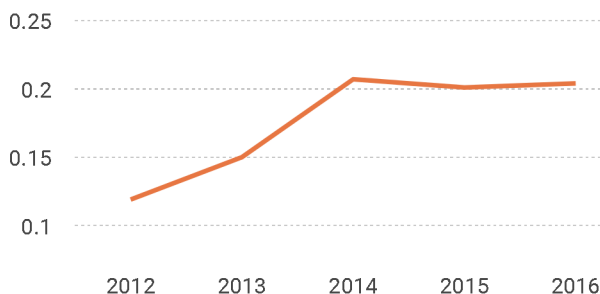
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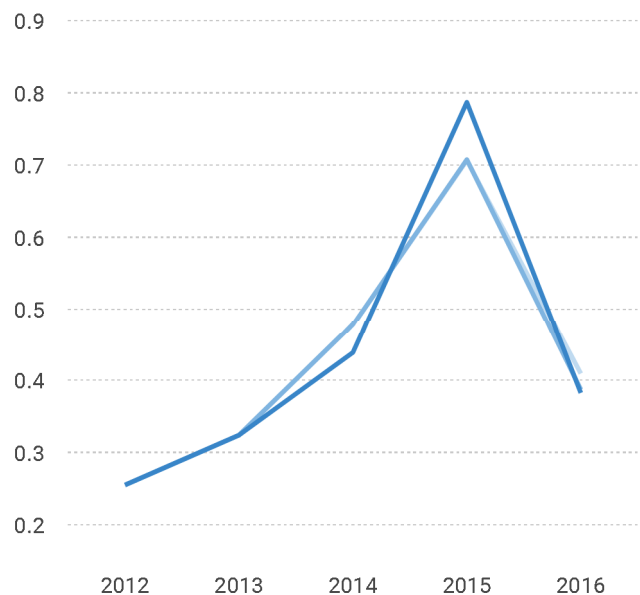
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Fee](#)**Title:** Comparative studies on thermal efficiency of single and double glazed flat plate solar water heater**Author (s):** J. Manikandan and B. Sivaraman

Abstract: A Study was under taken to assess the performance of single glass flat plate solar water heater (SGFPSWH) and double glazed flat plate solar water heater (DGFPSWH) were experimentally investigated. Galvanized iron plate of 1.42 x 0.7 m² size was employed as Flat absorber plates. A glass plate of similar size was used as top cover for SGFPSWH and two glass plates of same size with a gap of 2cm were used for DGFPSWH the glass plates used as protection for heat loss from absorber plate to atmosphere. Performance of SGFPSWH and DGFPSWH at different mass flow rates (0.0041, 0.0083, 0.0125 kg/s) were investigated and reported. Thermal efficiency is found to be higher for DGFPSWH compared to SGFPSWH.

[Full Text](#)**Title:** Design circular polarization microstrip antenna for 2400 MHz with rectangular basic patch**Author (s):** Rudy Yuwono, Bayu Ramadhan Hidayatullah and Erfan Achmad Dahlan

Abstract: The antenna have many variety of types and microstrip antenna has more advantages than the other types of antenna. The antenna was made from FR-4 epoxy with substrate $\epsilon_r = 3.9$ and $h = 1.6$ mm and works in frequency 2400 MHz with VSWR 1.589. S-Parameter level is below -10dB, the bandwidth of antenna shown as VSWR < 2, has circular polarization at frequency 2400 MHz. This design and results calculations using CST software.

[Full Text](#)**Title:** Developments in computer aided diagnosis used for Tuberculosis detection using chest radiography: A survey**Author (s):** K. G. Satheeshkumar and Alex Noel Joseph Raj

Abstract: One of the major health problems of global concern is Tuberculosis (TB). According to the global report of WHO, approximately 1.3 million people died out of 8.6 million reported with TB in 2012. Most of the TB death can be prevented if it is detected at an early stage. Hindrance to that is improper diagnosis at the initial stage. Chest X ray (CXR) image is the primary medical diagnosis used for identifying the lung diseases at the first stage. Interpreting the information from CXR depends upon the experience of the doctor and the possibility of over and under diagnosis is very high. To identify the disease accurately a proper classification tool along with computer aided diagnosis should be used. Neural network can be used as a classifier tool for the same. Advancement in VLSI technology reduces the computational complexity of Artificial Neural Network (ANN). The research of neural networks in medical images (x-ray images of TB, lung cancer) diagnosis during adolescent stage, show a lot of remarkable improvements. This paper describes the fundamentals of radiology of lungs (analysis of CXR), image processing, ANN and recent developments in this area using computer aided diagnosis (CAD). We have gone through the Chest Radiology and found that an accurate classifier is required for proper diagnosis.

[Full Text](#)**Title:** Estimation of XACML policy using dynamic privacy preservation methodology**Author (s):** S. Dhamodaran, E. Archana and J. S. Umashankar

Abstract: Extensible Access Control Mark-Up Language (XACML) based solutions for dynamic privacy policy management and decision enforcement is proposed in recent research to enhance the accuracy of the component like Policy Enforcement Point (PEP) and Policy Decision Point (PDP). Composition plan will be generated where any service WS1 which depends on another service WS2. To manage data privacy, Web Services defines a privacy policy for each instance in its OWL repository. Each repository manages data access through SPARQL endpoint. A dynamic, semantic-based privacy policy management framework is proposed in our system on the top of the XACML reference architecture for policy-based access control. XACML is a protocol of communication between a PDP and PEP used for context handling. The context handler accepts the request from an XACML formed by PEP and sends it to the PDP. The PDP uses the attributes to evaluate policies and it returns the final decision.

[Full Text](#)**Title:** Ensemble fuzzy support vector machine classifier based on maximum spanning tree for big data analytics**Author (s):** B. Rajendran and Saravanan Venkataraman

Abstract: Today the buzz word in information technology is big data. Classification is one among the thrust research problem in such big data and its corresponding application scenarios. This research work makes use of an ensemble fuzzy support vector machine in order to perform the classification task. Maximum spanning tree is used for feature selection among the big data. KDD Cup 99 is multivariate dataset which consists of 40, 00,020 instances with 42 attributes chosen for evaluating the performance of the proposed work. Simulation results show the proposed ensemble classifier.

[Full Text](#)

Title: Performance evaluation of UDP based on traffic size and traffic load using NS2

Author (s): Saif Uldun and Raed Alsaqour

Abstract: This study concerned on examining network matrices over user datagram protocol (UDP). The current challenges associated with network performance and streaming of packets was the main motivation for the researchers. A review of UDP was given with the relation to its network performance. We found UDP offer a minimal, unreliable, best-effort and message-passing transport to applications. Hence, a further examination of its performance was performed using NS2 on aspects related to traffic size and traffic load. The simulation result revealed that when establishing communication over UDP, it was noticed that changing packet size and traffic load has a small effect on UDP performance in which it was found a minimal associated end system state.

[Full Text](#)

Title: Optimization of chlorination stations intermediaries locations in a drinking water system

Author (s): Ammadi Abdelaziz and Elbelkacimi Mourad

Abstract: In this work provides for the publication of an optimal technique to end the problem of lack of chlorine in drinking water ends of the distribution network and ensure sufficient concentrations by chlorine injections through intermediaries chlorination stations to maintain the quality of drinking water to the consumer. This technique has two main objectives namely to minimize the number of chlorine deficit nodes and the number of stations to be set. This method is divided into two parts:- the first can detect target areas (chlorine <standard), these areas will be classified in order of importance (number of nodes lower, number of nodes swallows, flow ...)- Reduce the number of these nodes deficit up by chlorine injection. To meet these two criteria, we have developed an optimization tool able to offer sound solutions to minimize both the number of loss and nodes and the number of stations to be set.

[Full Text](#)

Title: Effective clusters culled out through algorithmic implementations

Author (s): Manalina and K. Mohana Prasad

Abstract: Data mining is a technology that collects and search a bulk of data from database to discover relationship among data. It is an application that view data from different angles and group it into information that is useful in many perspectives. There are different types of clustering methods that used to grouping the generated data sets such as K-means etc. K-means algorithm is a centroid based technique and has input parameter as k. This technique has two restrictions such as k-means value selection and centroid selection i.e. the size of cluster is assigned by manually and the centroid value is selected by randomly. These two parameter impacts on the clustering performance massively. Another metric such as distance metric also have impact on choosing the cluster also presented. This paper presents powerful K-means (PKM). To show the performance of the proposed algorithm various set of dataset have been taken. That has been applied on traditional K-means and proposed algorithm. The experimental result shows proposed algorithm gives better result when compared to traditional k-means.

[Full Text](#)

Title: An improved load-displacement prediction for a coned disc spring using the energy method

Author (s): Noor Fawazi and Jung-Youn Lee

Abstract: An improved computation of the load-displacement prediction for a coned disc spring is proposed. This work is an extension work of the previous proposed energy-based computation for coned disc springs. To show the validity of the improved method, the load-displacement results using the improved computation, the previous proposed method, and the finite element analyses are compared. In this work, the improved computation and the finite element analyses have accounted for the radial deflection of the disc spring in the form of energy method. This is different in the previous work where the radial deflection of the disc spring was ignored and the comparison to the finite element analyses without accounting the radial deflection is not practical. The present work makes the comparison to the finite element analyses to be more reasonable and more practical.

[Full Text](#)

Title: Identification of damaging assets irrigation levels of the tertiary to the area Bissua based on geographic information system (GIS)

Author (s): Abdul Rivai Suleman

Abstract: Damage to one of the buildings of irrigation will affect the performance of existing systems, resulting in the efficiency and effectiveness of irrigation to decrease. Bissua dam is one of the dam in South Sulawesi which drains approximately 10.785 hectares of rice fields by making capacity of 25 m³ / sec. Disruption of irrigation channels in this area either primary channels, secondary channels, or tertiary channel may result in a decrease in agricultural production and negative implications for farmers' income. This study is located at the point B.Bi5 or rather the Bi tertiary channels 5 (Left) Bissua Irrigation Area, District Bajeng, Regency of Gowa and aims to provide information as well as one source of data to formulate policies in managing the irrigation network and the local communities. This research-based geographic information system (GIS) where the results of this research data in the form of software such as Map Source, Arc GIS and Google Earth. To identify tissue damage tertiary irrigation survey using GPS, then take the coordinates, dimensions and damage photo at the point of damage. Based on Ministry of Public Works the Republic of Indonesia, No. 32 in 2007, obtained the degree of damage to Bi tertiary channels 5 (Left) with 7.84% the percentage of damage is categorized in good condition (damage level <10%).

[Full Text](#)

Title: Design and implementation smart security system based on Artificial Neural Network

Author (s): Israa Rafie Shareef

Abstract: Visual surveillance are used in surveillance sensitive application like as borders, stores ,banks, crowded public places, highways, etc... Smart surveillance, is the use a technologies of automatic analysis of video surveillance. Due to the technology of smart surveillance being a critical security infrastructures component, the architecture of smart system assumes a critical importance. Artificial Neural Networks (ANN) shown a promise in a wide areas of applications. Their intrinsic parallelism and massive makes ANN proper to solve difficult problems in computer vision application sand image analysis, chiefly when environments of non-stationary is occur. This research aim to design and implement surveillance system for building and government complex to detect most threads that may be exposed. In this research, a smart video surveillance system has been designed to detect and track moving object (such as human or cars) in real time, beside recognized human faces and recognized cars license plate. The systems consist of two main parts: Surveillance visual system and license plate recognition (LPR) system. The surveillance camera system are consist of multi cameras which have been connected to monitoring server that contains a program employee the ANN for smart detection of threat such as motion detection, face recognition etc. LPR system consist of fast camera connected to computer that include program to detect license plate of car that pass the gate of institute and detect if it authorized or unauthorized.

[Full Text](#)

Title: The strain-stress state of the rotor during entrance of the rotor-screw vehicle from water to ice

Author (s): Alla Koshurina, Aleksandr Blokhin, Maxim Krashennnikov and Roman Dorofeev

Abstract: A rotor is the main element in a construction of rotor-screw vehicle. Accordingly, the durability of the whole vehicle is in direct connection with the durability of a rotor. The loading mode in the case of the vehicle's entrance from water to ice is viewed in this work. The paper contains the computational scheme developed for the loading mode. The rotor of the universal Arctic rotary-screw rescue vehicle was chosen as an object of the research. This rescue vehicle is being developed in NNSTU named after R.E. Alekseev. The simulation model of the rotor was created in accordance with the computational scheme and technical characteristics of the vehicle. The strength calculation of the computer model was carried out by finite-element analysis with Autodesk Simulation Mechanical 2016. The paper shows the strain-stress state of the rotor as a result of the calculation. The influence of the reviewed loading mode to the rotor's construction is described in the conclusion.

[Full Text](#)

Title: QoS performance study of Real-Time Transport Protocol over VoIP

Author (s): Abdallah S. Abdelrahman, Rashid A. Saeed and Raed A. Alsaqour

Abstract: In recent years, Voice over IP (VoIP) has gained a lot of popularity and become an industry favorite over Public Switching Telephone Networks (PSTN) with regards to voice communication. This paper work consists of creating a VoIP network and testing for its known faults. Through this paper, we get a better understanding of the underlying layers of the network and see if and where improvements can be made. In implementation stage the Real-time Transport Protocol (RTP) packets for VoIP applications had been sent and compared with TCP/UDP packets to obtain results which are mainly related to Quality of Service (QoS) factors. The attained result approved that RTP consider to be better to reduce a packet loss than UDP and also approved that UDP/RTP are most reliable because they had a very small delay and jitter in contrast with TCP. Hence, we find that, UDP/RTP are more balance and prefer than TCP in real-time applications such as VoIP.

[Full Text](#)

Title: Live bandwidth allotment LBA-MAC protocol for MANETs

Author (s): S. Vimala and S. K. Srivatsa

Abstract: In this paper, the necessity to achieve a capable Medium Access Control protocol subject to bandwidth constraints is considered. As Medium Access Control has an important role on the bandwidth allotment, bandwidth efficiency is one of the main concept in the design of Medium Access Control (MAC) protocols for MANETs. Nodes are placed in an ad hoc manner, when transmitting the packets nodes will be inactive for more time and when it becomes an active state, some characteristics of MANETs and applications motivate a MAC that is different from IEEE 802.11 in some ways like Live Bandwidth Allotment and self-organization are the targets. The significance of routing protocol that makes security as wanted by providing a broad architecture of Secured PPEM Mechanism based Multi-Hop Strong Path Geographic Routing protocol (SMHSP) with effective key management, secure neighbor detection, secure routing data's, finding malicious nodes, and eliminating these nodes from routing table is considered. In this paper, we would implement the LBA-MAC protocol under SMHSP routing protocol and compare the performance parameters by varying number of nodes in the MANETs.

[Full Text](#)

Title: An efficient test data compression based on iterative XOR Matrix computation

Author (s): K. R. Krishnapriya and M.A. Muthiah

Abstract: The continuous increase in complexity of system on chip (SOC) design has resulted in higher test data volume. In this paper, we have proposed a new test data compression technique using an iterative XOR Matrix. This compression is a lossless compression technique that reduces the amount of test data and therefore reduction in test time. Experimental results on ISCAS 89 benchmark circuits are obtained. This demonstrates the effectiveness of the proposed technique in obtaining high compression ratio.

[Full Text](#)

Title: An effective retrieval of secured and ranked data in cloud environment

Author (s): R. Shanmugaapriya and A. Safiya Parvin

Abstract: Cloud computing is a successful environment due to many recent technologies. The main advantage of using cloud computing is that it allows users to store a copious amount of data. The mobile data which has been redistributed to the third party cloud requires protection from the trapdoor, intruders to do so the data were encrypted using asymmetric encryption into blocks and then distributed to the various cloud storages. But there exists some difficulties in search of those data in cloud, which may not give an accurate search results. The main aim of this paper is to overcome this drawback through gateway encryption and blind storage, through dynamic block splitting in order to preserve the redistributed data in the cloud storage. Natural Language Processing technique is used to extract keywords by secured multi-keyword search over the cloud data which pre computes the resulting data that the user needs to search and gives accurate and relevant results by without downloading the files contents .Indexing and the privilege preferences were also done prior to enhance the security and decryption of the entire group members file content is also done.

[Full Text](#)

Title: Implantable antennas for biomedical applications

Author (s): Manjulatha Velur and K. Ch. Sri Kavya

Abstract: Implantable antenna technology is a current trend in biomedical applications. Implantation is being used in Biotelemetry and Biomedical therapy. The trend of implantation started in 1960's with implantable pace makers and is emerging with improving the size and efficiency of implantable devices. Biomedical applications cover Biotelemetry and Biomedical therapy. Realization of implantable antennas demands for work in various s areas. This work can be categorized as (a) Choosing different antenna configurations suitable for lossy media, (b) minimizing the size of antennas and improving the efficiency, (c) packaging of antennas with proper insulating layers (d) testing the performance to enhance the range of Biomedical applications. This paper gives a review on the work done in all the above mentioned areas.

[Full Text](#)

Title: Development of Automated Dispatching Control System for concrete batching plants

Author (s): Andrey Ostroukh, Peter Yurchik, Nataliya Surkova, Aleksander Kolbasin and Dmitry Moroz

Abstract: In the article proposed the scientific approach to the problem for automation transportation planning construction materials in the two-tier control system. It is shown, that for a rational solution of the problem of transportation planning construction materials must use data mining methodologies and expert systems to assess the probability of the task. Automated Dispatching Control System (ADCS) has a layered structure, and may include multiple geographically distributed plants connected into a single technological system integrated into the enterprise management system. The proposed system is scalable and can include management subsystem concrete plants, air traffic control, laboratory, hydrothermal treatment, weight management, warehouse aggregates and cement, concrete targeted distribution, access control subsystems, jobs management personnel.

[Full Text](#)

Title: On the performance of segment averaging of Discrete Cosine Transform coefficients on musical instruments tone recognition

Author (s): Linggo Sumarno

Abstract: In the Discrete Cosine Transform (DCT) domain, the tones of musical instruments can be divided into two groups. The first one with the single significant local peaks and the second one with the multiple significant local peaks. The second one can be divided into two sub groups, which have many and a few significant local peaks. This research deal with multiple significant local peaks. In this research, segment averaging was used to reduce the number of DCT coefficients, in the DCT domain. In this case, the reduced number of DCT coefficients called feature extraction coefficients. Based on the experiment, when the segment averaging of DCT coefficients was used optimally for the tones which had many (i.e. thirteen) and a few (i.e. three) significant local peaks, it could give 8 and 16 feature extraction coefficients respectively. So, in order that segment averaging of DCT coefficients could be used optimally, either for the tones which have many or a few significant local peaks in the DCT domain, it could use segment length 4 points and DCT length 64 points. By using it, it could give 16 feature extraction coefficients.

[Full Text](#)

Title: High altitude operations with piston engines powerplant design optimization

Author (s): Luca Piancastelli, Leonardo Frizziero, Simone Pica and Giampiero Donnici

Abstract: In high altitude operations, the cooling system takes part to the vehicle design optimization process. An integrated design of the cooling ducts is strictly necessary. At high altitudes, the cooling air is taken from high-pressure areas into an alternate, extremely optimized, path. A diffuser reduces the airspeed and increases pressure of the cooling air. Then a group of high performance finned radiators rejects the heat from coolant, air charge and oil. The high altitude, after diffuser radiator performance is discussed in this paper. At first high performance Formula 1 radiators are introduced and discussed. Experimental data are also exposed and summarized. The pressure drop and heat rejection are expressed in function of Re and Pr numbers of cooling air. Then the radiator performance at high altitude is extrapolated from the ground test data. Finally a few suggestions on radiator and cooling ducts arrangement are introduced.

[Full Text](#)

Title: A novel constraint handling approach for metaheuristic techniques in solving economic dispatch problems

Author (s): Mohd Wazir Mustafa, Abdirahman Mohamed Abdilahi, Jafaru Usman, Jasrul Jamani Jamian, Saleh Abujarad, and Mamunu Mustapha

Abstract: This paper proposes a novel constraint handling strategy that is based on random walk (RW) for metaheuristic techniques in solving economic dispatch (ED) problems. To implement this CHM, a Cuckoo Search (CS) algorithm has been adopted. The absolute as well as the relative performance of the resultant hybrid algorithm is experimentally investigated using a standard test case with valve point effects. Statistical parameters are used in order to evaluate the robustness of the method. The proposed methodology proves that it outperforms established methods such as particle swarm optimization and genetic algorithm methods in terms of robustness and achieving consistent results throughout all the trials in each experiment.

[Full Text](#)

Title: Smart electronic system for dancing fountains control capable to create water and lighting scenarios synchronized with a music track

Author (s): Paolo Visconti, Paolo Costantini and G. Cavallera

Abstract: This work regards on hardware and firmware development of an electronic control and driving system for dancing fountains, able to manage water and lighting scenarios synchronized with mp3 music files stored on an external SD memory card connected to the designed system. The smart PIC-based control unit reproduces the music file related to a particular scenario and drives, in a synchronized way, fountain's LED-based headlights and water pumps to create amazing light and water plays.

[Full Text](#)

Title: Analysis of power quality disturbances based on kalman filter and MLP neural network

Author (s): P. Kalyana Sundaram and R. Neela

Abstract: This paper aims to develop a new technique for the classification of various power quality disturbances using Kalman filter and Multi-layer perceptron (MLP) neural network. Kalman filter is adopted to extract the three types of input features (standard deviation, peak value and variances) from the power quality disturbance waveforms simulated on a Matlab test system. The extracted features are given as inputs to the neural network. MLP based neural network has been used for disturbance classification and the neural network has been trained using 1800 number of test data at the rate of 200 samples for each class of disturbance. The algorithm has been tested with 1800 number of test data and the outcomes are recorded.

[Full Text](#)

Title: A particle Swarm Optimized PI controllers for the management of the Unified Power Flow Controllers in a single machine infinite busbar system

Author (s): K. A. Rani Fathima

Abstract: In this paper is presented the design and simulation based validation of a novel Particle Swarm Optimization (PSO) designed set of PI controllers for the management of the two converters of the Unified Power Flow Controller (UPFC). The performance of the PSO tuned PI controllers are compared against the performance of the PI controllers tuned by the traditional Zeigler Nicholas method. The proposed idea has been implemented in the MATLAB SIMULINK environment and the results of simulation validate the proposed idea.

[Full Text](#)

Title: A prototype of low cost implementation of an Intelligent Home Automation System

Author (s): B. Bharathi and Simhadri Mahesh Kumar

Abstract: Home Automation Systems have started gaining greater importance. The need of cognitive support for people with physical disabilities is the need of the day. The proposed idea of an Intelligent Home Automation System (VAHAS) is a simple way to control all electrical and electronic equipments at home using one's voice. All electrical equipments like fans, lights, television, air conditioners, etc are interfaced with the main system installed with the proposed software deployed on Linux environment. The interfacing is brought about by RF enabled switches. The system is designed so that it responds to commands given by user. The system intelligently changes state of the equipments by activating and deactivating them without human intervention. This prototype when tested with a sample of 60 voice commands resulted in an average of 85% goodness. Extendibility is given utmost importance and customized functions can be added later.

[Full Text](#)

Title: Hollow-core photonic crystal fiber refractive index sensor based on modal interference

Author (s): N. F. Baharin, N. Sidek, S. M. A. Musa, A. I. Azmi, A. S. Abdullah, M. Y. M. Noor and M. E. M. Roslan

Abstract: A refractive index sensor based modal interference in hollow core photonic crystal fiber (HCPCF) is proposed and demonstrated. The sensor is realized by splicing both ends of a HCPCF section to single mode fiber (SMF). At both splicing points, the HCPCF air holes are fully collapsed by the arc discharge. The collapsed regions excite and recombine core and cladding modes which formed modal interference for sensing purpose. The HCPCF sensor is tested in sugar solution and the response is measured from the wavelength shift in the interference spectra. The achieved sensitivity and resolution are 36.184 nm/RIU and 5.53×10^{-4} RIU, respectively, in refractive index range between 1.3330 and 1.3775. Result also shows that the sensor has a small temperature sensitivity of 19 pm/°C in the range of 35.5°C to 60.5 °C. The proposed sensor potentially can be applied in biomedical, biological and chemical applications.

[Full Text](#)

Title: Information security in d-media (digital media)

Author (s): S. Balakrishnan, A. Jebaraj Rathnakumar and K. N. Sivabalan

Abstract: Many thoughts were taken place to rollout Digital Cinema from Traditional Cinema. Security is perhaps the most important and least understood aspect of Digital Cinema. Adding to the challenge is the uniqueness of the cinema business, making it difficult to have a security model. Information Security interpretation here is in terms of Content Security. The discussion below highlights how Content Security is promised in the world of Piracy.

[Full Text](#)

Title: Kinetics of the thermal decomposition of Egyptian cotton stalks, corn stalks, and rice straw

Author (s): Eman A. Tora, Ali M. Radwan and Mohamed A. Hamad

Abstract: A kinetic study of three Egyptian agricultural wastes has been conducted at a heating rate of 50C/min using thermo gravimetric analysis TGA. The kinetic parameters (order of reaction, activation energy, and frequency factor) have been determined from the TGA experiment measurements. The kinetic results indicate that the thermal degradation is a first order reaction. The activation energies (25.7 - 26.2 - 26.1) kJ/mol and the pre-exponential factors ($5.86\text{E-}3$, $6.95\text{E-}3$, and $6.95\text{E-}3$) were attained for cotton stalks, corn stalks, and rice straw, respectively. These activation energy values are considered low, which specify the ease of gasification of these three types of the agricultural wastes.

[Full Text](#)

Title: Automation of the drying and milling unit for the mineral powders plant

Author (s): Andrey Ostroukh, Oleg Maksimych, Andrey Nikolaev, Aleksander Kolbasin and Igor Nedoseko

Abstract: The article gives a brief description of the block diagram of drying and milling units (DMU) for the mineral powder plant. The influence of structural and technological parameters of aggregates DMU on the character of the technological process of mineral powder. Software implementation ACS DMU is a complex of technical means, technical, informational, mathematical and software for management of technological objects. ACS DMU provides the optimal level of automation of collection and processing of information for generating control signals and transmit them without loss and distortion to the actuators in order to achieve the most efficient operation of engineering systems as a whole.

[Full Text](#)

Title: Assessment of URAL-20R machine use efficiency while developing potash salt fields

Author (s): G. D. Trifanov, D. I. Shishlyannikov and S. A. Lavrenko

Abstract: The paper has offered the control procedure of working conditions and proved the concept of the machine program recording set of the «URAL-20R» heading-and-winning machine. The paper has also presented the results of experimental works of load intensity and load variation conditions of the URAL-20R actuators obtained with the use of the VATUR portable measuring complex. In the course of experimental works the measuring and recording instantaneous current and instantaneous value of voltage of the working machine electric motors were taken, the actual and full power level, energy intensity of the process of potash massif deterioration were determined. Having used a mechanical-motion transducer there were travel speed of the machine to the bottom hole and the travel rate were registered. The paper has proved that existing means of the objective control procedure of working conditions of the URAL-20R machines do not provide best performance operation of the winning machines. The motor loading indicators that the newest models of the "URAL" machines have are adjusted to peak current and start alarming about the overload at 60-70 % of the load to the driving motors. On the basis of data analysis the paper has proved efficient operating conditions of the URAL-20R combine operation. It is proved that during the combine operation with its nominal performance of 7 t/min. as compared to usual performance of 4 t/min., energy intensity on the potash ore output recedes by 1, 5 times, and the extraction of the crude ore (-0,25 mm) decreases by 30%. The paper has recommended the stationary complex development registering load intensity and load conditions of the actuators monitoring technical condition of the combine transmission system performance predicting gas-dynamic phenomena in the potash massif.

[Full Text](#)

Title: Automatic system of detecting informed trading activities in European-style options

Author (s): Moshenets M. K. and Kritski O. L.

Abstract: We propose a computer-based system of detecting the informed trader activities in European-style options and their underlying asset. The model (9) with moving average component was written. Being added to it ARMA-process for log-price differences of underlying asset, the generalized model is written as Vector ARMA, stable at . We also proposed a mathematical criterion of informed trader activity presence which is a corner stone of automatic detecting system constructed.

[Full Text](#)

Title: Investigation of single beam near-infrared Free space optical communication under different weather anomalies

Author (s): Syed Mohammad Ali Shah, Muhammad Shafie Abd Latiff, Bhawani Shankar Chowdhry and Tahir Riaz

Abstract: The Free space optics (FSO) is a wireless optical communication system that connects directly to the atmosphere, where the connection is established between transmitter and receiver within in the line of sight. The FSO poses a high-speed broadband, which is the last mile wireless optical communication, deployed relatively fast. However, there are some weather factors may affect the performance of FSO transmission. In this paper, we analyzed the performance of Non-Return to Zero (NRZ) modulation schemes, which is used in FSO communication under extreme weather conditions over a range of 2Km. The performance has been analyzed under 980nm wavelength, Bit Error Rate (BER), and Q-factor using Opt system. The largest attenuation measured is 340dB/Km, correlate to the visibility of 50m. In addition the visibility exceeding about 50m, The Kruse formula provides a good measurement of optical attenuation over long distances under the clear weather and haze conditions respectively.

[Full Text](#)

Title: Comparative wear behaviour of Al 6063 with sic and nano sic metal matrix composites

Author (s): M. K. Aravindan and K. Balamurugan

Abstract: The current paper investigates the wear behaviour of sic and nano sic reinforced with aluminium metal matrix composites were prepared by stir casting method. In this method five sets of both the Almmcs were produced with incorporating 2,4,6,8 and 10 wt% of sic and nano sic particulate Aluminium composites, due to increase in weight percentage of sic and nano sic particulates reduces the fracture toughness, which results in higher wear rate. Plots depict that increase in % reinforcement of sic and nano sic reduces wear up to around 5 to 7% and beyond this the wear has a tendency to increase for Al composites. Pin on disc wear tests were conducted and the results were gives the effect of increasing sic with Aluminium increases wear rate. This work focuses on developing an Aluminium metal matrix composite (AMMC) material for turbocharger components made by wrought aluminium alloy with various weight fractions of aluminium silicon carbide and nano silicon carbide composites in order to make five different forms of metal matrix composites comparison on wear behaviour were discussed.

[Full Text](#)

Title: Fuzzy PID controller for nonlinear plant

Author (s): M. V. Burakov and V. G. Kurbanov

Abstract: This paper deals with a design of fuzzy PID controllers for nonlinear dynamic system. An important feature of decomposed fuzzy PID controller is their simple structure. In its simplest version, it uses three one-input one-output fuzzy inferences with three separate bases with simple rules. The fuzzy PID controller parameters are optimized by using genetic algorithm. The performance of the proposed method is compared with the conventional PID methods for a coupled pendulums systems using MATLAB/Simulink software package. The experiment results show that in contrast to traditional PID controller, the developed approach can achieve better rapidity.

[Full Text](#)

Title: Coronary artery disease (CAD) prediction and classification - A survey

Author (s): Rajkumar R. and Anandakumar K. and Bharathi A.

Abstract: Among many major dangerous diseases, Coronary artery disease (CAD) is considered as an important disease, because it can lead to sudden cardiac death. Manual checking is highly impossible to diagnose for this disease. To predict CAD several approaches have been carried out. This comparative study paper presented a thorough reviews on various approaches made towards prediction of heart diseases. Several data mining and soft computing approaches are studied. This study concludes that the performance comparison of accuracy, sensitivity and specificity of several algorithms and approaches. This research can be done in risk assessment among diabetic patients those who are developing heart diseases.

[Full Text](#)

Title: Robust fuzzy logic technique for low contrast image shadow removal

Author (s): A. Sunandini and D. Usha Nandini

Abstract: The shadows are playing very hazardous for recognizing objects in low contrast Images. Shadow leads to the problem of false positive errors and false negative errors. Shadows are created because the light source has been blocked by object. In the existing method, suspected shadows are extracted and removed by taking the shadow features into consideration during image segmentation and by calculating the statistical features of the image. But the main limitation of existing method is that the dark objects which could be mistaken for shadows are ruled out according to object properties and spatial relationship between objects. Many effective algorithms have been proposed for shadow detection but no algorithm is produced accurate results. In this project robust fuzzy logic technique is using to eliminate shadow of object. This method accurately identifies shadow areas with information such as gray scale and brightness of the images. The threshold value is obtained by s-curve from the estimated grayscale value of the shadow areas by estimating control parameters. This method work perfectly for low contrast, noisy and overlapped images.

[Full Text](#)

Title: Broad side loaded isosceles trapezoidal MEMS cantilever beam

Author (s): Dhineshkaarthi. K., Zachariah C. Alex and Sripadaraja K.

Abstract: In this paper we are presenting a design of isosceles trapezium shaped polysilicon cantilever beam at Micro Electro Mechanical Systems (MEMS) level that is highly sensitive for extreme low pressure measurements. Using surface micromachining technique, the design concentrates on optimizing the shape of the rectangular and triangular beam so that the final design provides tradeoff between sensitivity and maximum tolerable pressure. For the applied pressure, this paper concentrates a Finite Element Analysis (FEA) on beam's displacement, distribution of stress along its length using Intellisuite software simulation tool for the trapezoidal cantilever beam. The analysis is also extended to find the maximum tolerable pressure for the trapezoidal beam.

[Full Text](#)

Title: An efficient pilot carrier channel estimation using Genetic Algorithm in MIMO-OFDM system

Author (s): R. S. Ganesh and J. Jayakumari

Abstract: MIMO-OFDM (multiple input multiple output-orthogonal frequency division multiplexing) is an excellent technique used in modern wireless communication systems. It has excellent quality of high speed data/voice transmission with high spectral efficiency. The Least Square (LS) and Minimum Mean Square Error (MMSE) channel estimation are the most common methods presented by several researchers. Discrete Fourier Transform (DFT)-based channel estimation is introduced to minimize the receiver noise interference which cannot be possible in the LS and MMSE techniques. Also, Genetic Algorithm-based optimized channel estimation is proposed in this paper to identify the best channel matrix from the existing LS, MMSE and DFT estimation algorithms. The simulation results clearly show that the performance of optimized GA-based DFT channel estimation is better than the LS and MMSE estimation.

[Full Text](#)

Title: Translating company internal data into customer needs: A text mining analysis approach

Author (s): Ronald Sukwadi, Mokh. Suef and Enny Widawati

Abstract: Efficient product design process is crucial for enterprises willing to introduce new products or develop their existing products pursuing a short time to market. However, successful product design depends on the ability to effectively manage customer needs throughout the entire product development process. This study developed a voice of customer (VOC) program to help enterprises to identify customer needs. Accordingly, a text mining approach is proposed, which translates internal company data into customer needs automatically. Finally, an illustrative example is shown to clarify how this program can be applied by product designers in QFD.

[Full Text](#)

Title: Comparative study of Image Fusion techniques in spatial and transform domain

Author (s): Bhuvaneswari Balachander and D. Dhanasekaran

Abstract: The process by which different images or information from multiple images are combined is termed as Image fusion which is achieved by applying a sequence of operators on the images. Recently, a number of image fusion techniques have been developed. This paper presents a review on the main categories of image fusion namely spatial domain technique, transform domain technique and statistical domain fusion technique. Image Fusion is one of the latest fields adopted to solve the problems of digital image; image fusion produces high-quality images which contains additional information for the purposes of interpretation, classification, segmentation and compression, etc. The principle requirement of the fusion process is to identify the most significant features in the input images and to transfer them without loss of detail into the fused image. Image Fusion finds its application in vast range of areas. It is used for medical diagnostics and treatment. This paper presents a brief description of some of the extensively used image fusion techniques. Comparison of all available image fusion techniques concludes a better approach for future research on image fusion.

[Full Text](#)

Title: Scheduler for Shared memory among multiple cores with performance in dynamic allocator using arm processor

Author (s): Venkata Siva Prasad Ch. and S. Ravi

Abstract: In this paper we proposed Shared-memory in Scheduling for the Multi-Core Processors, Current trends in Scheduler of Shared Memory environments have gained More importance in multi-core systems with Performance for workloads highly depends on which processing tasks are scheduled to run on the same or different subset of cores (it's contention-aware scheduling). The implementation of an optimal multi-core scheduler with improved prediction of consequences between the processor in Large Systems for that We executed applications using allocation generated by our new processor to-core mapping algorithms on used ARM FL-2440 Board hardware architecture with software of Linux in the running state. The results are obtained by dynamic allocation/de-allocation (Reallocated) using lock-free algorithm to reduce the time constraints, and automatically executes in concurrent components in parallel on multi-core systems to allocate free memory. The demonstrated concepts are scalable to multiple kernels and virtual OS environments using the runtime scheduler in a machine and showed an averaged improvement (up to 26%) which is very significant.

[Full Text](#)

Title: Recognition of cloth pattern for optical defective personalities

Author (s): S. Annamal and R. Sakthi Prabha

Abstract: For the optically defective humanity choosing of cloth pattern and colour is a challenging task .In the computer vision this becomes a difficult in choosing cloth due to the large intra class pattern, scaling and rotation. The pattern of cloths is segregated into plaid, striped, pattern less irregular and handling complex patterns and colour that cannot be identified visually impaired people .This system integrates a camera, a microphone, a computer and a Bluetooth ear piece for audio description. Radon Signature descriptor is used to recognize the cloth pattern fuzzy clustering is adapted to capture the global features of cloth pattern and colour. Our approach achieves accuracy of 97% recognition of cloth and colour accuracy. It outperforms the texture analysis on clothing pattern recognition. This system would provide more support and independence in their daily life.

[Full Text](#)

Title: A review on CAPTCHA generation and evaluation techniques

Author (s): Mir Aman Sheheryar, Pradeep Kumar Mishra and Ashok Kumar Sahoo

Abstract: Tremendous scope in the field of designing and cracking CAPTCHAs (an acronym and stands for "Completely Automated Public Turning Test to tell Computers and Humans Apart") are in demand now-a-days. In the applicability part of designing and cracking, new gateways for computing research are obtained. Designing better CAPTCHA mean better security for systems in means of withstanding against odds and the breaking of current existing system refers to the advancement of artificial intelligence (AI) which is done by exploring the loopholes in system. CAPTCHA is basically used as a protection from malicious programs like Bots and evading deliberate attempts of accession by parties other than humans. For web security, we are using different type of CAPTCHA depending upon the parameters and approaches used for generation of particular primitive. In this paper, need, aspects like, design, strength, weakness and results obtained by various researchers in this field are explored. This will also help various researchers to carryout research in this direction.

[Full Text](#)

Title: Short-term and long-term land subsidence calculation using analytical relations and numerical modeling by FLAC3D software for southern part of line three of Tehran subway under rail lines and investigation of influencing parameters

Author (s): Hossein Soltani-Jigheh, Parviz Enany, Manouchehr Tajrostami and Ahmad Yaghoubi

Abstract: Earth response to digging an underground tunnel appears as changing stress field and displacements around digging location and this point depends on various factors such as geological conditions, geotechnical characteristics, the drilling process and the implementation of final and temporary maintenance. There should be a separation between these items; 1) subsidence due to digging methods in tunneling 2) conditions on the ground in terms of construction 3) loads available for subsidence in cutting face and subsidence that occurs on the backside of cutting face. However, due to the progress on the construction of automated machines, such as the TBM and Road header, paying attention to benefits of each of these devices is important to reduce occurrence of subsidence. Among all a device like TBM can change stress and displacement in the lands around the tunnel via simultaneously putting pressure on cutting face and walls of tunnels using filler injection, and this change should be so that amount of subsidence reach the minimum in short-term and long-term period comparing to the traditional methods of digging underground tunnels. In this research, calculation of land subsidence amount due to a tunnel passing under rail lines and also investigation of influencing parameters on subsidence using theoretical relations and modeling with FLAC3D are done. In order to have a real sample, one of the lifelines in Tehran subway was selected and influencing parameters including amount and place of dynamic forces caused by passing trains from the ground, underground tunnel boring method, and in the case of drilling with TBM, pressure changes on cutting face and tunnel walls simultaneous with digging the tunnel were considered. According to local observations and carried out analyzes, subsidence of land in short-term using mapping camera readings in long-term using analytical relations and computer modeling is determined, so in the case of subsidence being situated in dangerous range, injuries and irreparable damage be avoided through providing suitable solutions.

[Full Text](#)

Title: Multilevel inverter based power quality improvement for STATCOM

Author (s): Raja G. and S. D. Sundarsingh Jebaseelan

Abstract: The proposed work deals with comparison of grid connected STATCOM based multilevel inverter. The conventional method using five level inverter based grid connected STATCOM generating more harmonics. And the proposed system using nine level inverter generating low harmonics due to using of PWM based pulse modulation technique. The AC output voltage is obtained by the series cascading of the output voltage of the two inverters. The voltage across the load decreases due to the addition of extra load and the load voltage are restored back to normal value by using grid connected STATCOM. The ability of open loop system to bring the voltage and reactive power back to the set value is represented in this paper. The simulation studies for open loop systems are performed on a standard bus system.

[Full Text](#)

Title: Evaluating the performance of ergonomic working environment in assembly line

Author (s): Nurul Hanna Mas'aud and Bulan Abdullah

Abstract: Most of the workers in manufacturing industry, especially under assembly department have to perform their job in standing position due to the effectiveness. The research scope and objectives are to obtain the satisfaction of workers standing position to the workers. Besides that, the ergonomically design ergonomic working environment was implemented to reduce the aching feet, low back pain, swollen ankles and calves as well as leg and hip pain at the selected manufacturing plant. The data on the Musculoskeletal Disorders (MSDs) symptoms of pain and the workers' risks of exposure to vibration were collected via questionnaire and Rapid Upper Limb Assessment (RULA). After implementing the ergonomic working environment, direct interview was conducted to get the feedback from the workers as well as to verify the working environment. The research found that the workers are having pain in the right heels and left heel with percentage 33.9% and 32.1% respectively. RULA result found that 50% of the workers score 3 or 4, about 29% score 5 or 6 and 21% score 7. Therefore, after implementing the ergonomic working environment, the percentage of painful body part was decreased, RULA score was reduced and muscle is not in fatigue. Most of the workers are satisfied, they felt happy and comfortable. Overall, it raised the awareness of ergonomic among the workers and the organization as well.

[Full Text](#)

Title: Challenging for strategic sustainability appraisal implementation for transport policy evaluation in developing countries

Author (s): Rudi Sugiono Suyono, Ofyar Z. Tamin, Sony S. Wibowo and Heru Purboyo H. P.

Abstract: The concept of sustainability emerged in the early 1970s since The UN Conference in Stockholm in 1972. The sustainability concept must be implemented earlier in the strategic planning process, that the appraisal plays a key role. Through the good appraisal process, all the possibilities related to the impact of the implementation can be identified earlier. The infrastructure development in the developing countries, has the typical problems such as environmental, social and economic, the large demand of infrastructure development, but has inadequate funding and the issue of the short term and long term impact that arising from infrastructure development which often cannot be anticipated earlier. An

appropriate working title for this new assessment approach seems to be Strategic Sustainability Appraisal (SSA). The emphasis of SSA is on comprehensive transport policies, assessing policies simultaneously in order to detect possible interdependencies and cumulative impacts, handling the three basic aspects of sustainability equally.

[Full Text](#)

Title: Conceptual study of submarine pipeline using Submerged Floating Tunnel

Author (s): Ery Budiman, Raka I. G. P., Endah Wahyuni and Budi Suswanto

Abstract: Standard practice of submarine pipeline installation is by laid on the seabed. The risk in pipeline construction and operation caused by the challenging seabed and environmental load has led to the invention of new technologies of pipeline installation. The greatest risk of conventional pipeline is leakage and the oil will come out and pollute the sea. Innovative concept is offered to overcome that problem where the oil and gas pipeline placed in the Submerged Floating Tunnel (SFT) structure. This paper presents various advantages and points out some obvious disadvantages with this SFT usage for submarine pipeline. Furthermore, the expansion usage of SFT structure in order to house the submarine pipeline will also be presented.

[Full Text](#)

Title: Modified secure SPIN using cluster head selection for data centric wireless sensor networks

Author (s): K. R. R. Mohanrao and Ch. Vineela

Abstract: Routing protocols are proposed for the development of the data transmission in wireless sensor networks. Many protocols were proposed to transmit the data in an efficient manner. This Paper uses clustering algorithms to send the data over different geographic regions. This paper works on the data gathering and data aggregation to base station which is important and critical task in DCWSN. Based on user application for example: battle field environment, clustering algorithm is used. This paper assumes that sensor nodes were uniformly distributed and coordinates of the base station and nodes are known. This paper uses the cluster head based selection scheme and a proposed protocol known as SSPIN. Proposed scheme having better data gathering, energy efficiency, throughput, etc. compared to the standard LEACH protocol. The proposed scheme is implemented and simulated in NS2.34. Simulation shows proposed protocol performance through put is better than the existing system.

[Full Text](#)

Title: Biofilm derive from plantain peel: Effect of mechanical properties

Author (s): Mohd Shahrul Nizam Salleh, Noor Naimah Mohamed Nor, Sopia Ambong Khalid and Fatin Nurainaa Khazali

Abstract: The effect of modified and non-modified starch as a filler was investigated in this study. The blend of Polyvinyl Alcohol (PVA) and starch was prepared as a film for further analysis. The starch was modified by an acetylating process in which -OH group was substituted in the starch solution. Fourier-transform infrared (FTIR) analysis was used to analyze the presence of functional group of starch acetate. The biodegradable plastic film composed of plantain peel starch and PVA blend was made through solution casting method. The degradable film was produced by compounding the starch with PVA and the use of glycerol as a plasticizer. The blend was spread on the flat glass plate in order to produce the film with even thickness. The casted film is dried in an oven at 90°C for about one hour. The elasticity and strength of the film then was analyzed through tensile test. It was found that the film produced from modified starch has more flexibility and reliability compared to non-modified starch. The highest tensile strength and elongation at break of the film produced was found at 15g of the starch-PVA blend. Meanwhile, the Young's modulus obtained is concurrent to the tensile strength of produced film.

[Full Text](#)

Title: Detecting the smoothness of numerical solutions to the Euler equations of gas dynamics

Author (s): Sudi Mungkasi, F. A. R. Sambada and I. Gusti Ketut Puja

Abstract: Analytical solutions to the Euler equations for gas dynamics are not available for general cases. The Euler equations are three simultaneous partial differential equations representing the conservation of mass, momentum, and energy of the gas. In this paper, the Euler equations are solved using a finite volume numerical method. As the partial differential equations are of hyperbolic type, their solutions admit discontinuity. The finite volume solution is generally accurate at smooth regions and inaccurate at rough regions. Knowing which regions of the solutions where they are smooth or rough is the goal of this paper. To achieve our goal, here we propose the weak local residual of the entropy equation as a smoothness indicator for numerical solutions to the Euler equations.

[Full Text](#)

Title: Fabrication of magnetic ceramic materials based on nanostructured hematite powder by spark plasma sintering

Author (s): Evgeniy Konstantinovich Papynov, Ivan Anatol'evich Tkachenko, Arseniy Sergeevich Portnyagin, Evgeniy Borisovich Modin and Valentin Aleksandrovich Avramenko

Abstract: High-temperature consolidation of nanostructured hematite (α -Fe₂O₃) powder has been performed using the method of spark plasma sintering (SPS). Magnetic ceramic materials based on individual (α -Fe₂O₃) and composite (α -Fe₂O₃-Fe₃O₄) formulations of high construction strength (Young modulus 249 MPa) have been fabricated. The peculiarities of changes in composite phase composition and microstructure in the SPS temperature range from 700 up to 1100 °C are presented. The materials element composition was studied using the method of energy-dispersive spectroscopy, and the fact of carbon diffusion in the spark plasma current has been corroborated. The ceramic composites magnetic properties have been investigated and the regularities of changes in the values of their magnetization (Ms) and coercive force (Hc) in dependence on the SPS temperature have been described.

[Full Text](#)

Title: Application of natural and model experiment methodology in two-dimensional electrical impedance tomography

Author (s): Grayr Karenovich Aleksanyan, Nikolay Ivanovich Gorbatenko, Valeriy Viktorovich Grechikhin and Chan Nam Phong

Abstract: An analytical overview of the methods for solving problems in the field of electrical impedance tomography was performed. Realization of natural and model experiment methodology in electrical impedance tomography was reviewed. The structural installation diagram for natural and model experiment was shown. The use of conditionally well-posed problems was suggested. The algorithm of natural and model experiment was introduced and functional test was performed. Test results show relatively high accuracy and operation speed of the algorithm. It was traced the possibility of image reconstruction and biological objects anomaly detection based on the natural and model experiment methodology.

[Full Text](#)**Title:** Full duplex bidirectional UART communication between PIC microcontrollers**Author (s):** Dhineshkaarthi K., Sundar S., Vidhyapathi C. M. and Karthikeyan B.**Abstract:** Universal Asynchronous Receiver Transmitter (UART) is a communication protocol which is mainly used for serial communication. In full duplex asynchronous UART mode, there is no need for clock synchronization between two devices. In this paper, we are analyzing and presenting the results of serially transmitting messages between two PIC16F877A Microcontrollers using UART protocol in full duplex mode. The simulation results show that, the full duplex bidirectional communication entirely depends upon the length of the characters transmitted and received.[Full Text](#)**Title:** A new multi processor parallel string matching with omega model**Author (s):** K. Butchi Raju and S. Viswanadha Raju**Abstract:** In this paper, parallel string matching with omega computing model is proposed. This algorithm especially designed in a way that it works in omega computing model where text is split into number of chunks. The numbers of chunks depend on the target number of processors. The chunks and patterns are assigned to processors in the omega model; later the processors perform the search operation and return results. The proposed process improves performance and efficiency.[Full Text](#)**Title:** Municipal solid waste recycling facilities in Malang Raya, Indonesia**Author (s):** Hardianto, Yulinah Trihadiningrum and Udisubakti Ciptomulyono**Abstract:** The new paradigm of solid waste treatment that accentuate in reducing solid waste was applied in Malang Raya, Indonesia through 15 solid waste recycling facilities of different types. The objectives of this research were to identify types of the solid waste recycling facilities, and to determine solid waste recycling potential. Solid waste volume was measured according to load-count analysis method. Sampling for solid waste composition analysis was done randomly at solid waste recycling facilities with quarterly method. Total volume of solid waste input at solid waste recycling facilities was measured according to the amount and volume of various kinds of collecting vehicle. The results of this research showed that there were 4 types of solid waste recycling facilities in Malang Raya, which comprised 66.67% composting units, 20% Recycling and Compost Production Units (UDPK), 6.67% Integrated Solid Waste Treatment Facility (TPST), and 6.67% 3R Solid Waste Treatment Facility (TPST 3R). According to mass balance analysis, the recycling potential of solid waste was 76.77-88.92%.[Full Text](#)**Title:** The assessment of city air pollution by vehicles and industrial enterprises involving the comprehensive computative air pollution index**Author (s):** Inar Fargatovich Suleimanov, Gennady Vitalievich Mavrin, Mikhail Pavlovich Sokolov, Yuliya Evgenevna Suleimanova and Liliya Ramilevna Ardashirova**Abstract:** Within the framework of current study the authors conducted monitoring of the traffic flow structure and intensity on the highways, as well as collected the information on existing industrial air pollution sources in the city of Naberezhnye Chelny, implemented a system of computative monitoring of atmospheric pollution on the basis of the summary calculations of emissions from industrial plants and motor vehicles. The authors defined a list of priority polluting agents and determined the comprehensive computative air pollution index (CCAPI).[Full Text](#)**Title:** Design and implementation of multiple interface for integrated electric wheelchair with incorporated home automation**Author (s):** Nitin Tom and Komanapalli Venkata Lakshmi Narayana**Abstract:** Assistive technology is a rapidly growing field in the area of science and technology and is considered to be the part and parcel of the present technological innovations. A wheelchair is the most common assistive technology used globally to imparementation of an integrated electric wheelchair with multi-interface systems to address all classes of disabled personal mobility among people with disabilities. This paper describes the design and implems. The proposed system can respond to multiple inputs from the user based on the mode selected. The modes considered are speech, gesture and vision. An additional mode for autonomous navigation has also been implemented in the form of line/wall following principle. The wheelchair unit is incorporated with speech based home automation to make the users self-dependent. The integrated system aims at providing the user with multiple modes of control for mobility as well as control of appliances in the living environment.[Full Text](#)**Title:** A novel disjoint multipath routing algorithm for heterogeneous wireless sensor network**Author (s):** Y. Preethi and P. Saravanan**Abstract:** This paper describes disjoint multipath network algorithm (DHN) for the heterogeneous wireless sensor network. The algorithm calculates a disjoint path with minimum energy cost function among many paths available in the network which includes sensor node with minimum transmission range and processing capability and also super nodes with maximum transmission range and processing capability. Simulation results show that the disjoint path selected by the DHN algorithm are more reliable when compared to other existing protocols providing good throughput, packet delivery ratio and also it increases network life time.[Full Text](#)**Title:** Automatic skin lesion prediction using texture feature and probabilistic neural network**Author (s):** Rashmi Hari and V. G. Sivakumar

Abstract: The project presents malignant melanoma skin lesion classification with Radial basis (RB) kind network classifier and hybrid options illustration victimization color, Heraldic and discriminative strong native binary pattern. Here, 2 different descriptors area unit are utilized for characteristics extraction from numerous skin lesions and their fused options offers higher classification with newly approached probabilistic neural network. There area unit 5 different skin lesions unremarkably classified as property Actinic Kurtosis (AK), Basal Cell malignant neoplastic disease (BCC), Melanocytic nevus / Mole (ML), Squalors Cell malignant neoplastic disease (SCC), disease of the skin Kurtosis (SK). The system are accustomed classify the queried pictures mechanically to determine the stages of abnormality. For this approach, automatic classifier PNN with RBF are used for classification supported learning with several coaching samples of every phase. Here, the colour options from HSV area and discriminate texture options like energy, contrast, correlation and homogeneity area unit extracted. DRLBP represents an image options inter of histogram bins accustomed discriminate the native edges and texture pattern.

[Full Text](#)

Title: The detection of pulmonary nodules in CT images using heuristic approach segmentation and classification

Author (s): Sonali Singh and Ms. I. Mary Sajin Sanju

Abstract: Lung cancer in human body is proving to be a catastrophic threat to the mankind or humanity and is prime cause of deaths among other cancer related fatalities. The presence of solitary/isolated pulmonary nodules in human lungs in the form of benign or malignant calculates the gravity of lung ailment or disorder. In our project we are using a literature method for lung nodule detection, segmentation and classification/taxonomy using computed tomography (CT) images. One of the most common noise in CT imaging is an impulse noise which is caused by unstable voltage. In this paper, a new decision based technique called new adaptive median filter is presented which shows better performance than those already being used. The CT slices are initially preprocessed to remove the Gaussian noise by using Gaussian filter. Otsu thresholding is applied to extract the region of Interest (ROI). We have the different classifications about the nodules in the lung. It contains the different method of classification, segmentation and detection techniques. Malignant (virulent) cell presented in the lungs specified nodules are classified for the therapy processes. Now, we will classify the images into nodules and non-nodules. We will now take out the object's feature vectors in choosen /selected boxes. Lastly, the support vector machine (SVM) is applied which will classify the extracted feature vectors. The SVM will classify the images into normal or abnormal based on the second order gray level co-occurrence matrix features.

[Full Text](#)

Title: Profile based personalized web search using Greedy Algorithms

Author (s): P. Lakshmi Prasanna, B. Sekhar Babu, D. Rajeswara Rao, J. Lakshmi Anusha, A. Pratyusha, A. Ravi chand

Abstract: Internet usage is being increased as it provides information to all the users. The required information is retrieved by the search engines. The currently working search engines using sophisticated algorithms will not always provide relevant information to user's requirements. To resolve the issue, Personalized web search is used that will improve the quality of the search result by reordering the search results. This web search is done to provide relevant results using the user profile. The proposed UPS framework will dynamically generate a user profile for a user's query prioritizing the user's privacy. To acquire this we are implementing Greedy DP and Greedy IL Algorithms that are used for runtime generalization.

[Full Text](#)

Title: Enhancing access of archives and ranking in web search

Author (s): Archana Shree S. and Vigneshwari S.

Abstract: In recent days, web searching and security of the archives plays most incredible progress. The enduring research prototypes many web search show the result by searching the relevant data alone. Due to the mere relevancy search, the users may loss some useful data which are not included in the search result. Moreover, it also may consume more time by searching the data sequentially. To overcome these challenges stemming process is united with the existing model for searching the both labelled and unlabelled documents. Furthermore, User Based Advertisement (UBA) is included with the proposed search engine to display the advertisements based on search. To improve the ranking system, Time Stamp Based Analysis (TSBA) is incorporated in the process for easy search of users. With these improvements downloading one's file that are uploaded in the web search become quite easy. But security is a major concern sending a request for downloading a data. In order to overcome this difficulty, Email OTP Alert (EOTPA) is provided in the proposed model to increase the security in web search.

[Full Text](#)

Title: Study on security frameworks and data protection techniques for public cloud environment

Author (s): K. Meena and M. Gomathy

Abstract: Cloud computing provides computing resource in an on-demand manner. It is provisioned resources from huge data centers situated in different geographical locations in the world. It mainly supports small and medium scale enterprises to startup their business in globally. It has many advantages in resource provisioning and other services but it also has some security related problems. Cloud enables outsourced computing. The nature of outsourced computing brings up many security issues in cloud environment. Due to the security issues in cloud, users are not willing adopt the cloud. This paper presents an elaborated study on different security framework and data protection techniques in cloud environment. Each framework works on their functionality and address security issues in public cloud environment. Finally, paper discusses results of each framework and data protection techniques.

[Full Text](#)

Title: Data logging of boiler temperature using Real time operating system

Author (s): G. H. Rajavignesh and B. Rajasekar

Abstract: This paper presents an data recorder of boiler temperature using RL-ARM Real time operating system. In order to monitor the boiler temperature, the system will record the physical values of temperature sensor from boiler in the EEPROM along with Real Time Clock (RTC) information's. So it can enable to view and access the data from wherever from the Electrically Erasable Programmable Read-Only Memory (EEPROM) using Personal Computer (PC). This system uses ARM7 Processor very portable with Real Time Operating System (RTOS) it employs the system more real time and handling various processes depends upon multi-tasking using embedded C language, data acquisition application is ported into an ARM processor. RTOS are programs that schedule execution in the suitable manner and used to manage system resources and provide a consistent function for developing application code.

[Full Text](#)

Title: Determination of hardness, mechanical and wear properties of cast Al-Mg-Si alloy with varying Ni addition

Author (s): Nidhin Raj A. and Sellamuthu R.

Abstract: An investigation was carried out to determine the effect of Ni addition on the microstructure, hardness, tensile properties and wear rate of the cast Al-0.4Mg-8Si alloy. The Al-0.4Mg-8Si alloy was melted in an electric furnace and Ni was added to the melt in the appropriate amount. The melt was cast in a metal mould. The cast specimens were solutionised and aged. The microstructure was observed using an optical microscope and the phases present in the microstructure were identified using energy dispersive spectroscopy (EDS). The hardness, tensile properties, wear rate and coefficient of friction (CoF) were determined. The eutectic Si morphology was refined and an intermediate phase Al₃Ni was observed. The hardness and tensile properties increased, wear rate decreased and CoF remained constant for the Ni modified alloy compared to the base Al-0.4Mg-8Si alloy. It is concluded that the Ni addition significantly improves the properties of the base alloy.

[Full Text](#)

Title: Effect of using crushed sand and carbon fiber with different aspect ratio on some properties of reactive powder cementitious composite

Author (s): Zainab H. Mahdi

Abstract: This research studies the effect of crushed sand, aspect ratio of micro Carbon fiber (MCF) and nano-micro activated Metakaolin (NMAM) on the compressive strength, modulus of rupture, ultra sonic pulse velocity, density and electrical resistivity of reactive powder cementitious composite. The results show that the mixture which content crushed sand, 10% nano-micro activated Metakaolin and water/cementitious ratio 0.24 considerable improvements in all properties at all ages. The percentage increase were (110.6, 111.39, 31.58, 11.67, 257.47) % at 28 days respectively with respect to the mixture which content normal sand. The results also showed that the specimen that contain micro Carbon fibers getting a slight increase in modulus of rupture and go down a slight decline in electrical resistivity when increasing the aspect ratio of 4000.

[Full Text](#)

Title: Emission and performance characteristic of a PCCI-DI engine fuel with cotton seed oil bio-diesel blends

Author (s): K. Prashanth and S. Srihari

Abstract: In this research work, experimental studies have been carried out on emission and performance characteristics of a pre-mixed charge compression ignition (PCCI) setup using cotton seed bio-diesel blends. Port fuel injection strategy is the basic concept of PCCI engine. Bio-diesel was used in PCCI engine for further reduction in emissions. Bio-diesel was produced by trans-esterification process. Cottonseed oil (CSO) was selected for biodiesel production. The experiment was conducted with PCCI setup using diesel-diesel, blends of bio-diesel with varying percentage from 10% to 30% by volume. The experiments were conducted in PCCI setup with bio-diesel blends and compared with conventional diesel mode of operation. The experimental results showed that there was decrease in carbon monoxide (CO), nitrogen-oxide (NO_x) and increased hydrocarbon (HC) emissions. There was a reduction in smoke emission and increase in brake specific fuel consumption (BSFC) with increase in blends of bio-diesel in PCCI modes.

[Full Text](#)

Title: Study on silica fume replaced concrete with super plasticizer

Author (s): Madhanasree R. M., A. Joe Paulson and R. Angeline Prabhavathy

Abstract: This paper presents an experimental study on the nature of silica fume and its influences on the properties of fresh and hardened concrete. In the present study, an attempt has been made to investigate the strength parameters of concrete made with partial replacement of cement by silica fume using super plasticizer. Properties of hardened concrete viz ultimate compressive strength, flexural strength and split tensile strength have been determined for different mix combinations of materials and these values are compared with the corresponding values of conventional concrete. The present investigation has been aimed at to bring awareness amongst the practicing Civil Engineers regarding advantages of these new concrete mixes. The silica-fume concrete included 0%, 12.5%, 13% and 13.5% silica as equal replacement of ordinary Portland cement on the strength of M20, M25 and M30 grades. The ca/fa ratio included is 2.17. Extensive experimental investigation was carried out for various percentages. After de-moulding, the concrete specimens from each mix were moist cured in water and the compressive and tensile strengths were determined at 7 and 28 days. From the test results, it was found that 13% silica fume replacement with super plasticizer is optimum.

[Full Text](#)

Title: Split tensile strength of copper slag concrete

Author (s): T. Ch. Madhavi and Abilaash V.

Abstract: This research is based on the study of splitting tensile strength in concrete with replacement of copper slag which is a by-product of copper extraction by smelting. Slag that is quenched in water produces angular granules which are disposed as waste or utilized as replacement product. The objective of this study is to find the splitting tensile strength of concrete with copper slag for the replacement of fine aggregate which helps in reduction of pollutants in the environment caused by copper slag. This research work is done by replacing copper slag with sand from 0% to 60% in concrete and the splitting tensile strength of replaced copper slag concrete was compared with control concrete.

[Full Text](#)

Title: Electrical conductivity of concrete

Author (s): T. Ch. Madhavi and S. Annamalai

Abstract: Electrical conductivity of concrete is of current interest since it can be used as a parameter relating to certain characteristics of concrete. Electrical resistivity is the inverse of electrical conductivity. This literary study indicates that moist concrete behave as a semiconductor with resistivity of the order of 10⁵ ohm-mm while oven-dried concrete behaves as an insulator with resistivity of the order of 10¹² ohm-mm. The methods of measuring resistivity are studied which draws to the fact that Wenner probe method being the more reliable method. The principle behind the measuring techniques is to quantify the conductive properties of the microstructure or pore network of concrete. This study also presents the factors affecting the resistivity measurements and applications of the measured conductance in determining certain parameters of concrete.

[Full Text](#)

Title: Experimental investigations on compressive strength of copper slag in concrete

Author (s): T. Ch. Madhavi and S. Arvind Kumar

Abstract: The main objective comprises application of copper slag as fine aggregate replacement in concrete. As copper slag is cheaper in cost and is available in larger quantities, this could be convincingly used as a partial replacement with sand. Due to the advancement in concrete technology, there has been a reduction in the burden of pollutants in the environment. Leaving the waste materials to the environment directly can cause environmental problem. M30 concrete mix design has been selected and concrete cube specimens of standard size and replacement percentage ranging between 0 to 60% have been casted and tested and their relative compression strength has been analyzed.

[Full Text](#)

Title: Experimental investigations on flexural behavior of copper slag concrete beam at early age

Author (s): T. Ch. Madhavi and R. Hari Prashanth

Abstract: The increasing demand for natural aggregates has lead to the attempt of partial replacement of fine aggregates with copper slag in concrete. The primary test on flexural behavior of beams is conducted on the partially replaced concrete, to determine the possibility of using copper slag as a replacement of sand in concrete. The test results of concrete are obtained by replacing copper slag to sand in various percentages ranging from 0 to 60 percentages. All specimens are cured for 7 days before flexural behavior of the concrete beams are tested.

[Full Text](#)

Title: Effects of Temperature on concrete

Author (s): T. Ch. Madhavi and Ram Kumar P. K.

Abstract: This paper is to study effect different Temperature on concrete strength by partial replacement of fine aggregate. Concrete structure is submitted to various temperature changes during its time life. In this paper, the heat degradation of the concrete is measured in terms of compressive and tensile strength of various specimens. To understand the behavior of concrete under high temperature, it is necessary that several factors be taken into account for each experiment such as Strength of concrete, type of cement, aggregate, water cement ratio, density of concrete, Reinforcement detailing and cover to the reinforcement are some of the important factors that affect the performance of concrete at high temperature.

[Full Text](#)

Title: Behaviour of reinforced concrete beam with web openings

Author (s): R. Vivek and T. Ch. Madhavi

Abstract: In construction of modern buildings it requires many pipes and ducts in order to accommodate essential services such as air conditioning, electricity, telephone and computer network such that openings in concrete beams enable the installation of these services. It also provides substantial economic savings in the construction of a multi-storey building. Various studies have been conducted with regards to reinforced concrete beams which contain web openings. This paper shows the work on the behaviour, analysis and design of Reinforced Concrete (RC) beams with web openings. A various aspects have been discussed including the classification of openings, guidelines for opening location in the beam, and the structural behaviour of RC beams with web openings. In various design approaches will also be detailed, for example the American Concrete Institute (ACI) approach, and in the Architectural Institute of Japan (AIJ) approach method. Finally directions for the future research based on the gaps which exist in the present work are presented.

[Full Text](#)

Title: Finite element analysis of a shaft subjected to a load

Author (s): K. Sathishkumar and N. Ugesh

Abstract: The project is mainly concentrated about the analysis of a shaft with the help of a ANSYS software under workbench. In this the shaft is taken from the head stock of the lathe machine. In this analysis the shaft is connected with bearing and gear. This is the major important component to be taken into account while designing. The objective is to build a model and assemble the part files and to analyze the various stress and deformation. The part files and assembly are done by using CREO software and the analyzing are done by using a ANSYS software. The static analysis is used to analyze the stress and deformation of the shaft when it is subjected to a particular load and the modal analyze is executed to govern the vibration features (mode shapes and natural frequencies) of shaft. The results obtained by the stress analysis is found to be good agreement and modal analysis i.e., vibrational characteristic like frequency and mode shapes are presented are within the limit.

[Full Text](#)

Title: Fabrication and characterization of Al LM25/TiB2 in-situ composites

Author (s): J. Dinesh, G. Mohammad Ashraf and N. Radhika

Abstract: The Al LM25/TiB2 (10 wt %) composite is fabricated using in-situ process by stir casting method. LM25 alloy is melted in a graphite crucible at 8000C using electric furnace in argon gas atmosphere and a mixture of K2TiF6 and KBF4 is added to the melt gradually through the hopper attached at the top of the furnace. The melt is stirred with the aid of mechanical stirrer which rotates at 200 rpm for 40 minutes intermittently. The reaction between K2TiF6 and KBF4 in those conditions results in the formation of TiB2. This melt is poured in the stainless steel mould which is preheated at 2000C and the obtained casting have dimension 100 mm length and 20 mm diameter. The composite specimens are then machined according to the specification requirement of the experiments. All the specimens are polished using emery sheets of grade 1/0 and 2/0 followed by velvet polisher. The specimen used for microstructure analysis is further etched with Keller's reagent. Spectroscopy of LM25 alloy is carried out to observe its elemental composition. X-ray diffraction is used to ensure the formation of TiB2 during casting process. Inverted metallurgical microscope and Vickers hardness tester are used to study the microstructure and micro hardness of the fabricated composite respectively. The X-ray diffraction results revealed the formation of TiB2 particles in the fabricated composite. Microstructure analysis revealed uniform distribution of TiB2 in the aluminum matrix and Micro hardness test shows an increase in hardness of the composite (91HV) as compared to the un reinforced alloy (82HV) by 10%.

[Full Text](#)

Title: A experimental study on the durability characteristics of pervious concrete

Author (s): S. Deepa shri, N. Mohanraj and C. Krishnaraj

Abstract: Pervious concrete or enhanced porosity concrete has a strictly gap graded coarse aggregate phase and little or no fine aggregates so as to facilitate the formation of an interconnected network of pores in the material. The material is designed with cementitious material content just enough to coat the coarse aggregate particles so that a configuration that allows the passage of water at a much higher rate than conventional concrete. The pervious concrete has main advantages that improves city environment, recharge the ground by rain water and could be used as pavement for light vehicles, pedestrian pathways, parking lots, also it reduces the tire pavement interaction noise etc, the effectiveness of a pervious concrete pavement depends on the intrinsic permeability of the mass, and normally this is defined by the porosity. This paper presents a new method for determining the permeability of pervious concrete and provides design methodology to prepare pervious concrete based on experimental test values of pervious concretes.

[Full Text](#)

Title: A novel approach to multi-objective OPF by a new parallel non-dominated Sorting Genetic Algorithm-considering diverse constraints

Author (s): S. Ragavan Swaminathan and E. Nandakumar

Abstract: Transient stability constrained optimal power flow (TSCOPF) is able to reduce costs while keeping the operation point away from the stability boundary. While especially useful in modern power system operations, TSCOPF problems are practically very hard to solve; unacceptable computational time is considered to be one of the largest barriers in applying TSCOPF-based solutions. The basic idea of the proposed method is to model transient stability as an objective function rather than an inequality constraint and consider classic Transient Stability Constrained OPF (TSCOPF) as a tradeoff procedure using Pareto ideology. Second, a parallel elitist Non-dominated Sorting Genetic Algorithm II (NSGA-II) is used to solve the proposed multi-objective optimization problem; the parallel algorithm shows an excellent acceleration effect and provides a set of Pareto optimal solutions for decision makers to select. Case study results demonstrate the proposed multi-objective algorithm in IEEE39 bus system is quite strategic.

[Full Text](#)

Title: A novel neural network approach to data classification

Author (s): K. G. Nandha Kumar and T. Christopher

Abstract: Data classification is a major task in data mining paradigm. In this paper an artificial neural network approach is proposed for data classification. In this approach data classification is accomplished through a cluster analysis. It is a two-pass process, clusters are created in the first step and classification is achieved from the results of first pass. A self organizing map neural network (SOMNN) is used for clustering in the first pass. In the second pass classification task is completed by using multilayer neural networks (MNN). Basically SOM is an unsupervised neural network and multilayer networks are supervised neural network, hence this approach is a hybrid method. Nine hybrid neural networks (HNN1 to HNN9) are constructed from the combination of above said methods and are experimented. Performance of each hybrid neural network is evaluated by using metrics such as accuracy, precision, recall, and F-measure. Feed back of library users is used as data set for classification.

[Full Text](#)

Title: Berkeley synchronized algorithm based fault tolerant mechanism for Computational Data Grid in cloud environment

Author (s): Ramachandra V. Puji, S. N. Sivanandam and N. Suba Rani

Abstract: Computational Data Grid provides massive resource sharing and aggregated computing resources in a dynamic manner. Due to the limitation of available heterogeneous resources distributed through several networks in computational data grid, occurrence of failure poses severe problem. Providing efficient fault tolerance mechanism is a key optimization technique for improving scalability and attain QoS based fault tolerant dynamic replication in a wise manner. In this paper, Merkle Damgard Clock Synchronized based Fault Tolerant (MDCS-FT) mechanism is developed to overcome the fault occurrence in computational data grid. MDCS-FT in cloud services allows for concurrent transaction without relying on a centralized grid component, which amounts for better scalability. Clock Synchronized with Berkeley algorithm uses the optimized different data grid sequences to attain QoS based fault tolerant dynamic replication. Berkeley algorithm in MDCS-FT mechanism is more suitable for easily identifying the fault with time server. Time server in MDCS-FT Mechanism periodically fetches the time from all the clients and averages the results on cloud zone to secure data objects replication in cloud data grid by removing the fault. Experimental results demonstrate that the proposed mechanism achieves better performance by improving the scalability and QoS (error rate and transmission delay) and minimizes the fault tolerance compared to the state-of-the-art works.

[Full Text](#)

Title: Process parameters effect on the strength of Friction Stir Spot Welded AA6061

Author (s): R. Padmanaban, R. Vaira Vignesh, M. Arivarasu, Karthick K. P. and A. Abirama Sundar

Abstract: Friction Stir Spot Welding (FSSW) is a recent welding technique used for spot welding of thin sheets. Response surface methodology (RSM) is used to develop a model for the tensile shear failure load of AA6061 joined by FSSW. The experiments are conducted for different combinations of three parameters viz. tool rotational speed, dwell time and shoulder diameter as per Box -Behnken design and mathematical model is developed. The developed equation is used to find the optimum parameter combinations for obtaining joints with higher TSFL.

[Full Text](#)

Title: Strength and durability properties of High Performance Concrete with manufactured sand

Author (s): T. Shanmugapriya, K. Sathish Raja and C. Balaji

Abstract: The modernization of the construction sector led to the development of innovative materials in the last few decades. One such development is High Performance Concrete (HPC) and the HPC shall be produced by using silica fume. Another prime factor of concern is illegal sand mining which leads to the depletion of Natural Sand (N- Sand). Manufactured Sand (M-Sand) produced by the crushing of hard granite has been identified as a good substitute for natural sand. The main objective of this study is to check the strength and durability characteristics of HPC using M-Sand along with 5% silica fume. The natural sand was replaced by M-Sand on proportion of 0%, 20%, 40%, 60%, 80% and 100%. The compressive strength, flexural strength, splitting tensile and modulus of elasticity were studied. Similarly the durability properties like sorptivity and Rapid Chloride Permeability test were also conducted. The results indicated that a marginal increase in strength and durability properties of high performance concrete by addition of manufactured sand as a complete replacement of natural sand.

[Full Text](#)

Title: Investigation of wear behavior and mechanical properties of Al-SiC metal matrix composites

Author (s): P. Ramesh, A. Arun Raja, Ajay R. and Abhinav Vishnu A. R.

Abstract: This paper reveals the fabrication of aluminium silicon carbide metal matrix composite using stir casting method and various tests carried out and their outcomes. Generally metal matrix composites are formed with two constituents, one being a metal and the other material either being a different metal or other material like ceramic or organic compound. Metal matrix composites (MMC's) are generally costly but their performances justify the added cost. However various limitations exist during formation of the composite and is counteracted by considering the factors such as reactivity at the interface, volume fraction of the reinforcing material and type of reinforcing material being added. Aluminium silicon carbide metal matrix composite is prepared with Al 6082 as base material and SiC as reinforcement material. The weight of the reinforcement material is varied from 0 to 10% and different test samples are prepared. Various tests are conducted to evaluate the performance of the composite and the results obtained are discussed.

[Full Text](#)

Title: The mechanical behavior of Nano sized Al₂O₃ -reinforced Al-Si7-Mg alloy fabricated by powder metallurgy and forging

Author (s): Sathiaraj G., Mani R., Muthuraj M. and Mayakannan S.

Abstract: The study is to be undertaken to investigate the effect of Alumina particle size, sintering temperature, sintering time on the microstructure and mechanical properties of Al-Si7-Mg0.3 (A356). This metal matrix composite has been investigated by powder metallurgy. Powder metallurgy (PM) is a widely used fabrication method for producing metal matrix composites. This usually involves three major stages: blending of the metal and ceramic powders, pressing or cold compaction, and sintering. These last two steps are often combined during hot pressing. One of the advantages of PM compared to casting is having better control on the microstructure, where better distribution of the reinforcement is possible in PM compacts. Particle size and the amount of reinforcement had pronounced effect on the mechanical properties of composites. Proper addition of reinforcements to aluminum composites have a positive effect on mechanical properties, such as hardness, strength and wears resistance. The difference composition of Nano sized alumina particles is added 2wt%, 3wt%. The average size of aluminum and reinforcement particle size 30µm and 100nm respectively. For Proper production of the powder which will be placed in planetary ball mill. The sintering Temperature and time are in the range of 550-610°C for 60-120 min. Forging had been involved for increasing the properties of composites at 350-400 °C. The results that exhibited at elevated sintering temperatures, lower porosity is obtained. Higher relative densities are achieved at higher sintering temperature. Higher hardness was observed in samples containing finer alumina particles. The dependence of the diffusion to time may be explained for sintering temperature. It can be seen that the atomic displacement is proportional to the square root of time. This is responsible for the atomic diffusion leading to grain coarsening. It is seen that, at higher sintering temperatures, a denser structure is formed due to higher diffusion rates.

[Full Text](#)

Title: Thermodynamic analysis of aqua-ammonia based miniaturized Vapor Absorption Refrigeration system utilizing solar thermal energy

Author (s): Subi Salim and Rajesh V. R.

Abstract: Solar Energy based refrigeration is one of the most promising technology to meet up the hiking demands for cooling applications. Among the two refrigeration cycles, Vapor Compression Refrigeration (VCR) driven by Photovoltaic (PV) system proves to be the most widely used cooling equipment, while the Vapor Absorption Refrigeration (VAR) driven by solar thermal energy is at its infant stages of development and is biased for usage in industrial applications. This work emphasizes on the development of a miniaturized model of aqua-ammonia VAR system integrated with solar collector that can be used for small-scale cooling applications. The evaporator capacity is restricted to 0.5 ton of refrigeration (TR). The study is incorporated with theoretical design and evaluation of performance of the system in terms of Coefficient of Performance (COP). The COP estimated for the VAR system is 0.65. And the influence of evaporator temperature on COP is analyzed.

[Full Text](#)

Title: An overview on mechanical properties of particulate reinforced Ti6Al4V metal matrix composites

Author (s): R. Ramaswamy, P. Marimuthu and B. Selvam

Abstract: The main objective of this paper is to study the composite of titanium alloy (Ti6Al4V) processing methods and influence of the reinforcement particle addition in the matrix phase. The Ti6Al4V alloy is used in the aerospace and automotive components for the critical applications. The new developments are required to create new materials to overcome the day-to-day problems. The metal matrix composite is the best alternative to improve the performance of the conventional materials. The researchers have to work and find the materials for the betterment of the challenges. In this paper, the previous researchers' results have been discussed in the aspect of reinforcement particle sizes, manufacturing methods and its influence in microstructure, properties of composites and the environment for processing of composites. The most of the researchers' have used powder metallurgy technique to reduce the fabrication cost and hot isostatic pressing (HIP), cold isostatic pressing, hot pressing, hot extrusion and spark plasma sintering was used to achieve a higher relative density of the composites.

[Full Text](#)

Title: Transportation and logistics management in a pump manufacturing industry involving subcontractors

Author (s): Prathik Rudresh, Vigneshwaran Ramesh, Anbuudayasankar S. P., Rahul P. Kikani and Ayush Khandelwal

Abstract: In most industries today productivity improvement is a major cause for concern. This paper focuses on the logistics scenario followed by the company, involving contractors and subcontractors. In the company, more than 75% of the manufacturing processes are outsourced by the manufacturer and there is no orderly or pre-planned method to efficiently manage the logistics involved in outsourcing the required components. To help improve the current state, a Vehicle Routing Problem (VRP) was solved applying the existing constraints. The solution was obtained based on the VRP concepts. ODL Studio, an open source and free software was used to solve this rich VRP formulated. The obtained results were integrated with a map showing the optimal transportation sequence and the routes to be taken, thus instructing the driver on the sequence to be followed. With a structured mathematical approach towards the transportation problem, the total distance traveled and time taken by the vehicle was reduced. With reduction in time, there is an increase in the number of products that are being worked on at the manufacturer's facility.

[Full Text](#)

Title: LINGO based revenue maximization using aggregate planning

Author (s): Anand Jayakumar A., Krishnaraj C. and S. R. Kasthuri Raj

Abstract: Predictable variability is change in demand that can be forecasted. Products that undergo this type of change in demand create numerous problems in the supply chain, ranging from high levels of stock outs during peak demand periods to high levels of excess inventory during periods of low demand. Faced with predictable variability, a company's goal is to respond in a manner that balances supply with demand to maximize profitability. The goal of sales and operations planning is to appropriately combine two broad options to handle predictable variability. In this article we use aggregate planning to maximize revenue. LINGO is used as the optimization tool.

[Full Text](#)

Title: Design and development of simulation based model to rank job flow strategies

Author (s): V. R. Sathish Kumar, S. P. Anbuudayasankar and M. Thennarasu

Abstract: In recent days many business organizations make huge investment in establishing their shop floors, installing most mechanized machines. These mechanized machines ought to operate in tandem with other machines, whose productivity level are usually different, which leads to individual machines working in maximum efficiency and the overall shop floor working in sub-optimal level. A spool shop assembles flanges, valves and nozzles to lengthier pipe, which are used in the construction of power plant, petroleum refinery, and cement plant. Longer cycle time at different work stations, lengthier job queue waiting for processing, high level of work-in-progress are inherent issues in a spool shop. Individual machines operating at maximum efficiency without analyzing the flow metrics in a spool shop leads to bottleneck. Current study, aims at spotting and decongesting the bottle neck at various machines, improve the output of the spool shop and optimize individual machine utilization. Four simulation models are developed using ARENA and each one of them are evaluated on the following metrics: output from spool shop per time period, utilization of individual machines per time period, value added time per unit of pipe, average queue length at each machine, average waiting time of a pipe and work-in-progress. First model depicts the data captured in the existing spool shop. In second model, high priority is assigned to the jobs that ought to be further processed in shot blasting machine and heat treatment furnace, thus minimizing the wait time. In third model, a modification is suggested to the existing annealing process, where the job is allowed to cool outside the furnace, thus making the furnace available for the next job. Forth model uses the priority rule in the suggested modified model. In all these models, inter-arrival time of job from storage yard to spool shop is maintained constant. Evaluating each model against performance statistics and queue statistics helps rank models based on each metrics. Models with high priority for further processing make use of single piece flow, a proven lean principle technique that has enhanced the overall efficiency. This eventually motivates practicing shop floor manager to incorporate flow metrics in designing the layout and machine capacity for optimal overall utilization.

[Full Text](#)

Title: Experimental investigation and path deviation analysis of Square Structured Omni Directional Mobile Robot

Author (s): A. P. Mohanraj, A. Elango, M. Karthikeyan, N. Mani Prabu and S. Harihara Krishnan

Abstract: This paper describes a four wheeled, Square Structured Omni Directional Mobile Robot (SSODMR). The design, different motion analysis and prototype of SSODMR is fabricated. In this research, the Omni Directional wheel consists of eight rollers in a single row, which has been arranged over the circumference of the wheel. This SSODMR can move in all eight directions without steering its wheel. In addition, it can also make clockwise and anti-clockwise rotations. It consists of four Omni Directional Wheels, fixed with 12 V, 30 rpm D/C motors. A Square structured chassis holds the motors and they are manually controlled by DPDT switches. The motion analysis has been practically done on a cement floor. The deviation from the desired path has been measured and hence the mobility of SSODMR has been practically analyzed.

[Full Text](#)

Title: Performance comparison for aluminium, copper and steel shots in waste heat recovery and scrap preheating from solidifying molten metal

Author (s): Mobin M. Mathew, M. Thenarasu, Aravind G. and Selvaraj J.

Abstract: During solidification of molten metal in sand casting, the sensible, latent and superheat are lost to the sand. This research article focuses on waste heat recovery from solidifying molten metal and scrap preheating using the recovered heat. This is done by incorporating an intermediate heat transfer medium such as aluminium, copper and steel shots in green sand mould. These intermediate heat transfer media absorb the heat from the solidifying metal in the mold cavity; the heated shots are separated from the mold and allowed to transfer their heat energy to the metal scrap by conduction, convection and radiation. The experiments prove that 8.4 % of heat recovery is achievable by introducing copper shots with the green sand mold, compared to aluminium shots, which generates 3.7 % and steel shots achieving 3 %. This method has the potential to be instrumental in reducing the enormous amount of energy spent to melt the metal in foundries. The experiments reveal that about 84 kWh of energy can be saved by using copper shots for melting one ton of metal. Cumulative effect of this novel energy conservation method on energy costs and global warming mitigation is found to be very convincing for industrial implementation, particularly for countries such as India.

[Full Text](#)

Title: Present approaches for Analysis of Casting Defects: A review

Author (s): P. Sathish Kumar, A. Ramesh and M. Gokul

Abstract: Analysis of Casting Defects is very important for a systematic examination and evaluation of data or information, by breaking it into its component part to uncover their interrelationships. The separation of an intellectual or material whole into its constituent part for individual study and to understand cause-effect relationships, thus providing basis for problem solving and decision making. At present, casting defect analysis is carried out using techniques like Computerized Simulations (CAE), Holistic approach, Historical analysis, Pareto analysis, cause-effect diagrams, design of experiments, if-then rules (expert systems), and artificial neural networks (ANN). In this paper an attempt has been made to list different approaches for analysis of Casting Defects. This paper also aims to provide correct guideline to quality control department to find casting defects which are not desirable.

[Full Text](#)

Title: A collaborative application of AHP to enhance a routing model for logistics and reverse logistics

Author (s): Arun Raja A., Arjun M. and Anishkumar M.

Abstract: The routing of material transport determines the efficacy of logistics network. Due to the increased usage of plastics in the country like India, large quantities of HDPE bottles are generated every year. HDPE being formed from petroleum, production of new bottles cost a significant effect to the global warming. Therefore rework of defective bottles is necessary. The obstacles faced during the rework process are the uncertainty involved in collection of returned bottles from different manufacturing units, at the same time the diversity in the variety, quantity, quality of the products. This necessitates for an effective and well-organized reverse logistics network to return the remanufactured products. The objective of this work is to exemplify the role of transportation in reverse logistics for the purpose of further improvement and to assist the HDPE bottle manufacturing industries, having problems in efficient routing of defective goods. The

proposed model is solved using Arena optimization solver which provides the decisions related to the utilization capability of the manufacturing units and the allocation of the corresponding product flows. Energy analysis of the model is also presented to find the energy of transportation and to minimize the cost of transportation.

[Full Text](#)

Title: Microcontroller navigation and motion control system of the underwater robotic complex

Author (s): Evgeny S. Ogurtsov, Vilena A. Kokoreva, Sergey F. Ogurtsov, Talgat A. Usenbay, Abylaikhan S. Kunesbekov and Evgeny Lavrov

Abstract: Research and development of Remotely Operated Vehicles and Autonomous Underwater Vehicles are urgent and promising global challenges. Development of navigation and motion control system remains a priority task when designing underwater robotics. The article presents the development results of navigation and motion control system of the underwater multiple robots, the schematic circuit diagram of developed electrical and structural navigation and motion control system, as well as a review of the existing technical solutions. The authors propose also the developed operation algorithm of the designed system modules, as well as schematic circuit diagram of the navigation and motion control system of the underwater multiple robots. Presented return-to-investment diagram is constructed on the basis of conducted feasibility study and estimated annual economic effect from implementation of the developed system. The developed system is effective and its implementation is quite relevant, since it can be used in most modern underwater robotics.

[Full Text](#)

Title: Enhancing the energy properties of fuel pellets from oil palm fronds of agricultural residues by mixing with glycerin

Author (s): Muhamed Sharizal Sirrajudin, Mohd Sukhairi Mat Rasat, Razak Wahab, Mohd Hazim Mohamad Amini, Mazlan Mohamed, Muhammad Iqbal Ahmad, Janshah Moktar and Mohamad Azhar Ibrahim

Abstract: Nowadays, the main largest energy resource is coal followed by oil and natural gas. This phenomenon raises the public concerns to diversify the energy sources to sustain energy availability. To address these predicaments, biomass from agricultural residue is an important source for renewable energy. Oil palm frond is one of the abundant agricultural residues available from the oil palm plantation area in Malaysia. Processing the oil palm fronds into fuel pellets are seen as an attractive option, which is expected to reduce the amount of agricultural residue in the plantation area. In this study, 3 portions of oil palm fronds which are bottom, middle and top have been divided and 2 different particle sizes which are 0.5 and 1.5 mm were used combination with glycerin, a by-product from biodiesel production to determine their influences on the energy properties of fuel pellets. The glycerin was combined with oil palm fronds as a biomass binder to enhance the energy properties with the optimum ratio of ingredients (ratio of raw material and glycerin) for producing fuel pellets. Proximate properties (moisture content, volatile matter, ash content and fixed carbon) and energy content (calorific value) were conducted as the parameters to determine the energy properties of the fuel pellets. The glycerin content ranging from 15 to 45% (by weight), enhanced the calorific value of the oil palm fronds' fuel pellets from 16.73 to 22.72 MJ/kg. The results from the proximate and energy content analyses met the fuel pellet standard requirement according to the Pellet Fuel Institute (PFI). The highest of 22.72 MJ/kg heating value of fuel pellet were achieved from the middle portion of 1.5 mm particle size with the mixture ratio was 55:45; oil palm frond and glycerin respectively. In the result, the combination of oil palm fronds and glycerin can be used as an alternative material for biomass energy sources.

[Full Text](#)

Title: Preliminary study on properties of small diameter wild *Leucaena leucocephala* species as potential biomass energy sources

Author (s): Mohd Sukhairi Mat Rasat, Razak Wahab, Mazlan Mohamed, Muhammad Iqbal Ahmad, Mohd Hazim Mohamad Amini, Wan Mohd Nazri Wan Abdul Rahman, Mohammad Khairul Azhar Abdul Razab, Ag Ahmad Mohd Yunus

Abstract: The heavy reliance on non-renewable energy sources from fossil fuel such as petroleum, natural gas and coal has led to the scarcity of these sources and occurrence of global warming. This phenomenon raises the public concerns to diversify the energy sources to sustain energy availability. To address these predicaments, biomass is among the prominent alternative energy sources since it is renewable and possesses minimal harms to the environment. *Leucaena leucocephala*, or locally known as 'Petai Belalang' is one of the potential energy crops. In this study, 3 portions of *Leucaena leucocephala* stem which are bottom, middle and top have been divided and 2 different particle sizes which are 0.5 and 1.5 mm were used to determine their influences on the properties of the samples. Proximate analysis (moisture content, volatile matter, ash content and fixed carbon), physical analysis (specific gravity and bulk density) plus calorific value of *Leucaena leucocephala* were conducted as the parameters to determine the properties of the samples. Among the proximate parameters, portions differ significantly ($p < 0.01$) in moisture content, volatile matter and ash content except for fixed carbon. Whereas, particle sizes shown significant differences ($p < 0.01$) in moisture content, ash content and fixed carbon while differing ($p < 0.05$) in volatile matters. Both independent factors differ significantly ($p < 0.01$) in the physical parameters, including specific gravity and bulk density. The highest calorific value was observed in the bottom portion with particle size 0.5 mm which is 18.56 MJ/kg, whereas calorific values are significantly differing ($p < 0.01$) for both independent factors. In conclusion, *Leucaena leucocephala* species show a good result to be as potential biomass energy sources.

[Full Text](#)

Title: Potential of cassava root as a raw material for bio composite development

Author (s): Nurul Husna Baharuddin, Mazlan Mohamed, Mohd Mustafa Al Bakri Abdullah, Noorhafiza Muhammad, Rozyanty Rahman, Mohd Nazri Omar, Mohd Hazim Mohamad Amini, Mohammad Khairul Azhar Abdul Razab, Zairi Ismael Rizman

Abstract: In recent years, a lot of researches have done by domestic and foreign scholars to enhance and improve the development of man-made board production that based on natural fiber and agricultural residues. Due to a worldwide shortage of forest resources which have been excessive cutting, man-made board production has become one of the alternative ways to solve wood supply problems. Particle board is a panel product manufactured under pressure from particles of wood or other ligno-cellulosic materials and an adhesive. In Malaysia, the demand and trend of uses wood panel product such as particle board is increasing in the market. The purpose of this study is to identify the potential use of cassava root as a raw material for bio-composite development. In this research, cassava root from different ages (6, 9 and 12 months) were used for production of bonded particle boards by using polyester as a binder. Constant resin content, temperature, time pressing and pressure were applied during boards' production. Moisture content, density, water absorption and thickness swelling test were carried out to determine dimensional stability of the boards while static bending tests were carried out to assess the mechanical strength of the boards. Particleboard from 12 month cassava root gave the best results in term of physical and mechanical properties. But, particleboard from 12 month cassava root did not meet the ANSI/A208.1-1999 standard for general-purpose boards. For this reason, additional research needs to be done on improving the physical and mechanical properties produced from different ages of the cassava root.

[Full Text](#)

Title: Sustainable use of Cassava plant waste (branches) as raw material for bio-composite development: Particleboard properties due to plant maturity

Author (s): Farhah Rahimi, Mazlan Mohamed, Mohd Mustafa Al Bakri Abdullah, Noorhafiza Muhammad, Rozyanty Rahman, Mohd Nazri Omar, Mohamad Bashree Abu Bakar, Mohammad Khairul Azhar Abdul Razab and Zairi Ismael Rizman

Abstract: This research is to study the sustainable use of Cassava Manihot Esculenta Crantz waste from branches parted as a raw material for bio-composite development. Bio-composite is component phase that derived from biological origin for both reinforcement (fiber) and matrices (resin) with significantly different physical, mechanical and chemical properties. In this research, bio-composite use is natural fibers or bio fibers derived from cassava plants with polymer matrices which is polyurethane. Cassava plant is a woody perennial shrub, the composite product created is from wood fiber. Fiber of cassava plant used is in the particle form to create particleboard. This research focuses on the comparison of the most suitable age of cassava plant waste for making particleboard by comparing the final product chemical, mechanical and physical properties using density, moisture content, water absorption, thickness swelling, XRD (crystallinity percentage of fiber) and bending tests (modulus of rupture and elasticity). The manipulated variable is 3 different ages of white cassava plant waste and only one age of yellow cassava varieties of trees.

[Full Text](#)

Title: Surface morphology study in laser paint removal mechanisms on selected national car coated substrate

Author (s): Mohammad Khairul Azhar Abdul Razab, Mohammad Suhaimi Jaafar, Nor Hakim Abdullah, Mohamad Faiz Mohd Amin, Mazlan Mohamed

Abstract: Thirty six rectangular shapes of two types national car coated substrate samples were irradiated by using Nd: YAG laser for paint removal. The best and worst crater depth of highest laser paint removal efficiency was selected for surface morphology analysis by using Nova NanoSEM 450. The results show the surface texture of the crater depth was changed and varies based on the paint residue left after the paint stripping process.

[Full Text](#)

Title: Review on Welding Residual Stress

Author (s): Nurul Syahida Mohd Nasir, Mohammad Khairul Azhar Abdul Razab, Sarizam Mamat, Muhammad Iqbal Ahmad

Abstract: Residual stress classified as secondary stress that exist after all loads been removed. Residual stress can be favorable or detrimental to some components, depend on its type. Usually, tensile residual stress can cause harm to components while compressive residual stress can improve the component quality. Residual stress, either tensile or compressive present in almost all manufactured components. Both residual stress, either tensile or compressive can be found in welding components. Many researchers agreed that tensile residual stress can be found in the weld metal area, but the compressive residual stress distribution is complex. The distribution welding residual stress varies in different locations depends on welding parameters, types, sequence, component type, component materials and component sizes. This review paper provides the information of welding residual stress and their distribution. This paper can help and giving idea to researchers on planning their welding work with a minimum value of residual stress.

[Full Text](#)

Title: Comparison study of Congo Red dye degradation process using Fenton's reagent and TiO

Author (s): Wan Farahiyah Wan Kamarudin, Muhammad Nasri Abdul Rahman, Zildawarni Irwan and Afifah Afrani Donak

Abstract: Wastewater treatment is one of the major problems faced by textile manufacturers as they produce large volumes of wastewater. The main pollution in textile wastewater come from dyeing and finishing process. The effluent that comes from textile industries not only causes coloration of water, but also give potential to human health hazard and a threat to aquatic life. The main objective of the study was to evaluate and to compare the efficiency of degradation of Congo Red (CR) dye using Fenton reagent and TiO₂. The study also comprises the influence of different experimental conditions which are the concentration of CR dye used, the concentration of FeSO₄ as catalyst in Fenton reagent, the concentration of hydrogen peroxides (H₂O₂), the mass of TiO₂ and the value of the pH of the experimental solutions in CR dye degradation. The results indicated that the photo-degradation efficiency of the CR solution of dye was more effective when it is being treated by Fenton reagent than the TiO₂. For photo-Fenton reagent, the result showed that the operated condition for Fenton reagent was pH under 3 (pH < 3). As for the concentration of FeSO₄ as catalyst, the optimum concentration was at 4 x 10⁻⁵ M and the maximum removal of the CR dye for H₂O₂ concentration was at 2.9 x 10⁻² M with the initial dye and pH value. As for the TiO₂, the result showed less efficiency of degradation occurred compared with the Fenton reagent in this experimental value. The higher percentage removal of dye CR was at 0.4g of TiO₂ dose and at the pH 7 in this heterogeneous process. Additionally, the Fenton reagent was the efficient method for pollutant removal due to the addition of the catalyst FeSO₄ where the Fe³⁺ ion will undergo reduction under the ultraviolet (UV) light and through the photolysis of the H₂O₂ itself.

[Full Text](#)

Title: Identification of mosquito repellent in Etlingera Elatior (torch ginger)

Author (s): Sopiah Ambong Khalid and Amirah Nafisah Azman

Abstract: The commercial repellent product and insecticide used to repel mosquitoes was reported to contain toxicity, caused skin irritant and has given rise to environmental concern. In consideration of this, the need to develop environmental friendly products is imperative to control the mosquito attack. The means of this study are to analyze the content of 2-undecanone (repellent agent) in the extracted Etlingera Elatior oil of its stem, midrib, leaves and flower and also to identify its prospect as a natural mosquito repellent. Steam distillation was chosen for extraction of Etlingera Elatior with 2 different solvent which are methanol and n-hexane. The characterization of the oil was analyzed using Gas Chromatography-Mass Spectrometry. The obtained result is 2-undecanone, where the desired component was not identified in the Etlingera Elatior plant. Despite of the absence of 2-undecanone, a great number of different components were detected and a few of other potential reported mosquito repellent were present such as limonene, hexanal and dodecanoic acid in small amount. In conclusion, Etlingera Elatior has the potential to be a natural mosquito repellent.

[Full Text](#)

Title: Adsorption of methylene blue in aqueous solution by Musa paradisiaca stem powder

Author (s): Nurul 'Uyun Ahmad, Ahmad Faris Ahmad Azli, Noratiera Che Mat, Fathin Nor Faridah Mohamed Nawi and Mohd Hakimi Othman

Abstract: In Malaysia, textile industry contributes the most to the wastewater that has led to environmental problems. Most of the dyes used in textile industries are toxic in nature with suspended carcinogenic and mutagenic effect that affects aquatic lives and human beings. The focus of this study is to identify the potential of Musa paradisiaca stem (banana stem) which commonly available waste material that are low-cost, natural and an eco-friendly bio-sorbent for the economical removal of methylene blue (MB) dye in aqueous solution. In this study, the stem is acting as an adsorbent. Batch model experiments are conducted to determine the effect of pH and the initial concentrations of MB solutions, adsorbent dosages and its contact time in methylene blue solutions towards the efficiencies and adsorptivity (%) of the stem as a MB removal agent. The stem is dried and treated with Potassium Hydroxide to remove its lignin and to activate its cellulose part. The concentrations of MB solution are analyses using ultraviolet-visible spectrophotometry (UV-VIS) before and after the adsorption processes. The MB uptake has increased with the increased of pH value. The MB adsorption increased simultaneously with the adsorbent dosages and contact times. The maximum adsorptivity is identified as 91.47% at 70

ppm of MB solution at pH 12 using 0.6 g of adsorbent dosage. The best adsorbent dosage is found to be as 0.6 g due to its higher adsorptivity in all ranges of concentration and pH of the dye solutions. However, the removal percentage (%) decreases with the increased of initial MB concentrations. In conclusion, this study recommends that *Musa paradisica* can be used effectively in the adsorption of MB in aqueous solution.

[Full Text](#)

Title: Adsorption of methylene blue using oil palm (*Elaeis Guaneensis*) fronds as activated carbon

Author (s): Norkamruzita Saadon, Noraini Razali, Marshahida Mat Yashim and Nor Ashikin Yusof

Abstract: The application of underutilized resources and eco-friendly adsorbents is studied as the substitute for the commercially available activated carbon which occurred at high cost. The carbon type adsorbents were prepared from oil palm frond (OPF). It is a domestic waste that comfortably used to eradicate basic dye, which is methylene blue (MB) from aqueous solution using the adsorption removal method. The oil palm frond activated carbon is used to adsorb methylene blue as one of the effluents from the textile industry by varying the concentration, mass of adsorbent used and contact time. The findings disclose that the most efficient condition to remove the color intensity of methylene blue is by using 0.4g mass of OPF activated carbon at 10 minutes of contact time, which was tested on the lowest concentration of 20 ppm. The results from this research have proven that the percentage removal of dye decreases as the initial dye concentration increases. The percentage removal on the effect of adsorbent dosage increases with the increase of adsorbent dosage used. In overall, the findings give us hope to have a better water quality which is free from pollution.

[Full Text](#)

Title: Performance analysis of D-flip flop using single electron nanodevices

Author (s): S. Rajasekaran and G. Sundari

Abstract: Single electron technology offers the ability to maintain the transport of individual electrons. In this paper, we present a D-Flip flop using CMOS and single-electron Technology which is compare with normal logic D-flip flop. Single Electron Transistor (SET) is distinguished by a very small scale device, low power dissipation, high speed and high performance, is one of the most promising Nano-electronics devices to replace conventional CMOS. The single-electron D flip-flop and CMOS based D-flip flop is designed and studied the comparative analysis with normal flip-flop design. The flip flop design is simulated using SPICE simulator and analysed the performance of it's varies parameters.

[Full Text](#)

Title: Analysis of Polymethylmethacrylate as bone substitute of frontal human skull via finite element analysis

Author (s): Shahrul Hisyam Marwan, Abdul Rahim Bahari, Mohd Faizul Idham, Haizuan Abd. Rahman, Mohamad Daniel Benjamin Mohd Radzuan

Abstract: A study has been conduct to verify the compatibility of the biomaterials which is Polymethylmethacrylate (PMMA) by developing a frontal human head impact test using finite element analysis (FEA). This study is to compare the results between simulation and experimental result conducted by previous study. To conduct this study, the process involve is to develop finite element model of spherical skull in SOLIDWORKS and to analyze the data analysis using ANSYS Workbench. It is to study the impact conditions of human skull during a human head impact on the resulting of total deformation. Three finite element model of spherical skull are created using SOLIDWORKS, which the three of them is distinguished by their thickness which resembles the thickness of real frontal human skull. Then, all of the models are exported to the software called ANSYS Workbench to create a simulation of a frontal human head impact test. The result of the simulation is total deformation is then analyze by calculating the percentage error and percentage difference between the simulation result and the experimental result by previous study. The average percentage error between the simulations of spherical skull models with previous experimental result is 12.79%, while the lowest percentage error is around 10.91%. The average percentage difference for the simulation result using PMMA with the previous experimental result is around 4.74%, and the lowest percentage difference is around 3.00%. In conclusion, the result shows the PMMA is suitable as bone substitution for frontal human skull.

[Full Text](#)



ON THE PERFORMANCE OF SEGMENT AVERAGING OF DISCRETE COSINE TRANSFORM COEFFICIENTS ON MUSICAL INSTRUMENTS TONE RECOGNITION

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ABSTRACT

In the Discrete Cosine Transform (DCT) domain, the tones of musical instruments can be divided into two groups. The first one with the single significant local peaks and the second one with the multiple significant local peaks. The second one can be divided into two sub groups, which have many and a few significant local peaks. This research deal with multiple significant local peaks. In this research, segment averaging was used to reduce the number of DCT coefficients, in the DCT domain. In this case, the reduced number of DCT coefficients called feature extraction coefficients. Based on the experiment, when the segment averaging of DCT coefficients was used optimally for the tones which had many (i.e. thirteen) and a few (i.e. three) significant local peaks, it could give 8 and 16 feature extraction coefficients respectively. So, in order that segment averaging of DCT coefficients could be used optimally, either for the tones which have many or a few significant local peaks in the DCT domain, it could use segment length 4 points and DCT length 64 points. By using it, it could give 16 feature extraction coefficients.

Keywords: tone recognition, segment averaging, DCT, feature extraction.

1. INTRODUCTION

Based on the human perception, musical instruments have two aural characteristics: a particular kind of tuning (scale) and the particular kind of sound (timbre) [1]. The scale is an aural characteristic of high and low tones in a musical instrument. Thus, if the scale is getting higher, the higher the tone. Conversely, if the scale is getting lower, the lower the tone.

The timbre is aural characteristics of instrument type. Based on the timbre, in the DCT domain, the tone of musical instruments can be divided into two groups. The first one with single significant local peaks (which also called monophonic), and the second one with multiple significant local peaks (which also called polyphonic). For the multiple significant local peaks, it can be divided into two subgroups. The first one with many significant local peaks, and the second one with a few significant local peaks. Figure-2 shows examples of timbre representation in the DCT domain, for pianica and soprano recorder musical instruments that shown in Figure-1.



(a) Pianica



(b) Soprano recorder

Figure-1. Pianica dan soprano recorder.

In Figure-2, pianica is an example of a musical instrument with many significant local peaks in the DCT domain, while the soprano recorder is an example of a musical instrument with a few significant local peaks in the DCT domain.

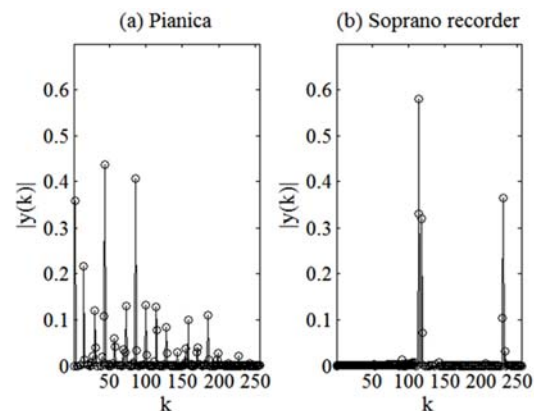


Figure-2. Timbre representation in the DCT domain $y(k)$ (see equation 2) of the tone 'C', for pianica and soprano recorder, and the use of 256 points DCT.

Previous researches associated with the tone recognition, essentially made use using time domain or transformed domain approaches. Tone recognition researches using time domain approach [2] [3], were basically based on autocorrelation. This time domain approach, deal less well to polyphonic tones. Previous researches using the transformed domain approach,



basically based on Fast Fourier Transform (FFT) [4] [5] [6] [7] or DCT [8]. Moreover, in this approach, there were basically based on a fundamental frequency [4] [5], and the other were not based on a fundamental frequency [6] [7] [8]. This transformed domain approach deal well with polyphonic tones. Furthermore, in this paper, it will be discussed the recognition of polyphonic tones which is not based on a fundamental frequency.

In the previous research, Surya [6] developed a pianica tone recognition using Kaiser Window, FFT, and the correlation function. In order to get a recognition rate of 100%, at least 128 feature extraction coefficients were. Sumarno [8] developed further a pianica tone recognition using Gaussian window, DCT, and the cosine distance function. In order to get the recognition rate of 100%, at least required a number of 32 feature extraction coefficients. Sumarno [7] developed further a pianica tone recognition using Blackman window, FFT, and the Euclidean distance function, as well as FFT windowing coefficient. For the recognition rate of 100%, at least a number of 12 feature extraction coefficients was required. By looking at the number of coefficients required for feature extraction, it can be seen that the tone recognition research to reduce the number of feature extraction coefficients is still wide open.

This paper describes a research about the tone recognition of pianica and soprano recorder tones, which each of them represent tones with many and a few significant local peaks in the DCT domain respectively (see Figure-2). It will be investigated the performance of segment averaging that inspired by Setiawan [9] to be used on a tone recognition system using DCT. In more detail, it will be investigated the influence of segment length and also the number of significant local peaks in the DCT domain, to the recognition rate and the number of feature extraction coefficients. The tone recognition used in this research adopted the template matching approach [11].

2. RESEARCH METHODOLOGY

2.1 Material and tools

The research materials were isolated tones of pianica and soprano recorder, in wav format. It was obtained by recording the tones of pianica and soprano

recorder, by using sampling rates 4800 Hz and 2400Hz respectively. The magnitude of sampling rates were chosen according to the Nyquist criterion, namely, the amount of the minimum sampling rate is twice the highest analog frequency of 2400 Hz for tone 'B' on pianica, and 995Hz for the tone 'B' on the soprano recorder. Based on the evaluation, recording duration for 2 seconds was adequate, because the sound produced was already in the steady state condition, especially in the middle part of the data, which was chosen for the purpose of frame blocking.

Research tools were a pianica (Brother brand) and a soprano recorder (Yamaha brand). A microphone Genius MIC-01A was used to capture the sound signals. A computer with an Intel Core i3 3220 processor and 4GB of RAM, was used to process the captured sound signals.

2.2 Design of the Tone Recognition System

The tone recognition system, shown in block diagram in Figure-3. The input is wav file and the output is a number that indicates the recognized tone.

Frame blocking is the process of taking a frame signal from a long signal series of signal [12]. The purpose of the frame blocking is to reduce the number of data signals to be processed. The effect of this reduction is a reduction in computing time. In this research, a frame signal is captured from the middle part of the signal, by assuming that in the middle part, the signal has reached its steady state time. The length of a frame signal was evaluated by using a number of lengths namely 32, 64, 128, and 256 points. The length of a frame signal has the same length with the length of DCT in the next process.

Normalization is the process of setting the maximum value to one, in a signal data. Normalization aimed to eliminate differences in maximum values from a number of signal data that came from recording results.

Windowing is a process of reducing discontinuities at the edges of the signal. At a recorded signal, usually found discontinuities at the edges of the signal. This case would give a number of harmonic signals in the transformed signal. The appearance of these harmonic signals would affect the accuracy of the feature extraction using DCT [8]. In order to reduce the appearance of harmonic signals, so the edges of the input signal needs to be reduced by using windowing [12].

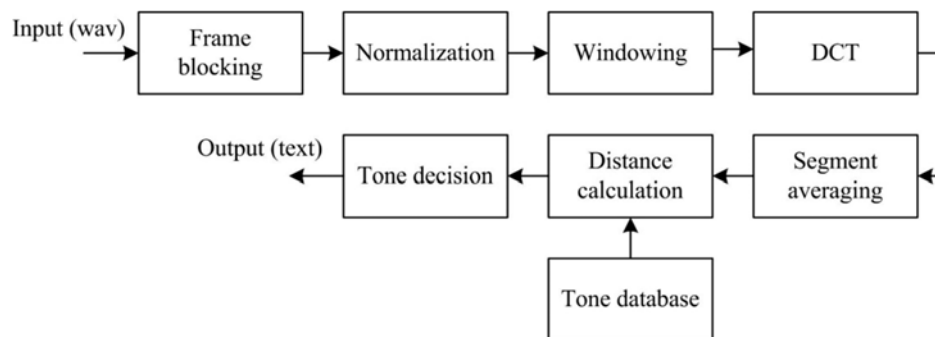


Figure-3. Block diagram of the tone recognition system.



Hamming window [13] is a window that is commonly used for windowing. Hamming window $w(n)$ with a width of $N + 1$ points defined below.

$$w(n) = 0.54 - 0.46 \cos\left(2\pi \frac{n}{N}\right), \quad 0 \leq n \leq N \quad (1)$$

DCT (Discrete Cosine Transform)

DCT is a transformation method. It is used to transform the signal from the time domain to the DCT domain. DCT of a series $u(n)$ which has N points in length, formulated as follows [10].

$$y(k) = \alpha(k) \sum_{n=0}^{N-1} u(n) \cos\left[\frac{\pi(2n+1)k}{2N}\right], \quad 0 \leq n \leq N-1 \quad (2)$$

where

$$\alpha(0) \triangleq \sqrt{\frac{1}{N}}, \quad \alpha(k) \triangleq \sqrt{\frac{2}{N}} \quad \text{for } 0 \leq n \leq N-1. \quad (3)$$

Segment averaging, which inspired by Setiawan [9], is a process to reduce the size of the signal. Basically, the signal that have been reduced in size represents the basic shape of the signal pattern. In this research, segment averaging was used to reduce the size of the signal after DCT process. Results of the reduction of the signal was called the feature extraction of the signal. The algorithm of segment averaging is shown below.

Segment averaging algorithm

1. Determine a series $y(k) = \{y(0), y(1), \dots, y(N-1)\}$ where $N = 2^p$ for $p \geq 0$.
2. Determine a segment length L where $L = 2^q$ for $0 \leq q \leq p$.
3. Divide the series $y(k)$ based on the segment length L . Therefore, it will be resulted a number of M segments as follow

$$M = \frac{N}{L}, \quad (4)$$

and also a series $f(r) = \{f(1), f(2), \dots, f(L)\}$ in each segment.

4. Compute the average value in each segment $z(v)$ as follow:

$$z(v) = \frac{1}{L} \sum_{r=1}^L f_v(r), \quad 1 \leq v \leq M. \quad (5)$$

In this research, a number of the segment length was evaluated based on the DCT length. Table-1 shows that.

Distance calculation is a process of calculating the distance, between the feature extractions of an input signal with the feature extraction of a number of signals in the tone database. Euclidean distance is a distance function that commonly used [14]. Euclidean distance is defined by

Table-1. Evaluation of the segment length based on the DCT length.

DCT length (points)	Segment length (points)
256	1, 2, 4, 8, 16, 32, 64, 128, and 256
128	1, 2, 4, 8, 16, 32, 64, and 128
64	1, 2, 4, 8, 16, 32, and 64
32	1, 2, 4, 8, 16, and 32

$$E(\mathbf{x}, \mathbf{y}) = \sqrt{\sum_{i=1}^m (x_i - y_i)^2} \quad (5)$$

where \mathbf{x} and \mathbf{y} are two vectors which have equal length (one vector is the vector of the input signal, whereas the other one is a vector that exists in the database), and m is the length of the vector \mathbf{x} or \mathbf{y} . Calculation of the distance is an indication of template matching [11] approach was used in this research.

Tone decision is a process to determine the tone of the input signal. Tone decision was carried out by finding the minimum value of distance calculation values. This values came from calculating the distance between a feature extraction of the input tone and a set of feature extraction of tones in a tone database. A tone which has a minimum distance value, determined as the output tone.

2.3 Tone database

Tone database was needed in the distance calculation process. To create the tone database, for each instrument (pianica and soprano recorder), the author take a number of 10 samples for each tone ('C', 'D', 'E', 'F', 'G', 'A', and 'B'). In this research it was assumed, by taking 10 samples for each tone, all variations for each tone pattern have been elaborated. Because from 7 tones, there are 10 samples for each tone, so in total there are 70 tones to create a tone database. Figure-4 shows a block diagram of the database generation process for each tone.

In this research, for each instrument (pianica and soprano recorder), a number of 30 sets of the tone database were generated. It were created based on a combination of values that were evaluated as shown in Table-1.

2.4 Test tones

Test tones were needed to evaluate the performance of the recognition system, at various tone databases that described above. In this research, for each instrument (pianica and soprano recorder), taken 10 samples for each tone ('C', 'D', 'E', 'F', 'G', 'A' and 'B'). Thus for each of these instruments there are a total of 70 test tones.

2.5 Recognition rate

Recognition rate was used to rate the performance of recognition system as described above. It was calculated by the following equation

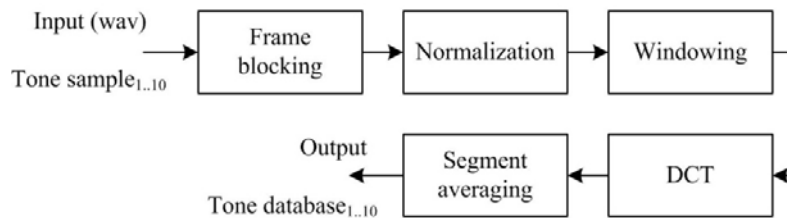


Figure-4. Block diagram of the tone database generation.

$$\text{Recognition rate} = \frac{\text{Number of recognised tones}}{\text{Number of test tones}} \times 100\% \quad (7)$$

where the number of test tones, as described above, is 70 tones for each musical instrument (pianica and soprano recorder).

3. RESULTS AND DISCUSSIONS

Tone recognition system test results on various combinations of DCT length and segment averaging length, for pianica and soprano recorder, are shown in Tables 2 and 3. As shown in Tables 2 and 3, in general, the longer segment length will decrease the recognition rate. This is due, as shown in Table-4, the longer segment length would further decrease the number of feature extraction coefficients.

Basically decreasing the number of feature extraction coefficients, it would decrease the pattern details. However, if the number of feature extraction coefficients are too little, too many pattern details will be

lost, which causes a pattern will be more similar with the other patterns (see Figure-5 (c)). As a result, it would be increasingly difficult to distinguish between a pattern with the other patterns, thereby resulting in lower levels of recognition. Thus, it could be said, if the number of the feature extraction coefficients decrease, it would also decrease the recognition rate.

Based on Table-2 and 4, for the recognition of pianica tones that have many significant local peaks in the DCT domain (see Figure-2), the smallest number of feature extraction coefficients that gave a 100% recognition rate is 8 coefficients. This result was better than that achieved previously by Sumarno [7], which required a total of 12 coefficients. However, based on Table-3 and 4, for the recognition of soprano recorder tones that have a few significant local peaks in DCT domain (see Figure-2), the smallest number of feature extraction coefficients that gives a 100% recognition rate increased to 16 coefficients. The cause of this case was shown graphically in Figure-6.

Table-2. The test results of pianica tone recognition, in various combinations of segment length and DCT length. Results shown: Recognition rate (%).

DCT length (points)	Segment length (points)								
	1	2	4	8	16	32	64	128	256
256	100	100	100	100	100	100	98.6	77.1	55.7
128	100	100	100	100	100	95.7	75.7	61.4	-
64	100	100	100	100	88.6	75.7	57.1	-	-
32	75.7	74.3	72.9	58.6	48.6	41.4	-	-	-

Table-3. The test results of soprano recorder tone recognition, in various combinations of segment length and DCT length. Results shown: Recognition rate (%).

DCT length (points)	Segment length (points)								
	1	2	4	8	16	32	64	128	256
256	100	100	100	100	98.6	78.6	60	37.1	22.9
128	100	100	100	100	74.3	62.8	42.8	21.4	-
64	100	100	100	97.1	67.1	37.1	20	-	-
32	88.6	98.6	95.7	80	44.3	22.9	-	-	-



Table-4. The number of feature extraction coefficients in various combinations of segment length and DCT length. Results shown: The number of feature extraction coefficients.

DCT length (points)	Segment length (points)								
	1	2	4	8	16	32	64	128	256
256	256	128	64	32	16	8	4	2	1
128	128	64	32	16	8	4	2	1	-
64	64	32	16	8	4	2	1	-	-
32	32	16	8	4	2	1	-	-	-

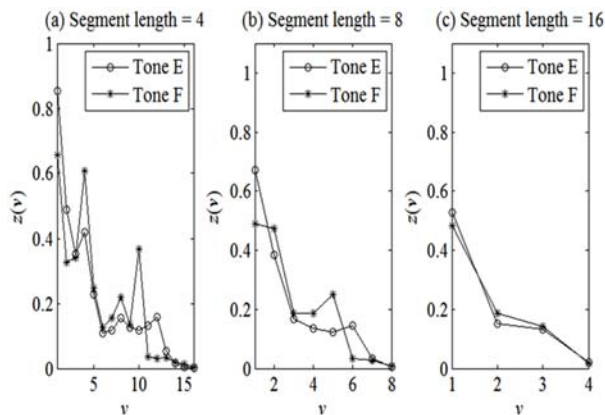


Figure-5. The influence of segment length to the calculation of segment averaging $z(v)$, for the use of 64 points DCT.

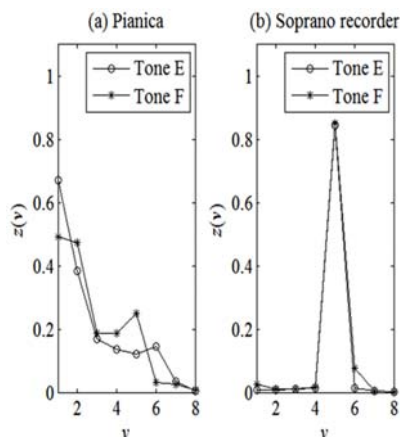


Figure-6. Examples of feature extraction difference between pianica and soprano recorder, for the use of 64 points DCT and 16 points segment length.

Figure-6 shows that, the graphic of feature extraction for the tone 'E' and 'F', for soprano recorder is more similar, when compared with pianica. This means, the results of soprano recorder feature extraction are more difficult to be distinguished each other, when compared

with the results of pianica feature extraction. Based on the discussion that described above, in order to able to be distinguished each other easily, it was the necessary to add more feature extraction coefficients. Therefore, soprano recorder requires more feature extraction coefficients when compared with pianica.

Based on Table-2, 3 and 4, it can be seen that in order that segment averaging of DCT coefficients can be used optimally, either for musical instruments that have many or a few significant local peaks in the DCT domain, it could use segment length 4 points and DCT length 64 points. By using it, it could give 16 feature extraction coefficients.

4. SUMMARY

Based on the above discussions, it can be summarized as follow:

- If segment averaging was used for signals which have many significant local peaks in the DCT domain, it would give a fewer number of feature extraction coefficients, rather than when it was used for signals which have a few significant local peaks in the DCT domain.
- In case of segment averaging was used for pianica signals which have many (i.e. thirteen) significant local peaks in the DCT domain, the optimal number of feature extraction coefficients was 8 coefficients. That coefficient was generated by using segment length 4 points, and DCT length 64 points.
- In case of segment averaging of DCT coefficients was used for soprano recorder signals which have a few (i.e. three) significant local peaks in the DCT domain, the optimal number of feature extraction coefficients was 16 coefficients. That coefficient was generated by using segment length 4 points, and DCT length 64 points.
- In order that segment averaging of DCT coefficients could be used optimally, either for musical instruments that have many or a few significant local peaks in the DCT domain, it could use segment length 4 points and DCT length 64 points. By using it, it could give 16 feature extraction coefficients.



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