SELCUK UNIVERSITY
FACULTY OF TECHNOLOGY

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October 26-28, 2018
Konya/TURKEY

ABSTRACTS BOOK

Editor
Prof. Dr Ismail SARITAS

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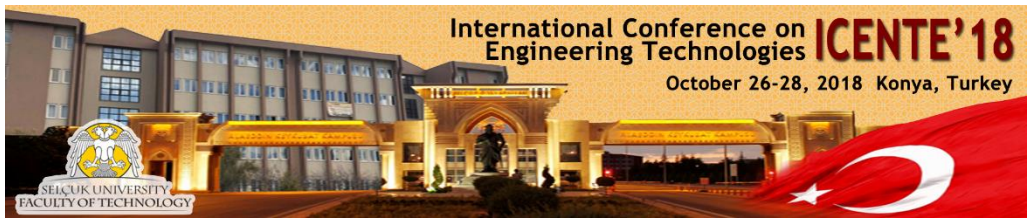

International Conference on Engineering Technologies

International Conference, ICENTE
Konya, Turkey, October 26-28, 2018

Abstracts

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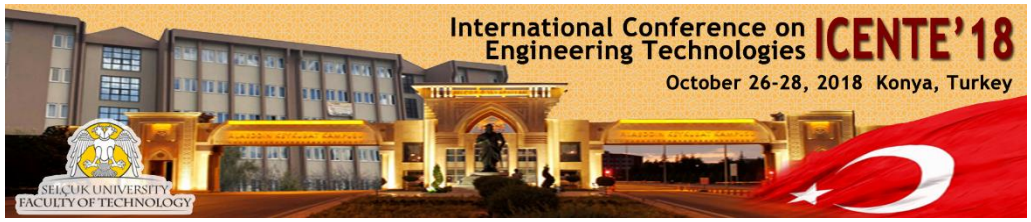

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PREFACE

International Conference on Engineering Technologies (ICENTE'18) was organized in Konya, Turkey on 07-09 October, 2018.

The main objective of ICENTE'18 is to present the latest research and results of scientists related to Electrical and Electronics, Biomedical, Computer, Mechanical, Mechatronics, Metallurgical and Materials Engineering fields. This conference provides opportunities for the delegates from different areas in order to exchange new ideas and application experiences, to establish business or research relations and to find global partners face to face for future collaborations.

All full paper submissions were double blind and peer reviewed and they were evaluated based on originality, technical and/or research content/depth, correctness, relevance to conference, contributions, and readability. Selected papers that were presented in the conference will be published in the Journal of Selcuk Technic if their content matches with the topics of the journal.

At this conference, there were 303 paper submissions from 16 different countries and 128 universities. Each paper proposal was evaluated by two reviewers. And finally, 163 papers from 12 different countries were presented at our conference.

In particular, we would like to thank Prof. Dr. Mustafa SAHIN, Rector of Selcuk University; Prof. Dr. Abdullah Uz TANSEL, City University of Newyork; Prof. Dr. Ahmet Fahri OZOK, Okan University; Assoc. Prof. Dr. Ayhan EROL, Afyon Kocatepe University; Journal of Selcuk Technic. They made crucial contribution towards the success of this conference. Our thanks also go to the section editors and colleagues in our conference office.

Prof. Dr. Ismail SARITAS
Editor

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THEORETICAL NBO AND TD DFT ANALYSIS OF GLYOXYLDIUREIDE

NIHAL KUS[1], SALIHA ILICAN[2]

[1] Eskisehir Technical University, Turkey ; [2] Eskisehir Technical University, Turkey

ABSTRACT

Glyoxyldiureide (also known as allantoin 2,5-dioxo-4-imidazolidinyl urea or the diureide of glyoxylic acid) is a product of purine metabolism and known for a long time ago to exist in nature, such as, in allantoic and amniotic fluids, in fetal urine and in many plants and bacteria. In this study, Natural Bond Orbital (NBO) calculations were performed with the Gaussian 09 suit of programs at the density functional theory with (B3LYP)/6-311++G(d,p) level of approximation. Electron density HOMO-LUMO surface level energy was found for most stable conformer. Stabilization energies for selected NBO pairs obtained from Fock matrix. TD-DFT (B3LYP) calculations were carried out and the results were evaluated.

KEYWORDS - Glyoxyldiureide, Time Dependent-Density Functional Theory (TD-DFT), Natural Bond Orbital (NBO).

HYBRID ORBITAL LOCALIZATION OF E CROTONIC ACID USING NBO ANALYSIS

***SALIHA ILICAN*[1] *, NIHAL KUS*[2]

[1] Eskisehir Technical University, Turkey ; [2] Eskisehir Technical University, Turkey

ABSTRACT

E-crotonic acid (ECA, C4H6O2) is the smallest carboxylic acid which has three conformers with planar C1 symmetry and one conformer with nonplanar Cs symmetry. All conformers were optimized using Density Function Theory (DFT) level using the 6–311++G(d,p) basis set and the B3LYP functional. The second-order Fock matrix was used to evaluate the donor-acceptor interactions in the Natural Bond Orbital (NBO) basis. The bond polarization and hybridization effects in wave functions associated with formation of the conformers. All calculations are performed by using Gauss-View molecular visualization program and Gaussian 09 program package. HOMO-LUMO energy value of ECA-I calculated and found to be about 4.23eV. Molecular Electrostatic Potential (MEP) surfaces of all the conformers were mapped.

KEYWORDS - E-crotonic acid, DFT, NBO, HOMO-LUMO energy.,MEP

COMPARISON OF PRK AND FS LASIK PROCEDURES IN TREATMENT OF MYOPIA AND MYOPIC ASTIGMATISM

SERVET CETINKAYA[1]

[1] Konyagoz Eye Hospital, Turkey

ABSTRACT

Purpose: To compare the results of photorefractive keratectomy (PRK) and femtosecond-assisted laser in situ keratomileusis (FS-LASIK) procedures in treatment of myopia and myopic astigmatism. Material and Methods: One hundred and fourteen eyes of 57 patients with myopia and/or myopic astigmatism who had undergone PRK procedure were compared with 114 eyes of 57 patients with myopia and/or myopic astigmatism who had undergone FS-LASIK procedure. Results: In respect to age and sex, there was no significant difference between PRK and FS-LASIK groups. Regarding preoperative and postoperative spherical, cylinderical and spherical equivalent values, UDVA and CDVA, there was no significant difference between two groups. Predictability, efficacy and safety index values were similar in both groups. Haze developed in two eyes in PRK group, but they recovered 6 months later and regression occured up to 1.00 D in three eyes in PRK group. However, these were not significant statistically. Conclusion: Both PRK and FS-LASIK are efficient, safe and predictable procedures for correction of myopia and myopic astigmatism. PRK may induce haze and regression in high diopters.

KEYWORDS - PRK, FS-LASIK , Haze, Regression

ANKLE FOOT ORTHOSIS A CONTROL STRATEGY

ZAIN SHAMI[1] , M NABEEL ANWAR[2]

[1] National University Of Sciences Technology Nust H 12 Islamabad Pakistan, Pakistan ; [2] National University Of Sciences Technology Nust H 12 Islamabad Pakistan, Pakistan

ABSTRACT

There have been efforts intending to help rehabilitation of patients and athletes with tendon injuries for their mainstreaming in daily life. It had recently been discovered that reducing inflammation of the injury is not effective on its own therefore the use of Orthosis to revive the muscle function becomes a necessity. In this paper efforts have been made to develop an active control system for a supportive Orthosis device for such people. A thorough related literature review was carried out to identify the technological gaps in the recent developments in control of ankle-foot Orthosis and to conceptualize a novel design and plan a theoretical framework. The control system is an integration of electronic and mechanical components. The proposed working principle of this Orthosis is that a partially paralyzed muscle when activated produces a weak raw Electromyographic (EMG) signal that is picked up by the surface EMG electrodes. This signal is pre-processed, rectified and smoothed and then fed to Control Module to control the mechanical parts and assist the ankle movement.

KEYWORDS **-** EMG, Orthosis, Muscle activation, Motor action, injury rehabilitation, Injuries, Athletes, Control System, Active Control System

A NEW APPROACH FOR FEATURE EXTRACTION FROM FUNCTIONAL MR IMAGES

GUZIN OZMEN[1] , SERAL OZSEN[2]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

The functional MR images consist of very high dimensional data containing thousands of voxels, even for a single subject. Data reduction methods are inevitable for the classification of these three-dimensional images. In the first step of the data reduction, the first level statistical analysis was applied to fMRI data and brain maps of each subject were obtained for the feature extraction. The second step is the feature selection. According to the feature selection method used in the classification studies of fMRI and which is called as the active method, the intensity values of all brain voxels are ranked from high to low and some of these features are presented to the classifier. However, the location information of the voxels is lost with this method. In this study, a new feature extraction method was presented for use in the classification of fMRI. According to this method, active voxels can be used as features by considering brain maps obtained in three dimensions as slice based. Since the functional MR images have big data sets, the selected features were once again reduced by Principal Component Analysis and the voxel intensity values were presented to the classifiers. As a result; 83.9% classification accuracy was obtained by using kNN classifier with purposed slice-based feature extraction method and it was seen that the slice-based feature extraction method increased the classification accuracy against the active method.

KEYWORDS - Feature extraction, fMRI,Classification,SPM

ELICITATION OF BIOMATERIALS FOR MIMICKING MICROPHYSIOLOGICAL SYTEMS ON A CHIP

***ECEM SAYGILI*[1] *, OZLEM YESIL CELIKTAS*[2]**

[1] Ege University, Turkey ; [2] Ege University, Turkey

ABSTRACT

As the cell culture based in vitro assays have a vital role in biomedical field, there is an increasing demand for tissue analogues to screen and functionalize tissue/organ models via microfluidic platforms. Depending on the desired application, the material selection and design of microchannels must be compatible to meet the demands. Thus, the materials for microfluidic platforms should present the appropriate properties. This study presents some of the advantages and challenges of using thermoplastics, thermosets and elastomers for microfluidic systems.

KEYWORDS - polymers, microfluidics, cell culture, tissue models

HOW MOLECULAR MODELING HELPS DRUG DESIGN COMPUTER AIDED DRUG DESIGN STRATEGIES

ESMA ERYILMAZ[1]

[1] Selcuk University Faculty Of Technology Department Of Biomedical Engineering, Turkey

ABSTRACT

Computational molecular modeling techniques have become an important tool in drug discovery process and pharmaceutical medicine. They are commonly used in not only determining the structure or physico-chemical properties of known biomolecules, but also designing unknown, new molecules serving your own purposes. By calculating characteristic properties of the molecule of interest, one can make a decision of whether the molecule is appropriate for that purposes or what type of modification needs to be taken for that molecule. Therefore, computational molecular modeling is essential tool used in personalized medicine. Two main modeling strategies are used in new drug discovery process according to the information you have regarding the structure of unknown biomolecule: Direct drug design and indirect drug design. In this presentation, we discuss both of the modeling strategies above on the applications in medicinal chemistry. Molecular structure visualization, conformation and lead molecule generation will be explained based on the modeling and simulation software, Visual Molecular Dynamics (VMD).

KEYWORDS - drug design,Computational modeling,biomolecular modeling,Visual Molecular Dynamics

FABRICATION OF DIFFUSION AND INTERNAL GELATION BASED ALGINATE SILICA HYBRID HYDROGELS FOR ENZYME IMMOBILIZATION

***RABIA ONBAS*[1] *, OZLEM YESIL CELIKTAS*[2]**

[1] Izmir Institute Of Technology, Turkey ; [2] Ege University, Turkey

ABSTRACT

The organic-inorganic hybrid materials have been preferred in various studies to immobilize biomolecules. The aim of this study was to compare two different synthesis methods in terms of enzymatic activity. Moreover, the new formulated internal gelation-based method was developed which yields homogenous gels with the possibility to control gelation rates. Thanks to these properties, this gel can be injected into microchannels, which allows the development of enzymatic microreactors to overcome limitations of immobilized enzymes in monoliths.

KEYWORDS - diffusion gelation method, internal gelation method, alginate-silica hybrid gel, β-glucosidase

DESIGN OF A HOME HEALTH CARE DATABASE IN MONITORING CHRONIC RESPIRATORY DISEASES

***ILAYDA HASDEMIR*[1] *, GOKHAN ERTAS*[2]**

[1] Yeditepe University, Turkey ; [2] Yeditepe University, Turkey

ABSTRACT

For chronic respiratory diseases, continues monitoring of the vital physiological parameters of the patients taking home health care is very important. Information technology-based applications offer useful tools in improving the quality of home health care services. In this study, we have worked on a framework for patients with chronic respiratory diseases and designed a database for home health care.

KEYWORDS - home health care, chronic respiratory disease, database

OPTIMIZATION OF CONCENTRATION AND SAND THICKNESS FOR AGAR ASSISTED SAND HARDENING PROCESS BY MICROBIAL BIOCALCIFICATION

ALPCAN ARIC[1] , BURAK TALHA YILMAZSOY[2] , IREM DENIZ CAN[3] , TUGBA KESKIN GUNDOGDU[4]

[1] Ege University Bioengineering Department, Turkey ; [2] Ege University Bioengineering Department, Turkey ; [3] Manisa Celal Bayar University Bioengineering Department, Turkey ; [4] Ege University Bioengineering Department, Turkey

ABSTRACT

This study presents a novel approach for microbial biocalcification process. Microbial biocalfication process was combined with sand hardening with Sporosarcina pasteurii grown on agar plates. The effect of different CaCl2 concentrations (25 mM, 50 mM and 100 mM) and sand thickness (1mm, 5mm and 10 mm) was tested in duplicates. The agar assisted sand hardening was found as successful with optimum concentration of 50 mM CaCl2 and optimum thickness with 10 mm.

KEYWORDS - biocalcification, bio cement, agar, sand hardening

EFFECTS OF LINEAR TIME OF FLIGHT MASS SPECTROMETER ON TISSUE MOLECULAR ANALYSIS METHOD

***YASEMIN GUNDOGDU*[1] *, HAMDI SUKUR KILIC*[2]**

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

New Technologies give some opportunities to analysis some important and volatile chemicals and large biological samples for describing, analysing and also characterizing interested materials. Time of Flight (TOF) mass spectroscopy technique has shown some significant improvement continuously in time. At the present time, this technique is used to reveal the molecular characteristic properties of tissues. In this work, we have produced some datas from several tissue samples obtained using Femtosecond Laser Mass Spectrometry (FLMS) technique. These data gives some characteristics of different types of tissue samples and then they have been analysed by a computer based methods to distinguish them from each other. The aim of this study is to show tissue identification using laser based mass spectroscopy method. Obtained results from different tissue samples will be presented and discussed in detail.

KEYWORDS **-** Femtosecond, laser, tissue,mass spectroscopy

PREDICTION OF SEPSIS DISEASE BY ARTIFICIAL NEURAL NETWORKS

UMUT KAYA[1] , ATINC YILMAZ[2] , YALIM DIKMEN[3]

[1] Izmir Kavram Vocational College, Turkey ; [2] Beykent University, Turkey ; [3] Istanbul University, Turkey

ABSTRACT

Sepsis is a fatal condition, which affects at least 26 million people in the world every year that is resulted by an infection. For every 100,000 people, sepsis is seen in 149-240 of them and it has a mortality rate of 30%. The presence of infection in the patient is determined in order to diagnose the sepsis disease. If there is an infection in the patient, by using the results of various QSOFA and SOFA evaluations and measurements, it is determined whether the patient has sepsis or not. With the increased usage of artificial intelligence in the field of medicine, the early prediction of many diseases and the early treatment of the disease with these methods are provided. Considering the learning, reasoning and decision making abilities of artificial neural networks, which are the sub field of artificial intelligence are inferred to be used in predicting early stages of sepsis disease and determining the sepsis level is assessed. Therefore, in this study, it is aimed to reduce the patient losses by using multi-layered artificial neural network to early diagnose of sepsis. In constructed of artificial neural network model, feed forward back propagation network structure and Levenberg-Marquardt training algorithm are used. The input and output variables of the model are the parameters which doctors use to diagnose the sepsis disease and determine the level of sepsis. The proposed method aims to provide an alternative prediction model for the early detection of sepsis disease.

KEYWORDS - Sepsis, artificial intelligence, artificial neural networks, sepsis risk prediction.

E TRANSACTIONS SECURITY ANALYSIS

TAHAR MEKHAZNIA[1]

[1] Larbi Tebessi University, Algeria

ABSTRACT

It is seems hard to proceed with an online transaction and, in the meantime, to keep an appropriate confidentiality of exchanged data. The problem becomes more complex when transmitting sensitive information such passwords, private documents or card indications via public networks. The security of electronic transactions is handled by various distinct protocols. Actually, the most widely used protocols are, the Secure Electronic Transaction, Secure Socket Layer, Internet Protocol Security and the 3D secure which are adopted by numerous participants in various economic, industrial and financial areas. The paper focuses on a comparison and analysis of such protocols characteristics, namely: privacy, authenticity, encryption algorithm uses, etc. We discuss also the advantages and shortcoming of these secure transaction mechanisms.

KEYWORDS - e-transaction; SET; SSL; IPSec; 3D-Secure

CLASSIFICATION OF EEG SIGNALS BY USING TRANSFER LEARNING ON CONVOLUTIONAL NEURAL NETWORKS VIA SPECTROGRAM

***AHMET ESAD TOP*[1] , *HILAL KAYA*[2]**

[1] Ankara Yildirim Beyazit University, Turkey ; [2] Ankara Yildirim Beyazit University, Turkey

ABSTRACT

Previous studies on classifying Electroencephalography (EEG) sleep data generally use the signal itself. Many of these studies need series of pre-processing operations, manual feature extraction, complex and hard application processes. There is no need for lots of pre-processing stages in Convolutional Neural Networks (CNN) and features can be learned automatically instead of using manually extracted features. Also CNNs have better performance over most of other methods in visual classification. The study presented in this paper is based on applying transfer learning with CNNs via spectrogram images, that were obtained by using Short-Time Fourier Transform (STFT), on ISRUC-Sleep dataset (ISRUC) for classifying EEG signals. AlexNet trained with 100 patient subjects from ISRUC was used as pre-trained CNN. For classifying sleep stages, single-channel EEG data, that was taken from 10 healthy people, was used as target domain. To reduce overfitting, we employed an image translation operation and images were augmented horizontally. The main purpose of using transfer learning method in this study is achieving better training duration and accuracy. Applying transfer learning increased the accuracy of the classification by 3.11%, when compared to the result of using non-pretrained AlexNet, which was trained from scratch. For the evaluation of the proposed methodology, non-pretrained AlexNet and AlexNet trained with ImageNet were also performed on the same target domain and the results were compared. When the source domain of transfer learning was ImageNet, the accuracy was decreased by 2.73% compared to the result of training from scratch. Results showed that transfer learning increases the accuracy when target and source domains are similar, but it may decrease the accuracy when used on different domains (i.e., ImageNet includes images and ISRUC consists of signals).

KEYWORDS - Electroencephalography (EEG), Convolutional Neural Network (CNN), transfer learning, spectrogram, Short-Time Fourier Transform (STFT)

SPIRAL SEARCH OPTIMIZATION ALGORITHM APPLIED TO IIR DIGITAL FILTER DESIGN

OUADI ABDERRAHMANE[1] , BENTARZI HAMID[2]

[1] Igee Boumerdes University, Algeria ; [2] Igee Boumerdes University, Algeria

ABSTRACT

The digital filters are more forward, give better, faster, less error in the output. They can perform different operations that highly difficult to be pursued by analog filters. The types of digital filters are Infinite duration impulse response (IIR) filter and Finite duration impulse response (FIR) filter. An IIR filter that is unlike FIR has feedback and gives better response with less compatible cost. The IIR filter is suitable for lower order filter and found more targeted than FIR. In designing IIR filter, the main difficulty may be faced in the higher order. Therefore, in this research work, the spiral search optimization technique may be used for designing higher order IIR digital filters. It is considered in the design providing unimodal error objective function. It can be noted that the spiral search optimization algorithm has succeeded to converge to only global optimum.

KEYWORDS - Spiral Search Technique, Optimization, IIR digital filters, Unimodal error, Objective function.

AUTOMATIC LEARNING OF SEMANTIC RELATIONSHIPS FOR THE ONTOLOGY CONSTRUCTION APPLICATION ON ARABIC TEXT

BENABDALLAH ALI[1]

[1] Superior School Of Management Tlemcen, Algeria

ABSTRACT

Abstract—The construction of an ontology from a textual corpus begins with the extraction of concepts constituting this ontology, and these concepts will be linked by semantic relationships. In this paper, we propose an extraction approach of the most important elements of the ontology, based first on a statistical method of extraction of the terms which is called "repeated segments method", followed by the application of a weight filter to choose the most common terms. Then, in order to extract the semantic relationships linking the extracted concepts, we apply a machine learning technique based on a set of syntactic and semantic features of the sentences of the corpus. And finally we will discuss the results that can be obtained by applying our approach on a textual corpus of the Arabic language.

KEYWORDS - Extraction of semantic relations Artificial Learning ontology construction syntactic and semantic features Arabic Natural Language Processing

OBJECT RECOGNITION SYSTEM BASED ON ORIENTED FAST AND ROTATED BRIEF ORB FEATURES

AHMED MOHAMMED AHMED BAYATI[1] , ERSIN KAYA[2]

[1] Selcuk University Fen Bilimleri, Turkey ; [2] Selcuk University Fen Bilimleri, Turkey

ABSTRACT

Recently, Object recognition systems become more exciting research subject because of its applications in vast fields of life. However, to build a prosperous object recognition system that requires a low power consumption, high performance, and low computation cost, the feature extraction algorithm is critical to achieving such results. Recent advances in computer vision field lead to many approaches. The systems that based on local point features has become a widely accepted and used method over the last years. In this research paper, we introduce an object recognition system based on ORB (Oriented FAST and Rotated BRIEF) algorithm which is a robust option to SIFT and SURF if we concerning the performance and cost.

KEYWORDS - Keywords: Object recognition, ORB, BRIEF , FAST , Features matching.

ECG ARRHYTHMIAS CLASSIFICATION USING SVM CLASSIFIER

MUSTAFA ALGBURI[1] , ERSIN KAYA[2]

[1] Selcuk Univercity Fen Bilimleri, Turkey ; [2] Selcuk Univercity Fen Bilimleri, Turkey

ABSTRACT

Heart diseases are the leading cause of death around the world About 610,000 people die of heart disease in the United States every year, that is 1 in every four deaths. ECG Arrhythmia classification plays a significant rule in heart disease diagnosis. In recent years, ECG feature extraction techniques have attracted researchers around the world, and numerous approaches have been developed for ECG signal analysis. The proposed methods were mostly based on Artifical neural networks. In this research paper, we present a heart arrhythmias recognition technique based on SVM(Support vector machines) compared to KNN classifier and ECG R-R interval variations. The paper focuses on three arrhythmias. Ventricular bigeminy, Ventricular tachycardia, and Ventricular trigeminy. The data used is from the MIT-BIH dataset and apply the Pan-Tompkins QRS detection algorithm for R-R variations calculation. The proposed approach using SVM reach 98% recognition accuracy and KNN is 97% accuracy. Our proposed work can be used as a smartphone application with a wearable ECG monitor.

KEYWORDS **-** ECG,KNN,SVM,arrhythmias,HEART,ECG PATCH,Ventricular bigeminy, Ventricular tachycardia, Ventricular trigeminy.

ACTIVATION FUNCTIONS IN SINGLE HIDDEN LAYER FEED FORWARD NEURAL NETWORKS

ENDER SEVINC[1]

[1] University Of Turkish Aeronautical Association, Turkey

ABSTRACT

Especially in the last decade, Artificial Intelligence (AI) has gained increasing popularity as the neural networks represent incredibly exciting and powerful machine learning-based techniques that can solve many real-time problems. The learning capability of such systems is directly related with the evaluation methods used. In this study, the effectiveness of the calculation parameters in a Single-Hidden Layer Feed-forward Neural Networks (SLFNs) will be examined. We will present how important the selection of an activation function is in the learning stage. A lot of work is developed and presented for SLFNs up to now. Our study use one of the most commonly known learning algorithms, which is Extreme Learning Machine (ELM). Main task of an activation function is to map the input value of a neural network to the output node with a high learning or achievement rate. However, determining the correct activation function is not as simple as thought. First we try to show the effect of the activation functions on different datasets and then we propose a method for selection process of it due to the characteristic of any dataset. The results show that this process is providing a remarkably better performance and learning rate in a sample neural network.

KEYWORDS - Machine Learning, SLFN, ELM

TEMPORAL EXTENSIONS TO RDF

***DI WU*[1] *, ABDULLAH UZ TANSEL*[2]**

[1] The Graduate Center Cuny, United States ; [2] Pattaya Campus Thammasat University, Thailand

ABSTRACT

The Semantic Web is based on Resource Description Framework (RDF) which is widely used in practice. RDF represents information by only binary predicates. This simple representation scheme is the basis of an elaborate layers of methodologies, called Semantic Web Layer Cake. Though simple, it is very powerful for modeling data and basic knowledge. However, it is very limited in representing their temporal variation. Reification is the method proposed in RDF for modeling temporal changes in data and knowledge. Moreover, reification is cumbersome since it requires at least four more triples to represent just one temporal fact. By their very nature, RDF repositories are large in general and reification causes them to explode in size. In this paper, we review Semantic Web techniques that are proposed for representing temporal data in RDF.

KEYWORDS - Semantic Web, Temporal Data, Temporal Knowledge

PROVIDING CONTEXT AWARE SERVICES TO DEMENTIA PATIENTS AND CAREGIVERS

OZGUN YILMAZ[1]

[1] Ege University, Turkey

ABSTRACT

As a result of increased human lifespan, dementia becomes a national public health and social care priority worldwide. Although, there is no cure for dementia, the wandering behavior of dementia patients can be managed by an ambient assisted living system. In this paper, Wandering Behavior Ontology (WBO) used for dealing with wandering behavior seen in early stage dementia patients is proposed. WBO is used in iCarus, which is an intelligent ambient assisted living system, for providing context-aware services to dementia patients and their caregivers. Knowledge sharing, knowledge reuse and logical reasoning are provided by using ontologies. iCarus aims to reduce the problems and financial burden associated with a wandering episode for the patients and their caregivers. It provides longer independent living for the elderly people and a cost-effective way of remotely monitoring them. The actions that are to be taken are determined by rule-based reasoning. These actions are sequential and they are defined in the developed ontology. These actions include warning the patient and informing the caregiver and the emergency service.

KEYWORDS - Context-awareness, Rule-based reasoning, Ambient Intelligence, Ambient Assisted Living

FUZZY LOGIC BASED CONTROLLER DESIGN FOR CONTROL OF VENTILATION SYSTEMS

ILKAY CINAR[1] , ILKER ALI OZKAN[2] , MURAT KOKLU[3]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey ; [3] Selcuk University, Turkey

ABSTRACT

The health and productivity of living things in closed areas is directly related to indoor air quality. In order to prevent the deterioration of indoor air quality, ventilation systems that enable the transfer of clean air to the inner environment or ventilation systems that enable the transfer the delivery of carbon dioxide gas to the outer environment are widely used. In cases where ventilation systems are inadequate, the increase in the amount of carbon dioxide and carbon monoxide in the inner environment can damage human health. In addition, obtaining the level of external environment with excessive ventilation can lead to unnecessary energy consumption. In this study, a system that absorbs air from the environment using carbon dioxide, oxygen and carbon monoxide values in ambient air and controls the operation of the ventilation system that gives fresh air to the environment is designed with fuzzy logic method. The overall purpose of the system is to achieve the ideal ventilation level. Two separate ventilation valves were controlled at the same time with the fuzzy control system designed in the study. The fuzzy control system was created with MATLAB Fuzzy Logic Toolbox and the operating structure of the control system had analyzed.

KEYWORDS - Fuzzy logic control, ventilation systems, closed areas

COSTS AND CO BENEFITS OF PASSIVE HOUSES ANKARA RESIDENTIAL SECTOR

GUL NIHAL GUGUL[1]

[1] Selcuk University, Turkey

ABSTRACT

The number of single detached houses are increasing parallel to the rapid increase in population and economic growth in Ankara, Turkey where building energy standardization level is not sufficient. For this reason, energy savings in residential sector is of high significance. Passive Houses are buildings with low heating demand (below 15 kW h/m2 year), with comfortable indoor conditions. However, in order to achieve passive house target in addition to technical knowledge, cost and co-benefit analyses should be done to prove practicality. This paper investigates the economic feasibility and co-benefits of passive houses in Ankara climate. Costs of energy efficiency investments such as high insulation, improved architectural design, air tightness and heating systems are evaluated. The cost analysis in this study is conducted for newly build homes and by using cutting edge technology. The paper also shows, for the first time, the reason of low tendency to passive houses in Turkey.

KEYWORDS **-** Passive house, Economic analyses, Residential energy

FEASIBILITY STUDY OF A PASSIVE HOUSE ANKARA CASE

GUL NIHAL GUGUL[1]

[1] Selcuk University, Turkey

ABSTRACT

The amount of residential energy consumption has a significant share over final energy consumption in Turkey and increasing parallel to the rapid increase in population, economic growth and the number of houses. For this reason, energy savings in residential sector is of great importance in Turkey. In this study, technical feasibility study of a single detached "Passive House" located in Ankara, Turkey is investigated using building energy simulation software. House is developed to draw advantage from sun in maximum level with convenient shape, color and window/wall ratio. House has high insulation level and low air tightness The space heating demand of the 3 bedroom, 120 m2 single detached house is estimated as 6,2 kWh/m2-year, overcompensating the "15 kWh/m2-year" Passive House target sufficiently. The primary energy demand is calculated as 30,8 kWh/m2, marginally below the 120 kWh/m2 target.

KEYWORDS - Passive house, Low energy buildings,Energy efficiency,Simulation

FUSION OF SMARTPHONE AND SMARTWATCH SENSORS FOR SMOKING RECOGNITION

SUMEYYE AGAC[1] , MUHAMMAD SHOAIB[2] , OZLEM DURMAZ INCEL[3]

[1] Galatasaray University, Turkey ; [2] University Of Twente, Netherlands ; [3] Galatasaray University, Turkey

ABSTRACT

Human activity recognition using different types of sensors is used for many applications, such as well-being. Motion sensors integrated in smartphone and smartwatch devices are suitable platforms to recognize daily activities. In this paper, the objective is to recognize some activities where hand movements play an important role, such as smoking and eating. We use a dataset of 45 hours collected from 11 participants. The dataset includes both simple activities, such as sitting and standing, and complex activities, such as smoking while walking and drinking while standing. In total, we have ten different activities in our dataset and most of them have similar patterns. We use accelerometer and gyroscope sensors available on smart phones and smart watches, which are commonly used motion sensors. We first determine the high impact features in order to reduce the number of features and choose the most efficient ones, by applying feature selection algorithms. We use random forest classifier to determine the impact of using smartwatch sensors alone, smartphone sensors alone and the fusion of two on the recognition performance of activities. The results show that fusion of the sensors on the two devices increases recognition performance of the considered activities. By using sensors from both devices, we achieve an increase of 21%, 43%, 44% and 5% for smoking related, drinking related, eating and simple (sitting, standing and walking) activities respectively, compared to using only phone sensors.

KEYWORDS **-** Activity recognition, wearable computing, motion sensors

SMARTPHONE BASED ACTIVITY RECOGNITION USING K NEAREST NEIGHBOR ALGORITHM

ALMONTAZER MANDONG[1] , USAMA MUNIR[2]

[1] Karadeniz Technical University, Turkey ; [2] Karadeniz Technical University, Turkey

ABSTRACT

Activity recognition of smartphone-based accelerometer sensor data using k-Nearest Neighbor (kNN) algorithm was studied. MATLAB is used in order to extract the data features (Mean, Median, Standard Deviation, Variance, Minimum Value and Maximum Value) and a sliding window algorithm with an overlap of 50% every 2.56 seconds. Data classification using kNN algorithm was done by using WEKA knowledge analysis software. An accuracy of 97.9769% was achieved by using kNN algorithm with k value of 3. A root mean squared error of 0.08, mean absolute error of 0.0101, and a relative absolute error of 3.6861% was also achieved during the process. kNN algorithm demonstrated to be an exceptional algorithm with high accuracy and low statistical error in predicting/classifying periodic daily activities such as walking, sitting, lying down and others.

KEYWORDS - Activity Recognition, Machine Learning, Sensors, Artificial Intelligence, Data Analysis.

RECOGNITION OF SIGN LANGUAGE USING CONVOLUTIONAL NEURAL NETWORKS

MUCAHID MUSTAFA SARITAS[1] *, ILKER ALI OZKAN*[2]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

Hearing impaired people use sign language consisting of hand gestures for communication. It is important that individuals with hearing impairments communicate effectively in order to ensure their participation in society and to improve their quality of life. Efforts are currently underway to develop effective communication tools to help the social interaction of hearing-impaired people. In this study, a convolutional Neural Network (CNN) based application has been proposed to recognize the sign language with numbers with maximum efficiency. Automatic feature extraction and classification was performed using this proposed CNN model. With the proposed model, a classification success of 97.63% was achieved with 5-fold cross verification.

KEYWORDS - Deep Learning, CNN, Sign Language Recognition

THE EFFECT OF MAXIMUM AGGREGATE GRAIN DIAMETER ON THE MIX DESIGN AND COMPRESSIVE STRENGTH OF CONCRETE AND ARTIFICIAL NEURAL NETWORKS ANN APPLICATION

MEHMET PARLAR[1] , ULKU SULTAN KESKIN[2] , GULAY TEZEL[3]

[1] The Institute Of Sciences Of Konya Tecnical University, Turkey ; [2] The Institute Of Sciences Of Konya Tecnical University, Turkey ; [3] The Institute Of Sciences Of Konya Tecnical University, Turkey

ABSTRACT

Concrete is the primary material used for the construction of buildings with significant importance for human life, such as power plants, airports, ports, buildings, and bridges all over the world. The construction materials are produced by mixing cement, aggregate, water and, in some cases, additives and minerals with certain ratios considering the preconceived design. In connection with concrete production that can meet different needs with low costs, the types, properties and mixing ratios of the materials forming the concrete are of great importance. For this reason, various experimental studies have been carried out in this area all over the world and are still carried out. In this study, concrete production was carried out by using aggregates of four different maximum diameters (Dmax = 32mm, Dmax = 22.4mm, Dmax = 16mm, Dmax = 8mm) with 300 and 400 doses of cement in constant water/cement ratio. The mixture grain-size curves of the aggregates were determined to provide the reference curves separately for each aggregate mixture in each maximum grain size, and the aggregates were used according to the determined rates. At first, the fresh concrete tests such as unit weight test and slump test were conducted on the produced concrete. In total 8 groups, 96 specimens with 15x15x15 cm sizes were subjected to the standard compression test after 7 and 28 days. Some of the samples were cured in site conditions until the 7th and 28th day while some of them were cured in the laboratory environment. On-site curing, the curing was performed by irrigating in the morning and evening, twice a day for 3 days after the samples were removed from the form, and then they were left in room temperature until the 7th and 28th days. It is aimed to observe the effects of the maximum aggregate diameter and cement content used in concrete and the curing conditions exposed to concrete to properties such as concrete strength and unit weight by looking at the data obtained after the experimental studies. The following conclusions were deduced on the relationship between the properties of the concrete, and the effects of these concrete properties on each other were observed. ♣ Maximum aggregate grain size - concrete unit weight ♣ Maximum aggregate grain size - concrete strength ♣ Maximum aggregate grain size - concrete mix design ♣ Maximum aggregate grain Size - concrete compactness ♣ Maximum aggregate grain Size - concrete's compressive strength speed ♣ Cement content - compressive strength ♣ Cement content - concrete unit weight ♣ Cement content - concrete's compressive strength speed ♣ Concrete curing conditions - compressive strength ♣ Concrete curing conditions - hardened concrete unit weight ♣ Concrete unit weight - compressive strength Furthermore, in this study, it was aimed to model experimentally obtained concrete strength data with Artificial Neural Networks (ANN). The purpose of the modeling is to minimize time loss, cost and possible errors in experimental studies. The sample type determined by experimentally measured mix, maximum aggregate grain size, cement content, concrete curing conditions, hardened concrete unit weight, fresh concrete unit weight, concrete slump value and the number of waiting days were used as the input parameters to estimate the strength of concrete samples that are the output parameters of the targeted model in the most accurate way. In order to find the best prediction model, the experiments were performed and Mean Absolute Error (MEA), Mean Square Error (MSE) and R2 performance benchmarks were selected to compare the success of models and the most successful result was obtained with two-tiered ANN. According to the obtained results, the R2 value of the model in the test phase was 0.838.

KEYWORDS - Concrete Mix Design, Maximum Aggregate Grain Diameter, Concrete Cure, Concrete Compressive Strength, Concrete Unit Weight, Cement Content, Artificial Neural Networks (ANN)

INVESTIGATION OF DIFFERENT REINFORCED CONCRETE FLOORING AND DIFFERENT BUILDING FOUNDATION SYSTEM SOLUTIONS IN TERMS OF BUILDING COST

MUSTAFA ALTIN[1]

[1] Konya Technical University, Turkey

ABSTRACT

Computer Aided Design (CAD) programs have entered a very rapid improvement process with support of artificial intelligence. The development of computer hardware systems also affects CAD programs. Development of computer hardware provides to get fast and safe results, to present economic solutions, to prepare as many alternatives as possible and most significantly to calculate the optimum cost for designed projects. The most essential subject in stage of preparation of the design is to prepare the safest, economical and aesthetic system without making concessions. The choice of construction system for construction in the project stage, preparation of projects according to different production systems and obtaining the most cost-effective materials by preparing the quantities are the priority subjects for the producer companies. In this study, commonly used CAD program in Turkey the IdeCAD Structural ver. 8.62 was used and for a light weighted workshop both architectural and reinforced statics project was prepared. Three different flooring systems are considered for the reinforced statics project. These are normal flooring, ribbed (filler-joist floor) flooring and Beamless flooring. Continuously and Spread foundation preferences were evaluated as the building basement system. Separately reinforced concrete static projects were prepared in accordance with current regulations. For all alternatives, concrete, mold and reinforcement quantities were prepared very quickly with the CAD program and cost analyzes were made at the current unit prices. All prepared alternatives have been compared and construction of the building by using normal flooring system and Spread foundation is decided as the most appropriate choice and recommendations are made.

KEYWORDS - Reinforced Concrete Flooring,Building Foundation System,Building Cost ,Computer Aided Design

PYRAMID SHAPED NET ZERO ENERGY DORMITORY BUILDING DESIGN

MUSTAFA ALTIN[1] *, GUL NIHAL GUGUL*[2]

[1] Konya Technical University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

Pyramid shaped buildings take advantage of solar radiation and day light further more compared to traditional buildings. In this study a pyramid shaped net zero energy passive dormitory building is designed and system requirements of the building is calculated. Heating, electricity and hot water demand of the dormitory building is supplied by PV/T panels integrated on exterior wall of the building. Electricity consumption of the dormitory is estimated as 286 kWh/day whereas heating demand is calculated as 62 MWh/day. The PV/T system to raise this building to net zero energy building standard is calculated as nearly 8500 kW system composed of 34 PV panels with an area of 85 m2 coated on exterior wall.

KEYWORDS - Net zero building, Energy, Building Design, Pyramid

REGISTRATION AND AUTHENTICATION CRYPTOSYSTEM USING THE PENTOR AND ULTRAPENTOR OPERATORS

ARTAN LUMA[1] , BESNIK SELIMI[2] , BLERTON ABAZI[3]

[1] South East European University, Macedonia ; [2] South East European University, Macedonia ; [3] Ubt Kosovo, Macedonia

ABSTRACT

Any Internet banking system must solve the issues of authentication, confidentiality, integrity, and no repudiation, which means it must ensure that only qualified people can access an Internet banking account, that the information viewed remains private and can't be modified by third parties. However, this kind of approach does not involve image encryption and their safe storage for avoiding direct compromise of the data used for authentication and identification. Other work involves the definition of a strict authentication system by introducing a multi-level authentication technique that generates a password in multilevel instances for accessing and using cloud services inside of which, an e-mail cloud service can reside as well. In our research we will present a new approach on how the cryptosystems will validate the registration and authentication process using the mathematical pentor and ultrapentor operators. The paper will be followed by a concrete example of implementation with a detailed explanation through which we will defend our approach. In this section, you will briefly describe the project / dissertation based on which this manuscript has been prepared. You can mention the motivation that led you to take up this project and its objectives.

KEYWORDS - authentication; identification; cryptosystems; cryptography; pentor operator; ultrapentor operator; information security; cyber attacks

COMPARISION OF MATURITY MODEL FRAMEWORKS IN INFORMATION SECURITY AND THEIR IMPLEMENTATION

ARTAN LUMA[1] , BESNIK SELIMI[2] , BLERTON ABAZI[3] , MENTOR HAMITI[4]

[1] South East European University, Macedonia ; [2] South East European University, Macedonia ; [3] Ubt Kosovo, Macedonia ; [4] South East European University, Macedonia

ABSTRACT

Data is the key element of most businesses today and the volume of data continues to grow by 50% a year, along with an increase in server numbers by 20% a year. Data center grows in the same way, the risk of data manipulation opportunities increases. Rapid development of information technology and the transformation of society and digital businesses has made the need for data security to grow tremendously. Nowadays we face with more and more information security challenges. Information security ensures that within the enterprise, information is protected against disclosure to unauthorized users (confidentiality), improper modification (integrity), and non- access when required (availability). Companies that are responsible for information security, continuously develop systems and update the existing systems in order to provide secure solutions on the market and as well to have system readiness from eventual attacks. Risk assessment, however, assumes risk measurement without it is difficult for organizations to identify or measure the level of risk and as such its exposure would undermine the organization's security. Organizations that have an undefined status in relation to risk measurement are potentially vulnerable to possible attacks. Risk assessment is directly linked to the metrics. To protect the system in advance we need to identify what to protect, what should we protect and how to protect it. Information security assessment allows an organization to "recognize itself" about their risk exposures. Our main research goal on the paper is to provide a comparison and new approach to the frameworks of maturity model in the field of information security.

KEYWORDS - information security, maturity model, confidentiality, risk assessment, framework.

A FUZZY CONTROL SYSTEM DESIGN ACCORDING TO THE DEVELOPMENT PERIODS OF THE CULTIVATED MUSHROOMS

VILDAN EVREN[1] , ABDULKADIR SADAY[2] , ILKER ALI OZKAN[3]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey ; [3] Selcuk University, Turkey

ABSTRACT

Determination of the indoor air quality of the cultivation medium in the cultivation of mushroom affects the production efficiency of mushrooms. Ventilation systems in the cultivation of mushrooms are widely used to provide the desired temperature and humidity values. The optimal temperature and humidity values for cultivation vary depending on the period. In different periods, the optimum temperature and humidity values can be controlled by controlling the ventilation system for optimum cultivation and it is important to affect the production quality and efficiency. In this study, a fuzzy control system design was made according to two different development periods of the cultivated mushroom.

KEYWORDS **-** Cultivated mushroom cultivation, Fuzzy Expert System design, Fuzzy control system

COMPARATIVE STUDY ON AUTOMATIC SPEECH RECOGNITION

***ARZO MAHMOOD*[1] *, ERSIN KAYA*[2]**

[1] Konya Technical University, Iraq ; [2] Konya Technical University, Turkey

ABSTRACT

Speech is a tools used as a means of communication between society. Along with the developing technology, various methods have been proposed to enable people to communicate and interact with the machines. In this study, Mel Frequency Cepstral Coefficients and Pitch Feature were obtained from the data set consisting of ten classes with different speakers. The obtained features were compared with classification achievements using k-Nearest Neighbor (KNN), Decision Tree (DT) and Quadratic Discriminant Analysis (QDA) classifiers. Furthermore, sensitivity of classifiers used with different numbers of training data is presented.

KEYWORDS - Speech Recognition, Mel Frequency Cepstral Coefficients, k-Nearest Neighbor, Decision Tree, Quadratic Discriminant Analysis.

COMPARISON OF VARIOUS MACHINE LEARNING METHODS ON WART TREATMENT PERFORMANCE OF CRYOTHERAPY

KADIR SABANCI[1] , MURAT KOKLU[2] , MUHAMMED FAHRI UNLERSEN[3]

[1] Karamanoglu Mehmetbey University, Turkey ; [2] Selcuk University, Turkey ; [3] Necmettin Erbakan University, Turkey

ABSTRACT

Warts are skin growths that are caused by the human papillomavirus (HPV). HPV stimulates quick growth of cells on the skin's outer layer. Most common warts go away without treatment, though it may take a year or two and new ones may develop nearby. It is more comfortable to perform wart treatment under a professional supervision because of the reasons that the treatment does not give results at home, the warts are aesthetically and physically disturbing and prone to spread. The goals of treatment are to destroy the wart. There are various methods of wart treatment. These treatments can be listed in basic concepts like Stronger peeling medicine (salicylic acid), Freezing (cryotherapy), Other acids, Minor surgery, and Laser treatment. Although the treatment method decision depends on the doctor's opinion, a system that presents the treatment success rate by using the basic characteristics of the patient and the wart can be useful for doctors. In this study, a success rate calculation system of cryotherapy treatment on warts is performed. For this purpose various machine learning methods are investigated and the most effective results are presented. The results present that the best performance of treatment result estimation is achieved as %91.24.

KEYWORDS - Machine Learning Methods, MLP, KNN, KStar, Wart Treatment.

EXAMINATION OF MACHINE LEARNING METHODS IN HAND POSTURE ESTIMATION

***MUHAMMED FAHRI UNLERSEN*[1] *, MURAT KOKLU*[2] *, KADIR SABANCI*[3]**

[1] Necmettin Erbakan University, Turkey ; [2] Selcuk University, Turkey ; [3] Karamanoglu Mehmetbey University, Turkey

ABSTRACT

In this paper, a static hand posture identification is investigated. A dataset created by Vicon motion capture camera system is obtained from University of California, Irvine Machine Learning Repository. The dataset consists of unlabeled point sets which are reflective marker positions on the glove worn by a user. On each finger, there are 2 reflective points. And there is one more reflective point on the middle of the glove. Totally there are 11 reflective points on the glove. There is five hand posture in the dataset for different users. Totally there are 78095 records in the dataset. But in each posture, all of the reflective points' coordinates cannot be collected. So in the dataset, some coordinates are marked as unknown. In order to evaluate the machine learning methods, the number of attributes on each record needs to be equal. For this purpose, some manipulations are done on the dataset. For achieving the best estimation performance various machine learning methods are tested. The dataset is divided into two groups as training and testing with the ratio of %66 and %34 respectively. In the result of the test, the Random Forest method produced the best performance with 98.38% correctly classified instance. This success is followed by MLP and Knn Methods with success rates of 96.02% and 95.53% respectively.

KEYWORDS - Machine Learning, Classification, Hand Postures, Remote sensing.

ULTRA LOW COST WIRELESS SENSOR NETWORK NODE DESIGN FOR EDUCATIONAL USE

AYHAN AKBAS[1]

[1] University Of Turkish Aeronautical Association, Turkey

ABSTRACT

Wireless Sensor Networks (WSN), as a popular hot topic, are attracting many researchers to investigate the challenges encountered during the deployment, operation or design phase of the wireless sensor networks. Hence, universities all around the world have already started undergraduate courses on WSNs and established WSN laboratories to practice the theoretical knowledge taught. In this paper, a design is proposed to meet the need for a WSN node for lab use, fulfilling design requirements of a wireless sensor node. Though WSN node designers usually focus on the energy efficiency to achieve maximum possible network lifetime, we have considered of secondary importance since the main goal is to achieve a WSN node design to practice the WSN strategies and protocols in lab environment at the lowest cost possible. In the paper, we present a novel WSN node design under \$10 for educational purposes employing ultra-low cost STM8S105C6 MCU of ST STMicroelectronics and Si4432 based RF transceiver.

KEYWORDS - Wireless Sensor Networks, Sensor Node Design, STM8S105C6, Si4432, DRF4432F20

PERFORMANCE ESTIMATION OF SORTING ALGORITHMS UNDER DIFFERENT PLATFORMS AND ENVIRONMENTS

MENTOR HAMITI[1] , ELISSA MOLLAKUQE[2] , SAMEDIN KRRABAJ[3] , ARSIM SUSURI[4]

[1] South East European University, Macedonia ; [2] University Of Prizren, Other Country ; [3] University Of Prizren, Other Country ; [4] University Of Prizren, Other Country

ABSTRACT

Sorting data is the ordering of data in a regular way, such as: from the largest value to the smallest value or vice versa. The research object is to implement five sorting algorithms on several computer platforms and specific environments, which will bring us some conclusions. The research object has been analyzed in terms of performance and are addressed in which computer architecture is most appropriate.

KEYWORDS - sorting, sorting algorithms, performance, programming language, processor

THE EFFECT OF BALANCING PROCESS ON CLASSIFYING UNBALANCING DATA SET

SAMARA JWAIR[1] , ERSIN KAYA[2]

[1] Konya Technical University, Iraq ; [2] Konya Technical University, Turkey

ABSTRACT

Unbalanced data indicates a situation where the number of monitoring is not the same for all categories in the label data set. In some fields, unbalanced data problems are very common. Some of machine learning classifiers failed to deal with unbalanced training data sets because they are sensitive to the proportions of different classes. As a result, these algorithms tend to favor the class with the largest proportion of observations known as the majority class, which may lead to misleading accuracy. Most of data sets are unbalanced because most of the data collected over the diseases are usually not disease. These data when used in the classification algorithm it gave un-well results, the data sets used in the training process must be balanced to increase this success. In this article, (SMOTE) synthetic minority over-sampling technique is used on data sets. K-Nearest Neighbors (K-NN), and Naïve Bayes (NB) classification algorithms are applied to classify the balanced datasets and according to the obtained classification results the balanced data sets achieved a better classification success.

KEYWORDS - Unbalanced data, SMOTE, K-NN, NB, classification.

MAPPING LOCATION OF A SUSPECT BY USING FORENSIC IMAGES TAKEN WITH THEIR OWN MOBILE PHONE

KERIM KURSAT CEVIK[1] , FARUK SULEYMAN BERBER[2] , ECIR UGUR KUCUKSILLE[3]

[1] Akdeniz University, Turkey ; [2] Suleyman Demirel University, Turkey ; [3] Suleyman Demirel University, Turkey

ABSTRACT

The location information of photos taken with today's mobile phones is stored in the same photo file with a structure called exif. With the software developed in this study, an analysis of the places where the suspect was in the past is carried out by reviewing location information on photos of suspects' mobile phones. With this process, suspect's location map is drawn based on dates. In addition, photos whose location information were deleted or modified using anti-digital forensic techniques or photos without location information can also be used to map the suspect's location. In this regard, an original study has been carried out. In this study, 1582 photographs with location information and 268 photographs without location information, which were obtained from a mobile phone and which were taken between 01.01.2018 and 31.06.2018 were used as data set. This data set was subjected to classification using CNN (Convolutional Neural Network) and it was determined that the same class images were taken at the same place. As a result of the information obtained, all the photographs are shown in application designed in this study by marking them on the map. The digital evidence examined by the software and findings obtained have been presented in this study.

KEYWORDS - Digital forensics, Anti digital forensics, forensics software, exif, gps location, mapping, deep learning.

TWO DIMENSIONAL MEASUREMENT SYSTEM FOR PVC PROFILES VIA IMAGE PROCESSING

***MURAT AKDOGAN*[1] *, SULEYMAN YALDIZ*[2]**

[1] Selcuk University Technology Faculty Graduate School Of Natural And Applied Sciences, Turkey ; [2] Selcuk University Technology Faculty Graduate School Of Natural And Applied Sciences, Turkey

ABSTRACT

With technological advances in cameras and machine vision algorithms, many vision based measurement systems are now available in variety of industrial application [6]. Today, machine vision systems are widely used in the mass production. Image processing based computer vision applications use many different areas. In one of the works carried out for this purpose, digital image processing technology to measure geometrical size's of Pvc profile is used. Aiming at the problems in dimension measuring of extruded pvc profile, a real-time detection system is developed based on machine vision. The present work focuses on measurement of wall thickness of extruded pvc profiles through image processing technique. For this, a experimental setup has been prepared to hold digital camera in a fixed plane to capture the images of pvc profiles which help to get more accurate wall thickness results using image processing. This work has been done for measurement of up, down, left and right wall thickness of pvc profiles. The images are captured by using high resolution digital camera which are fixed in the experimental setup. OpenCV programming function was utilized in Python scripting language to perform image processing. So the high resolution captured images of profile are processed a sequential operations which are correcting defective images caused by working environment. And then developed image processing algorithms are applied to measurement of profile wall thickness. Finally, the geometrical sizes of profile are measured based on the calibration parameters information of the developed system. The acquiring results are compared with the results obtained by conventional systems. Dimension Control System decrease the non-standard profiles production and minimize the unnecessary consumption of raw materials.

KEYWORDS - Camera calibration, Quality Control, Image Processing, Measurement.

PROJECT DEVELOPMENT WITH SERVICE ORIENTED ARCHITECTURE

***RIDVAN SARACOGLU*[1] *, EMINE DOGAC*[2]

[1] Van Yuzuncu Yil University, Turkey ; [2] Van Yuzuncu Yil University, Turkey

ABSTRACT

In organizations that have more than one automation system, the modules / functions of the applications should be able to be used by other applications. The use of a service-oriented architecture (SOA) approach, which is designed to achieve this, is the focus of this study. It is important to simplify and standardize the automation services given to organizations. specific solutions to organizations should be modelled / analyzed easily. If more than one institution or organization is hosted in the same database, it is possible to reduce costs by using service-oriented architecture. It is ensured that the Information Technology (IT) departments of organizations increase their dominance over automation. In this way, the infrastructure will be created to support the production of new projects within the Corporation. With the programs of different companies within the institution and organization, it is ensured that integration opportunities are created in an independent manner.

KEYWORDS **-** information technology ,service-oriented architecture ,software development

MODEL DEVELOPMENT FOR ESTIMATION OF TRAFFIC ACCIDENTS WITH METAHEURISTIC ALGORITHMS

***AHMET OZKIS*[1] , *TAHIR SAG*[2]**

[1] Konya Technical University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

In this study, mathematical models have been developed to estimate number of traffic accidents, injuries and fatalities occurred in Turkey between 2002 and 2014. In order to determine the appropriate values of three weight factors of these models, well-known metaheuristic algorithms, PSO and ABC, were used. Mean absolute errors (MAE) between the observed and estimated data were addressed as objective function and aimed to be minimize. The comparison of the obtained results show that the prediction successes of the ABC models are higher than that of the PSO models.

KEYWORDS - Artificial bee colony, Estimation of traffic accidents, Nonlinear regression, Particle swarm optimization

MONITORING ANDROID USERS ACTIVITIES KEYLOGGER APP

***AHMET CALISKAN*[1] *, SAKIR TASDEMIR*[2]**

[1] Kuveyt Turk Participation Bank Research Development Center Kocaeli, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

Nowadays the use of mobile devices has increased considerably. The increase in the number of mobile application users leads to increased interest in mobile application development. In this study, a keylogger application that to work on Android smartphones was developed for mobile security awareness. The device user's all keystrokes will be saved. These records can be monitored remotely on the admin device. There are currently similar apps on the Google Play Store. Many of these applications on Play Store perform keylogger function by using their own application keyboard instead of device keyboard. In this study, the new keyboard has not been developed. Keystrokes of the user these using the device keyboard are stored in the database on the server. This application on the administrator device allows remote monitoring.

KEYWORDS - Android, Mobile, Keylogger, Spyware

ARTIFICIAL NEURAL NETWORK AND AN APPLICATION IN BUSINESS FIELD

ISMAIL AHMET KURUOZ[1] *, SAKIR TASDEMIR*[2]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

In today's world, information technologies are integrated into all vital and social elements. Besides, these technologies are attractive for the people of all ages. Each business has a life span like human beings and it is impossible for the businesses to adapt the competition and/or to survive by keeping away from the information technologies. The developments like artificial intelligence, expert systems and artificial neural networks (ANN), which provide future estimation to the businesses as well as aim the optimization of the conducted processes, are irreplaceable for these businesses. ANN, one of these techniques, has been started to be used frequently in business life thanks to the its success in producing solutions. In this study, general information about ANN is given, general information about business and types of businesses are explained and an example of ANN application is performed after literature research. To exemplify ANN, TOPSIS (The Technique for Order of Preference by Similarity to Ideal Solution) method of participation banks is applied to ANN in order to predict 2017 4th quarter data and performance is sorted. Based on the results, chosen banks are affected by the factors such as crises, exchange rate etc. and thus, it is detected that their performances are depended on extrinsic factors.

KEYWORDS - Business, Artificial Neural Network, Financial Failure Prediction

GAS ROBOT IMPLEMENTATION AND CONTOL

ALI MARDAN HAMEED QUTUB[1] *, ISMAIL SARITAS*[2]

[1] Institute Of Sciences, Iraq ; [2] Institute Of Sciences, Turkey

ABSTRACT

- Gas is one of the four basic forms of issue. A pure gas can be composed of individual molecules, simple molecules coming from a variety of atoms, or compound molecules coming from various atom. The gas admixture may have a wide kind of clear gases, similar as air. What dividing gas and solid solid per unit of gas particles by large spaces. These separations is generally an invisible uncolored gas for the human viewer. In our daily life, both domestic and industrial gas usage is becoming widespread and becoming one of the indispensable sources of energy in our lives. Gas leakage means that native gas or differents gases products leak of a pipelines or anothers container to the staying space either each another space where the gases shouldn't will be present. The fiery gases be possible make explode when submitted to fire and sparks, which is so risky for the public.

KEYWORDS - Methan, Benzin, LPG, Gas robot, Control.

COMPARISON OF AGILE SOFTWARE DEVELOPMENT AND TRADITIONAL SOFTWARE DEVELOPMENT IN TURKEY

CIHAN UNAL[1] , FATIH BASCIFTCI[2] , CEMIL SUNGUR[3]

[1] Institute Of Science And Technology, Turkey ; [2] Technology Faculty, Turkey ; [3] Faculty Of Engineering, Turkey

ABSTRACT

Agile approaches are the general name of the methods used to answer quickly to the need of change encountered late during the software development stages. Agile methodologies assist market demands faster by supporting various organizations and developing projects. Agile test strategy is the most suitable method for Information Technologies (IT). In this work, by focusing more on Agile software testing concept, agile software testing and traditional software methodologies are compared.

KEYWORDS - Software development methods, agile software development, traditional software development, software industry implementations in Turkey.

EPILEPTIC SEIZURE CLASSIFICATION USING SUPPORT VECTOR MACHINES

***BURAK TEZCAN*[1] *, ILKER ALI OZKAN*[2] *, SAKIR TASDEMIR*[3]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey ; [3] Selcuk University, Turkey

ABSTRACT

Epilepsy is one of the most common brain disorders affecting millions of people. Epileptic seizures can have many trigger factors such as genetics, brain damage etc. and can occur without warning. Epileptic people have spasms during the seizure that might result in serious injuries. Therefore, the detection of epilepsy and classification on seizure signals are carries an important role in neurology. Electroencephalogram (EEG) is widely used for diagnosis of epileptic seizures. In this work, Support Vector Machines (SVM) are used for the classification of epileptic seizures in EEG signals. The dataset is a highly popular epileptic seizure detection dataset from Bonn University. SVM performance highly depends on its parameters. Crow Search Algorithm (CSA) has been used for the parameter optimization of SVMs. CSA-SVM has achieved seizure detection rate of 98.69% accuracy.

KEYWORDS - Support Vector Machine, Classification, EEG, Epilepsy, Metaheuristics

GERMAN CREDIT RISKS CLASSIFICATION USING SUPPORT VECTOR MACHINES

***BURAK TEZCAN*[1] *, SAKIR TASDEMIR*[2]**

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

Support Vector Machines (SVM) is one of the most popular classification algorithms. SVM penalty parameter and the kernel parameters have high impact over the classification performance and the complexity of the algorithm. So, this brings the problem of choosing the suitable values for SVM parameters. This problem can be solved using meta-heuristic optimization algorithms. Salp Swarm Algorithm (SSA) and Crow Search Algorithm (CSA) are new meta-heuristic algorithms. SSA is a swarm algorithm that is inspired from a mechanism salps forming in deep ocean called salp chain. CSA algorithm is inspired by the intelligent behavior of crows. In this paper, SVM parameter optimization is done using SSA and CSA. German Credit dataset from the UCI data repository is used for the experiments. All experiments results are gathered from a 10-fold cross validation block. Evaluation criteria determined as accuracy, sensitivity, specificity and AUC. SSA and CSA gave accuracy results of 0.72±4.62 and 0.71±3.53 respectively. Also, ROC curves and box plots of the algorithms are given. CSA algorithm draws better graphs.

KEYWORDS - Support Vector Machines, Optimization, Parameter, Metaheuristics

A CLUSTERING PROBLEM WITH GAUSSIAN MIXTURE MODEL BASED ON EXPECTATION MAXIMIZATION

EBRU PEKEL[1] , ERDAL KILIC[2]

[1] Ondokuz Mayis University, Turkey ; [2] Ondokuz Mayis University, Turkey

ABSTRACT

Progressive technology, the development of the industry and the lack of protective precaution, and the responsibility for the uneducated employees are the main causes of work accidents. In this study, work accidents are clustered by taking into consideration the types of injuries, the effects of the injuries on the body and types of the accidents via Gaussian Mixture Model (GMM). The Gaussian mixture model (GMM) is a clustering method based on the Bayesian approach. In this study, work accidents were divided into classes by GMM. GMM were constructed on a dataset from an international construction company. According to the experimental results, it's explicit that it is possible to distinguish three groups by considering their own characteristic similarities of the work accidents. To cluster work accidents will play an important role in creating a policy of prevention in a workshop.

KEYWORDS - Gaussian mixture model, clustering, machine learning, accident

AN APPLICATION OF HYBRID SUPPORT VECTOR MACHINE AND GENETIC ALGORITHM TO CLASSIFICATION MODEL

***ZEYNEP CEYLAN*[1] *, EBRU PEKEL*[2]**

[1] Ondokuz Mayis University, Turkey ; [2] Ondokuz Mayis University, Turkey

ABSTRACT

Support Vector Machine (SVM) is one of the most popular machine learning algorithms in literature. A SVM is a discriminative classifier formally defined by a separating hyperplane. In other words, SVM offers an optimal hyperplane which categorizes new examples in supervised learning. This paper presents a hybrid method that uses SVM and Genetic Algorithm (GA) together. Three different datasets obtained from UCI Machine Learning Repository were used to evaluate the performance of the proposed hybrid algorithm which were named as German, Messidor, Pima Indian datasets. The numerical results showed that the hybrid GA-SVM algorithm provides a better prediction performance in improving the weights compared to traditional SVM Algorithm. As a results, as the accuracy rate has increased from 76.4% to 77.1% in German datasets, it has increased from 67.5% to 77.8% in Messidor datasets and from 65.0% to 81.7% with GA-SVM in diabetes data.

KEYWORDS **-** Classification, Machine Learning, Support Vector Machine

MODIFIED GREY WOLF OPTIMIZATION THROUGH OPPOSITION BASED LEARNING

TAHIR SAG[1]

[1] Selcuk University, Turkey

ABSTRACT

OBL strategies have a growing research interest in the field of metaheuristic optimization since it can accelerate the convergence to optima without tackling to local extrema. On the other hand, GWO which is an outstanding algorithm, has been recently presented and it has gained a good place in literature owing to its performance. Three types of opposition-based learning (OBL) methods, known as Type-I, center based sampling, and generalized OBL, are adapted to Grey Wolf Optimization (GWO) algorithm. The proposed approaches are then applied to test functions in order to evaluate the performance. The effect of OBL methods on GWO algorithm is investigated in this study.

KEYWORDS **-** OBL, GWO, optimization.

A NEW MULTI OBJECTIVE ARTIFICIAL BEE COLONY ALGORITHM FOR MULTI OBJECTIVE OPTIMIZATION PROBLEMS

ZULEYHA YILMAZ ACAR[1] , FIKRI AYDEMIR[2] , FATIH BASCIFTCI[3]

[1] Selcuk University, Turkey ; [2] Kuveyt Turk Participation Bank, Turkey ; [3] Selcuk University, Turkey

ABSTRACT

Since real-world problems have multi-objective optimization problems, algorithms that solve such problems are getting more important. In this study, a new multi-objective artificial bee colony algorithm is proposed for solving multi-objective optimization problems. With the proposed algorithm, non-dominated solutions are kept in the fixed-sized archive. It has benefited from the crowding distance during the selection of elite solutions in the archive. Moreover, the onlooker bees are selected from the archive members with the proposed algorithm. It is aimed to improve the archive members with this modification. To evaluate the performance of the proposed algorithm, ZDT1, ZDT2 and ZDT3 from ZDT family of benchmark functions were used as multi-objective benchmark problems and the results were compared with MOPSO and NSGA-II algorithms. The results show that the proposed algorithm is an alternative method for multi-objective optimization problems.

KEYWORDS **-** Optimization, multi-objective optimization, artificial bee colony algorithm, swarm intelligence

PMUS PLACEMENT OPTIMIZATION FOR FAULT OBSERVATION IN POWER SYSTEM

***BENTARZI HAMID*[1] *, ZITOUNI ABDELKADER*[2]**

[1] Igee Boumerdes University, Algeria ; [2] Igee Boumerdes University, Algeria

ABSTRACT

This paper presents a new approach for obtaining the optimal placement of the phasor measurement units (PMUs) in smart power grids to achieve full network observability under fault conditions. The proposed modeling framework is implemented using the binary teaching learning based optimization (BTLBO) technique. It is proposed for the objective function and constraints alike. The proposed approach is applied to the IEEE 14-bus benchmark system. The simulation results demonstrate that the proposed framework can give a fine-tuned optimal solution with a simple model and acceptable solution characteristics compared with previous works in the literature.

KEYWORDS **-** Binary teaching learning technique, optimization, PMUs placement, fault, obeservability.

REGENERATIVE BRAKING BEHAVIOR ANALYSIS OF A L7 CATEGORY VEHICLE IN DIFFERENT DRIVE CYCLES

DILARA ALBAYRAK SERIN[1] , ONUR SERIN[2]

[1] Sabanci University, Turkey ; [2] Kocaeli University, Turkey

ABSTRACT

Electric vehicles came into scene of automotive industry in early 1800s. At those times electric vehicles were seen as more reliable than internal combustion engines. But with decrease in price of oil and faced obstacles in cell chemistry and related components interest in electric vehicle area shifted towards vehicles with internal combustion engines until mid-1950s. With increased carbon gasses and global warming threads, automotive industry accelerated their researches on electric vehicles. When it comes to powering electric vehicles and maximization of energy utilization, regenerative braking phenomenon is one of the most crucial concepts in electric vehicle subject. Hence this study aims to observe behavior of regenerative braking over a L7 category vehicle in different cycles and discuss possible ways of making best of regenerative braking in this type of vehicles.

KEYWORDS - Electric vehicles, modeling, regenerative braking, simulation.

TACKLING CLIMATE CHANGE GLOBAL EFFORTS AND ENERGY PREFERENCES

HAYRIYE SAGIR[1] , AKIN AKYIL[2]

[1] Graduate School Of Social Sciences, Turkey ; [2] Graduate School Of Social Sciences, Turkey

ABSTRACT

Humanity has been in interaction with its surroundings since its existence. Humanity uses environment for improving life standards and make changes on the surroundings by means of developing technology. The change has been exponentially increasing after industrial revolution. Effective usage of energy has utmost importance in the present day, during which exponentially increasing energy demand and sharply decreasing fossil resources are at stake. The ratio of the fossil fuels in compensating energy need of the world is about 80-85% recently. Utilization of alternative energy sources will become indispensable considering the depleting fossil fuel resources. Additionally, fossil fuels harm environment and humanity in an irreversible manner. Especially, increasing consciousness about environment led countries to renewable energy sources starting from 1980s. In order to process renewable energy sources, problems that are related with technical and economical resources should be solved. It is expected that renewable energy sources will become the primary energy sources in the second part of 21th century after these aforementioned problems will be overcome. Important studies from the literature about global tackling of climate change and determination of sustainable environmental policies are reviewed in this work. Also the potentials and utilization rates of energy resources that pose importance in tackling climate change are investigated specifically to Turkey.

KEYWORDS **-** Climate change, Energy, Fossil fuels, Paris agreement, Renewable energy sources

PERFORMANCE EVALUATION OF P O IC AND FL ALGORITHMS USED IN MAXIMUM POWER POINT TRACKING SYSTEMS

FUAD ALHAJ OMAR[1] , GOKSEL GOKKUS[2] , AHMET AFSIN KULAKSIZ[3]

[1] Selcuk University, Turkey ; [2] Nevsehir Haci Bektas Veli Universitesi, Turkey ; [3] Konya Technical University, Turkey

ABSTRACT

- Solar energy is the most viable alternative source; furthermore, the implementation of solar energy technologies can reduce the problems of environmental pollution and electricity production costs besides securing the demands of electrical power. This research addresses the evaluation of three algorithms used in maximum power point tracking systems (MPPT). These algorithms are Perturbation & Observation (P&O), Incremental Conductance (IC) and Fuzzy Logic (FL). They are considered as the most used in MPPT due to their simplicity and ease of realization. Based on Matlab/Simulink environment, the mathematical models of the three algorithms are designed and tested under various weather conditions. Collected simulation results illustrated the effectiveness of Fuzzy logic algorithm to draw more energy, decrease oscillation and provide a fast response under variable weather condition. The final simulation results show the fuzzy logic algorithm exhibits a better performance compared to both perturbation & observation and Incremental conductance algorithms.

KEYWORDS - Photovoltaic, MPPT, Incremental Conductance, Perturbation & Observation, Fuzzy Logic.

DESIGN AND ANALYSIS OF GRID TIED PHOTOVOLTAIC PV SYSTEMS UNDER UNCERTAIN WEATHER CONDITIONS

UMAIR YOUNAS[1] , BAYRAM AKDEMIR[2] , AHMET AFSIN KULAKSIZ[3]

[1] Konya Technical University, Pakistan ; [2] Konya Technical University, Turkey ; [3] Konya Technical University, Turkey

ABSTRACT

Considering the rapid growth in global energy demand, renewable energy resources (RERs) particularly solar PV is the prominent need of modern power systems to mitigate the global energy crisis. PV is considered as one of the most useful RER, since it is inexhaustible, abundant, and clean. Besides, the power efficiency of Solar PV is highly affected by variations of solar irradiance and temperature of the solar cells. Hence, Maximum Power Point Tracking (MPPT) controller is used to control the switching duty cycle of the power converters which ultimately maximize the output power of the PV array. In this paper, case study of 240-kw solar PV array is performed in MATLAB/Simulink environment. Simulation is performed on 'SunPower SPR-400E-WHT-D' PV array which is comprised of 88 parallel strings and 7 series connected modules per string. The impact of variable weather conditions (irradiance and temperature) is analysed. Moreover, the 240 kw PV array is connected to 20 KV grid using boost converter and Voltage Source Converter (VSC). In this way, the inverted AC output power is coupled with AC grid. This bidirectional output power with unity factor can be utilized by industrial / commercial consumers to fulfil their energy demands.

KEYWORDS - Renewable Energy, Solar PV system, MPPT, DC-DC Boost Converter,Voltage Source Converter

OVERVIEW OF POTENTIAL OF RENEWABLE ENERGY SOURCES IN ARTVIN PROVINCE

MEHMET CUNKAS [1] ***, ENES HALIT AYDIN*** [2]

[1] Selcuk University Faculty Of Technology, Turkey ; [2] Artvin Coruh University, Turkey

ABSTRACT

In this study, Turkey's Black Sea located to the east of and having a fairly rugged terrain Artvin province's potential for renewable energy sources is investigated. The current map data of the General Directorate of Renewable Energy and the solar radiation quantities and wind velocity potentials of the Provincial Directorate of Artvin Meteorology is used. Weibull and Rayleigh distributions are calculated by using hourly wind velocity data of the meteorological station 17045 in Artvin province. Monthly wind power density is determined between June 2017 and September 2018 for this station. As a result of the calculations, the predictive power of the Weibull and Rayleigh distributions are compared and although the results are close, the weibull distribution is seen to produce more stable results.

KEYWORDS - Renewable Energy, Solar Energy, Wind Energy, Artvin

AN OVERVIEW ON FIRE DETECTION SYSTEMS

***MEHMET CUNKAS*[1] *, VACIP DENIZ*[2]**

[1] Selcuk University Faculty Of Technology, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

Unfortunately, thousands of fires occur all around the world every year and of course the fire is a great disaster. These fires cause loss of lives, emotional depressions and loss of labor force in places that affect, additional for huge financial losses. That's why; human beings have constantly developed fire detection and prevention systems. Today, there are many effective and modern systems for fire detection. In this study, methods and techniques commonly used in fire detection are investigated. In addition, the advantages and disadvantages of the examined systems according to experiment and test results are discussed.

KEYWORDS **-** – Fire, fire detection, optic camera, wireless sensor networks, sensor node

LIFE PREDICTION OF ALUMINUM ELECTROLYTIC CAPACITORS USED IN TWO LEVEL INVERTERS

VOLKAN SUEL[1] , HALIL ALPER ONAY[2] , MUHAMMET KENAN AKINCI[3] , TAYFUN OZGEN[4]

[1] Akim Metal R D Center, Turkey ; [2] Akim Metal R D Center, Turkey ; [3] Akim Metal R D Center, Turkey ; [4] Akim Metal R D Center, Turkey

ABSTRACT

Aluminum electrolytic capacitors (AL-CAPs) are widely used in two-level inverter applications with having prominent features such as high capacitance – high voltage ratings, energy storage capability and good voltage regulation performance at low-cost. Reports show that Al-CAPs play a critical role on determining a power electronics system's life performance. With increasing safety concerns brought by standards, it is crucial to deeply analyze Al-CAPs life performance in advance. For this reason, this paper focuses on the life estimation of Al-CAPs used in two-level inverters. In order to do this, a prototype is implemented and a practical and easy to understand method is suggested for selection and life estimation of Al-CAPs based on measurements on prototype. Life improvement methods are also discussed in the scope of the work.

KEYWORDS - Aluminum electrolytic capacitor, dc link capacitor, life estimation, equivalent series resistance, fast fourier transform.

DESIGN AND SIMULATION OF A NEW SINGLE PHASE MULTILEVEL INVERTER STRUCTURE

ERSOY BESER[1] , BIROL ARIFOGLU[2]

[1] Kocaeli University, Turkey ; [2] Kocaeli University, Turkey

ABSTRACT

Inverters have become an indispensable element for many industrial applications today. Several types of inverters have been developed and multilevel inverter systems have also been introduced in the literature. Multilevel inverters produce voltage with low harmonic distortion. In this study, a new single-phase multilevel inverter design was given. The principles of proposed inverter structure were explained in detail. In addition, the simulation results of the developed design were included and the total harmonic distortion was calculated for the simulated cases. Level number of output voltage can be easily increased in the proposed inverter and output voltages with low harmonic content can be obtained. In the study, multilevel inverter structures in the literature were examined and compared with the proposed inverter structure. When the designed inverter structure is compared with similar structures in the literature, it is seen that when the same number of switching elements are used, it produces the highest number of output level. This shows that the output voltage with the lowest THD value can be obtained when the same number of switching elements is used.

KEYWORDS - Single-phase, multilevel inverter, total harmonic distortion, half bridge cascaded multilevel inverter

USE AND ADVANTAGES OF ONLINE PARTICLE SIZE DISTRIBUTION SENSOR IN INDUSTRIAL APPLICATIONS

NIHAT CANKAYA[1] , OMER AYDOGDU[2]

[1] Necmettin Erbakan University, Turkey ; [2] Konya Technical University, Turkey

ABSTRACT

Raw materials used in industrial production are generally in granular structure. One of the most important quality parameters of granule raw materials is particle size distribution. Due to production techniques, not all grain of raw materials can be produced at the same size. Instead, a particle size distribution range is given. Although ideally aimed at a single size, production is allowed within a reasonable tolerance. Narrow tolerance means quality product. In general, large particles can be reduced to smaller pieces by continuing to the production process. But small particles are discarded, or they become a product with lower commercial value. In the conventional method, the particle size distribution in the production is understood by sieve analysis. This is a time-consuming process. According to this analysis, the process is intervened. Until the sample is taken out, the process conditions may have already changed and the desired result may not be obtained. However, thanks to the development of laser and image processing technology, sensors have been developed that can instantaneously measure particle size distribution from powder raw material. Instant measurements could be made with these sensors mounted on raw material conveying pipes. These sensors were called "online particle size distribution sensor" (Online PSD). These sensors work according to the laser diffraction method. The system consists of a laser source and a sensitive receiver surface to which this laser is projected. In addition, advanced image processing software is used. Using these sensors, processes could be controlled more efficiently. In this study, the usage area and advantages of the online PSD sensor were explained in industry.

KEYWORDS - control; online particle size distrubition sensor

SIMULATION OF MULTI LEVEL INVERTER FED PERMANENT MAGNET SYNCHRONOUS MOTOR PMSM

ESRA KANDEMIR BESER[1] , ERSOY BESER[2]

[1] Kocaeli University, Turkey ; [2] Kocaeli University, Turkey

ABSTRACT

In this study, a three-phase multi-level inverter topology is proposed for a permanent magnet synchronous motor (PMSM). PMSM model was formed in terms of a,b,c phase variables. The proposed inverter and switching strategy was introduced. The multi-level inverter was simulated together with PMSM and results were given. The inverter has a switch number advantage over the topologies in the literature and it exhibits a convenient feature for the sinusoidal machines as PMSM since it possesses sinusoidal voltage and current waveforms by increasing the level number.

KEYWORDS - Three-phase, multilevel inverter, half bridge cascaded multilevel inverter, permanent magnet synchronous motor (PMSM)

RAYLEIGH BASED OPTICAL REFLECTOMETRY TECHNIQUES FOR DISTRIBUTED SENSING APPLICATIONS

KIVILCIM YUKSEL[1]

[1] Izmir Institute Of Technology, Turkey

ABSTRACT

In this paper, we discuss the operation principles, sensing mechanisms, challenges and application areas of the optical reflectometry techniques exploiting Rayleigh scattering phenomenon, considering both time- and frequency-domain schemes. A review of distributed optical fiber sensor (DOFS) systems is given with a special emphasis on distributed acoustic sensor (DAS) interrogation methods. Recent progresses obtained through our research collaborations are also presented. Acknowledgment The author gratefully acknowledges financial support from the TUBITAK (BIDEB-2219-1059B191600612).

KEYWORDS - Rayleigh scattering, optical reflectometry, fiber optic sensors, distributed sensing

A NOVEL PASSIVE FILTER TO ELIMINATE HARMONICS IN STAND ALONE DFIG WITH NON LINEAR LOADS

CAGATAY KOCAK[1] , MEHMET DAL[2] , KAZIM TOPALOGLU[3] , MUSTAFA YEGIN[4]

[1] Kocaeli University, Turkey ; [2] Kocaeli University, Turkey ; [3] Aktif Grup, Turkey ; [4] Kocaeli University, Turkey

ABSTRACT

In this study, a novel design approach proposed for a single-tuned passive filter is presented. The design approach based on a trial and error method aims to improve suppression capability of single-tuned filters group for specific harmonics originating from non-linear loads. Both the proposed single-tuned filter and the standard one were tested through comparative simulations for a stand-alone wind power generation system integrated with doubly-fed induction generator (DFIG) with non-linear loads. The simulation results derived using Plecs verify that the proposed method is more effective than the single-tuned filter which are known well and used traditionally in power system applications.

KEYWORDS - Harmonic elimination, doubly fed induction generator, harmonic filter, and energy quality

A STUDY ON THE EFFECT OF DAYLIGHT IN ENERGY EFFICIENCY

***AYKUT BILICI*[1] *, ISMAIL SARITAS*[2]**

[1] Gaziantep University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

In this study; it was aimed to increase the quality of lighting and to use electrical energy more efficiently by utilizing LED lighting tools (LLT) and daylight. An electronic circuit board is made for this purpose. A luxmeter is placed on the circuit to measure the effect of daylight on lighting systems. By using LED lighting tools, light reduction or bighting process has been achieved until the specified lighting environment was reached. Pulse Width Modulation (PWM) technique was used to reduce or increase the LLT used in lighting. As a result, the determined light intensity was obtained. By means of the inclusion of daylight, the system was realized according to the seasonal periods and the location of the environment where the lighting process was performed and electrical energy savings were achieved. Thanks to the system performed, increasing motivation and desire for work will be ensured in working environments by keeping the lighting intensity constant. In addition, better lighting system will increase in the safety of employees, as well as the costs resulting from error will be reduced.

KEYWORDS **-** intelligent, arduino, lighting, led, efficiency

OPEN SOURCE CODED REMOTE MONITORING OF RENEWABLE ENERGY SYSTEMS

ERDAL KAPLAN [1] **, *AHMET YONETKEN*** [2]

[1] Afyon Kocatepe University Science Institute, Turkey ; [2] Afyon Kocatepe University Electrical Engineering Institute, Turkey

ABSTRACT

Renewable energy systems have become one of the preferred electricity generation methods because of their environmental friendliness and low cost of operation. This system, which can be used in almost every area, has become very popular with innovative building applications. Remote monitoring of the renewable energy systems are being sold in the developing countries such as our country in high cost ready equipments. The remote monitoring of the energy generated from the production center will be designed and the system will be provided with the use of open source code development.

KEYWORDS **-** Remote Monitoring of Renewable Energy Systems,Remote Monitoring Of Solar,Open Source Coded Remote Monitoring

DRONES AND THEIR APPLICATION IN AMBIENT ASSISTED LIVING

RADOSVETA SOKULLU[1] , ABDULLAH BALCI[2] , EREN DEMIR[3]

[1] Ege University, Turkey ; [2] Ege University, Turkey ; [3] Ege University, Turkey

ABSTRACT

Extending lifespan and increased aging population in many countries around the world present a consider-able challenge for healthcare services and systems. The two main options – personal care at home or in care in a nursing facility – are very human labor demanding and place a huge financial burden both for the elderly and their relatives, and the healthcare system. Many IoT based applications ensure continuous monitoring of the patient and his surroundings, providing assessment and triggering assistance when necessary. AALS is a growing area of research where new enabling technologies help add new features and solve new challenges. Unmanned aerial vehicles (UAVs), commonly known as drones, are one such technology. For years they have been indispensable for many military applications, but recently they have claimed their place in our everyday lives as well. From weather probing and gaming, to photography and transportation, drones have quickly become the new disruptive force in our society. Could they also add something new to AALS? How will the conservative elderly accept these flying mini robots? There are numerous questions that can come to one's mind. This work presents an overview of existing drone based applications for ambient assisted living followed by a critical analysis and evaluation of drone related technologies and their possible applications in AALS for the elderly.

KEYWORDS - unmanned aerial vehicles, drones, Internet of Things, elderly, dementia, Ambient Assisted Living

NUMERICAL MODELING OF A SINGLE FREQUENCY METAL DETECTOR

MEHMET BURAK OZAKIN [1] ***, SERKAN AKSOY*** [2]

[1] Gebze Technical University Kocaeli Turkey King Abdullah University Of Science And Technology Thuwal Saudi Arabia, Turkey ; [2] Gebze Technical University Kocaeli Turkey, Turkey

ABSTRACT

In this work, detection performance of a single frequency (narrow-band) metal detector is investigated numerically for a buried conductive object. The numerical solution is based on a full wave analysis of Maxwell's equations at low frequencies. Finite-Difference Time-Domain method with a concept of the magneto-quasi-static approximation is used for the numerical solution [1], [2]. The problem space in Cartesian coordinates consists of a transmitter and a receiver loop antenna, air-ground interface and a buried nonmagnetic conductive object. The transmitter and receiver loop antenna are modeled as monochromatic magnetic dipoles. First, validation of the time-domain numerical solution is performed by comparing numerical and analytical radiation patterns of a magnetic dipole [3]. Then, the horizontal (spatial) distribution of scattered magnetic fields is calculated. Thus, the detection performance of the metal detector is investigated for the different scenarios of non-environmental and unchangeable parameters (such as the antenna-ground distance and depth of the object).

KEYWORDS - Metal detector, buried conductive object, detection, time-domain numerical methods.

CORRELATIONS BETWEEN COLOR FEATURES OF VITREOUS AND NON VITREOUS DURUM WHEAT KERNELS WITH LINEAR REGRESSION

ESRA KAYA[1] , ISMAIL SARITAS[2]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

The vitreousness of durum wheat is an indicator of the wheat kernel protein content thus its quality and color characteristics of durum wheat kernels can give us an idea about the vitreousness of durum wheat. In this study, linear regression analysis was applied in order to compare the color characteristics of vitreous and non-vitreous durum wheat kernels and to see if there is a linear relationship between them. The results were presented as a series of correlation confusion matrices and fit function graphs.

KEYWORDS **-** Color Features, Correlation, Durum Wheat, Linear Regression Analysis, Vitreousness

PERFORMANCE COMPARISON OF 2 D ZALMS AND BM3D ALGORITHMS FOR IMAGE DENOISING

***GULDEN ELEYAN*[1] *, MOHAMMAD SALMAN*[2]

[1] Avrasya University, Turkey ; [2] American University Of The Middle East, Kuwait

ABSTRACT

Abstract - In this study, a performance comparison was performed using our recently proposed two-dimensional zero attracting least mean square (2D ZA-LMS) algorithm and the popular block-matching and 3-D filtering (BM3D) algorithm for image denoising problem. Different experiments were carried out using different noise types such as Gaussian, Salt&Pepper and Speckle. Experimental results show that the ZA-LMS algorithm has a better performance for both sparse and non-sparse images.

KEYWORDS - least mean square, image denoising, sparse signals,adaptive filters

AN INVESTIGATION OF THE PV MAXIMUM POWER POINT TRACKING MPPT SYSTEMS

***MUMTAZ MUTLUER*[1] *, KUBRA ORKUN*[2]**

[1] Necmettin Erbakan University, Turkey ; [2] Necmettin Erbakan University, Turkey

ABSTRACT

Solar systems are silicon structures that convert solar energy directly into electrical energy and have an important place in electricity generation. There are disadvantages such as high cost of investment, efficiency in energy conversion not being at desired level, although it is beneficial such as not polluting the environment, making no noise, not needing fuel. For these reasons, efforts to improve the efficiency of systems powered by solar energy have gained importance. Recent research and developments in the field of power conversion systems have led solar systems to gain momentum in recent years. The three most important factors directly affecting electricity generation from solar panels are solar radiation, ambient temperature and panel voltage. If the power transferred from the solar panel to the load is not optimal, the power obtained from the photovoltaic panel is inefficient. Maximum Power Point Tracking (MPPT) are used to maximize the efficiency of solar energy systems. However, users generally do not know which maximum power point tracking method should be used. In this study, we investigated the most efficient MPPT system design for solar panels and the most common MGN methods in the literature.

KEYWORDS - PV Solar Tracking Systems, Maximum Power Point Tracking (MPPT)

WIND FARM POTENTIAL SITES IDENTIFICATION AND PRIORITIZATION FOR SUSTAINABLE ENERGY DIVERSIFICATION IN ZAMBIA GIS ANALYTIC BASED APPROACH I

MABVUTO MWANZA[1] , KORAY ULGEN[2]

[1] Ege University Solar Energy Institute, Turkey ; [2] Ege University Solar Energy Institute, Turkey

ABSTRACT

Wind energy is clean, free, and renewable energy source which is increasingly used in the world for electricity generation as it is the key factor for inclusion in the electricity generation mix in many countries. However, just like any other alternative energy supply option, wind farms developments at utility-scale are not free from imposing impacts on both the environmental and the society. These potential impacts can hinder or delay wind energy technology deployment in wind potential sites. Hence, in order to address these negative issues and increase social acceptability and support environmental sustainability of wind farm deployment in Zambia. A bottom up approach using Geographical Information System methods has been adopted in this study for wind energy potential sites identification and prioritization. The potential sites are grouped into four suitability levels depending on the level of wind speed. The results shows a total feasible potential site of approximately 1.31% (9,854.26km2)of the total surface area of Zambia with the extremely suitable sites accounting for only 0.45% (3,391.23km2) representing electricity generation potential of 65.48TWh/year at a hub height of 90m. This wind electricity generation potential is more than the 2030 projected energy demand (21TWh/year) for the entire country. The study is very important to help guide in the deployment of wind energy technology across the country and also guide the decision makers, energy planners and developers when planning and setting target of wind energy share in the national electricity generation mix. It will further help guide for the development of mini off-grid, grid tied, and hybrid system based on wind energy across the country with increased public acceptability and reduced environmental impacts

KEYWORDS - Renewable Energy,Wind Energy, Sustainability,Zambia,Wind Potential Sites,Wind Technical Potential

WIND PV HYBRID SYSTEM POTENTIAL SITES AND ELECTRICITY GENERATION POTENTIAL ANALYSIS IN WESTERN PROVINCE OF ZAMBIA GIS BASED ANALYTIC APPROACH II

MABVUTO MWANZA[1] , KORAY ULGEN[2] , MANUEL F ARIZA TABA[3] , ALAIN C BIBOUM[4] , KAKOMA MWANSA[5]

[1] Ege University Solar Energy Institute, Turkey ; [2] Ege University Solar Energy Institute, Turkey ; [3] Ege University Solar Energy Institute, Turkey ; [4] Ege University Solar Energy Institute, Turkey ; [5] University Of Zambia School Of Engineering, Zambia

ABSTRACT

Wind and Solar energy is clean, free, and renewable energy sources which is increasingly used in the world for electricity generation in many countries. However, just like any other alternative energy source option, wind/PV hybrid systems development is not free from imposing negative impacts on both the environmental and the society. Thus, these potential impacts can hinder or delay hybrid energy technology deployment in wind/solar potential sites. Hence, in order to address these negative issues and increase social acceptability and environmental sustainability of wind/PV hybrid system deployment in Zambia, a bottom up approach using GIS and analytical methods has been used in this study for analyzing the potential sites for wind/PV hybrid system development and electricity generation potential in these sites for Western Province of Zambia. The potential sites are categorized into four levels depending on the wind speed value. The total feasible potential site suitable for development of wind/solar hybrid systems is found to be approximately 7.80% (9859.24km2) of the total surface area of Western Province representing wind/solar PV hybrid electricity generation potential of 208.96TWh/year at a hub height of 90m. The electricity generation potential is nine (9) times more than the projected 2030 energy consumption for the entire country. The study is very important to help guide in deployment of mini off-grid and grid-tied wind/PV hybrid energy technology across the province with increased public acceptability and reduced environmental impacts

KEYWORDS - wind energy,solar energy,energy sustainability, wind/solar hybrid system potential sites,Zambia,Wind Availability

IMPLEMENTING PEAK CURRENT MODE CONTROL OF INTERLEAVED SEPIC CONVERTER

ONUR KIRCIOGLU [1] ***, MURAT UNLU*** [2] ***, SABRI CAMUR*** [3]

[1] Kocaeli University, Turkey ; [2] Kocaeli University, Turkey ; [3] Kocaeli University, Turkey

ABSTRACT

The SEPIC converter can operate both as a step down and as a step up and widely used in photovoltaic applications, power factor correction circuits and LED drivers. In this study, interleaved two phase SEPIC converter with peak current control is designed and peak current mode controller implemented. The open-loop and closed-loop responses (duty ratio to output voltage and inductor current to output voltage) of the converter are obtained. The simulation results show that the converter has good dynamic response in the case of input voltage and load changes.

KEYWORDS - SEPIC converter, peak current mode control, interleaved converters, frequency responses, coupled inductors

CLASSIFICATION OF SNORE SOUNDS BASED ON DEEP SPECTRUM FEATURES

GULSEVIN KODALOGLU [1] ***, FIKRET ARI*** [2] ***, DOGAN DENIZ DEMIRGUNES*** [3]

[1] Ankara University Graduate School Of Natural And Applied Science, Turkey ; [2] Ankara University Faculty Of Engineering, Turkey ; [3] Gulhane Training And Research Hospital Biomedical And Clinical Engineering Center, Turkey

ABSTRACT

In this paper, we proposed a method to automatically extract features from snore sound signals to diagnose sleep apnea. It was observed that post apneic snore sounds starting points change abruptly, with the use of this information snore sounds' change points were detected. Different sub datasets were obtained, spectrograms were calculated from them and Convolutional Neural Network (CNN) were used as a feature extractor. Two different machine learning algorithms were used as classifiers which were CNN and Support Vector Machine (SVM) respectively. As can be seen from the results, the feature vectors obtained with time reference to the starting points of the snore segments gave better results in apnea diagnosis as expected.

KEYWORDS - Sleep apnea, Snore sound, Abrupt change detection, Spectrogram, CNN, SVM

THE IMPORTANCE OF THE DIVERSITY FACTOR

MEHMET FAHRI YAPICIOGLU[1] , HASAN HUSEYIN SAYAN[2] , HAKAN TERZIOGLU[3]

[1] Gazi University, Turkey ; [2] Gazi University, Turkey ; [3] Konya Technical University, Turkey

ABSTRACT

Electrical installation requirements of all structures are specified in the Electrical Internal Installation Project, necessary design and calculations; Electrical Internal Facilities Regulation, Electrical Installation Project Preparation Regulation, Measurement and Details of Cable Chimney and Energy Room and Application Areas and related local circulars are prepared by reference, controlled and approved by responsible Electricity Distribution Companies. The concurrent power mal calculations performed in the Electrical Internal Installation Project directly affect the selection of the materials related to the electrical facilities of the structures. Simultaneous power (at the same time the power drawn) is obtained by multiplying the coefficient of synchronization with the installed power. Therefore, synchronous coefficient plays an important role in the electrical internal installation projects in order to determine the electrical materials of the buildings at ideal values. In the present case; Synchronization coefficients in the Electrical Internal Installation Projects are made by reference to the synchronization coefficients specified in the a.2 subparagraph of the 57.MADDE of the Electrical Internal Facilities Regulation, which was prepared many years ago and cannot respond to the developments in today's conditions and the constantly renewed technology. In parallel with the evolving living standards and current technology, this simultaneous power spending account will increase the reliability of all structures in terms of performance and cost of the electrical installations. In this article, the concurrency coefficient; I will try to explain what impacts and how they affect risk, performance, cost and reliability. Thus, the importance of the coefficient of synchronization will be emphasized.

KEYWORDS - İnstalled power, simultaneous power, diversity factor, Electrical Internal Installation Project.

CONTROL OF SPWM APPLIED 15 LEVEL INVERTER WITH ARM PROCESSOR

ABDULVEHHAB KAZDALOGLU[1] , BEKIR CAKIR[2] , TARIK ERFIDAN[3] , MEHMET ZEKI BILGIN[4]

[1] Kocaeli University, Turkey ; [2] Kocaeli University, Turkey ; [3] Kocaeli University, Turkey ; [4] Kocaeli University, Turkey

ABSTRACT

In multi-level inverters, it is desirable that the output voltage is sinusoidally close and the total harmonic distortion is low. For this purpose, different methods and applications are applied to control multilevel inverters. In this study, matlab / simulink supported ARM processor and control system were used to control multilevel inverters (MLI). Thus, the control circuit is easily designed using the simulation circuit generated by matlab / simulink. With this method, any changes to the matlab / simulink control circuit algorithm can be easily applied. The control of the 15-level inverter circuit designed in this study was done with ARM processor and the results were evaluated.

KEYWORDS - Multilevel inverter, Simulation, ARM processor

ESTIMATION OF POWERLINE ROUTE FROM AIRBORNE LIDAR

MUSTAFA ZEYBEK[1]

[1] Artvin Coruh University, Turkey

ABSTRACT

In this study, powerline extraction investigated from aerial LiDAR data. Powerline transmission line is important task to inspect. LiDAR data include millions of points with geospatial data information. However, it requires processing to obtain useful information from these point clouds. Automatically extraction of powerlines is a crucial task for powerline managements. Here we propose an automatic planimetric (2D) powerline extraction from aerial LiDAR data. Results are showed that the automatic fitting methods are sufficient to extract powerline from LiDAR data.

KEYWORDS - Powerline, Airborne LiDAR, Segmentation.

ELECTRICAL PROPERTIES OF METAL SEMICONDUCTOR STRUCTURE WITH INTERFACIAL LAYER

***HAYATI ALTAN*[1] *, METIN OZER*[2]

[1] Gazi University, Turkey ; [2] Gazi University, Turkey

ABSTRACT

Metal-semiconductor (MS) Schottky barrier diode is one of the most basic devices in the area of semiconducture device technology. These devices play a big role in constructing some devices in semiconducter technology e.g., in high energy experiments, in aerospace technology, in integrated circuits, in solar cells, in detectors. Generally, Schottky barrier inhomogenities influence barrier parameters exracted from current-voltage (I-V) measurements due to poor Schottky interface quality of diode. The presence of interfacial layer at the MS structures plays an impotant role in the determination of the characteristic parameters of these devices. Wide-band gap semiconductors are suited for high power and high temperature. n-6H-SiC with wide-band gap, 2,9 eV is more suitable in the electro-optic devices, in radiation hard environments, in solar cells, in detectors. Some polimer materials, for example P3HT and PCBM is important materials due to low-cost. In this study, Au/P3HT:PCBM(2:1)/n-6H-SiC/Ag (1500 cycle) Schottky diode was produced with everyone knows the spin coating method. The I-V characteristics of diode were measured depend on temperature and investigated. The imported paramters, ideality factor and barrier height values of the diode were determined thermionic emission theory, Cheung's and Norde's methodes. These parameters were found temperature dependent The ideality factor (n) and barier height (ΦB) were calculated 3.76 and 0.942 eV at 300 K respectively. It was observed that the ideality factor decreases and barier height increases with increasing temperature. The series resistance (RS) of the diode were calculated using Cheung's and Norde methods. The RS values were found 80,06 Ω and 75.98 Ω at 300 K, respectively. Results show that the series resistance varies depending on temperature. Acknowledgment The authors would like to thank Assoc. Prof. Dr. Özge Tüzün Özmen and Muzaffer Şağban from Düzce University, for their help in preparing the sample.

KEYWORDS - Schottky barrier,barrier hight,ideality factor,series resistance

APPLICATION OF VARIOUS BANDWIDTH ENHANCEMENT METHODS ON SELJUK STAR MICROSTRIP ANTENNA

DILEK UZER[1] , SEYFETTIN SINAN GULTEKIN[2] , RABIA TOP[3] , MEHMET YERLIKAYA[4] , OZGUR DUNDAR[5]

[1] Konya Technical University, Turkey ; [2] Konya Technical University, Turkey ; [3] Karamanoglu Mehmetbey University, Turkey ; [4] Karamanoglu Mehmetbey University, Turkey ; [5] Necmettin Erbakan University, Turkey

ABSTRACT

In the study, antenna performance is analyzed on Seljuk star geometry microstrip patch by applying various bandwidth enhancement methods one by one or together. Antenna parameters and methods that give the best results are determined by trying every design made in simulation media. Therefore, it is indicated that desired improvements of antenna performance can be obtained by applying more than one method together.

KEYWORDS **-** – Seljuk star, antenna, bandwidth, HFSS.

INDUCTION MOTOR VARIABLE FREQUENCY DERIVE

AKRAM RASHID CHOWHURY[1] , NABEEL BANGASH[2]

[1] Air University, Pakistan ; [2] Air University, Pakistan

ABSTRACT

Variable frequency drive drives the motor by changing the frequency and voltage supplied to the electric motor. V and F method is used for varying the speed of the induction motor and also the starting current (inrush current) required by the motor is reduced. Gate drive circuitries used for inverter stage. The IR2110 and PIC- 18f4520 are used for controlling the Gate drive circuitries. To accelerate an AC motor to full speed using a full voltage connection, a large inrush current may be required. Additionally, the torque of the AC motor is mostly uncontrolled and can shock the connected equipment, potentially causing damage. As a protection measure an idea of Variable Frequency derive is introduced in this research work. In this research work Variable frequency drives are used in applications where: Complete speed control, Energy savings is required. AC supply: Comes from the facility power network (typically 208V, 230V, 480V, 690V / 50 Hz AC.) Rectifier: Converts (rectifies) network AC power to DC power Chokes and DC bus: Work together to smooth the rectified DC power and provide clean, DC power to the inverter with low ripple content. Inverter: Uses DC power from the DC bus and chokes to invert an output that resembles sine wave AC power using a pulse width modulation (PWM) technique. Pulse width modulation: Switches the inverter semiconductors in varying widths and times that, when averaged, create a sine waveform

KEYWORDS **-** : Variable Frequency drive, Induction Motor, Torque, Speed control, Adjustable Frequency, Pulse width modulation

HARMONIC FILTERING IN A POWER GRID WITH POWER GENERATION

GLAOUI HACHEMI GLAOUI[1]

[1] University Of Bechar, Algeria

ABSTRACT

With the advancement of technology, electricity generation using wind has drawn an increased attention in the world. As the amount of wind power integrated into the system is increased, it causes power quality and stability problems. Therefore power utilities are developing stringent grid codes which are to be satisfied by the wind power producers. Voltage control capability, reactive range capability, frequency control ability and fault ride through capability are among the major requirements stipulated in the grid codes. Due to the variable speed operation capability of Doubly Fed Induction Generators (DFIGs), they are becoming popular in wind power generation. The voltage control of the DFIG wind farm has been identified as the latest challenge with the present grid code requirements. In this paper, for bus voltage control and to reduce power system harmonics, the active filtering technique is used in the mechanism of wind turbine control. Here a grid-connected doubly fed induction generator (DFIG) is considered in a wind turbine. In addition to harmonics that are related to the DFIG, a nonlinear load is also added to the system to simulate loads that produce more harmonics. The active filtering approach is implemented to mitigate current and voltage harmonics, which is one of the main concerns of distribution systems. A bus voltage control strategy is also used for this purpose. The main advantages of this article are using a simple and effective active filtering technique and applying a voltage control method to mitigate the mentioned harmonics. The presented methodology is examined in both local and remote control conditions and also for both normal and contingency (load change) situations. Simulation results obtained from applying the presented method on a distribution test system confirm suitable performance of the proposed strategy to mitigate current and voltage harmonics.

KEYWORDS - WECS, Doubly fed induction generator (DFIG), Harmonic reduction, Active filter, Voltage control

A NEW APPROACH WITH FUZZY LOGIC BASE FOR PHOTOVOLTAIC PANEL SURFACE CLEANING

MUMTAZ MUTLUER[1] *, ABDURRAHIM ERAT*[2]

[1] Necmettin Erbakan University, Turkey ; [2] Necmettin Erbakan University, Turkey

ABSTRACT

Today, electricity is generated by solar energy through photovoltaic solar cells and the efficiency of the systems developed in this direction is being investigated. The efficiency of the photovoltaic panels used to transform solar energy into electricity is utmost importance. Dusting, equipment used (DC conductors, inverter, panel interior design, etc.), shadowing, amount of radiation and many other factors have affect to the efficiency of photovoltaic solar panels. Recent studies have shown that dust and dust derived particles on the panel surfaces have a very serious effect on the efficiency and so photovoltaic panel surfaces must be kept clean to absorb more effective solar radiation for increase the efficiency of photovoltaic panels. The surface cleaning of the photovoltaic panels can be done manually or by intelligent systems. However, when the enormous expansion areas of solar power plants are considered, the use of automated intelligent systems will be more rational. Thanks to an intelligent panel surface cleaning system, very serious photovoltaic efficiency gains will be achieved. In this declaration, it is planned to design an intelligent system with a fuzzy logic base that can automatically clean the panel surfaces.

KEYWORDS - Arduino, Fuzzy Logic, PV Panel Surface Cleaning System, PV Panel Efficiency

STATISTICAL FEATURE EXTRACTION AND ANN BASED CLASSIFICATION OF TEMPORAMANDIBULAR JOINT SOUNDS

***UGUR TASKIRAN*[1] *, SALIMKAN FATMA TASKIRAN*[2] *, MEHMET CUNKAS*[3]

[1] Selcuk University, Turkey ; [2] Konya Technical University, Turkey ; [3] Selcuk University, Turkey

ABSTRACT

- In this study, a statistical feature extraction method is used to classify the Temporomandibular Joint (TMJ) sound. Temporomandibular Disorder (TMD) is the problems arising from or related to disorder of TMJ which is commonly known as jaw bone joint. TMD is a recurrent disorder related to jaw joint and common problem among the population. In fact TMD is so frequent that more than two third of population have some kind and level of TMD. TMJ sound listening is the easiest and quickest diagnose methods used by the clinic dentists. In the study, statistical features of TMJ sounds are extracted. Then extracted statistical features are applied to ANN for training and testing. Mean classification success rate of 87% to 89% is obtained in the study.

KEYWORDS - TMJ, TMD, sound classification, statistical feature extraction, ANN based classification

EVALUATING THE STABILITY AND HEAT TRANSFER PERFORMANCE OF CARBON BASED AQUEOUS NANOFLUIDS

TUGCE FIDAN ASLAN[1] , MEHMET OZGUR SEYDIBEYOGLU[2] , ALPASLAN TURGUT[3] , ELIF ALYAMAC SEYDIBEYOGLU[4]

[1] Izmir Katip Celebi University, Turkey ; [2] Izmir Katip Celebi University, Turkey ; [3] Dokuz Eylul University, Turkey ; [4] Izmir Katip Celebi University, Turkey

ABSTRACT

Due to its high thermal conductivity values, the use of carbon nanotubes in heat transfer fluids has recently become a popular research topic. Dispersion of carbon nanotubes in different base fluids is a challenging issue. The aim of this study is to prepare stable nanofluids and to increase their thermal conductivity. Aqueous dispersions of single-walled carbon nanotubes (SWCNT) were successfully prepared through ultrasound technology in the presence of polyethylene glycol-polyhedral oligomeric silsesquioxane (PEG-POSS) as a stabilizer. Stability evaluations were carried out by Ultraviolet-Visible (UV-Vis) spectrophotometry and zeta potential measuring device (Zetasizer Nano). Nanofluids which can remain stable for up to 60 days have been produced. Besides, 3ω method was used for determination of thermal conductivity of nanofluids. The results indicate that increase in nanoparticle and stabilizer concentration provided better stability of nanofluids.

KEYWORDS - SWCNT, POSS, nanofluid, thermal conductivity

MECHANOCHEMICAL SYNTHESIS OF TUNGSTEN SILICIDES STARTING FROM DIFFERENT POWDER BLENDS

DIDEM OVALI[1] , DUYGU AGAOGULLARI[2] , M LUTFI OVECOGLU[3]

[1] Osmaniye Korkut Ata University, Turkey ; [2] Istanbul Technical University, Turkey ; [3] Istanbul Technical University, Turkey

ABSTRACT

Transition metal silicides have gained growing interests for their probable usage both in microelectronic applications and structural applications at elevated temperatures. Among transition metal silicides, tungsten silicide can also be regarded as an attractive material highlighted by high strength at elevated temperatures accompanying with its high melting point, its ability to form a SiO2 layer on its surface at high temperatures and its great corrosion resistance. The main purpose of this study is to investigate tungsten silicide powders after mechanochemical synthesis procedure. For this aim, we used different initial powders including WO3, W, SiO2, Si and Mg. The mechanochemical synthesis procedure of tungsten silicides was examined in terms of the type of initial powders, milling time, and an excess amount of initial powders. After synthesis of tungsten silicides, mechanochemically synthesized powders were subjected to a purification process to remove Mg-based by-products. Thermodynamic calculations were theoretically performed by FactSage™ 7.1 thermochemical software. The program was utilized to understand the effects of the stoichiometric and excess amount of initial powders on the reaction products and to compare them with the experimental results. Phase and microstructural characterizations of the as-blended, mechanically alloyed and leached powders were performed using X-ray diffractometer (XRD), particle size analyzer (PSA), scanning electron microscope (SEM) and transmission electron microscope (TEM).

KEYWORDS - Silicide,metal oxide,mechanochemical synthesis,powder synthesis

EFFECT OF PH ON STRUCTURAL AND OPTICAL PROPERTIES OF ZNO NANOPOWDERS SYNTHESIZED VIA SPRAY DRYING SUBSEQUENT THERMAL DECOMPOSITION

SEYMA DUMAN[1] , BURAK OZKAL[2]

[1] Natural And Applied Sciences, Turkey ; [2] Science Engineering And Technology, Turkey

ABSTRACT

In this study, ZnO nanopowders were synthesized at different pH values via spray drying subsequent thermal decomposition. Combining processes spray drying and thermal decomposition in air is a new method used in the synthesis of ZnO based nanomaterials and this method was utilized in the previous study [1]. Different amounts of solid sodium hydroxide (NaOH) were used for pH adjustment from 6.3 to 13 in spray drying slurries containing zinc acetate powders. Spray drying conditions like inlet temperature, feed rate and drying air flow rate were adjusted 200 oC, 3 ml/min. and 800 ml/min, respectively. Purification process were applied the spray dried powders in order to remove the impurity ions as washing 5-6 times with distilled water, centrifuging and drying at 100 oC. The obtained powders were thermally decomposed at 300 oC for 12 h in air atmosphere at 2 oC min−1. The study aimed to investigate the effects of different amounts of sodium hydroxide on the particle size and morphology of ZnO nanopowders. The synthesized samples were characterized by a variety of characterization techniques such as X-ray diffraction (XRD), scanning electron microscopy (SEM), BET surface area analyzer and Ultraviolet–visible (UV–vis) spectroscopy. It was observed from XRD results that synthesized powders had hexagonal wurtzite structure. The surface area values of the ZnO synthesized between pH 6.3 and 13 were in the range of 18.50–29.66 m2/g. It has been notified in literature that morphology of the nanoparticles is affected by pH [2] and this situation was also confirmed in SEM examinations of ZnO nanopowders. Moreover, the UV-vis study showed that different amounts of NaOH played a role on optical properties of ZnO nanopowders.

KEYWORDS - ZnO, pH, spray drying, thermal decomposition, optical properties

SPARK PLASMA SINTERING OF MECHANOCHEMICALLY SYNTHESIZED NIOBIUM SILICIDE POWDERS

DIDEM OVALI[1]

[1] Osmaniye Korkut Ata University, Turkey

ABSTRACT

In this study, the sintering attempt of mechanochemically synthesized niobium silicide powders was carried out by Spark plasma Sintering (SPS). Before sintering studies, the niobium silicide powders were obtained by a mechanochemical synthesis procedure. To obtain niobium silicide powders by mechanochemical reactions, niobium oxide (Nb2O5), silicon dioxide (SiO2) and magnesium (Mg) powders were used as initial powders. After the mechanochemical reaction, a leaching procedure with HCl acid was also applied for purification. In the mechanochemical reactions, we used two different proportions (the stoichiometries and 50 wt. % excess Mg added) for initial powder batch. Thus, we investigated and compared the sintering behavior of those synthesized powders having different starting material compositions. The SPS parameters were a sintering temperature of 1300 ºC, a heating rate of 100 ºC/min, a pressure of 50 MPa and a duration of 5 min. Phase and microstructural characterizations of the sintered products were performed using X-ray diffractometer (XRD), optical microscope (OM), scanning electron microscope (SEM). The microhardness and fractured toughness values of sintered products were determined using Vickers hardness measurements.

KEYWORDS - Silicide, niobium, mechanochemical synthesis, spark plasma sintering.

FLAME RETARDANT FINISH FOR COTTON FABRIC USING BORON HYBRID SILICA SOL

ESRA GELGEC[1] , SULTAN ARAS[2] , FATMA FILIZ YILDIRIM[3] , PERINUR KOPTUR[4] , SABAN YUMRU[5] , MUSTAFA COREKCIOGLU[6]

[1] Ozanteks Tekstil San Ve Tic A S, Turkey ; [2] Ozanteks Tekstil San Ve Tic A S, Turkey ; [3] Ozanteks Tekstil San Ve Tic A S, Turkey ; [4] Ozanteks Tekstil San Ve Tic A S, Turkey ; [5] Ozanteks Tekstil San Ve Tic A S, Turkey ; [6] Ozanteks Tekstil San Ve Tic A S, Turkey

ABSTRACT

In this study, the flame retardant properties of boric acid in a 100% cotton fabrics were examined. The boron compound was implemented to fabrics using various combinations of sol-gel method. Duration of inflammation, amount of combustion, spectrophotometer and stiffness the results are compared with the reference fabric and the cotton fabric which is treated with commercial flame retardant product. As a result; the flame retardant sol-gel system containing Silica Boron (S-B) was found to be as successful as the commercial product in the combustion test.. The treated fabrics exhibited some changes in color and stiffness relative to the reference fabric. Although the stiffness values of the fabrics have increased, the colors of the treated samples have become lighter

KEYWORDS **-** Cotton, Flame retardancy, Boron hybrid, Sol-gel, washing durability

AN APPLICATION IN THE AUTOMOTIVE SECTOR WITH THE PURPOSE OF INVESTIGATION AND PREVENTION OF EDGE CRACK PROBLEM AT 980 MPA AND ABOVE LEVEL STEEL MATERIALS

EBRU BARUT[1] , BAHADIR KUDAY[2] , ORCUN YONTEM[3]

[1] Toyotetsu Otomotiv Parcalari San Ve Tic A S, Turkey ; [2] Toyotetsu Otomotiv Parcalari San Ve Tic A S, Turkey ; [3] Toyotetsu Otomotiv Parcalari San Ve Tic A S, Turkey

ABSTRACT

Automotive industry; is a dynamic sector which is constantly developing in line with the increasing demands in our country and in the world. Thanks to the issue of reducing greenhouse gas emissions from the subjects that have been studied in recent years, vehicle lightening studies for the automotive sector have been one of the important issues concerning the world. In this respect, due to the high strength values in the vehicles, the need for lightening of the steels used in high amounts has also arisen. It is aimed to develop high strength low density steels and to obtain steels with mild but desired strength values. The strength of the steel materials is determined by the phases they contain. The austenite phase in the structure when high temperatures are reached during the shaping of the steel material; high-strength steels are obtained by converting to ferrite and martensite phases with rapid cooling. Due to the martensite phase embedded in the ferritic matrix, the high strength steels also have high hardness values. When shaping high-strength steel materials; One of the main problems encountered is the formation of edge cracks. Formation of edge cracks; The microstructure of the material varies depending on the parameters such as the mechanical properties and edge quality, and the edge cracks can be analyzed with the Hole Expansion Ratio test. In the present study; deformations occurring in high-strength steels and macroscopic and microscopic studies have been conducted to understand the edge cracking problem. In this context, it was aimed to examine the effects of steel composition on edge cracking by selecting steels with different strength values and different compositions. The ratios of alloying elements forming the chemical composition were compared and their effects on hardenability were evaluated. Within the scope of the study, the control of the chemical composition for the samples was made by Optical Emission Spectrometer (OES) and Light Microscopy (IM) and Scanning Electron Microscopy (SEM) were used for the determination of phase distributions and structural phases of the samples. At the same time, crack propagation and fracture mechanisms were also investigated by using Scanning Electron Microscopy (SEM) and all results were evaluated.

KEYWORDS **-** Advanced High Strength Steel (AHSS) Sheets, DP980(Dual Phase), Failure Analysis, Edge Crack.

MODELLING OF HARDNESS VALUES OF AISI 304 AUSTENITIC STAINLESS STEELS

NECIP FAZIL YILMAZ [1] ***, AYKUT BILICI*** [2] ***, MUSA YILMAZ*** [3]

[1] Gaziantep University, Turkey ; [2] Gaziantep University, Turkey ; [3] Gaziantep University, Turkey

ABSTRACT

Arc stud welding (ASW) is a process by which a metal stud is combined to a metal workpiece by heating both parts with an electric arc. Stud welding is a method of joining a bolt or specially formed nut to a workpiece generally in the form of sheet or plate. The arc stud welding process are affected from many factors and welding parameters such as welding time, welding current, plunge and lift. Each parameters has influence on the weld quality performance. In this study, using the Adaptive Neural Network Based Fuzzy Inference System (ANFIS), mathematical modeling of the complex relationship between the output parameters and the input parameters is formed and this model has been developed to estimate the hardness test results of stud welding in AISI 304 Austenitic Stainless Steels. This model will guide the users of the stud welding using AISI 304 austenitic stainless steels.

KEYWORDS - Arc Stud Welding,Hardness,ANFIS

EFFECT OF VARIOUS ACIDS MODIFICATION ON WALNUT SHELL EPOXY COMPOSITES

RUYA ISAM BAKR ALBAKER[1] , SUHEYLA KOCAMAN[2] , MUSTAFA ESEN MARTI[3] , GULNARE AHMETLI[4]

[1] Konya Technical University, Turkey ; [2] Konya Technical University, Turkey ; [3] Konya Technical University, Turkey ; [4] Konya Technical University, Turkey

ABSTRACT

Environmental awareness and bio-degradation have hastened the many industries to look forward for sustainable materials with least impact on the existing surroundings. Natural fillers reinforced bio-degradable composites seem to be a good alternative in this sence. In this study, walnut shell waste (WSh) was used as raw material to obtain bio-based epoxy composite materials. Different chemical structure carboxylic acids such as formic, oleic and citric acids were used for chemical modification of walnut shell and the effect of modification on mechanical properties of epoxy based composites have been investigated. Unmodified WSh slightly decreased the mechanical properties of epoxy while chemical modification of WSh enhanced the tensile strength of the composites materials. Elongation of composites were observed to decrease with the WSh content in the composites. Modification of WSh with sitric and formic acids was found more effective in terms of mechanical properties.

KEYWORDS - Walnut shell, Epoxy resin, Modification, Composite

ESTIMATION OF DRINKING WATER PROPERTIES FILTERED WITH GRAPHENE OXIDE MATLAB BASED FUZZY LOGIC MODELING

OZGE BILDI CERAN[1] , INCI SEVGILI[2] , HALUK KORUCU[3] , BARIS SIMSEK[4] , OSMAN NURI SARA[5]

[1] Cankiri Karatekin University, Turkey ; [2] Cankiri Karatekin University, Turkey ; [3] Cankiri Karatekin University, Turkey ; [4] Cankiri Karatekin University, Turkey ; [5] Bursa Technical University, Turkey

ABSTRACT

In this study, improvement rates of drinking water quality criteria were predicted using Matlab-based fuzzy toolbox. The data set were entered to the Matlab toolbox as fuzzy rules. The increase or decrease rates can be calculated for the water characteristics with the desired drinking water standard with the use Matlab fuzzy model. The amount of graphene oxide required for this desired improvement rate can be determined with the help of the expert system.

KEYWORDS **-** Graphene oxide, water purification, fuzzy logic model, Matlab

COMPRESSIVE BEHAVIOR OF GLASS CARBON EPOXY 55 FILAMENT WOUND HYBRID PIPES CONFINED COMPOSITE CONCRETE WITH EXPANSIVE CEMENT

LOKMAN GEMI [1] ***, MEHMET ALPASLAN KOROGLU*** [2] ***, MERVE CALISKAN*** [3]

[1] Necmettin Erbakan Universitesi Meram Myo, Turkey ; [2] Necmettin Erbakan Universitesi Muh Mim Fakultesi, Turkey ; [3] Necmettin Erbakan Universitesi Muh Mim Fakultesi, Turkey

ABSTRACT

Today, a wide variety of modern composite materials and products found in the construction market offer many useful possibilities for using them in both structural and non-structural industrial building elements. The aim of this project; Investigation of the behavior under axial load of cylindrical columns produced using expanded concrete with cement water ratios of 0.4, 0.5 and 0.6 as reinforced with hybrid composite pipes with winding angle of ±55° produced by filament winding technique and investigating the effect of the columns on load capacity. Columns reinforced with composite pipes were tested and their behaviors were investigated by comparing cylindrical reference samples produced from expanded concrete with the same cement water ratio. As a result of the study, it was determined that there is a significant increase in load strength in the composite pipes strengthened girders compared to the reference specimens.

KEYWORDS - Filament Winding, Composite Pipe, Expanding Cement, Damage Analysis, Confinement

EXPERIMENTAL INVESTIGATION OF BEHAVIOR OF HYBRID GFRP BOX BEAM SECTIONS

MEHMET ALPASLAN KOROGLU[1] , LOKMAN GEMI[2] , MEHMET YARIMOGLU[3]

[1] Necmettin Erbakan Universitesi Muh Mim Fakultesi, Turkey ; [2] Necmettin Erbakan Universitesi Meram Myo, Turkey ; [3] Necmettin Erbakan Universitesi Muh Mim Fakultesi, Turkey

ABSTRACT

In this study, bending behavior of Glass Fiber Reinforced Polymer (GFRP) square box beams infilled by concrete and hybrid beams with steel reinforcements are investigated experimentally. Load displacement curves were investigated under four-point bending tests. Bending load capacity of (GFRP) square box beams was developed when compared to the bending load capacity of (GFRP) square box beams infilled with various concrete ratio after bending tests. Additionally, both bending load bearing capacity and ductulity of beams were developed significantly when GFRP square box was used.

KEYWORDS - Bending Test, FRP, GFRP, Hybrid, Beam, Composite

CHEMICAL RECYCLING OF POLYETHYLENE TEREPHTHALATE PET BOTTLE WASTES WITH ALCOHOLYSIS TRANSESTERIFICATION OF SHREDDED PET WITH 2 ETHYLHEXANOL TO PRODUCE DIOCTYL TEREPHTHALATE DOTP

VEDAT ARDA KUCUK[1] , BARIS SIMSEK[2] , TAYFUN UYGUNOGLU[3] , MEHMET MUHTAR KOCAKERIM[4]

[1] Cankiri Karatekin University, Turkey ; [2] Cankiri Karatekin University, Turkey ; [3] Afyon Kocatepe University, Turkey ; [4] Cankiri Karatekin University, Turkey

ABSTRACT

In this study, dioctyl terephthalate (DOTP) synthesis was performed by chemical recycling from shredded waste polyethylene terephthalate (PET) bottles. Alcoholysis of PET with 2-ethylhexanol was preferred for experiments to produce dioctyl terephthalate (DOTP) which is a commonly used plasticizer for PVC. The characterization of the synthesized samples was done by Fourier-transform infrared (FTIR) spectroscopy. When FTIR spectra were examined, it was determined that DOTP was obtained.

KEYWORDS - polyethylene terephthalate, PET, waste PET, PET recycling, chemical recycling of PET, PET bottle waste, plasticizer, dioctyl terephthalate, DOTP, alcoholysis, solvolysis, transesterification, esterification

A CALORIMETRIC INVESTIGATION OF CO2 N2 AND AR ADSORPTION

FEHIME CAKICIOGLU OZKAN[1] , ASLI ERTAN[2]

[1] Izmir Institute Of Tech, Turkey ; [2] Hayat Kimya, Turkey

ABSTRACT

Calorimetric properties of CO2, N2 and Ar gases on synthetic zeolites namely, 5A and 13X, natural zeolite from Gördes/Bigadiç region and its acid (using HCl and H3PO4) treated forms were investigated by using a Tian-Calvet calorimeter, Setaram C80 at 25 oC. The zero coverage heat of adsorption values of CO2, N2 and Ar on the zeolites were determined. CO2 adsorption on the adsorbents yielded the highest heat of adsorption values due to high quadrupole moment of CO2 and hence formed strong specific interactions with the adsorbent. Ar adsorption exhibited the lowest zero coverage heat of adsorption values. Among the acid treated natural zeolites the one treated with 1.1 M H3PO4 solution was determined to have the highest heat of adsorption at zero coverage which has a close adsorption heat with the natural zeolite (about 80 kJ/mole) for CO2 adsorption.

KEYWORDS - : adsorption heat, calorimetry, acid treatment, natural zeolite, gas adsorption

EFFECT OF REACTION TEMPERATURE ON THE AMOUNT OF CARBON NANOTUBES BY CHEMICAL VAPOR DEPOSITION IN FLUIDIZED BED

MEHMET GURSOY[1] , DUYGU UYSAL ZIRAMAN[2] , OZKAN MURAT DOGAN[3] , BEKIR ZUHTU UYSAL[4]

[1] Selcuk University, Turkey ; [2] Gazi University, Turkey ; [3] Gazi University, Turkey ; [4] Gazi University, Turkey

ABSTRACT

In this study, carbon nanotubes were synthesized on Fe/Silica catalyst by chemical vapor deposition in a fluidized bed reactor. The mixture of CO and H2 was fed into reactor The purification experiments of carbon nanotubes were performed by multi-step method including oxidation and acid washing. After purification, carbon nanotubes were detected by high-resolution transmission electron microscopy. This study indicated that the reaction temperature is an important parameter determining the obtained amount of carbon nanotubes. At the same experimental conditions, carbon nanotubes were synthesized at three different reaction temperatures (700, 800 and 900°C). The largest amount of carbon nanotubes was produced at 800°C.

KEYWORDS - Chemical vapor deposition, carbon nanotube, fluidized bed.

PREPARATION AND CHARACTERIZATION OF CHITOSAN BASED EDIBLE FOOD PACKAGING FILMS INCORPORATED WITH KUMQUAT PEEL EXTRACT

FATMAGUL SAHIN[1] , ILKNUR KUCUK[2]

[1] Yildiz Teknik Universitesi, Turkey ; [2] Yildiz Teknik Universitesi, Turkey

ABSTRACT

The accumulation of synthetic plastics, mainly from food packaging, is causing a serious environmental problem. It is driving research efforts to the development of biodegradable films and coatings. Edible films and coatings play an important role for conservation, distribution, and marketing of food products and they are very important alternatives to non-biodegradable materials. The biopolymers used as raw material to prepare biodegradable films should be renewable, abundant and low-cost. Chitosan is a promising biopolymer for developing of edible films and coatings on an industrial level because of its film-forming, biodegradable, non-toxic, and antimicrobial characteristics. Chitosan based edible film with incorporated peel of the kumquat fruit that is the natural enemy of the cancer has the potential to become an innovative food packaging. In this work, edible films were prepared by using solution casting method using chitosan, glycerol and various amount of kumquat peel. To determine the best conditions required to achieve the adequate response in terms of the shape stability of edible films, the effect of kumquat peel concentration was evaluated. The biofilms were characterized by physical, mechanical, optical and thermal properties such as moisture content, swelling degree,water solubility, water vapor permeability (WVP), tensile strength, transparency, thermogravimetric analyses as their structures were confirmed by FTIR.

KEYWORDS **-** Biopolymer, edible film, chitosan, kumquat, glycerol, crosslinking

AN APPLICATION OF SLIP CASTING METHOD ON SOLID OXIDE FUEL CELLS

***RASIT SEZER*[1] *, AHMET EKERIM*[2]**

[1] Karadeniz Technical University, Turkey ; [2] Yildiz Technical University, Turkey

ABSTRACT

In recent years, the growing need for clean energy has led to an increase of researches in fuel cell technology. In this study, slip-casting method has been tested as an alternative production method for Solid Oxide Fuel Cell (SOFC) components. It is aimed to develop an appropriate process in the cost of production of the solid oxide fuel cell with a slip casting method. Half cells were produced by forming the electrolyte layer via slip-cast on the anode or cathode plates that were produced by tape casting and calendaring techniques. The anode, cathode plates were produced from Ni/YSZ, and LSMYSZ powders, respectively. The porosities of anode and cathode plates, sintered in 1200°C and 1350°C, were measured in the range of 20 – 40 %. The anode and cathode plates were produced with 0.75 mm thickness then; they were cut in the size of 15 mm x 15 mm and then sintered. After that 8YSZ electrolyte layer was applied with the slip-casting technique on the electrodes. Morphologies of the half-cells, sintered at 1200°C, 1350°C and 1450°C, were examined by SEM analysis. As a result of the SEM analysis, the size and distribution of the porosity samples are observed as homogeneous.

KEYWORDS - Solid oxide fuel cell, Slip casting, Half cell

THEORETICAL CALCULATIONS ON STRUCTURAL PROPERTIES OF 1 4 DIAMINOBUTANE

***AYSUN GOZUTOK*[1] *, AKIF OZBAY*[2]**

[1] Selcuk University Department Of Physics, Turkey ; [2] Gazi University Faculty Of Sciences Department Of Physics Ankara, Turkey

ABSTRACT

In this study, molecular structure parameters and vibrational frequencies of the 1,4-diaminobutane molecule were calculated in the most stable condition by Hartree-Fock (HF) and Density Functional theory (DFT) methods with Gaussian package program. Calculated results of bond angles and bond lengths were compared with Meng and Lin's study experimental values. Vibrational frequencies of the 1,4-diaminobutane molecule were compared with Sağlam et al.'s study experimental values.

KEYWORDS - 1,4-diaminobutane, DFT, HF, vibrational frequency, molecular structure properties

THEORETICAL STUDIES OF N N TETRACHLORO 1 4 DIAMINOBUTANE AND N N TETRABROMO 1 4 DIAMINOBUTANE

***AYSUN GOZUTOK*[1] *, AKIF OZBAY*[2]**

[1] Selcuk University Department Of Physics, Turkey ; [2] Gazi University Faculty Of Sciences Department Of Physics Ankara, Turkey

ABSTRACT

In this paper, geometric parameters and vibrational frequencies of the title molecules were calculated Hartree-Fock (HF) method with Gaussian package program. Calculated results of bond angles and bond lengths were compared with the experimental values in literature. Vibrational frequencies were compared with experimental frequencies in literature.

KEYWORDS - HF, vibrational frequency, geometric parameters

PTAU ALLOY NANOPARTICLES AS AN ELECTROCHEMICAL SENSOR FOR HYDROGEN PEROXIDE

OZLEM GOKDOGAN SAHIN[1]

[1] Konya Technical University, Turkey

ABSTRACT

PdAu/C, Pd/C and Au/C catalysts sensing activities for non-enzymatic hydrogen peroxide (H2O2) was investigated. The detection of H2O2 was performed with different electrochemical techniques such as cyclic voltammetry (CV) and chronoamperometry (CA). Electrochemical results revealed that PdAu/C catalyst showed perfect electrocatalytic activity in terms of electro-oxidation of H2O2. PdAu/C catalyst showed a fast response of less than 5 s with a linear range of 7.0×10−3- 6.5 mM and high sensitivity of 210.3 mA mM -1 cm -2. PdAu/C catalyst exhibited great selectivity for detecting H2O2 in the existence of several hindering species such as uric acid and ascorbic acid.

KEYWORDS - Platinum, gold, bimetallic nanocatalysts, hydrogen peroxide.

EFFECT OF FLUX SALTS ON THE RECOVERY EXTENT AND QUALITY OF LEAD CALCIUM ALLOY FROM SPENT RECHARGEABLE LEAD BATTERIES

MAHMOUD RABAH[1]

[1] Central Metallurgical Reseasrch And Development Institute Cmrdi, Egypt

ABSTRACT

Abstract Lead-calcium alloy containing up to 0.10% calcium was recovered from spent rechargeable sealed lead batteries. Two techniques were investigated to explore the effect of flux salts on the extent and quality of the recovered alloy, pyro-metallurgical and electrochemical methods. About 10 kg of the spent batteries were collected for testing. The sample was washed with hot water and dried. The plastic cases of the batteries were mechanically cut out and the contents were dismantled manually, the plastic containers were shredded for recycling. The compacted powder in the electrode plates were freed were mixed with carbon/lime and placed in SiC crucible and covered with alkali chloride salts. The loaded crucible was heated in an electronically controlled chamber furnace type Nabertherm C3 at temperatures up to 800 °C. The obtained metals were analyzed. The product was discharged from the cucible and reacted with nitric acid. The effect of temperature, rate of heating, atmospheric conditions, composition of the flux salts on the extent and quality of the recovered products were studied. Results revealed that the spent rechargeable batteries contain 2-3 groups of 3 plates of Pb-Ca grids packed with lead oxides/sulphate. Heating of the battery powder with lthe carbon/ime in a silicon carbide crucible produces lead calcium alloy containing 0.10% was obtained after 3 h of heating due to the partial oxidation of the alloying calcium element. Rate of temperature increase has a considerable effect on the yield of the lead alloy composition. Flux sodium salts benefits the recovery process. Sodium salts are more powerful as compared to potassium salts. Lead calcium alloy meeting the standard specification was successfully recovered from the spent rechargeable acid lead batteries with a very competitive cost to the same alloy prepared from primary resources.

KEYWORDS **-**

EFFECT OF PROCESS CONTROL AGENT ON THE CHARACTERISTICS OF 316L POWDERS PREPARED BY MECHANICAL ALLOYING ROUTE

CIHAD NAZIK[1] , NECMETTIN TARAKCIOGLU[2]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

316L SS (stainless steel) powders were milled by adding direct and gradual methanol (as process control agent) different times as the first step. After the milling, characterization tests of them were investigated by SEM analysis (Scanning Electron Microscope) and particle size measurement. In the SEM analysis; it was observed that flake structured powders were formed at 5-hour and 10-hour milling when direct methanol was added. As a result, increase of milling time directly influenced on the characteristics of 316L SS powders.

KEYWORDS - 316L, Flake powder metallurgy, Mechanical alloying, Particle size, Process control agent

EFFECT OF MILLING TIME ON PROPERTIES OF AA7075 POWDERS ENHANCED BY MECHANICAL ALLOYING METHOD

EMRE CAN ARSLAN[1] , CIHAD NAZIK[2] , NECMETTIN TARAKCIOGLU[3] , EMIN SALUR[4]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey ; [3] Selcuk University, Turkey ; [4] Selcuk University, Turkey

ABSTRACT

In this study, gas atomization technique was used to produce AA7075 powders. AA7075 powder was milled within planetary type ball milling machine by adding methanol. After the milling, characterization tests of the powders were investigated by SEM analysis (Scanning Electron Microscope), XRD analysis (X-Ray Diffraction) and particle size measurement. In the SEM analysis; it was observed that flake structured powders were formed at 2h milling time. The mean powder size decreased with increasing milling time and the powder hardness increased due to excessive deformation. It was also seen that the XRD peaks width increased with increase of milling time. As a result, the change in the milling time directly affected the particle size, crystallite size and morphology of AA7075 powders.

KEYWORDS - AA7075, Flake Structure, Mechanical alloying, Methanol, Particle Size

STUDY OF THE EFFECT OF FE DOPING ON THE TENSILE STRENGTH OF SINGLE WALLED ZIRCONIA NANOTUBES USING FINITE ELEMENT ANALYSIS

IBRAHIM DAUDA MUHAMMAD[1] , MOKHTAR AWANG[2]

[1] Univeristy Of Abuja, Nigeria ; [2] Universiti Teknologi Petronas, Malaysia

ABSTRACT

The effect of doping single-walled zirconia nanotubes (SWZNTs) with varying (1-5%) amount of iron was investigated by numerical simulation via Finite Element Analysis. It was found out that there is decrease in the intensity of tensile strength as the content of Fe-content increases, with the intensity of change dependent on the type and geometry of the SWZNTs. The zigzag-type SWZNTs have relatively higher tensile strength with comparatively constant rate of reduction (12%); while armchair-type have lower strength in addition to irregular reduction (12-24%) as the amount of dopant increases. Thus, in order to obtain needed tensile strength in the areas of applications, minimal amount of iron nanoparticles should be added to SWZNTs.

KEYWORDS - Zirconia Nanotubes; Doping; Tensile Strenght; Finite Element Analysis

EFFECTS OF COMPOSITION ON ELASTIC PROPERTIES OF METAL MATRIX COMPOSITE MATERIALS

ABDULLAH ASLAN[1] , EMIN SALUR[2] , AYDIN GUNES[3] , OMER SINAN SAHIN[4]

[1] Selcuk University, Turkey ; [2] Sel, Turkey ; [3] Konya Technical University, Turkey ; [4] Konya Technical University, Turkey

ABSTRACT

In this study, effects of mixture ratio on elastic properties were investigated. Metallic chips were recycled by isostatic hot pressing as an alternative to melting process. Metal matrix composites were produced at four different composition as 90%-80%-70%-60% CuSn10 and 10%-20%-30%-40% GGG-40 contents. Compression tests were carried out in order to determine strength and consolidation mechanism of metallic chips. As a result of tests, it is observed that CuSn10 metallic chips shows excessive plastic deformation and completely covered to GGG-40 chips also penetrate to narrow zones. The compression strength of metal matrix composites was determined to be varied between 90-105 % of bulk CuSn10. Besides, porosity values were between 100-150% of bulk CuSn10. It is said that the highest strength of metal matrix composites was %90CuSn10-%10GGG-40 contents specimen. However, increasing GGG-40 ratio cause decrease in strength and other elastic properties (secant modulus, resilience…etc). As a consequence, metallic chips were recycled successfully by new recycling method. It is showed that produced metal matrix composites materials have good mechanical properties in comparison with bulk CuSn10.

KEYWORDS - Mechanical characterization, CuSn10, GGG-40, Isostatic hot pressing, Recycling, Metallic chips

INVESTIGATION OF THE EFFECTS OF DIFFERENT PRODUCTION PARAMETERS AND COMPOSITIONS ON MACHINABILITY PROPERTIES OF MMCS RECYCLED BY HOT PRESS DURING DRILLING

EMIN SALUR[1] , ABDULLAH ASLAN[2] , AYDIN GUNES[3] , OMER SINAN SAHIN[4]

[1] Selcuk University, Turkey ; [2] Selcuk, Turkey ; [3] Konya Technical University, Turkey ; [4] Konya Technical University, Turkey

ABSTRACT

In this study, the effects of different production parameters on the machinability of metal matrix composites (MMCs) recycled by hot press were investigated. The metallic chips which were found as waste in the industry were recycled by hot press. In this study, bronze (CuSn10) based MMCs reinforced with 10-40 wt. % spheroidal cast iron (GGG-40) were produced at different production parameters. The results of surface roughness and thrust forces were measured after drilling process. Machinability tests were made without using cooling liquid by CNC milling machine. As a result of drilling experiments, minimum, average and maximum forces were determined with the help of 'Dynoware' software and the maximum thrust forces were taken into consideration. When the overall trend was examined, as the proportion of spheroidal cast iron in the composition increased the thrust forces decreased. When the effect of temperature was examined, it was seen that the general tendency decreased with the increasing temperatures. This situation can be attributed to the fact that when high temperatures are reached, the chips can be softened and penetrated better and the samples can be machined more easily as a result of better bonding. Generally, the surface roughness values increase as the cast iron content increases. When the force was applied during the process, the cast iron chips were broken off from their area rather than cutting and rougher surfaces were obtained.

KEYWORDS - Machinability properties, thrust forces, surface roughness, production parameters, metallic chips

INVESTIGATION OF MECHANICAL PERFORMANCES OF SIO2 NANOPARTICLE FILLED GFR EPOXY COMPOSITES

MEHMET TURAN DEMIRCI[1]

[1] Selcuk University, Turkey

ABSTRACT

Glass fiber reinforced (GFR) polymer based on composites have been used widely range in many industries including automotive, aircraft, defense etc. due to their mechanical properties, chemical resistance and insulation. However, to increase the mechanical properties as well as reduced damages of GFR composites, nowadays nanoparticles have been filled into matrix materials of composites. In order to investigation the mechanical properties, in this study, SiO2 nanoparticles have been filled into epoxy resin. DGBEA epoxy resin and E-Glass fiber has been used as matrix and reinforcement materials respectively. 10 laminated plates for SiO2 nanoparticles filled and unfilled GFR/Epoxy composites were produced via hot press. According to ASTM D 3039/D 3039M standard tensile tests have been applied to all composites. At the end of experiments, nanoparticles addition into GFR/Epoxy composites increased the tensile strength of composites approximately %30. In addition, nanoparticles addition decreased damages of composites like delamination and debonding by providing fracture mechanisms.

KEYWORDS - GFR, SiO2 nanoparticles, nanocomposites, tensile strength.

REMOVAL OF PHOSPHORUS USING MG AL LAYERED DOUBLE HYDROXIDES

HASAN KIVANC YESILTAS[1] , TURAN YILMAZ[2]

[1] Cukurova University, Turkey ; [2] Cukurova University, Turkey

ABSTRACT

In this study, phosphorus removal in synthetic wastewater was investigated by Mg-Al layered double hydroxides (LDH) synthesized in the laboratory by co-precipitation method. The Mg-Al LDHs synthesized were classified according to their particle diameters and all studies conducted in the laboratory were operated as batch systems. For the 600-850 μm particle class, which has the lowest grain diameter class, 90,56% removal efficiency was obtained and adsorption batch experiments results were well fitted when applied to Langmuir isotherm.

KEYWORDS - Phosphorus Removal, Layered Double Hydroxides, Co-preparation Method, Adsorption, Synthesis, Adsorption Isotherms

THE QUALITY STEEL IN TURKEY PAST TODAY AND TOMORROW

CELAL ERKAL KAHRAMAN[1] , HASAN GURCAN TATLICAN[2] , HAKAN ERCAY[3] , TUNCAY DIKICI[4]

[1] Ozkan Demir Celik San A S, Turkey ; [2] Ozkan Demir Celik San A S, Turkey ; [3] Ozkan Demir Celik San A S, Turkey ; [4] Dokuz Eylul University, Turkey

ABSTRACT

In the world, the degree of iron and steel production and consumption level in a country is regarded as one of the most important indicators of prosperity and economic development. In developing countries as well as countries that have strong economies, iron and steel consumption is constantly increasing and production capasities are being created to supply the consumption rate. More than half of global steel consumption is used in the construction sector. The construction sector is followed by automotive, machinery-equipment, and petroleum-natural gas sectors. In recent years, Turkey has become one of the fastest growing countries in iron and steel industry. The crude steel production capacity of around 20 million tons in 2000, exceeded 50 million tonnes by the end of the 2015, with the acceleration of investments in flat and structural steels. In 2000, Turkey which is the world's seventeeth largest crude steel producer, it has risen to the eigth place in 2016. In contrast to the way of the World steel production, crude steel production in Turkey is carried out largely in electric arc furnaces. These plants which use scrap metal in production process supply the needs of goods from foreign markets, and Turkey is the world's largest importer of scrap metal. Countries that are technologically advanced in the world have started to produce quality and high-added value steels instead of making too much production in iron and steel production. Quality steels are carbon, medium and high alloy steel products which provide the expected chemical, metallurgical, mechanical and physical properties and also all control, inspection and repair operations are performed to quarantee these features in the last step of production. According to the TÜİK (Turkish Statistical Institute) data, the export of Quality steel has increased by about 2,5 times from 2013 to 2017, reaching 663.661 tons. On the other hand, the situation does not look very good in import figures. Our import figures of quality steel, which is 1.418.232 tons in 2013, reached 2.848.729 tons in 2017. This data shows that we should work much more in this field. The iron and steel industry needs to increase the amount of quality steel production and exports so that it can make the maximum contribution to the country's exports of $ 500 billion for 2023 and to exceed the targets set. At the same time, the national-scale economic crises in recent years have placed priority on the necessity of reducing foreign-market dependence on such goods.

KEYWORDS - quality steel, high added-value, import-export

INVESTIGATION OF LOW VELOCITY IMPACT BEHAVOURS OF NANOSILICA FILLED AND BASALT FIBER REINFORCED NANOCOMPOSITES AT SEA WATER CORROSION CONDITION

IBRAHIM DEMIRCI[1] , NECATI ATABERK[2] , MEHMET TURAN DEMIRCI[3] , AHMET AVCI[4]

[1] Selcuk University, Turkey ; [2] Necmettin Erbakan University, Turkey ; [3] Selcuk University, Turkey ; [4] Necmettin Erbakan University, Turkey

ABSTRACT

- In this study, the sea water exposed for 40 days and unexposed nano-silica filled and unfilled BFR/Epoxy composites were applied to the low velocity impact tests. The adding % weight ratio was determined as 4wt% on the basis of studies and literature searches. Low velocity impact tests were carried out at 10 j and 20 j energy levels according to ASTM D7136 / 7136M standard. As a result of experiments; the nanosilica addition into composites increased the maximum force for the corrosive and uncorrosive conditions. In addition sea water exposed all composites for 40 days corrosion period has reduced the maximum forces. It was found that the decreases of maximum forces with addition of nanosilica were lower than unfilled nanosilica at the end of 40 days of corrosion. At the same time, while increasing the bending stiffness by filling nanosilica, It has been found that at the end of the 40 days corrosion period, high rigidity values are shown according to the unfilled nanosilica BFR/Epoxy composites. It was determined that the addition of nanosilica decreased the displacement. In addition, at the end of 40 days of corrosion period, the displacement was increased for all of nanosilica filled and unfilled BFR/Epoxy composites but it was determined that the displacement for nanosilica filled composites was less than unfilled BFR/Epoxy composites.

KEYWORDS - Basalt fibers, Nanocomposites, Nanosilica, Low velocity impact behavior, Seawater corrosion

MEASUREMENT OF WALL THICKNESS OF EXTRUDED PVC PROFILES USING IMAGE PROCESSING METHODS

***MURAT AKDOGAN*[1] *, SULEYMAN YALDIZ*[2]**

[1] Selcuk University Technology Faculty Graduate School Of Natural And Applied Sciences, Turkey ; [2] Selcuk University Technology Faculty Graduate School Of Natural And Applied Sciences, Turkey

ABSTRACT

Today, machine vision systems are widely used in the mass production. The present work focuses on measurement of wall thickness of extruded pvc profiles through image processing technique. For this, a experimental setup has been prepared to hold digital camera in a fixed plane to capture the images of pvc profiles which help to get more accurate wall thickness results using image processing. This work has been done for measurement of up, down, left and right wall thickness of pvc profiles. The images are captured by using high resolution digital camera which are fixed in the experimental setup. OpenCV programming function was utilized in Python scripting language to perform image processing. So the high resolution captured images of profile are processed a sequential operations which are correcting defective images caused by working environment. And then developed image processing algorithms are applied to measurement of profile wall thickness. The acquiring results are compared with the results obtained by conventional systems. Dimension Control System decrease the non-standard profiles production and minimize the unnecessary consumption of raw materials.

KEYWORDS - Image Processing, Quality Control, Measurement

DESIGN AND DYNAMIC MODELLING OF AN ANKLE FOOT PROSTHESIS FOR TRANSFEMORAL AMPUTEES

SELIN AYDIN FANDAKLI [1] ***, HALIL IBRAHIM OKUMUS*** [2]

[1] Karadeniz Technical University, Turkey ; [2] Karadeniz Technical University, Turkey

ABSTRACT

Today amputee people prefer low-cost and low-functioning passive prosthesis or costly active prosthesis with microcontroller. The aim of this study is the design and development of powered ankle-foot prosthesis that has low-cost, low-element, multi-functional for below-knee transfemoral amputees. For people who have lost their ankle and foot for various reasons, the system that carries out two controllable degrees of freedom, Dorsiflexion-Plantarflexion (DP) and Inversion-Eversion (IE) movements and can be controlled by EMG signals is proposed. Control using EMG signals will not be the subject of this paper, but will be touched upon that in future reports. A dynamic model of the main mechanism of the prosthesis has been established in order to be able to perform the system control.

KEYWORDS - Ankle, Foot, Gait, Prosthesis, Amputee, Design

INVESTIGATION OF THE EFFECTS OF WALNUT BIODIESEL ON A DIESEL ENGINE EXHAUST EMISSIONS

A ENGIN OZCELIK[1] , HASAN AYDOGAN[2] , MUSTAFA ACAROGLU[3]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey ; [3] Selcuk University, Turkey

ABSTRACT

Diesel engines are the most efficient thermal machines capable of reaching up to approximately 40% of thermal efficiency. Different studies are carried out to increase the efficiency of diesel engines and also to reduce environmental pollution. The studies aimed at improving the combustion process constitute the most important part of them. As is known, with the improvement of combustion process; Besides increasing the efficiency of the engine, environmental pollution is also reduced. For this reason, in recent years to improve combustion process in diesel engines; Both structural (conconstructive) studies and fuel-related studies are underway. Structural works include exhaust manifold designs, improving the shape of the combustion chamber, increasing the valve count and Valve section area, regulations and improvements in the spraying system, the expansion of the turbocharger application, etc. Located. In the studies related to fuels; More economical use of existing fuels and studies on different alternative fuels can be given as examples. In this study, Biodiesel was produced from walnut oil by transesterification method. The walnut biodiesel is then mixed with the Eurodiesel fuel, which will be 7% (B7) and 10% (B10) by volume. Eurodiesel fuel was accepted as comparison fuel. Diesel engines with common-rail fuel system were used in the experiments. The results of the tests were compared with the emission values of CO, CO2, HC, O2, smoke and NOx with Eurodiesel fuel values.

KEYWORDS - Walnut, biodiesel, engine, emissions

ENERGY PROFILE OF KARAMAN

BEKIR CIRAK[1] , MEHMET ONUR OGULATA[2] , SEZGIN ESER[3] , YASIN UNUVAR[4]

[1] Engineering Fac Of Karamanoglu Mehmetbey University, Turkey ; [2] Engineering Fac Of Karamanoglu Mehmetbey University, Turkey ; [3] Engineering Fac Of Karamanoglu Mehmetbey University, Turkey ; [4]Karamanoglu Mehmetbey University Institute Of Natural And Applied Sciences, Turkey

ABSTRACT

Inrecent years, the energy demand has increased rapidly due to increasing population, industrialization, urbanization and developing technologies. Also, the troubles in production and consumption of this necessity once again show the importance of effective and efficient use of energy resources. For this reason, it is very important to know the energy resources potential in our country and to use them effectively. In this study, Karaman province energy profile which is one of the most important energy potential areas of Turkey has been studied. Renewable energy sources such as sun, wind, biomass, geothermal energy sources and non-renewable energy sources, fossil energy sources and natural gasare shined out in Karaman.

KEYWORDS - Renewable energy, Sun, Wind, Biomass, Geothermal energy, Oil

ELECTRICAL ENERGY HARVESTING WITH PIEZOELECTRIC

SEDAT YAYLA [1] ***, MEHMET ORUC*** [2]

[1] Van Yuzuncu Yil University, Turkey ; [2] Van Yuzuncu Yil University, Turkey

ABSTRACT

Fossil fuels are used in industrial plants, automobiles and machines, and they have negative effects on human health with their gas and fossil particles. In order to meet the energy we need, instead of this renewable energy source, we need to turn to energy sources that can use the natural processes for energy production and that can be produced more rapidly than the exhaustion time of the energy resources used. Within the scope of the studies, vortex producer plates with different angles and diameters have been designed in order to obtain electrical energy from the renewable energy source hydraulic energy. Within the scope of this study, studies on renewable energy have been mentioned.

KEYWORDS - Piezoelectric material, renewable energy, vortex generator plate

NUMERICAL SIMULATION OF THE COALESCING OIL WATER SEPARATOR

SEDAT YAYLA [1] ***, MEHMET ORUC*** [2]

[1] Van Yuzuncu Yil University, Turkey ; [2] Van Yuzuncu Yil University, Turkey

ABSTRACT

During the production of oil, a large amount of contaminated water is produced which has a harmful effect on the environment. In this research, the separation of the fluid mixture at a certain velocity between the plates was investigated by using the 3D computational fluid dynamics (CFD) program. As a result of the researches, it was observed that the distance between the combined plates is inversely proportional to the decomposition efficiency and at the same time the rate of introduction of the mixture into the system is proportional to the dissociation efficiency and sweat. It has also been found that the best separation efficiency is in the plates with a cylindrical shape having a hole diameter of 15 mm. It was found to be. The separation efficiency results ranged from 38% to 98% depending on the different speed values used and the distance between the plates.

KEYWORDS - CFD, two-phase flow, oil-water separation efficiency, coalescing plate

EFFECT OF RED MUD AS A NANOFLUID ON COOLING PERFORMANCE

AHMET ALI SERTKAYA[1] , EYUB CANLI[2]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

Fluids such as water, oil, glycerin and ethylene glycol are conventional heat transfer fluids that are used in heat exchangers. Improving heat transfer and effectiveness are the primary topics among the always studied ones for fluids. A type of improvement works is adding solid materials that have high thermal capacity and conductivity into the fluid. Al2O3, CuO, TiO2, SiC, TiC, Ag, Au2, Cu2 and Fe are the most common materials as solid particles that are used for enhancing heat transfer of fluids. Early on, macro scaled additives were tried, however desired outcomes couldn't be obtained due to fouling, blockage and sedimentation. Recently, studies on ability to be enhanced and improved of heat transfer and hence heat exchangers with high effectiveness by the addition of nano particles to fluid have become intensive. Precious elements such as Al2O3, SiO2, Fe2O3, TiO2, Na2O, CaO, P2O5 are contained in the body of red mud as a disposal in the process of producing aluminum from bauxite. Thermal capacity and thermal conductivity of these matters are very high. Effects of nano scale red mud added into heat transfer fluid on the cooling performance are investigated in this work.

KEYWORDS - Enhancement, Heat exchanger, Heat transfer, Nano fluid, Red mud

HEAT RECOVERY OPTIMIZATION

CEYDA KOCABAS[1] , AHMET FEVZI SAVAS[2]

[1] Bilecik Seyh Edebali Universitesi, Turkey ; [2] Bilecik Seyh Edebali Universitesi, Turkey

ABSTRACT

In this study, changes in the heat recovery performance of the system under different operating conditions are investigated. A waste heat recovery device was installed for the experimental setup. A cross-flow plate heat exchanger made from cellulosic material is placed and thus heat transfer is ensured. Three different operating parameters were determined. Optimum conditions were determined by giving different values to these parameters. Statistical design of experiment method (DOE) was used for analyzes. As a result of the study, the values to be set for each parameters are explained in order to maximize the thermal effectiveness.

KEYWORDS - Design of experiment, Plate heat exchanger, Cellulosic, Waste heat recovery, Thermal effectiveness

DYNAMIC CHARACTERIZATION OF THE TORSIONAL VIBRATION DAMPER USING QUASI STATIC TORQUE LOADING TEST

OMER FARUK UNAL[1] , HASAN ANIL ERKEC[2] , CIHANGIR KAPLAN[3] , YUKSEL CETINKAYA[4] , TUNCAY KARACAY[5]

[1] Kentpar Automotive, Turkey ; [2] Kentpar Automotive, Turkey ; [3] Kentpar Automotive, Turkey ; [4] Kentpar Automotive, Turkey ; [5] Gazi University, Turkey

ABSTRACT

Torsional vibration occurs in the crankshaft of an internal combustion engine due to the sudden burst in the firing orders. The torsional vibration dampers (TVD) are used to reduce these torsional vibrations. TVD's although it has different types, consist of a pulley, inertia ring and vulcanized rubber that connects the two parts to the hub, it works as dynamic absorber. Therefore, the design and determination of dynamic characteristic of TVD is critical for proper operations. Experimentally, the dynamic characteristic of a TVD could be determined by modal testing either using impact hammer or sweep test using a modal exciter. In this study, the dynamic characteristic of a TVD is determined using the quasi-static torque test data. Combining these data with the mechanical properties of the pulley and hub, the dynamic torsional characteristic of a TVD is obtained and the results are compared with the modal testing which is conducted by impact test.

KEYWORDS - Torsional vibration damper, quasi-static torque test, torsional stiffness

INVESTIGATION OF CONCRETE SLAB CRACK WHEN PLACED DIRECTLY ON CLAY

AHMED ABDULLAH[1]

[1] Nature And Applied Science, Turkey

ABSTRACT

In this paper , Investigation of concrete slab cracks when placed directly on clay, ultrasonic pulse velocity, cracks depth , modulus of elasticity and compressive strength were investigated. A total of eigtht SSC mixtures were produced with 500 kg/m3 of total contentious materials content and with a constant water/binder ratio of (0.55). each SSC mixture were casted over clay layer, each layer containing various water content, SSC samples were either cured by spraying at 23_C or maximum temperature of 28 days curing period. Test results revealed that 28-days compressive strength enhanced while leading to reduced in ultrasonic pulse velocity, it was found that the SSC mixtures that placed over high clay water content had higher compressive strength and lower dry shrinkage values compared to the samples that casted over low water content clay. However e-modulus of elasticity increased due to dry shrinkage .

KEYWORDS - clay, compressive strength, concrete slabs, dry shrinkage

STRENGTH AND MODAL ANALYSIS OF 8 MEMBERED WALKING MECHANISM

ALI FEYZULLAH[1] *, KORAY KAVLAK*[2]

[1] Konya Technical University, Turkey ; [2] Konya Technical University, Turkey

ABSTRACT

Different designs have been made and various control systems have been developed for the application of walking motion to robots. One of these designs is the one degree of freedom walking mechanisms. One degree of freedom walking mechanisms have some important advantages, such as wheeled and tracked robots, which are easier and more stable to move in uneven terrain. In this study, the design of an 8-link mechanism developed from 4 bar mechanism to use in the robot was made by the geometric analysis program (Cinderella) and the length of the links was optimized. The strength and modal analysis of the three dimensional modeled mechanism were performed with Solidworks.

KEYWORDS **-** Walking mechanism, legged robot, coupler point curve, strength analysis, modal analysis.

ENERGY CONSUMPTION OPTIMIZATION FOR HEAT PUMP DOMESTIC HEATER

***EMRE SAGLICAN*[1] *, OZDEN AGRA*[2]

[1] Yildiz Technical University, Turkey ; [2] Yildiz Technical University, Turkey

ABSTRACT

Nowadays, usage of heat pump systems as home appliances has become increasingly common in order to reduce the increased energy consumption. In this study, charge amount and compressor speed on the energy consumption (EC) and heat pump operation time (toperation) were investigated experimentally. Water is heated from 15°C ± 2°C to 52°C by the heat pump system. R600a is used as the refrigerant. The air source evaporator uses the ambient heat. Experiments have been carried out at different compressor speeds with 30 g, 35 g and 40 g refrigerant charges. According to results, energy consumption has been found to be optimum between 2600 rpm and 3500 rpm compressor speed in 35 g charge amount.

KEYWORDS **-** Heat pump, Charge amount, Compressor speed, Energy consumption, Operation time

DYNAMIC ANALYSIS AND CONTROLLING OF A 2 DOF ROBOT MANIPULATOR USING FUZZY LOGIC TECHNIQUES

***BEKIR CIRAK*[1] *, SAMI SAFA ALKAN*[2] *, FATIH IRIM*[3]**

[1] Karamanoglu Mehmetbey University Engineering Faculty Department Of Mechanical Engineering, Turkey ; [2] Konya Technical University Institute Of Graduate Studies, Turkey ; [3] Konya Technical University Institute Of Graduate Studies, Turkey

ABSTRACT

This paper reviews the literature on control of 2-DOF robot manipulator using fuzzy logic control (FLC). Different schemes of FLC laws are considered here. These are PID control, sliding mode control (SMC), and adaptive control. Importance of each control techniques with its advantages and disadvantages is discussed here. It is highlighted that the robustness of the system has improved considerably by using FLC than classical controller. System performance was evaluated by simulations of two degree of freedom robot arm.

KEYWORDS **-** Robot manipulator, Control, Fuzzy Logic, Two-DOF, Dynamic Analysis

USABILITY OF FUZZY LOGIC CONTROL FOR PERFORMANCE OF DUAL AXIS SOLAR TRACKING SYSTEM

BEKIR CIRAK[1] , FATIH IRIM[2] , SAMI SAFA ALKAN[3]

[1] Karamanoglu Mehmetbey University Engineering Faculty Department Of Mechanical Engineering, Turkey ; [2] Konya Technical University Institute Of Graduate Studies, Turkey ; [3] Konya Technical University Institute Of Graduate Studies, Turkey

ABSTRACT

This paper describes fuzzy logic controller applied to a dual-axis sun tracking system. Sun tracker is the device that follows the position of the sun throughout the day to harness the output power. Sun tracking increases the output power production by keeping the panel parallel to the sun so that sun radiation makes 90° angle with panel. Solar tracking system is designed to optimize the operation of solar energy receivers. More solar energy is collected by the end of the day if solar receivers are installed with a tracker system. In this paper, a solar tracking system is modeled using Matlab/Simulink and a fuzzy logic control is designed for the control of this system. The generated controller was combined with the solar tracking system and the control was realized with the fuzzy logic controller in the Matlab/Simulink environment. Dual-axis solar tracking system with microcontrollers of fuzzy logic control was designed to increase the efficiency output obtained from solar energy and it was compared with the fixed system.In the moving system, mini PV panels are used as sensors to find the real position of the sun and that geared DC motors in the mechanism with PWM signals obtained from the fuzzy logic controllers were conducted in an intelligent way. All day long the electrical data obtained from fixed and tracking system was transferred to a computer online with the Arduino Due card.The voltage, current and power data of both systems were analysed through Matlab/Simulink software. When the data obtained from the designed prototypes was studied microcontroller-based solar tracking system was observed to have an 26.46% increase in efficiency according to the fixed system.

KEYWORDS - Photovoltaic,Solar Tracking,Fuzzy Logic Controller,Arduino

RISK ANALYSIS AND MANAGEMENT IN CONSTRUCTION PROJECTS

AYMAN H AL MOMANI[1]

[1] Mutah University, Jordan

ABSTRACT

Risk is inherent and difficult to deal with, and this requires a proper management framework both of theoretical and practical meanings. Significant improvement to construction project management performance may be achieved from adopting the process of risk assessment. The types of exposure to risk that an organization is faced with are wide-ranging and vary from one organization to another. These exposures could be the risk of business failure, the risk of project financial losses, the occurrences of major construction accidents, default of business associates and dispute and organization risks. It is desirable to understand and identify the risks as early as possible, so that suitable strategy can be implemented to retain particular risks or to transfer them to minimize any likely negative aspect they may have. This research will argue that, to get a better understanding of the risk involved in the construction market, the risk should be analyzed at three different levels: (1) Macro (or country), (2) market, and (3) project. The macro level will define the general risk to an investor. The risk associated with a specific national and international construction market will be defined as the market level risk, which also includes the impact of the macro level on the construction market. The project level defines the risk associated with a project in the national construction market, which includes the impact of the macro and market levels on the project. Furthermore, the number and complexity of the risk indicators involved at the three levels (macro, market, and project) makes it difficult to analyze their impact without a structured method or analysis. Therefore, a comprehensive risk assessment model is required that would facilitate a structured analysis of (1) risk at the macro level; (2) the risk at the construction market level; (3) risk at the project level; (4) impact of the macro environment on the construction market and project level risk; and (5) impact of the construction market environment on the project level risk. This research will fill this important gap to assist the decision maker in evaluating the potential risk at the macro, market, and construction project levels by using available information, knowledge, and expertise. As such, it can be used effectively before conducting extensive market research and investment in the construction market, as well as during the project planning and execution stages. Clearly, risk is an important factor in the development process of construction projects, which often takes place in a short time frame and competitive market environment. The current study is focused on concepts of risk management and will cover the related literature on the topic, development of a proper research method and suggestions related to risk management practices in construction industry in Jordan. No comprehensive study that captures the whole process of construction cycle; describes how risk is taken into account throughout the development process. However, in practice, contractors tend to approach risk more circumspectly because of a set of complex, microeconomic factors like the scope of works, forward workload, need-for-work, competition and other exigencies of construction practice that also affect projects. In order to compare the theoretical risk analysis models with the practice of risk analysis in Jordan, the whole construction development process will be shadowed in the top construction contractors. The aim here was to explore deeply rather than superficially into what contractors actually do. Hence, the participant will help to achieve a high degree of validity of the research findings.

KEYWORDS - Risk analysis, RISK INFORMATION , construction projects,construction management

TECHNO ECONOMIC ANALYSIS OF 5 MWE HYBRID POWER PLANT USING A COMBINED RANKINE CYCLE IN FARO BOUKI CAMEROON

***ALAIN BIBOUM*[1] *, AHMET YILANCI*[2]**

[1] Institute Of Solar Energy, Turkey ; [2] Institute Of Solar Energy, Turkey

ABSTRACT

Adamawa is one of the northern provinces of Cameroon benefiting from both a high biomass potential coming from agricultural activities and a good Irradiation estimated at 2140 kWh/m2 per year. The lake of Information in renewable energy policy specifically for thermal power plant technologies using Solar and Biomass in many sub-Saharan countries has hindered the rapid deployment of these technologies in the continent, hence this study is conducted to present a synopsis of thermodynamic analysis and cost optimization for 5 MWe power plant project development in Cameroon. The aim of this paper is to conduct a techno-economic analysis of a solar-biomass hybrid system to meet electricity needs and energy for manufacturing processes purposes in Faro-poli. In order to achieve the aim, some incentives and reasonable value of Feed-in-Tariff (FiT) have been suggested through the use of a synopsis analysis. The studied system is a combination of a Concentrated Solar Power using Parabolic Trough Collector (CSP-PTC) and a biomass-fired technology generating power. In order to carry out the analysis in System Advisor Model (SAM) and MATLAB program, Meteonorm7 and Excel program has been used to extract meteorological and technical data for the location. The results show that the studied system is able to generate 33.12 GWh per year with an annual sorghum feedstock consumption estimated at 30198.2 tons per year. The initial investment of the hybrid system is approximately at 53.15 Million US Dollar with a payback period of approximately 8 years with some incentives. The project Levelized cost of electricity (LCOE) and net present value has been estimated using an internal rate return of 7 %. The comparative study with a standalone CSP-PTC or biomass-fired systems shows various advantages able to provide a good negotiation of feed-in-tariff (FiT) with a flexibility able to exceed 30% of the initial value of LCOE using CSP technology. The use of Carbon credit (CERT/TAX) and other incentives such as the equipment quality of thermal power technology in the renewable energy policy of sub-Saharan countries can positively contribute to ensuring the stability of transmission grids and promoting the use of these technologies in the continent.

KEYWORDS - FiT,LCOE,HPP,CSP-PTC,CER/TAX

EMISSION CHARACTERISTICS OF BIODIESEL BLENDS IN COMMON RAIL DIESEL ENGINE

***HASAN AYDOGAN*[1] *, A ENGIN OZCELIK*[2] *, MUSTAFA ACAROGLU*[3]**

[1] Selcuk University Technology Faculty, Turkey ; [2] Selcuk University Technology Faculty, Turkey ; [3] Selcuk University Technology Faculty, Turkey

ABSTRACT

As a renewable, sustainable and alternative fuel for compression ignition engines, biodiesel instead of diesel has been increasingly fueled to study its effects on engine performances and emissions in the recent 10 years. Biodiesel is easily produced from the transesterification of vegetable oils (both edible and non-edible), animal fats, used cooking oil, and algae oil. Hence, biodiesel is a renewable, biodegradable, nontoxic and environmentally friendly biofuel. For example, biodiesel can be derived from palm oil, which is an edible oil; Jatropha, which is a non-food plant growing in dry and marginal land; or used cooking oil, which reduces the health risk from the repetitive re-use of oil. In the present study, the effects of 60% canola, 20% sunflower and 20% safflower oils blends biodiesel fuels obtained through transesterification on engine emissions of these fuels compared to diesel fuel were determined particularly focusing on new blend ratios of B7 and B20.

KEYWORDS - Biodiesel, engine emissions, common rail engine

TOOL WEAR BASED SURFACE ROUGHNESS PREDICTION VIA NEURAL NETWORK IN FACE MILLING

***HACI SAGLAM*[1] *, MUSTAFA KUNTOGLU*[2]**

[1] Faculty Of Technology, Turkey ; [2] Faculty Of Technology, Turkey

ABSTRACT

Actually, face milling is most widely used to generate flat surfaces in manufacturing industry. The quality of machined surface is evaluated in terms of surface roughness parameters as Ra and Rt and surface geometry as flatness. The estimation of surface roughness has closely dependent on flank wear-VB as tool wear-and also the monitoring of tool wear is very important for optimisation of cutting parameters and performing the automated manufacturing as reliable as possible. The machined surface reflects the rate of tool wear and the plot of surface provides reliable information about tool condition. At the beginning of cutting, the tool insert is sharp that surface roughness is higher, and then decrease with increased tool wear after that increase with exceeded tool wear. Therefore the tool life is limited by required surface quality. In this paper the quality of surface parameters defined depend on tool wear is estimated by artificial neural network (ANN). Multilayer perceptron (MLP) neural networks (NN) trained by backpropagation are used for estimating surface roughness with four input parameters as three component of cutting forces and tool wear-VB into account. Also the effects of input parameters on surface roughness are also evaluated. Since metal machining is shown a nonlinear character, ANN with parallel computation ability and having high success solving nonlinear equation systems the estimated results are very close to the experimental results.

KEYWORDS - Surface Roughness, Tool Wear, Tool Condition Monitoring, Artificial Neural Network

A COMPUTATIONAL STUDY FOR PLAIN CIRCULAR PIPE FLOW

ALI H ABDULKAREEM[1] , EYUB CANLI[2] , ALI ATES[3]

[1] Kirkuk University, Iraq ; [2] Selcuk University, Turkey ; [3] Selcuk University, Turkey

ABSTRACT

Although much has been said on Newtonian flow in a circular conduit, emerging computational fluid dynamics codes are still of interest to capture the real world physics as close as possible. There are studies going on in terms of methods, tools, models and validation. According to the recent literature in this work, Direct Numerical Solution is especially seen more frequently. Nano particules as two phase flows for heat transfer research, non-newtonian flows and secondary flows in big diameter pipes at the radial plane are the other topics that are recently encountered. Also, emerging software tools are another point to be emphasized. In order to draw a theoretical frame, a common Computational Fluid Dynamics code was also utilized for the work and described in detail. While 0.0005 m/s uniform velocity inlet boundary condition was selected, flow remained in the development region due to the laminar flow and 4 m axial length of the pipe. Results are in accordance with the known velocity profiles. Future needs are addressed and the topic is also evaluated in terms of mechanical engineering education.

KEYWORDS **-** Circular, Newtonian Flow, CFD, Review

THE RELATIONSHIP BETWEEN TIRE MECHANICS AND ENERGY

***EYUB CANLI*[1] *, SERAFETTIN EKINCI*[2]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

Tire mechanics are a field of study for academia and engineering due to its complex responses to operational conditions and due to the probabilities of material parameters. A lot of work have been conducted on characterizing the tire behavior under various loads. However there is a relationship between tire behavior, especially rolling resistance and friction factor with vehicle energy consumption since some of the consumed energy is spent on rolling resistance cost while some of the consumed energy is regarded as waste energy because of the slippage. In this work, some examples in the literature dealing with the relation between tire mechanics and energy are surveyed and some analytical and empirical relations are examined. It is seen that tire mechanics are directly related with energy consumption of the vehicles. Rolling resistance is a factor on tire slippage, leading to efficient utilization of the consumed energy. However there is an optimum and this is subjected to research and design studies. In the last part of the paper, some remarks are provided for the future work.

KEYWORDS **-** Energy, Mechanics, Rolling Resistance, Slippage, Tire

CFD CASE STUDY ON A NOZZLE FLOW LITERATURE REVIEW THEORETICAL FRAMEWORK TOOLS AND EDUCATIONAL ASPECTS

ALI H ABDULKAREEM[1] , EYUB CANLI[2] , ALI ATES[3]

[1] Kirkuk University, Iraq ; [2] Selcuk University, Turkey ; [3] Selcuk University, Turkey

ABSTRACT

State of art engineering involves lots of software types and numbers. The theoretical framework on a vocation is not sufficient for today's undergraduates to integrate into the industry. Therefore, engineering programs are implementing courses on related software types. This work focuses on particular and widespread Computational Fluid Dynamics software in respect of mechanical engineering education. A case was determined which involved a nozzle flow analysis. Particular attention was paid on recent works for the case and for the related education studies. After a theoretical framework section containing governing equations of the physical phenomena, a section is dedicated on the used software tool. Subsequently, a results section is provided on case results and this section also includes evaluation of the results in terms of undergraduate education of mechanical engineering. Finally some concluding remarks are listed. As a major conclusion, skills on using software and skills on understanding and evaluating results in respect of engineering should be separated from each other and should be subject of different courses. The two dimensional CFD analysis results show that the analysis is in agreement with real world physics. The static pressure values ranged between -88120 Pa gauge pressure and 286200 Pa gauge pressure while Mach Number ranged between 0.15 to 2.85.

KEYWORDS - CFD, Fluid Mechanics, Nozzle, Mach, Engineering Education

THE DESIGN OPTIMIZATION OF A GRIPPER MECHANISM USING THE BEES ALGORITHM

OSMAN ACAR[1] , METE KALYONCU[2] , ALAA HASSAN[3]

[1] Selcuk University, Turkey ; [2] Konya Technical University, Turkey ; [3] University Of Lorraine, France

ABSTRACT

Mechanisms are used for a specific objective. The objective of a mechanism may be following a trajectory or transmitting force. For a gripper mechanism, several objectives can be written. Performing the objectives with success requires optimized link lengths of the mechanism. There are several methods for optimization nowadays. Heuristic optimization methods are advantageous for problems with multivariable objective functions. One of the heuristic and population-based optimization method, the bees' algorithm searches optimal points in a wide space of solution of the objective function. In this paper, a gripper mechanism was optimized by using the bees' algorithm and compared with non-dominated sorting genetic algorithm version II (NSGA-II).

KEYWORDS - Optimization, Heuristic Optimization, The bees' Algorithm, Gripper Mechanism, NSGA II.

COMPARISON OF EMPIRICAL AND EXPERIMENTAL RESULTS OF TEMPERATURE ON CUTTING TOOL HARDNESS DURING ROUGH TURNING

MUSTAFA KUNTOGLU[1] , HACI SAGLAM[2]

[1] Faculty Of Technology, Turkey ; [2] Faculty Of Technology, Turkey

ABSTRACT

– The temperature variation on cutting tool during machining informs about the tool wear improvement indirectly. Rough turning operation requires maximum material removal rate in minimum machining time. Higher machining parameters generate high temperatures and reduce tool life. Because of this, cutting temperatures should be optimized and considered as a function of tool life. For minimization of experimental work and production cost, prediction-based approaches have increased attention in last years. This study investigates the cutting tool temperatures on the rough turning of AISI 1050 material with different type of cutting tools in dry cutting conditions. Depth of cut was kept constant and cutting speed (135-194-207 m/min), feed rate (0,171-0,214-0,256 mm/rev) and hardness of cutting tool (P10-P25-P35) were chosen as variables. The research is performed with both experimental and empirical approaches and comparison curves showed that two results seem compatible. Experiments were committed based on full factorial design principle and empirical analysis was performed with orthogonal cutting conditions. Analysis of variance (ANOVA) showed that cutting tool hardness (45%) and cutting speed (44%) have dominant effect on cutting tool temperature. Empirically provided data show promising results to investigate the orthogonal process in future studies.

KEYWORDS - Temperature, Variation of Tool Hardness, AISI 1050, Rough Turning, Empirical Calculation,Analysis of Variance

ANALYSIS OF EXERGY DESTRUCTION RATES IN THE COMPONENTS OF THE ORC SYSTEM USING N PENTANE FLUID

ALI KAHRAMAN [1] **,** ***REMZI SAHIN*** [2] **,** ***SADIK ATA*** [3]

[1] Necmettin Erbakan University, Turkey ; [2] Kto Karatay University, Turkey ; [3] Kto Karatay University, Turkey

ABSTRACT

In this study, exergy analysis of ORC model designed using n-pentane fluid was performed. The effect of evaporation pressure and superheating temperature on system performance was determined. MATLAB and EES (Engineering Equation Solver) program was used in this study. In the simple ORC model, the exergy loss caused by the change in the evaporation pressure of n-pentane fluid between 250 kPa and 400 kPa was investigated. The exergy destruction in the pump, evaporator, turbine and condenser is determined comparatively. In addition, the effect of superheating temperature on the efficiency of the system has been investigated. Three different models were created for this. These are the system with no superheating temperature, a system with a superheating temperature of 10 °C and 20 °C. The effect of evaporation pressure and superheating temperature change on energy and exergy efficiency was determined in three different models. The percentage of exergy destruction occurring in system components within the total irreversibility value was determined. In which case it is indicated which component should be improved.

KEYWORDS - Organic Rankine Cycle (ORC), n-pentane, Exergy, Exergy Destruction

POTENTIAL EVALUATION OF SCALING AND SIMILARITY FOR TRACTOR TIRES

***EYUB CANLI*[1] *, SERAFETTIN EKINCI*[2]**

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

The common exercise in investigations and industrial applications for tires and specifically tractor tires is experimenting. However there are difficulties which will be detailed in the text. Similar issues are encountered in fluid mechanics but fluid mechanics studies sometimes involves scaled models and uses similarity approaches to overcome some of the difficulties. However only one significant study has been encountered in the literature about tire scaling and no study is encountered about tractor tires. In this report, scaling, similarity and dimensionless analyses are introduced first. Then the work about tire scaling is viewed. Scaling tractor tires are evaluated. Some concluding remarks and propositions are made for future work.

KEYWORDS - Similarity, Scaling, Tire, Tractor

MATHEMATICAL MODELING OF THERMOELECTRIC GENERATOR BY REGRESSION ANALYSIS

ABDULLAH CEM AGACAYAK[1] , HAKAN TERZIOGLU[2] , SULEYMAN NESELI[3] , GOKHAN YALCIN[4]

[1] Konya Teknik University, Turkey ; [2] Konya Teknik University, Turkey ; [3] Selcuk University, Turkey ; [4] Konya Teknik University, Turkey

ABSTRACT

As countries grow, their need and demand for energy grow as well. The development of the technology and industry, which come to exist due to the growth of the country, a brings about a rise in energy consumption, as well as increasing the damage to the environment. Therefore, as the environmental and energy-related issues started to emerge more and more, we have seen an increase in the number of studies on energy production and its effects on the environment. Such studies highlight the renewable energy sources among the non-polluting alternative energy sources. Geothermal energy, particularly, shines out among the other renewable energy sources. It is a clean energy source that has been sustained since the Earth was formed. This study focuses on the design of a device named thermoelectric generator (TEG) that converts a renewable energy source, geothermal energy, directly into electric energy. Hence, we ran a simulation of a regression analysis and mathematical model on the thermoelectric modules TEC1-12706 and TEC1-12710, which can easily be found on the market, and then crosschecked the simulation results of different temperature, pressure, and water flow with experiments. The values for current, voltage, power, hot and cold surface temperatures, and the temperature difference between hot and cold surfaces were constantly monitored and recorded. The results of the experiment were compared using the regression analysis method. For the device TEC1-12706, error percentage of 9 experiments was 16.52% while it was 9.70% for TEC1-12710. At 90°C temperature difference, for TEC1-12706, output voltage was Vmax = 2.03V, output power Pmax = 2.17W, and efficiency 10.3%. For TEC1-12710, output voltage was Vmax = 2.11V, output power Pmax = 3.42W, and efficiency 3.3%.

KEYWORDS - Geothermal energy, thermoelectric generator (TEG), modeling, regression analysis

INTERN ENGINEERING APPLICATION STATISTICS

***EYUB CANLI*[1] *, AHMET ALI SERTKAYA*[2]**

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

Internship is a common tool for undergraduate education. Although engineering faculties in Turkey has internship applications, most of them are restricted for a limited period of time; about 60 days and usually it is done in summer semester. By the advancement of technology, conventional education and internship have become insufficient as their content can be short for recent technique. In the last decade, 21 technology faculties were established for engineering training and they have an internship program that can be regarded as a novel application. This new internship program involves private sector as the field of application and students spend almost 4 months, which should be normally spent in classes, in one of the winter semesters in the private sector companies. The impact of this application should be measured and assessed in order to aid decision making of the remaining engineering training facilities in Turkey and may be in the world. This work describes the experience of Selcuk University Technology Faculty Intern Engineer Program. It is also a preliminary step towards a comprehensive impact measurement. Some statistics such as student numbers, semesters, company numbers are provided. Some projections are given it the last part of the paper.

KEYWORDS - Engineer, Impact Assesment, Intern, Internship, Private Sector

VARIATION OF FRACTURE TOUGHNESS OF RESISTANCE ON SPOT WELDED SHEET STEELS WITH HARDNESS

IBRAHIM SEVIM [1] ***, MUHAMMED EMIN TOLU*** [2]

[1] Karamanoglu Mehmetbey University, Turkey ; [2] Karamanoglu Mehmetbey University, Turkey

ABSTRACT

In order to estimate the fatigue life of resistance on a spot welded joint one needs to know fracture toughness, strain energy release rate, and critical crack length. The weld bead of a welded pair has been investigated under tensile-shear condition to impose a welding zone shear stress. Both the fracture toughness and the strain energy release rate depend on the shear stress. In this study, we investigated the variation of fracture toughness, strain energy release rate and crack length with the hardness of the spot welding bead. We used the tensile-shear force obtained from the data for Mod II fracture to determine the variations in fracture toughness and the stain energy release rate with hardness of the welding zone for Mod I fracture. The fracture toughness and stain energy release rate for spot welded steel sheets are calculated by using the formula given in literature. The results are compared with the literature. The results show that the fracture toughness, KIIC and strain energy release rate GIIC, decrease as the hardness, H, increases, the critical crack length aIIC increases to critical value of fracture toughness, and the stress intensity factors KI, KII, can be estimated for spot-welded joints, for any one of the modes I or II.

KEYWORDS - Resistance spot welding, fracture toughness, strain energy release date, Vickers Hardness, critical crack length.

FEASIBILTY OF SOLAR WIND HYBRID ENERGY SYSTEM A CASE STUDY IN SOMALIA

***ZAKARIA IBRAHIM ALI*[1] *, FARUK KOSE*[2]**

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

The demand for affordable and reliable electricity everywhere in Somalia is high and increasing. Moreover, Somalia suffers from a deficiency of power in rural communities. only an estimated 15% of the population has a connection to power. In urban areas, 35 % of the population is connected to electricity while in rural areas, only 1 % are connected to electrical services. It suffers from a deficiency of power in rural communities Solar and wind energy offers a way to deliver current energy needs and challenges associated with the country. There is significant potential in all Somali areas in terms of renewable and alternative energy sources like wind and solar energy but so far, due to both security and funding problems, only very small, timid experiments have been carried with solar and wind power. The solar energy potential varies from 5–7kWh/m2 /day with more than 310 sunny days in a year. Somalia is also identified by powerful winds with a seasonal mean wind speed of 1.5 to 11.4m /s. Feasibility of Solar-Wind hybrid Energy System in Somalia is presented in this study. Solar and wind energy potentials at different geographic locations in Somalia was investigated then selected location is analyzed using Hybrid Optimization Model for Electric Renewables (HOMER) software tool. The average electric load demand of a sampled community was estimated and a feasibility study on how to provide energy to a measured community was presented. A analyze of the technical and the economic feasibility of the chosen combination system for electric generation is presented.

KEYWORDS - Solar, Wind, Hybrid, Renewable, Energy

EFFECT OF CEMENT SUBSTITUTION BY CKD ON THE MECHANICAL BEHAVIOR OF CEMENT PASTES

BOUZEROURA MANSOUR[1]

[1] Bejaia University, Algeria

ABSTRACT

Cement is considered the most consumed material in the field of construction, it must be produced every year in massive quantities. This production leads to polluting the environment by releasing amounts of CO2 emission in addition to producing solid waste known cement kiln dust CKD. The purpose of this study is to explore the possibility of using this material as a cement replacement in the production of concrete mortar, which occupies about half the volume of concrete. Chemical analysis and some physical properties of three different CKD replacements (5%, 10% and 15% by weight of cement) are represented in this article. the study showed that the substitution of cement by CKD for the three percentages gave no improvement in the mechanical resistance or at least for 5% of substitution the behavior is similar to that of the cement. the results obtained are supported by XRD, INFRARED and take-up tests, with these results can confirm that the substitution at 5% of CKD does not modify the actual behavior of the cement.

KEYWORDS - CEMENT,SUBSTITUTION ,CKD,MECHANICAL BEHAVIOR

CRITICISM ON APPLIED TRAINING REVIEWS RENEWABLE ENERGY FIELD CASE

EYUB CANLI [1] **, *SELAHATTIN ALAN*** [2]

[1] Selcuk University, Turkey ; [2] Selcuk University, Turkey

ABSTRACT

The rapid advancement in technology weakens effectiveness of conventional technical education. New fields of earnings are emerging and there is a decreasing tendency towards technical departments. Skilled technical professionals are sought. A practical solution seems to be short trainings of existing professionals and recent graduates. A significant field that can exemplify the issue is the renewable energy (renewables) sector with its intrinsic characteristics. There is a struggle towards promoting renewable energy conversion systems. However it is a relatively new field and there is a need of skilled man power. Some researchers focused on the studies for training professionals and they try to assess various approaches and try to measure their impact. Because, there is diversity in training approaches and a common application is hard to be mentioned. In this report, some references from literature are reviewed while conceptual and principal criticisms are made for some of the methods and evaluations in terms of assessment of the effectiveness of applied training. In a general manner, selected quantities for grounding qualitative conclusions seem not adequate or sufficient. Most of the comments are based on subjective responses. Monitoring practical skills on applications is missing. Long term monitoring of new professionals haven't been encountered in the literature. Significant examples on applied training on a specific application are hard to find. Therefore, some propositions are made for better assessment of the applied training.

KEYWORDS - Applied training, Assessment, Qualitative, Quantitative, Renewable Energy, Review

EFFECTS OF IMPLANT ABUTMENT DIAMETER AND CONNECTION TYPE ON THE FATIGUE PROPERTIES OF DENTAL IMPLANTS

HALIM KOVACI[1]

[1] Ataturk University, Turkey

ABSTRACT

Dental implants are commonly used in the treatment of complete or partial edentulism. The most important parameter that determines the biomechanical performance of dental implants is their fatigue resistance because dental implants and teeth are subjected to variable and cyclic loads during mastication. Also, there are many different types of dental implants in use, which are produced by different manufacturers, with different designs parameters such as implant-abutment diameter and connection type. However, as well-known, the fatigue properties of dental implants are directly related to these design variables. Therefore, the effects of implant-abutment diameter and connection type on the fatigue properties of dental implants were investigated in this study. For these investigations, fatigue tests were performed on 8 different dental implants, which have various implant diameters (changing between 3 mm and 3,7 mm) and designs, according to ISO 14801:2007 (Dynamic fatigue test for endosseous dental implants). The results showed that the fatigue limit of these implants changed between 120N and 300 N and the increasing implant diameter increased this limit. On the other hand, it was also seen that dental implants, which had same implant diameter, showed different fatigue limit values. This result revealed that the fatigue limit of dental implants in same diameter depended strongly on the design of implant-abutment-screw connection type.

KEYWORDS - Fatigue, Dental implant, abutment, screw

APPLICATIONS OF 3D PRINTING TECHNOLOGY IN DENTISTRY

BEKIR CIRAK[1] , MEHMET ONUR OGULATA[2] , SEZGIN ESER[3] , YASIN UNUVAR[4]

[1] Engineering Fac Of Karamanoglu Mehmetbey University, Turkey ; [2] Engineering Fac Of Karamanoglu Mehmetbey University, Turkey ; [3] Engineering Fac Of Karamanoglu Mehmetbey University, Turkey ; [4]Karamanoglu Mehmetbey University Institute Of Natural And Applied Sciences, Turkey

ABSTRACT

In this study, applications of 3D printing techniques in dentistry sector are explained. In 3D applications, there are single tooth coating, bridge, implant tooth making, partial and prosthetic tooth making studies. These applications, which are made with 3d instead of manual according to the mouth of the patient, are longer lasting and useful. Therefore, 3d printing technology has started to be important and necessary in dentistry. It is preferred to use an abrasion resistant plastic material and porcelain material. The important point here is that a carcinogenic material should not be used as it is a study of oral and dental health. Such a study should be done by health and chemistry society.

KEYWORDS - Dentstry; 3D Prınter; Design

STRENGTH AND COMPACTION CHARACTERISTICS OF RECYCLED CONCRETE AGGREGATES

EKREM BURAK TOKA [1] ***, MURAT OLGUN*** [2]

[1] Konya Technical University, Turkey ; [2] Konya Technical University, Turkey

ABSTRACT

Every year, a large amount of construction and demolition wastes are produced worldwide. The use of these wastes in the granular road base (GRB) and granular road subbase layers (GRSB) contributes to sustainability. In Turkey, the necessary attention should be given to the reuse of these materials. In this study, compaction and strength properties of recycled concrete aggregates obtained from 3 different building demolitions, one natural aggregate (NA) and one crushed aggregate (CA) from Konya City/Turkey were investigated comparatively. For this purpose, Modified Proctor and unsoaked California Bearing Ratio (CBR) tests were performed on the pure forms of these 5 different aggregates and the mixtures of 25% -75%, 50% -50%, 75- 25% ratios of RCAs with CA and NA. As a result of the Modified Proctor tests, it was found that the optimum water content of RCAs compared to NA and CA were high due to high water absorption of RCAs and the maximum dry unit weights were low due to low specific gravities of RCAs. As a result of the CBR tests, the CBR values of the RCAs were high enough to be compared to the CA; however, in the mixtures, a decrease in CBR values was observed. The results showed that the RCA in Turkey has some sufficient mechanical properties to be used in GRB and GRSB; however, further studies must be done.

KEYWORDS - Recycled concrete aggregate, Granular road base, Granular road subbase, California bearing ratio, Modified proctor.

NUMERICAL INVESTIGATION AND MODELLING OF CONFINED TURBULENT RECIRCULATING FLOWS

TAHIR KARASU[1]

[1] Eskisehir Osmangazi University, Turkey

ABSTRACT

This original paper presents the results of an extensive study of numerical investigation and modelling of steady, incompressible, and axisymmetric confined turbulent recirculating flows in circular-sectioned sudden expansion pipes at three different Reynolds numbers. Employing the finite-volume method with a hybrid scheme, a computer program based on the SIMPLE (Semi-Implicit Method for Pressure Linked Equations) algorithm has been developed. Numerical solution of the conservation equations of mass and momentum, together with the standard k-e turbulence model, are obtained using an iterative numerical solution technique. Near the solid boundaries, wall-functions are employed. Numerical computations for radial profiles of axial velocity, turbulence kinetic energy, turbulence kinetic energy dissipation rate, effective viscosity, axial variation of centre-line velocity, locus of flow reversal, wall static-pressure coefficient, wall-shear stress and friction coefficient distribution along top wall of the axisymmetric sudden expansion pipe flow geometry are presented and compared with experimental measurements. The results of numerical investigation show generally very good agreement with experimental data.

KEYWORDS - Confined turbulent recirculating flows, k-e turbulence model, Computations.

INVESTIGATION OF THE EFFECTS OF DIFFERENT CEMENTS ON THE PERFORMANCE OF SMALL SCALE DEEP MIXING COLUMNS

MOJEBULLAH WAHIDY[1] , MURAT OLGUN[2]

[1] Science Institute, Afghanistan ; [2] Science Institute, Turkey

ABSTRACT

In this study, small samples were formed by mixing cement as mineral binder with clay. Thus, rheological experiments were performed as preliminary tests to find the optimum water / cement ratio used in the mixture. Therefore 4 types of cement were used in the study. This cements are CEM I 42.5 R, CEM II / A-M (P-L) 42.5 R, CEM III / A 42.5 N & Microfine cement. İn this context marshal funnel test, sedimentation test and vicat test was performed in different water / cement ratio. This ratios are 0.4, 0.5, 0.6, 0.75, 0.9, 1, 1.25, 1.5, 2 and they are different for each test. With the rheological experiments performed, 0.9 was chosen as the optimum water / cement ratio for each cement. the clay mixture was obtained by mixing injection that prepared in optimum (W/C), with clay paste prepared in liquid limit. In the preparation of the mixtures, the cement amount for each cement type was chosen as 4 different ratios (6, 9, 12, 15%) of the dry weight of the clay percentage. Prepared mixture was filled regularly into small PVC containers for, 7,14,28 days Curing time. UCS experiments were performed on the samples at specified times. The results show that CEM II is more resistant than other cements.

KEYWORDS - Liquid limit, Mineral binder, Mixture, resistant, Sedimentation test

INVESTIGATION OF WEAR OCCURRED IN DRY CLUTCH DISK WORKING UNDER VARIOUS TORQUES AND ROTATION SPEEDS

IBRAHIM SEVIM[1] , MUHAMMED EMIN TOLU[2] , NURULLAH GULTEKIN[3] , MURAT MAYDA[4]

[1] Karamanoglu Mehmetbey University, Turkey ; [2] Karamanoglu Mehmetbey University, Turkey ; [3] Karamanoglu Mehmetbey University, Turkey ; [4] Karamanoglu Mehmetbey University, Turkey

ABSTRACT

Effect of the friction factor observed in the mechanical systems is too much to deny. Friction causes wear that induces many serious problems in the system elements. Correct measurement and calculation of the wear between system elements that occurs because of the friction is extremely important to take precautions and keep system life, long. In this study, we aimed to observe and measure the wear caused by the friction of clutch disk that was operated at the conditions of 58, 78, 108, 148, 208 rotations per minute for totally 10 minutes and 42 Nm, 45 Nm, 48 Nm torque values for all rotation speed values. Weight of the clutch disk is 770,11 gr. before the experiments. Weight of the disk is measured after operating the clutch disk for 10 minutes, at all three different torque values and five different rotation speed values to evaluate the wear amount. Measured weight values are used to calculate the changes occurred at the weight loss, wear ratio and wear resistance. Obtained results are presented as tables and diagrams. The most appropriate and optimum working conditions determined and presented as conclusions.

KEYWORDS - Dry clutch, wear, friction, rotation, torque

UTILIZATION OF IONIC LIQUIDS AS EFFECTIVE AGENTS TO PRODUCE FUELS AND CHEMICALS FROM BIOMASS

***ISIK SEMERCI*[1] *, FATMA GULER*[2]

[1] Ankara University Energy Engineering, Turkey ; [2] Ankara University Food Engineering, Turkey

ABSTRACT

Lignocellulosic biomass is unique for being a natural, abundant and low-cost raw material among renewable energy resources. Lignocellulosic biomass, which is the only renewable resource of fixed carbon, possess an original content and structure. This unique content and structure enable biomass conversion into a variety of fuels and chemicals that can replace petroleum-based products. Although catalytic strategies have received a great deal of interest in the recent years for biomass processing, some challenges such as the loss of catalyst's selectivity and stability with time and the complexity of reaction medium lead researchers to seek alternative solutions. At this point, ionic liquids emerge as successful solvents; having high solvation capability towards lignocellulosic biomass and being capable of separating different biomass components with high purity. Ionic liquids (ILs), which have been known as "green solvents", have low vapor pressures and can be recycled and reused following their reaction with biomass. That is particularly linked to their increased thermal stability. Modifications in their cations and anions enable ILs to be effective on different biomass components. Under certain conditions, separation and recovery of soluble and insoluble biomass components from the reaction medium by various antisolvents at the end of the reaction considered as a significant advantage. In this study, we represented the effects of protic and aprotic ILs with respect to their potentials in the fractionation and valorization of biomass into biofuel, ethanol and aromatic product lignin.

KEYWORDS - Bioenergy, biomass, ionic liquids,ethanol, lignin

DETERMINATION OF BASIC CONSTRUCTION PARAMETERS OF KNITTING MACHINES

DUYGU ERDEM[1] , GABIL ABDULLA[2]

[1] Selcuk University, Turkey ; [2] Suleyman Demirel University, Turkey

ABSTRACT

To obtain a knitted structure, many elements should work together in a harmony in a knitting machine. However, each element is produced in some certain production limits and that makes them harder to work compatible with each other. To overcome this situation lots of equations should be derived and the most appropriate one should be chosen. In this study, the most basic design parameters were determined, and their relations were studied.

KEYWORDS - Knitting machines, knitting elements, machine design

HOSPITAL FACILITY LAYOUT PLANNING AN APPLICATION WITH CLASSICAL METHODS

GOKCE KILICKAYA[1]

[1] Istanbul Gelisim University, Turkey

ABSTRACT

The main purpose of the facility layout is expressed as the most effectively work area and equipment. A good workplace settlement provides significant competitive advantage by reducing operating costs. In real life problems, there are many factors that affect facility layout. For this reason, it is important to consider more than one purpose while looking for solutions to facility layout problems. It is aimed to increase the production efficiency and reduce the material transportation cost with a good solution for facility layout problems. The most commonly used models for solving plant layout problems are classical methods. In this study, applicability of classical methods with hospital example for facility location is analyzed and results have been discussed. We considered how flow and layout problems could be analyzed on a hospital example. We have many constraints from professional personel survey on results. According to these constraints was created new facility area more effective than current state.

KEYWORDS **-** Classical Methods, Facility Layout, Hospital.

MODERNIZATION AND PRODUCTIVITY ANALYSIS OF A CLASSICAL PRODUCTION LINE WITH INDUSTRY 4 0

HAKAN SAHMAN[1] , ABDURRAHMAN KARABULUT[2] , MEHMET AKIF SAHMAN[3] , ABDULLAH OKTAY DUNDAR[4] , HASAN ERDINC KOCER[5]

[1] Afyon Kocatepe University Institute Of Natural And Applied Sciences, Turkey ; [2] Afyon Kocatepe University Faculty Of Technology Department Of Mechanical Engineering, Turkey ; [3] Selcuk University Faculty Of Technology Department Of Electrical And Electronics Engineering, Turkey ; [4] Necmettin Erbakan University Academy Of Applied Sciences Department Of Transportation And Logistics Management, Turkey ; [5]Selcuk University Faculty Of Technology Department Of Electrical And Electronics Engineering, Turkey

ABSTRACT

Beekeeping is of great importance for the world ecosystem and is an important source of income. Have a lot of natural and nectar sources, there is no need more capital and agricultural land, advantages such as not being dependent on foreign investment and the necessary equipment in terms of low beekeeping has become growing industry in Turkey. Turkey is the second ranked in the world in honey production, but the honey yield is low for each hive in our country. Errors in honey harvest time, the use of old techniques and technologies have a negative impact on honey production efficiency. In addition, errors at harvest time cause the death of the offspring which are of great importance for the future of the colon. In this study, in order to increase the honey productivity, modernization has been done with a three-dimensional simulation in the computer environment by utilizing the Industry 4.0 components. The productivity analysis of the proposed system was made and compared with the existing systems. The proposed system was found to be about 45% more productive than existing systems.

KEYWORDS - Beekeeping, Industry 4.0, Modernization, Productivity Analysis

INDUSTRY 4 0 INNOVATIVE DECISION SUPPORT TOOL FOR SUPPLY CHAIN PERFORMANCE MANAGEMENT

MUHAMMET TURKER AHI[1] , KURSAT YILDIZ[2] , MEHMET AKIF YERLIKAYA[3]

[1] Tg Consulting And Engineering, Turkey ; [2] Gazi University, Turkey ; [3] Gazi University, Turkey

ABSTRACT

As the Industry 4.0 is commonly referred to as the fourth industrial revolution. The industries' main problem are time, speed and quality pressure to be competitive on the global market. In the era of digitalisation, the companies are competing with their supply chain performances. Only the measurement of the supply chain performance can support to identify the problems existing in the current supply chain to take improvement actions. The conflict between the bottom-up implementation process and the top-down strategy decomposition is important. Hence, it is crucial to combine the strategic objectives with the operational ones and support the managers to know more about the operational background of supply chains for a more clear and risk-free decision process. In this study, an integrated approach which brings analytic network process (ANP), technique for order preference by similarity to ideal solution (TOPSIS) and decision-making trial and evaluation laboratory (DEMATEL) method together is proposed for the decision-making support. Supply chain operations reference (SCOR) model is applied to model the operational and strategic objectives. The ANP is used to analyze the performance metrics and determine weights of metrics, TOPSIS method is used to make a normalization of metric values containing different units, DEMATEL technique to evaluate the importance of performance metrics so a decision about the supply chain performance and most important impact parameter will be available. The proposed approach is converted into a program and is applied in a manufacturing company. Managers were impressed by the results and application as a decision support tool.

KEYWORDS - Industry 4.0, Supply Chain Performance; ANP; TOPSIS; DEMATEL; Decision Tools

A NEW APPROACH FOR COST REDUCTION IN STEEL STRUCTURES TOPOLOGICAL OPTIMIZATION

HAKAN SAHMAN[1] , ABDURRAHMAN KARABULUT[2] , MEHMET AKIF SAHMAN[3]

[1] Afyon Kocatepe University Institute Of Natural And Applied Sciences, Turkey ; [2] Afyon Kocatepe University Faculty Of Technology Department Of Mechanical Engineering, Turkey ; [3] Selcuk University Faculty Of Technology Department Of Electrical And Electronics Engineering, Turkey

ABSTRACT

Optimization is the process of finding the best under certain conditions and constraints. In structural optimization, it is study to optimize the dimensions, shape or topology of a part. In topological optimization, which is one of the structural optimizations, the purpose is to find the structure with the highest resistance or natural frequency while reducing the weight of a part. In this way, the side equipment and capacities used in the topologically optimized structure are reduced. A significant reduction in costs is achieved with the reduction of both weight and material capacities. Reducing costs in all systems with steel construction is also of very important. In this study, the topological optimization study of the telescopic crane, which can be move to a horizontal position of 11 meters, is use to weld the bridge feet. The telescopic crane is driven by a linear car on a horizontal axis. ANSYS 18.2 was used for the analysis of the system. At the end of the study, it was determined that it was appropriate to select small models in linear cars with Topological Optimization. Besides, a 20% reduction in weight and a gain of about 30% in total cost.

KEYWORDS - Telescopic Crane, ANSYS 18.2, Topological Optimization, Welding, Cost, Steel Structure

INSULATION OF THE FORCE CONDUCTED VIBRATION TO THE FLOOR IN WORKBENCH

ABDURRAHMAN KARABULUT[1] , AHMET KOKEN[2] , ENES KARABULUT[3] , HAKAN SAHMAN[4]

[1] Afyon Kocatepe University Faculty Of Technology Department Of Mechanical Engineering, Turkey ; [2] Dumlupinar University Kutahya Vocational School Of Technical Sciences Department Of Machinery And Metal Technologies, Turkey ; [3] Afyon Kocatepe University Institute Of Natural And Applied Sciences, Turkey ; [4] Afyon Kocatepe University Institute Of Natural And Applied Sciences, Turkey

ABSTRACT

The occurred forces by cutting or drilling causes vibration at the workbenches used in production area. The vibration in the machine is transferred to the floor by the foots of the machine. Thus, a vibration will occur on the ground as well. In order to prevent this vibration, it is required that workbench feet should be insulated. In this study, it was tried to prevent the forces exposed to the machine to pass to the ground by considering the frequency of warning formed by the machine forces. With a four-channel vibration sensor, the vibration of the machine and the floor is measured simultaneously. The two channels of the sensor are connected to the feet of workbench and the other channels are connected to the ground. It has been seen that the relative force of the workbench and the ground changed depending on the rate of damping by the insulation. Additionally, due to the insulating material used in the connection, it has been seen that the transmitted force decreased substantially and the amplitude of the ground decreased.

KEYWORDS - Vibration,Workbench Floor Isolation,Damping,Insulating Material

FATIGUE TESTER DESIGN AND FRAME ANALYSIS FOR ESTIMATION OF FATIGUE LIFE OF HELICAL COMPRESSION SPRINGS

GOKHAN YALCIN[1] , SULEYMAN NESELI[2] , HAKAN TERZIOGLU[3] , ABDULLAH CEM AGACAYAK[4]

[1] Konya Teknik University, Turkey ; [2] Selcuk University, Turkey ; [3] Konya Teknik University, Turkey ; [4] Konya Teknik University, Turkey

ABSTRACT

The springs sometimes break suddenly due to the loads under dynamic operating conditions. For this purpose, the determination of the fatigue strength of the helical thrust springs in the working environment requires the use of specially designed devices, especially in the case of high frequency vibration. In this study, a test device is designed to measure the fatigue limit of helical compression springs. The design is made by taking 5 helical pressure springs with 5 windings and 30 mm free length. The building is then thought to be a test unit body and a control panel unit. The movement from the horizontally positioned motor in the test section is transferred to the springs to be tested in groups by means of the eccentric drive device. In order to increase occupational safety and health, the test part has been designed as closed and 360 degree security has been taken into consideration. In addition, thanks to the enclosed environment, fatigue strength is measured to be isolated from environmental conditions. In addition, the deflection performed by the forces performed during the study was carried out by FEM analysis. It is concluded that the chassis formed by the analysis carries the forces formed safely.

KEYWORDS - Fatigue test device, Helical compression springs, Displacement analysis.

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