

1 **Title: A VIRTUAL REALITY BASED EDUCATIONAL MODULE FOR KNOWLEDGE LEARNING & SKILLS TRAINING**

Author: Prof. Kasim M. Al-Aubidy, **Published Year:** 0

Faculty: Faculty of Engineering

Abstract: Advances in computers and multimedia technology have changed traditional methods for learning and skills training. Today, multimedia education has been popular, it can provide an environment where virtual reality can be used to create interactive interfaces and real-time software can monitor every response made by the user. This paper presents an attempt to introduce the concepts of fuzzy set theory and multimedia technology in the design of a virtual reality based educational module. Such a module can deal with uncertainties in the knowledge acquisition, representation and decision making. It provides a powerful educational tool that can assist users in learning and training without actually handling real tools.

Keywords: Computer aided learning & training, Fuzzy set theory, Decision making, Multimedia technology, Software Engineering, Virtual reality systems.

2 **Title: A Hierarchical MRAC-Based Neuro-Controller for Robots in Flexible Manufacturing Systems**

Author: Prof. Kasim M. Al-Aubidy and Dr. Mohammed M. Ali, **Published Year:** 0

Faculty: Faculty of Engineering

Abstract: In one hand, the Model Reference Adaptive Control (MRAC) architecture has been widely used in linear adaptive control field. The control objective is to adjust the control signal in a stable manner so that the plant's output asymptotically tracks the reference model's output. The performance will depend on the choice of a suitable reference model and the derivation of an appropriate learning scheme. While in the other hand, clusters analysis has been employed for many years in the field of pattern recognition and image processing. To be used in control the aim is being to find natural groupings among a set of collected data. The mean-tracking clustering algorithm is going to be used in order to extract the input-output pattern of rules from applying the suggested MRAC scheme. These rules will be learnt later using the widely used Multi-layer perceptron neural network to gain all the benefits offered by those nets. A hierarchical MRAC based Neuro-controller is suggested to control robots in a flexible manufacturing system. This proposed controller will be judged for different simulated cases of study to demonstrate its capability in dealing with such a system.

Keywords: MRAC, mean-tracking clustering algorithm, MLP neural nets (BNN), computer control, real-time systems, robots, FMS.

3 **Title: Wireless Gateway Programming Model**

Author: Dr. Qadri Hamarsheh, **Published Year:** 2010

Faculty: Faculty of Engineering

Abstract: This paper suggests architecture for Wireless Gateway Programming Model that consists of building blocks to solve the main WAP Gateway functions. The design of the suggested architecture takes into consideration the technical and business problems of wireless environment. The paper describes various fundamental aspects of the WAP model, the integration of the wireless networks over the internet technologies according to the topics related to the security, caching, state management, etc.

Keywords: Wireless Application Protocol (WAP), Wireless Gateway, WAP Client,

WAPSecurity, WAP Gateway Programming Model.

4 **Title: FCT-Based Convolution, Filtering and Correlation of Signals' Unified Structure**

Author: Dr. Qadri Hamarsheh, Published Year: 2008

Faculty: Faculty of Engineering

Abstract: This paper focuses on constructing efficient algorithms of the main DSP discrete procedures : convolution, correlation functions and filtering of signals based on discrete cosine transform (DCT-II) and presenting them using unified structure . This structure is very useful in reducing the computational complexity by $3N^2$ – real multiplications and $2N$ – real additions in comparison with indirect fast Fourier transforms (FFT) based algorithms calculated through fast cosine transform (FCT). The DCT and its fast calculation ways effectively can be used to calculate convolution, filtering and correlation of signals. For their calculating, the classic schema(two DCT + product of cosine spectrums + IDC) will be save.)

Keywords: Convolution, Filtering and Correlation of Signals, Fast Fourier Transform (FFT), Fast Cosine Transform (FCT).

5 **Title: Unified Matrix Processor Design for FCT-IV and FST-IV Hartley Based Transforms**

Author: Dr. Qadri Hamarsheh, Published Year: 2006

Faculty: Faculty of Engineering

Abstract: A new Unified Fast Shifted Cosine and Sine Transform Matrix Processor based on fast Hartley Transform is presented and described. It is also shown that the decimation-in-frequency (DIF) FCTIV and FST-IV can be computed using the same building blocks which are used for computing decimation-in-time FCT-IV and FST-IV. A Unified Fast Shifted Cosine and Sine Transform Matrix Processor can be designed to compute either the DCT-IV or DST-IV depending on a single line control signal.

Keywords: Matrix Processor , FCT-IV, FST-IV, Hartley Transform.

6 **Title: Design and Evaluation of a Fuzzy-Based CPU Scheduling Algorithm**

Author: Prof. Kasim Mousa Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Scheduling in computer science means determining which tasks run when there are multiple runnable tasks. Several CPU scheduling algorithms have different features, and no single one is ideal absolutely for every application. This paper presents an attempt to apply fuzzy logic in the design and implementation of a rule-based scheduling algorithm to solve the shortcoming of well-known scheduling algorithms. Results given in this paper demonstrate that the average waiting time and the average turnaround time in the proposed algorithm are better than that obtained using priority scheduling, and closed to that obtained from shortest-job-first (SJF) scheduling. The new proposed algorithm is a dynamic scheduling algorithm which deals with both task priority and its execution time, while the SJF algorithm doesn't.

Keywords: Task Scheduling; Fuzzy Decision Making; Operating Systems; Real- Time Systems.

7 **Title: AUTONOMIC MULTIMEDIA DELIVERY SERVICES SELF-CONFIGURATION**

Author: Prof. Kasim Mousa Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: The rapid growth of networks and services has introduces new complex environments. To cope with this complexity, IBM proposed autonomic computing. It allows systems to mange themselves instead of relying on IT professionals. On the other hand, overlay networks are getting a great attention due to the reliable and effective services that they provide. With the increased number of mobile users and services, overlay networks management is becoming more complex. Selfconfiguration can be used to solve overlay networks management complexity through creating a self-configured environment that can respond automatically and transparently to changing conditions. In this paper we provide a thorough survey of self-configuration systems and present their basic concepts, architectures, and challenges in addition to presenting a proposed self-configuration architecture for multimedia delivery services.

Keywords: *self-configuration, autonomic computing, overlay networks, management complexity.*

8 **Title: TOWARDS SELF-CONFIGURABLE OVERLAY NETWORKS**

Author: *Prof. Kasim Mousa Al-Aubidy, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: The rapid growth of networks and services has introduces new complex environments. To cope with this complexity, IBM proposed autonomic computing. It allows systems to mange themselves instead of relying on IT professionals. On the other hand, overlay networks are getting a great attention due to the reliable and effective services that they provide. With the increased number of mobile users and services, overlay networks management is becoming more complex. Self-configuration has been used to solve overlay networks management complexity through creating a self-configured environment that can respond automatically and transparently to changing conditions. In this paper we provide a thorough survey of self-configuration systems and present their basic concepts, architectures, and challenges in addition to presenting a proposed self-configuration architecture for multimedia delivery services.

Keywords: *self-configuration, autonomic computing, overlay networks, management complexity*

9 **Title: Maximum Power Point Neuro-Fuzzy Tracker for Photovoltaic Arrays**

Author: *Prof. Kasim Mousa Al-Aubidy, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: Photovoltaic systems can meet virtually any electric power need and are used for several applications including satellites, telecommunications, homes, factories and businesses. Advancements in efficiency and cost reduction have made photovoltaic systems economically competitive with traditional power sources. This paper presents an intelligent method of maximum power point tracking for photovoltaic systems. The tracking algorithm is based on tracking the maximum power point by measuring the voltage and current of the solar array and computing the required duty cycle of the PWM signal to control a switch of a buck-boost DC to DC converter. Both conventional fuzzy logic controller and neuro-fuzzy controller are implemented to evaluate PV system performance. Obtained results show that the neuro-fuzzy controller can deal with different load and weather conditions and deliver more power from the photovoltaic systems.

Keywords: *Photovoltaic System, Solar cells, Fuzzy logic, Neuro-fuzzy, Maximum power point tracking.*

10 **Title: Conservation of Palestinian Urban Heritage: The Danger of Destruction and**

Methodology of Documentation

Author: *Dr. Ahmad Abu AlHaija, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: This research illustrates models and methods of the destruction of Palestinian urban cultural heritage by Israeli occupying authorities between 1984 and 2008, demonstrating a systematic colonialist approach through the expropriation of Arab lands and its historical identity. The role of Palestinian Authority is highlighted by the management of natural and historical heritage in West Bank and Gaza Strip through legislation, regional and local plans and its failure to control the continuous demolition of traditional buildings and transformation of urban and rural fabric. This research documents some of important resources concerned with Palestinian urban cultural heritage, identifies problems of archaeological and traditional buildings registration under occupation and the lack of modern scientific approach. It also presents analytical studies and scientific methodology in order to prepare basic fundamentals of documentation process from the administrative and technical point of view. In conclusion, the recommendations of the research highlight the Palestinian urban cultural heritage on the local and international levels, and proposing legislative and planning tools necessary to conserve the urban heritage and organize the documentation phases.

11

Title: Historic and Traditional Urban Centers in Jordan: the Physical Transformation of Architecture and Landscape

Author: *Dr. Ahmad Abu AlHaija, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: Traditionally, the richness of Jordan consists of its history; ancient civilizations left their testimonial traces in several regions such as; Dead Sea, Petra, Jerasa, Um Kais, Madaba, Ajloun, etc. Nowadays, Jordan has significant role because of its geopolitical position in the Middle East and its economic position as a result of its relationship with Saudi Arabia and Arab Gulf Region. The rapid urban development due, essentially, to the modern economic models caused serious variation of the historic agglomerations and urban landscape. Local territorial laws and building regulations contributed both positively and negatively in the process of transformation. This research illustrates some physical aspects of Jordanian historic centers concerning their urban character and architecture; in order to discuss the relationship between traditional and modern planning methodology and building techniques. Particular attention was given to the urbanization impacts on the local community and physical integrity of historic center, the landscape alteration effect in relation with environmental condition and the sustainability of new built environment. At the same time, it takes into consideration land cost, building density, public and standard services, etc. This research highlights recommendations regarding the importance of introducing the sustainable concept in Jordanian planning strategy and physical historic urban conservation. It also advocates the promulgation of territorial laws and introducing specific guidelines for intervention methodology and building regulation with particular attention to: texture, shape, volumes, heights, morphology, cohesions, sustainable materials (insulation, energy saving, maintenance, etc.).

12

Title: Tourism Development in Aqaba and Human Sustainability

Author: *Dr. Ahmad Abu AlHaija, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: The Aqaba Gulf and the city of Aqaba are extremely important for the future of Jordanian investment plans. It is the only port in Jordan. The coast of Aqaba is also important for the internal and external tourism because of natural resources, variety of

landscape and historic sites in the area. On the other side of the Gulf lies the new city of Eilat, established in few years with an ambitious development plans. Israel's strategies aim at benefiting from regional potentialities (geophysical structure in the Gulf of Aqaba, Red Sea, Sina'a Desert, Wadi Rum Desert, Petra, etc.), establishing a modern mechanism of communication networks, publicizing and creating an attractive tourist city through an innovative system of infrastructure, particular urban spaces and advanced structures of tourist facilities. The Jordanian strategy, by getting advantage from its own resources in view of the regional challenges and to compete with Eilat, declared the formation of Aqaba Special Economic Zone Authority (ASEZA), in order to encourage foreign investments, elaborating a new Master Plan to the city. More than 7 billion dollars are invested in Aqaba in the last 7 years, used mainly in the development of tourist sectors. But the existing inefficient infrastructure of the city center, the shortage of public facilities and the degradation of popular residential quarters, laid shadows on the economic success of ASEZA.

13 **Title: Conservation of Umayyad Palaces in the Desert of Jordan: The Case Study of Qusair Amra**

Author: Dr. Ahmad Abu AlHaija, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Due to technical and economic problems, most of the historic monuments and cultural material of important Umayyad Palaces located in the desert of Jordan is under risk of deterioration, This research illustrates some of these Palaces, their location and relationship with the Jordanian and inter-regional context, the existing uses, the physical aspects and state of conservation. It tacks Qasr Amra as a case study, which is one of the most important Umayyad Palaces in Jordan from the architectural and artistic point of views. Specific historic and material analyses is elaborated in order to evidence some important artistic particularities of this important building. The objective of research is to highlight the existence of some world heritage Palaces, which necessitate more attention from the international organizations in order to be appropriately protected and managed, tacking into consideration the importance of tourism international networks. The hypothesis concerns a sustainable protection approach, through a national tourism plan and a building conservational approach.

14 **Title: Housing Need and Sustainability**

Author: Dr. Ahmad Abu AlHaija, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Jordan is actually facing a rapid urban development mainly due to local and regional immigration and economic and social growth. This condition affected particularly the housing need and increased the cost of lands and buildings. It also enlarged the gap between demand and offer of shelters. The Jordanian planning government tried to resolve the increasing housing need, implementing infrastructural facilities and building new residential units. It also supported residents by financial mechanism and offered affordable lands. Therefore, the public housing production was substantially irrelevant to satisfy the housing need for low income groups. The urban problems became difficult to sustain especially concerning the slum areas and the environmental pollution due to the high residential density, the aggression on the agricultural lands and the reduction of natural and energy resources. This paper analyzes the housing condition in Jordan in general and Amman city in particular. It exposes the results of studies developed by the Housing Corporation and Urban Development (HCUD) regarding the Jordanian housing production and need, in order to establish a realistic approach which could contribute to increase the productivity

and sustainability taking into consideration the life cycle cost, proposing residential buildings suitable to the environmental, economic and cultural conditions. Methodologically, this paper is based on analyses and evaluation approaches, considering concretely practical issues which help to comprehend the existing condition and the possible future scenarios.

15 **Title: Danger of Tunnels on Al Aqsa Mosque Buildings**

Author: Dr. Ahmad Abu AlHaija, Published Year: 0

Faculty: Faculty of Engineering

Abstract: For more than 40 years, the city of Jerusalem has faced accelerated historical transformation on urban, social, economic and political levels, because of the attempts of occupants in transforming the city's aspect, directing its policy and strategy according to a clear ideology, which aims to evacuate Jerusalem from its Arab residents, through gradual demolition of their houses, decreasing the construction of buildings and urban development in the Arab neighborhoods, while increasing Israel's settlement activities inside and around these areas, and excavating tunnels under Al Aqsa Mosque and the Arab historical town to weaken the foundation of buildings. This research highlights Palestinian, Israeli and international important reports about the excavations under Al Aqsa Mosque, with the objective to pursue its dangerous influence on the structure of Islamic buildings which are threatened by collapse. Methodologically, this research is based on the documentation of changes which affect the Holly Area of Al Aqsa and its buildings through published photos, studies and investigations in this field, and through highlighting theoretical models of buildings behaviour stressed by vertical loads which affect the bearing capacity in case of any sudden land settlement or horizontal force.

16 **Title: Environmental healthy requirements in residential buildings: Amman as a case study**

Author: Dr. Ahmad Abu AlHaija, Published Year: 0

Faculty: Faculty of Engineering

Abstract: This paper discusses the requirements of having healthy environment in the Jordanian residential buildings, in general, and in Amman particularly, considering the healthy problems and the consequences of deceases, shortage of comfort and difficulty in using the spaces. The study presents a real problematic case in Jordan because of norms and executive instruments which are rarely ensure the minimum requested for a healthy environment in the modern buildings, especially regarding the natural aeration and illumination requirements. The paper discusses also the building regulation in Grater Amman Municipality and the Jordanian Building Cods concerning the healthy environment. It uses an analytical scientific approach and a comparison with developed countries in this field (particularly: Lombardia Italian Region). Moreover, it describes some regulation problems and contradictions among deferent norms, which obstacle the realization of acceptable quality of a healthy regulation. The paper conclusions aim to update the Jordanian cods and building regulations in the field of residential healthy environment, particularly regarding the architectural spaces, aeration and illumination.

Keywords: Jordan, Environment, Health, Quality, Architecture, Design

17 **Title: Evaporative system for water and beverage refrigeration in hot countries**

Author: Dr. Ahmad Saleh, Published Year: 0

Faculty: Faculty of Engineering

Abstract: The present study proposes an evaporative refrigerating system used to keep water or other beverages cool in hot arid regions. The system uses a flow of air that flows around a water container, which is wrapped in a wet fabric. The air before being introduced could be dehumidified and cooled to capture more quantity of water vapour. A mathematical model has been developed to describe the system behaviour and the model has been solved numerically. The effects of many parameters on the system performance have been investigated. Results showed that the surrounding pressure around the tank has a significant effect. A cross-over value of mass flow rate at which the effect of ambient temperature changes is found. The results obtained are found to be consistent with the available literature data

Keywords: *evaporative refrigeration, heat and mass transfer, humidification and dehumidification processes, numerical solution*

18 **Title: The effectiveness of multi-stage dehumidification-humidification for improving the cooling ability of evaporative air conditioning**

Author: *Dr. Ahmad Saleh, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: Evaporative cooling systems are commonly used because of their low initial and running cost. These systems have a great potential to provide thermal comfort in places where humidity is low; however, they are less efficient where air humidity is high. The present work proposes a system that can be used either in dry or humid climates by introducing a new concept: multi-dehumidification–humidification processes that can be coupled with evaporative cooling systems. The effect of this modification on the production of low temperature is investigated. To validate the model, the improvement carried out is quantified by comparing the performance of a classical evaporative cooling system and with the proposed single-step dehumidification–humidification system. It is found that increasing the number of dehumidification–humidification processes greatly reduces the air temperature and improves the performance of the system. In some cases, the reduction in the air temperature exceeds 20 C in humid climates, a result that is comparable with those obtained by vapour-compression cooling systems. In conclusion, the proposed system delivers the low cost benefits of evaporative cooling systems with the high performance of conventional compression cooling systems.

Keywords: *evaporative cooling, heat and mass transfer, humidification and dehumidification process*

19 **Title: Variational formulation of hyperbolic heat conduction problems applying Laplace transform technique**

Author: *Dr. Ahmad Saleh, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: In this paper, a non-Fourier heat conduction problem is analyzed by employing newly developed theory. Application of conventional numerical schemes leads to strong oscillations of the results around discontinuities in solution domain. To overcome this difficulty the variational formulation of the Laplace-transformed hyperbolic heat conduction equation is developed. The results were used for evaluation of parameters used in approximate transformed temperature profiles. To validate the approach the results were compared with the exact analytical solution solved at special case and with an approach previously reported in the literature. Both showed a close agreement with the proposed approach

Keywords: *Hyperbolic heat conduction equation; Variational formulation; Laplace transform*

20

Title: Modeling and experimental studies on a domestic solar dryer**Author: Dr. Ahmad Saleh, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: A domestic solar dryer with transparent external surfaces was designed, built and tested. Thin-layer drying models that describe the drying phenomena in a unified way, regardless of the controlling mechanism; have been used to estimate the drying period for several products. Temperature of the drying medium is one of the factors that affect the drying rate constant of the exponential model. This fact introduces a problem when used to predict the drying rate under solar drying conditions since the temperature of the drying medium is rarely constant. This paper aims to propose a solar dryer with a uniform temperature profile that meets the requirements of the exponential model over a wide range of cases, thus, providing a simple and accurate design tool. The dryer is characterized by collecting the maximum possible solar energy by having a longer drying period, and allows the fixed dryer to approach with its performance the tracked one with all technical and economical advantages of the tracking system. The performance was tested under different operational conditions and the drying characteristics were experimentally investigated by conducting the experiments on two local herbs, Jew's mallow and mint leaves. The dryer was able to reduce moisture of the tested products to the recommended level (6% wb) in about a 12 h period. The reliability of the exponential model was evaluated by comparing the experimental with the predicted curves. A reasonable agreement was found for the different tests carried out for the entire drying period

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Title: Solar Cooker Utilizing Satellite Dish Technology**Author: Dr. Ahmad Saleh, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: A parabolic dish-type solar cooker was built and tested utilizing satellite dish technology. A common satellite-TV dish was utilized as a solar cooker after covering it with a highly-reflective aluminum foil, which resulted in a highly imaging reflective surface. The system was tested under four modes of operation: fixed and movable dish, each along with a bare pot and a pot covered with a glass enclosure. The tracking system changes the azimuth angle of the collector to follow the sun during the operating hours of the day and adjusts the focal point according to the solar altitude angle. The effect of the enclosure is to reduce convection losses. Measurements of various temperatures and solar intensities were performed for various days at various operational winter and summer conditions. The performance is reported in terms of cooking power, which is a standard parameter used for interpreting the performance of the cooker. Measurements of solar cooker power for different dates are found to be fairly consistent and agree well with the performance of common solar cookers. The device efficiency for the four modes of operation was compared. It was found that the tracking system based on satellite technology has a substantial effect on the performance and that the effect of the glass enclosure is marginal. The combined effect of tracking and glass enclosure resulted in an improvement of the performance of the system by almost 33% in terms of cooking power.

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Title: A Solar Still Augmented with A Flat-Plate Collector and A Reflector**Author: Dr. Ahmad Saleh, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: A solar distillation system was built and tested to study the effect of increasing the solar radiation incident on a roof-type still, which was also augmented with a flat-plate collector. The modification was performed by adding a reflective

surface to a structure that was already used to carry the hot and cold water tanks which were parts of the solar water heating system. The reflective surface was designed to reflect mid-day solar radiation on a single stage, basin type solar still connected to the conventional flat-plate collector system. The surface was fixed on one side of the water tank, and the relative position of the tank and the still has been modified to maximize the radiation reflected by the reflecting surface on the surface of the still. Measurements of various temperatures, solar intensity, and distilled water produced were performed for various days at various operational conditions. The performance of the modified system was investigated and compared with the performance of two other modes of operation: still operating alone and still connected to collector. It was found that the addition of the reflective surface has a net positive effect on the distilled water production, which improved the performance of the system. The productivity of the still augmented with the reflector in addition to the collector was increased to about 212%. In a clear sky day it exceeded 5.5 liters/m². When the still was augmented only with the collector, the increase was about 168%. The increase due the reflector with respect to the collector alone was about 126%.

23 **Title: Conservation And Preservation In arabic Islamic Civilization**
Author: Dr. Badi Al-Abed, Published Year: 0
Faculty: Faculty of Engineering
Abstract:

24 **Title: Theory Philosophy of Conservation Preservation In Islamic Civilization**
Author: Dr. Badi Al-Abed, Published Year: 0
Faculty: Faculty of Engineering
Abstract:

25 **Title: Arab Muslim Architectural Thought: The School of Archaeology**
Author: Dr. Badi Al-Abed, Published Year: 0
Faculty: Faculty of Engineering
Abstract:

26 **Title: Conceptual Approach to Architecture**
Author: Dr. Badi Al-Abed, Published Year: 0
Faculty: Faculty of Engineering
Abstract:

27 **Title: The Architectural Identity Of Jerusalem And Its Impact Upon The Political Identity - The Dome Of The Rock Or The Claimed Temple**
Author: Dr. Badi Al-Abed, Published Year: 0
Faculty: Faculty of Engineering
Abstract:

28 **Title: The Urban Planning Of Jerusalem And The Impact Of The Dome Of The Rock Upon The Architectural Fabric Of Italian Cities / The Dome Of The Rock As A Symbol For The Three Faiths**

Author: Dr. Badi Al-Abed, Published Year: 0
Faculty: Faculty of Engineering
Abstract:

29 **Title: K-means Clustering Algorithm Identification System Using Wavelet Transform**

Author: Dr. Khaled Daqrouq, Published Year: 0
Faculty: Faculty of Engineering

Abstract: The Speaker identification is the process of determining which registered user provides a given utterance. In this paper, a powerful combination between the Discrete Wavelet Transform (DWT) and logarithmic Power Spectrum Density (PSD) is used for speaker first five formants extraction of one utterance, that are used as distinguishable classification features. As a classification method, the new approach by K-means algorithm is proposed, which uses the average of sums of point-to-centroid distances in the 1-by-K vector. To verify the experimental analysis for this work a Matlab simulation is performed and gave an excellent capability of features tracking even with 0dB SNR. This work is verified for text ependant security systems applications such as password or PINs identification. Moreover, the attained results show excellent performance in classifications, which reaches about 94% classification rate.

30 **Title: Wavelet Formants Speaker Identification Based System via Neural Network**

Author: Dr. Khaled Daqrouq, Published Year: 0
Faculty: Faculty of Engineering

Abstract: In this paper Discrete wavelet Transform with logarithmic Power Spectrum Density (PSD) are combined for speaker formants extraction, to be used as evident classification features. For classification, Feed Forward Back Propagation Neural Network FFBN method is proposed. The Discrete Wavelet formants Neural Network DWFNNT system works with excellent capability of features tracking even with 0dB SNR. Text - dependant system is used, so that the system can be applied in password or PINs identification in any security system. The proposed system is compared with K-means algorithm based clustering method. The results show excellent performance with 93.21% Recognition Rate (RR).

31 **Title: Quality Evaluation of Reconstructed Biological Signals**

Author: Dr. Khaled Daqrouq, Published Year: 0
Faculty: Faculty of Engineering

Abstract: This paper presents the use of wavelet transforms for reconstructed signal evaluation for biological signals. The method adapted on this paper, is a new modeling technique and based on calculating the reconstruction error of the wavelet transform sub-signals that have different frequency bands and different deformation degree. The paper processes a special set of application in biomedical field, called Electrocardiogram (ECG) signal. Compression applied on the electrocardiogram (ECG) and speech signals. Discrete Wavelet Transformation (DWT) with the thresholding compression method was applied to test the proposed reconstruction evaluation method. The proposed algorithm technique gave an excellent result showing that, using wavelet transform is a suitable technique for reconstruction signal evaluation. Also, the presented method determined the exact place and location of deformation in the reconstruction signal.

32 **Title: An investigation of speech enhancement using wavelet filtering method**

Author: Dr. Khaled Daqrouq, Published Year: 0

Faculty: Faculty of Engineering

Abstract: This paper investigates the utilization of wavelet filters via multistage convolution by Reverse Biorthogonal Wavelets (RBW) in high and low pass band frequency parts of speech signal. Speech signal is decomposed into two pass bands of frequency; high and low, and then the noise is removed in each band individually in different stages via wavelet filters. This approach provides better outcomes because it does not cut the speech information, which occurs when utilizing conventional thresholding. We tested the proposed method via several noise probability distribution functions. Subjective evaluation is engaged in conjunction with objective evaluation to accomplish optimal investigation method. The method is simple but has surprise high quality results. The method shows superiority over Donoho and Johnstone thresholding method and Birge-Massart thresholding strategy method

33 **Title: A Fuzzy Decision Maker For Web-Based Distance Learning Systems**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: This paper presents an attempt to introduce the concepts of fuzzy set theory in the design of web-based distance learning systems. A fuzzy decision making process is used to update the learner model and specify his/her learning level to provide appropriate teaching materials to each learner. Such a system can deal with uncertainties in the learner's degree of understanding in each unit. It provides a powerful web-based learning tool through which learners can follow dynamically from one learning unit to the other according to his/her learning level.

Keywords: Computer aided learning & training, Web-based distance learning, e-learning, Fuzzy set theory, Decisionmaking.

34 **Title: A Hierarchical Manufacturing Route Planner Based on Heuristic Algorithm: Design and Evaluation**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: This paper presents the design and evaluation of a manufacturing route planner for flexible manufacturing systems. The aim of the planner is to find the optimal manufacturing routes for jobs using well-designed cost functions. This route planner, which is based on heuristic [A*] strategy, has been designed to work under dynamic arrival pattern environment. The proposed algorithm consists of two levels; the cell level, which controls the jobs flow between cells, and the machine level which controls the jobs flow between the machines inside the cells selected at first level. The solutions of the route planner are contained in a dynamic knowledge base that passes information to the sequencing and monitoring stage. The suggested model has also the capability to detect and response with suitable alternation for the damaged elements in the manufacturing system. To improve the performance of the planner, the design is organized into distributed programming media using the concurrent features of the modula-2 programming language. Finally, two case studies are considered to illustrate the functionality of the proposed algorithm.

Keywords: Flexible manufacturing systems, Modeling and simulations, Artificial intelligence, Heuristic algorithms.

35 **Title: A Software Tool for Web-based Distance Learning Systems Design**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Today, distance learning is becoming a popular alternative to traditional programs, due to advances in computers and communication technology. Most of the available computer aided learning systems cannot provide appropriate materials for remote learners. These systems use classical methods to handle vague information in the knowledge representation and decisionmaking. The proposed project consists of two parts, the first part(*) presents an attempt to introduce a software tool for development of a web-based distance-learning course. The second part covers the design of a fuzzy decision making system to deal with vague information. A fuzzy decision making process is used to update the learner model and specify his/her learning level to provide appropriate teaching materials to each learner. Such a system can deal with uncertainties in the learner's degree of understanding in each unit. It provides a powerful educational tool that can assist the learner to move from one learning unit to the other according to his/her learning level.

Keywords: Computer aided learning, Web-based distance learning, Fuzzybased decision-making.

36 **Title: Applying Fuzzy Logic for Learner Modling and Decision Support in Online Learning Systems**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Advances in computers and multimedia technology have changed traditional methods for learning and skills training. Online learning continues to play a major success of any academic program. Such learning can personalize learning needs for students, it can provide an environment where virtual reality techniques are used to create interactive interfaces and real-time software can monitor every response made by the user. This paper presents an attempt to introduce the concepts of fuzzy set theory the design of a an online educational module. Such a module can deal with uncertainties in the knowledge acquisition, representation and decision making. The fuzzy logic principles are used in creating the learner model and to provide the appropriate teaching material to each learner according to his/her learning level.

Keywords: Online learning, Virtual learning environment, Fuzzy logic, Learner modeling, Decision making,

37 **Title: Design of a Programmable Bus for Microprocessor-Based Systems**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: A programmable bus system has been developed to solve several problems in the design and implementation of microprocessor-based systems. This bus system consists of two parts; a standard I/O bus add-on card, and the bus system motherboard. The proposed bus provides four slots, each slot has independent interrupts, decoding signals, and a programmable oscillator with a wide frequency range. Such a bus system is suitable for many applications with normal requirements.

Keywords: PC buses, bus systems, microprocessor interfacing, Shared memory, microprocessor-based systems

38 **Title: Development of A Web-based Distance Learning System Using Fuzzy Decision Making**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Advances in computers and communication technology have changed traditional methods for learning and skills training. Today, distance learning is becoming an increasingly popular alternative to traditional programs. This paper presents an attempt to introduce the concepts of fuzzy set theory in the design of web-based distance learning systems. A fuzzy decision making process is used to update the learner model and specify his/her learning level to provide appropriate teaching materials to each learner. Such a system can deal with uncertainties in the learner's degree of understanding in each unit. It provides a powerful educational tool that can assist the learner to move from one learning unit to the other according to his/her learning level.

Keywords: *Computer aided learning & training, Web-based distance learning, Fuzzy set theory, Decision-making*

39 **Title: Fast Energy Loss Computation and Fuzzy-Based Shunt Capacitor Insertion**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Fast energy loss computation is implemented using supervisory control and data acquisition system (SCADA) with personal computer. Logic Control Array (LCA) and EPROM circuits are used to implement SCADA system and to measure the Volt-Ampere, KVolt and KVAR and draw the daily load curve for residential and commercial customers. LCA, EPROM and PC are used to simplify the electronic circuits, reduce the cost and speed up the computation time. An illustrative example was done to measure, store and show the active power, reactive power, load voltage, load current, power factor, and the shunt capacitors current. It is found that when 2.7 MVAR bank capacitor is inserted in the network the load current is decreased from 740.8A to 688.4A and the power factor is improved from 80% up to 93%, and led to add more loads on the network and release the feeder capacitor. A rule-based fuzzy decision maker has been designed and tested with the real data collected from Jordan using SCADA system. The calculated output is almost similar to that obtained from the first approach presented in this paper. The advantage of using fuzzy decision maker is its simplicity that can be implemented on a programmable logic device and can be programmed to improve the power factor.

Keywords: *Energy loss computation, Power factor improvement, Intelligent systems, Fuzzy logic, Fuzzy decision maker, Rule-based system.*

40 **Title: Fast Power Loss Computation and Shunt Capacitor Insertion Using Fuzzy Logic Technique**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Fast power loss computation was implemented using supervisory control and data acquisition system (SCADA) with personal computer. Logic Control Array (LCA) and EPROM circuits were used to implement SCADA system to facilitate the required measurements to obtain the daily load profile for residential and commercial customers. LCA, EPROM and PC were used to simplify the electronic circuits, reduce the cost and speed up the computation time. An illustrative example had been considered to measure, store and show the active power, reactive power, load voltage, load current, power factor and the shunt capacitors current. It as observed that when 2.7 MVAR bank capacitor inserted in the network the load current decreased from 740.8A to 688.4A and the power factor was improved from 0.80 to 0.93, which reduced the apparent power, hence allowing to add more loads to the network and release the feeder capacitor. A rule-based fuzzy decision maker had

been designed and tested with the real data collected from Jordan electricity board using SCADA system. The calculated output was almost similar to that obtained from the first approach presented in this study. The advantage of using fuzzy decision maker was its simplicity that can be implemented on a programmable logic device.

Keywords: *Power factor improvement, power loss computation, fuzzy-based decision maker, capacitor insertion, programmable logic device*

41 **Title: FPGA Implementation of Fuzzy Inference System for Embedded Applications**

Author: *Prof. Kasim M. Al-Aubidy, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: Implementing algorithms in software limits the performance of real-time systems, since the data is processed serially. The new generation of FPGAs with embedded processors are attracting the interest of the real-time applications. With enhanced capabilities most of the processing tasks can be loaded from the software program stack to embedded processors on the FPGA to improve performance and reduce the cost of the whole system. A fuzzy inference system has been implemented on an FPGA, and used to control a PM motor in a washing machine. The given results demonstrate the capability of such embedded controller in washing machine applications where simplicity, reliability and stability are more important issues.

Keywords: *FPGA, Fuzzy logic, Fuzzy inference system, PM motor, Washing machine*

42 **Title: FPGA-Based Fuzzy Inference System for Real-time Embedded Applications**

Author: *Prof. Kasim M. Al-Aubidy, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: The traditional way of implementing algorithms in software limits the performance of real-time systems, since the data is processed serially. The new generation of FPGAs with embedded processors are attracting the interest of the real-time applications. With enhanced capabilities most of the processing tasks can be loaded from the software program stack to embedded processors on the FPGA to improve performance and reduce the cost of the whole system. A fuzzy inference system has been implemented on an FPGA, and used to control a PM motor in a washing machine. The given results demonstrate the capability of such embedded controller in washing machine applications where simplicity, reliability and stability are more important issues.

Keywords: *FPGA, Fuzzy logic, Fuzzy inference system, PM motor, Washing machine*

43 **Title: Fuzzy logic control implementation in sensorless PM drive systems**

Author: *Prof. Kasim M. Al-Aubidy, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: The PM motor drive systems are becoming particularly popular in many industrial applications. They have many of the desirable performance characteristics of both the AC and DC drive systems. In this paper, a fuzzy logic controller is proposed for the real-time control of a Sensorless PM drive system. An implicit detection method has been used to detect the rotor position and to measure both the rotating speed and internal load angle. The results given in this paper demonstrate the capability of such a drive system in applications where simplicity, reliability and stability are more important issues. Furthermore, the proposed hardware and software design is simple and can be implemented by a single-chip microcontroller for real-time applications.

Keywords: *Sensorless drive systems, Rotor detection, Fuzzy logic control, Intelligent systems, Real-time systems*

44 **Title: Fuzzy-Based Decision Making**

Author: *Prof. Kasim M. Al-Aubidy, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: Several efforts have been made to develop computer-based learning and training systems. However, computer animation alone will not provide users with opportunities to obtain real-sense learning/training and develop their skills. For that reason, there is a need to explore more advanced technologies to improve learning and training. Virtual reality has found a number of applications in learning and skills training. Real educational processes deal with uncertainty in human knowledge. Most of available educational systems use classical methods to handle vague information in the knowledge representation and decision making. Furthermore, fuzzy set theory incorporates precise techniques for solving such problems. Fuzzy logic concepts have been used in ESs for knowledge representation and reasoning. Fuzzy logic is the most suitable tool to deal with vague knowledge and the process of decision making in the educational system.

45 **Title: Mixed Reality Environment for Web-Based Laboratory Interactive Learning**

Author: *Prof. Kasim M. Al-Aubidy, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: This paper presents a web-based laboratory for distance learners by incorporating simulation and hardware implementation into web-based e-learning systems. It presents a development consisting of laboratory course through internet based on mixed reality technique to setup, run and manipulate set of experiments. Each experiment has been designed in a way that allows the learner to manipulate the components and check if it works properly in order to achieve the experiment objective. The proposed laboratory e-learning tool has web-based components accessed by authorized users. Learners can acquire the necessary skills they need, while learning the theory of the experiment and the basic characteristics of each component used in the experiment. Finally, a case study was conducted to show the feasibility and efficiency of the proposed method.

Keywords: *Web-based learning, Online interactive learning, Mixed reality environment, Laboratory learning, Fuzzy logic, Learner modeling.*

46 **Title: Mixed Reality Environment for Web-Based Laboratory Interactive Learning**

Author: *Prof. Kasim M. Al-Aubidy, Published Year: 0*

Faculty: *Faculty of Engineering*

Abstract: This paper presents a web-based laboratory for distance learners by incorporating simulation and hardware implementation into web-based e-learning systems. It presents a development consisting of laboratory course through internet based on mixed reality technique to setup, run and manipulate set of experiments. Each experiment has been designed in a way that allows the learner to manipulate the components and check if it works properly in order to achieve the experiment objective. The proposed laboratory e-learning tool has web-based components accessed by authorized users. Learners can acquire the necessary skills they need, while learning the theory of the experiment and the basic characteristics of each component used in the experiment. Finally, a case study was conducted to show the feasibility and efficiency of the proposed method.

47

Title: Modeling an Interactive FMS Scheduler Using Colored Petri Nets**Author: Prof. Kasim M. Al-Aubidy, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: A new hierarchical model based on CPN for general FMS scheduler is presented. The designed model is partitioned into two levels to face the complexity of the manufacturing systems. The first level in the model is the cell-level, which supervises the jobs scheduling between cells. The second level is the machinelevel, which supervises the scheduling of the manufacturing jobs between machines inside the active cells. The goal of the model is to interpret the output of the manufacturing route planner into graphical representation and to achieve the sequencing, dispatching and monitoring the real time execution of these manufacturing plans. Also the proposed CPN model generates feedback status to monitor the abnormal conditions. Sub CPN priority structures are embedded in the main model to control the election from the competitive jobs to use the limited resources in the system. The hierarchy organization will enhance the real time response of the sequencing and monitoring capabilities. The designed scheduler has been evaluated for different case studies and the achieved results are very encouraging.

48

Title: Modeling and Analysis of an On-line FMS Scheduler Colored Petri Nets**Author: Prof. Kasim M. Al-Aubidy, Published Year: 0****Faculty: Faculty of Engineering****Abstract:**

49

Title: Neural-Network-Based Fuzzy Identifier: Design and Evaluation**Author: Prof. Kasim M. Al-Aubidy, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: This paper is concerned with the design and development of a simple fuzzy system for modeling of ill-defined dynamical systems. This system, which is represented as a feed forward neural network, is able to incorporate qualitative and quantitative information. Supervised linear back propagation learning algorithm has been applied to model a system through identifying the fuzzy parameters. This adaptive fuzzy system is implemented as an identifier of dynamical systems. The system performance has been evaluated for different simulated systems to demonstrate the application of the proposed system to identify the dynamics of linear and nonlinear time-invariant and time-variant systems.

50

Title: Neuro-Fuzzy Controller of a Sensorless PM Motor Drive For Washing Machines**Author: Prof. Kasim M. Al-Aubidy, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: The trend towards the adoption of direct drive washing machines utilizing PM motors is increasing due to the mechanical simplicity, high performance and efficiency of the system. This work deals with design and performance of a sensorless PM motor drive for washing machines. An implicit rotor position detection unit which consists of groups of search coils are inserted into the motor stator. A simple neuro-fuzzy controller has been used. The results given in this paper demonstrate the capability of such a drive system in washing machine applications where simplicity, reliability and stability are more important issues.

Keywords: PM motors, Direct drive washing machines, Neuro-fuzzy control, Neural

networks, Rotor position detection

51 **Title: Novel Technique to Control the Premature Infant Incubator System Using ANN**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Premature infant incubator system is a vital and critical area because it deals with premature infant or illness baby. It is essential to detect any abnormal conditions occur in the premature infant incubator system as soon as possible. Temperature, humidity, and oxygen concentration are the main parameters must be control in the premature infant incubator system. In this paper novel technique by using Artificial Neural Network ANN is used in order to simulate the premature infant incubator control system by implementing the back propagation method. Sensors are used to indicate temperature, humidity, and oxygen concentration of the incubator internal environment. Sensors output are entering to the ANN, which identify the corresponding case and decide the suitable reaction upon previous training. The proposed ANN premature incubator control system in all conditions that can occur in the premature infant incubator environment proved right decision.

Keywords: Premature infant, Incubator, Computer control, ANN, Neural control

52 **Title: Real-Time Fuzzy Control of Sensorless PM Drive Systems**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: The PM motor drive systems are becoming particularly popular in many industrial applications. They have many of the desirable performance characteristics of both the AC and DC drive systems. In this paper, a fuzzy logic controller is proposed for the real-time control of a Sensorless PM drive system. An implicit detection method has been used to detect the rotor position and to measure both the rotating speed and internal load angle. The results given in this paper demonstrate the capability of such a drive system in applications where simplicity, reliability and stability are more important issues. Furthermore, the proposed hardware and software design is simple and can be implemented by a single-chip microcontroller for real-time applications.

Keywords: Sensorless drive systems, Rotor detection, PM Motor control, Fuzzy controller, Intelligent systems, Real-time systems

53 **Title: Simulation and FPGA Implementation of A Simple Computer**

Author: Prof. Kasim M. Al-Aubidy, Published Year: 0

Faculty: Faculty of Engineering

Abstract: FPGA technology offers the potential of designing high performance systems at low cost. FPGAs have been used for many computational tasks, and this paper presents the microoperation simulation of a basic computer and its implementation on an FPGA. Also, it covers the design of an assembler for the designed computer, which can be used for educational purposes. Such implementation offers good code density, easy customization, easily developed software, small area, and high performance at low cost.

Keywords: Computer systems, Processor design, Simulators, Microprogramming

54 **Title: Teaching Computer Organization and Architecture Using Simulation and**

FPGA Applications

Author: Prof. Kasim M. Al-Aubidy, *Published Year: 0*

Faculty: Faculty of Engineering

Abstract: This paper presents the design concepts and realization of incorporating micro-operation simulation and FPGA implementation into a teaching tool for computer organization and architecture. This teaching tool helps computer engineering and computer science students to be familiarized practically with computer organization and architecture through the development of their own instruction set, computer programming and interfacing experiments. A two-pass assembler has been designed and implemented to write assembly programs in this teaching tool. In addition to the microoperation simulation, the complete configuration can be run on Xilinx Spartan-3 FPGA board. Such implementation offers good code density, easy customization, easily developed software, small area, and high performance at low cost.

Keywords: *Teaching tool, Computer organization and architecture, Processor design, Microprogramming, Assembler design, FPGA implementation*

55

Title: The State of Engineering Postgraduate Studies in Iraqi Universities

Author: Prof. Kasim M. Al-Aubidy, *Published Year: 0*

Faculty: Faculty of Engineering

Abstract: Higher Education in Iraq goes back to the first half of the last century. On the other hand engineering postgraduates did not start seriously until around 1970. The environment in which the postgraduate studies had developed in was far from being ideal or anywhere near normal. There was the Iraq-Iran conflict 1980-1988, the 1991 Gulf conflict followed by the sanctions of 1990- 2003, then the occupation of the country in 2003 and the catastrophic aftermath that followed which included a massive brain drain of the Iraqi academia. All these negative factors contributed immensely to stun the actual development of the postgraduate studies in general, but had a particular negative impact on the engineering postgraduate studies. This chapter will address the background of the education system in Iraq and identifies the general challenges facing any revitalization of the postgraduate studies with special focus on engineering postgraduate studies. A road map for the revitalization of the postgraduate studies will be suggested.

Keywords: *Iraqi education system, Iraqi postgraduate studies, Engineering postgraduate, Revitalization, Road map*

56

Title: Windows-based Active-router Design and Evaluation

Author: Prof. Kasim M. Al-Aubidy, *Published Year: 0*

Faculty: Faculty of Engineering

Abstract: The paper presents the design and evaluation of an Active Router (AR) architecture, which provides flexibility for the development of future network services. The hardware is based on a personal computer with 2GHz, Intel P4 processor. The designed AR depends on the use of Windows OS, enhancing the Active Network Encapsulation Protocol (ANEP) and the efficient use of C++ programming. Windows OS and C++ language are rarely used in such projects due to complexity of kernelmode and network-oriented programming requirements. Enhancing ANEP gains novel service composition scheme. Finally, the success of the AR architecture and prototype implementation is evaluated by means of a practical application.

Keywords: *Active Network, Programmable Network, Active Router, Programmable Router, IM Driver*

57

Title: The Effect of Cell Phones on Human Health**Author: Ibrahim N. Abu-Isbeih and Dina Saad, Published Year: 2011****IEEE-SPIE Joint Symposium on Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments 2011, Poland
Faculty: Faculty of Engineering**

Abstract: The effect of cell phone radiation on human health is the subject of recent interest and study, as a result of the enormous increase in cell phone usage throughout the world. Cell phones use electromagnetic radiation in the microwave range, which some believe may be harmful to human health. Other digital wireless systems, such as data communication networks, produce similar radiation. The objective of this survey is to review the effects of cell phones on human health: A large body of research exists, both epidemiological and experimental, in non-human animals and in humans, of which the majority shows no definite causative relationship between exposure to cell phones and harmful biological effects in humans. This is often paraphrased simply as the balance of evidence showing no harm to humans from cell phones, although a significant number of individual studies do suggest such a relationship, or are inconclusive.

Keywords: Human health, mobile phone, effect on human health, cell phone and human health

58

Title: Laplacian Filtered Minimum Shift Keying Modulation**Author: Ibrahim N. Abu-Isbeih and Mohammad Maqusi, Published Year: 2010****IEEE-SPIE Joint Symposium on Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments 2010, Poland
Faculty: Faculty of Engineering**

Abstract: Gaussian minimum shift keying (GMSK) is a continuous-phase frequency-shift keying modulation scheme. It is similar to standard minimum-shift keying (MSK); however the digital data stream is first shaped with a Gaussian filter before being applied to a frequency modulator. This has the advantage of reducing sideband power, which in turn reduces out-of-band interference between signal carriers in adjacent frequency channels. In this paper a new method of premodulation filtered MSK called Laplacian minimum shift keying (LMSK) is proposed. LMSK is proposed as a method for achieving good spectral efficiency over regular MSK, and it turns out to achieve improvement in error rate performance over the known GMSK. To compare the behavior of the system under the proposed method, bandwidth efficiency (i.e., bps/Hz), fractional out-of-band power and error rate performance in such systems are used. Results show that the proposed LMSK attains good improvement in spectral efficiency over MSK; and in using LMSK we have also good improvement in power efficiency over GMSK.

Keywords: Minimum Shift Keying MSK, LMSK, GMSK

59

Title: Optimum Pulse Shaping Application of Walsh-Functions used in MSK**Author: Ibrahim N. Abu-Isbeih and Mohammad Maqusi, Published Year: 2009****IEEE-SPIE Joint Symposium on Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments 2009, Poland
Faculty: Faculty of Engineering**

Abstract: Minimum Shift Keying (MSK) is considered to be a spectrally efficient modulation scheme, in comparison with other families of constant envelope modulation. However, its main sidelobe can be of some worry in digital data transmission, particularly over nonlinear channels. Therefore, it is practically of interest to search for efficient pulse shaping schemes, largely proposed either through baseband pulse shaping and/or filtering processing. In this paper a new pulse shaping

method based on Walsh functions is proposed to be used in MSK-type signaling. A methodology is proposed for designing the optimum pulse shape; and this attains improvement in spectral efficiency (i.e., bps/Hz) over straight MSK, for the same channel bandwidth. The fractional out-of-band power is used to compare the behavior of the system under the new proposed technique. As well, error rate performance in such system is used in the evaluation of this work. Results reveal that good improvement can be attained in spectral efficiency at the expense of error rate performance when these functions are used.

Keywords: MSK, pulse shaping, Walsh functions

60 **Title: Unified Matrix Processor Design for FCT-Based Filtering, Convolution and Correlation of Signals**

Author: Dr. Qadri Hamarsheh, Published Year: 2012

Faculty: Faculty of Engineering

Abstract: A new unified matrix processor for the main DSP discrete procedures: convolution, correlation functions and filtering of signals based on discrete cosine transform (DCT-II), is proposed and described. It is shown that these procedures can be computed using the same building blocks which give the processor universal computational structure property. The computational complexity analysis of the proposed processor shows that the FCT-based matrix processor for N- point convolution and correlation computing allows a reduction by $2N - 3$ real multiplications and $N - 2$ real additions in comparison with other processors of the same class. The architecture of the processor supports the classic schema for computing DSP procedures: (Two DCT spectrums + product of cosine spectrums + IDCT transform). The proposed architectures employ simple Processor Elements (PE) that require real multiplications and additions.

Keywords: Matrix Processor, Discrete Cosine Transform (DCT), Convolution, Filtering and Correlation of Signals, DCTdomain filtering, FCT Processor.

61 **Title: Mechatronic System Identification using an Impulse Response Recursive Algorithm**

Author: Dr. Tarek Tutunji, Dr. Mohammad Molhim, Dr. Eyad Turki, Published Year: 2007

Faculty: Faculty of Engineering

Abstract: A recursive identification algorithm is used to identify mechatronic systems using impulse response data. The algorithm is based on an auto regressive moving average (ARMA) model with a steepest descent method to minimize the least square error between the original and predicted outputs. Two mechatronic systems are tested: DC motor and gyroscope. Impulse voltage input is used to excite the system and the angular speed output is measured. In both systems, the torque and angular velocity outputs are dependent on the voltage and current inputs. This relationship is governed by characteristics such as inductance, resistance, moment of inertia, friction, load, and system constants. Once the ARMA model is constructed, the transfer function is realized. Then the input voltage is varied and the identified model results are compared with the original system. Simulation results using Simulink and experimental results using Labview with data acquisition card (DAQ) are presented. Results show that the recursive identification algorithm is able to identify the two systems with minimal error.

Keywords: Mechatronic Systems, System Identification, ARMA models

62

Title: Mechatronics curriculum development at Philadelphia University in Jordan
Author: Dr. Tarek A. Tutunji, Dr. Mazin Jumah, Dr. Yehia Hosamel-deen, Dr. Saber Abd Rabbo, Published Year: 2007

Faculty: Faculty of Engineering

Abstract: Mechatronics system engineering has gained global interest in the past decade from the educational and industrial sectors. Several universities in the middle east have introduced mechatronics engineering for undergraduate studies. One of those pioneers is Philadelphia University (PU) in Jordan. This paper presents the mechatronics curriculum developed at Philadelphia University with emphasis on regional needs. The paper also includes comparisons among local and global curricula. It is concluded that there is a rising demand of mechatronics engineering studies in the middle east. Local mechatronics programs must establish strong ties to the local industry and cooperate with global partner universities in order to overcome obstacles such as lack of funded research and design centers.

Keywords: *Mechatronics, Engineering Education*

63

Title: Hardware-In-the-Loop for on-line identification and control of three-phase squirrel cage induction motors

Author: Dr. Ashraf Saleem, Dr. Rateb Issa, Dr. Tarek Tutunji, Published Year: 2010

Faculty: Faculty of Engineering

Abstract: This paper describes a strategy for identification and control of three-phase squirrel cage induction motors. The strategy in this work is divided into 3 stages: on-line identification, off-line controller design, and on-line control. First, the transfer function is identified online. Next, the controller design is performed in a pure simulation environment using the identified transfer function. Finally, the designed controller is applied to the real system. Simulation and experimental results are presented to show the validity of the proposed strategy. Advantages of the proposed strategy include high accuracy in the identified system, simplicity, and low cost.

Keywords: *HIL, System Identification, mechatronics, control, induction motor*

64

Title: THE EFFECTS OF MOS LAYERS ON SENSING PROPERTIES OF MOS PHOTODIODE

Author: Prof. Wagah Farman Al-azzawi, Published Year: 0

Faculty: Faculty of Engineering

Abstract: In this research work, many samples of metal "oxide "silicon photodiodes were laboratory prepared by thermal evaporation techniques. Some silicon samples were left in the air for a predefined time for SiO₂ to grow naturally, while others were thermally coated with measured thickness of SiO. A number of the samples were coated with nickel while others with aluminum and one sample was coated with indium. Various tests and measurements were conducted; these include transmittance tests with a range of wavelength and for different thicknesses. The ideality factors of the samples and the potential barrier height were calculated from I-V and C-V characteristics. The photogenerated current of the samples were also measured at photoconductive mode under reverse voltage. Quantum efficiency measurement indicated that native oxide samples provided higher quantum efficiency than those thermally deposited samples. Detectivity measurement showed that thermally deposited oxide samples had low detectivity as compared to native oxide samples

Keywords: *Schottky Barrier Diode, Photodiode, MOS Photodiode, Silicon Photodiode*

65

Title: Optoelectronic Properties Of Silicon Photodetector Doped With Indium Or Aluminum

Author: Prof. Wagah farman Ai-azzawi, Published Year: 0

Faculty: Faculty of Engineering

Abstract: In this research paper, the photoelectronic properties of laboratory fabricated silicon photodetector doped with indium or aluminum are measured and discussed. The effects of diffusion temperature, diffusion time, doping and reverse voltages on the photoelectronic properties are analyzed. It was found that the PN devices exhibit very good rectification properties at 1050 OC diffusion temperature and 30 minutes diffusion time. I-V characteristic curves showed that samples doped with 150 nm indium and 200 nm of aluminum exhibit better electronic properties of low leakage current with ideality factors equal to 1.7 and 1.87 respectively. Photogenerated current exhibits maximum value at 0.85 μm and it still has more than 35% of its maximum values at 1.1 μm wavelength. The correlation of the simulated and the experimentally measured results show that the profile of photogenerated current with the wavelength is almost identical in shape. Furthermore the position of the peak currents occurs nearly at the same wavelength.

Keywords: Silicon photodetector; Impurity photovoltaic; Photogenerated current; Ideality factor.

66

Title: Theoretical models and simulation of optoelectronic properties of a-Si-H PIN photosensors

Author: Prof. Wagah farman Ai-Azzawi, Published Year: 0

Faculty: Faculty of Engineering

Abstract: this research aims to study and discuss the theoretical models and simulation of optoelectronic properties of a-Si-H PIN photosensors based on Shockley-Read-Hall assumptions. The variation of carrier life time, recombination and generation rates as a function of the intrinsic layer (I-layer) thickness will be simulated using MATLAB program. The effects of intrinsic layer thickness on electrons and holes concentration, collection efficiency and short circuit current density have been studied and analyzed. It has been found that as the thickness increased, the parameters: recombination rate, generation rate, internal electric field, electrons and holes concentration, carriers' life times, and short circuit current density, were subjected to some variations.

Keywords: Silicon photosensors; PIN photodiode; amorphous Si; optoelectronic properties.

67

Title: Simulation of photogenerated current of PN silicon photodetector enhanced by impurity photovoltaic effect

Author: Prof. Wagah Farman AI-Azzawi, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Silicon photodiodes have proved to be excellent detectors in the visible wave length range. On the other hand, high-performance photodetectors development remains needed. This research paper will focus on the calculation and improvement of photogenerated current of PN silicon photodetectors enhanced by the impurity photovoltaic effect. Various parameters that affect the behavior of the photogenerated current will be analyzed and studied using simulation techniques, namely MATLAB. Other aspects for the improvement of the device will include the responsiveness and the extension of the operating wavelength range. Different types and densities of impurities will be considered, analyzed and discussed. Four metallic impurities are used in the simulation, which are namely boron, indium, gallium, and aluminum. On the issue of validation of the data obtained from in this paper a practical investigation

was conducted in a separate research work which involved laboratory preparation of silicon samples with indium or aluminum. Only one figure out of many will be presented in this paper. It will be seen that the variation of the photogenerated current with wavelength has a similar profile, which indicates the good agreement of the results &

Keywords: Silicon photodetectors Photogenerated current Modified Shockleyâ€“Reedâ€“Hall model Impurity photovoltaic effect

68 **Title: APPLICATION OF SMC AND NLFC INTO A PRRR ROBOTIC ARM**

Author: Dr. Mohammad Ahmad Qasim AlShabi, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Industrial robotic arms are widely used nowadays. Accuracy and efficiency that fulfill userâ€™s requirements are achieved through robust controller. This paper investigates dynamics modeling and control of a four DOF (PRRR) robot that is dedicated to perform a Pick-and-Place move of a certain product. The arm is undergoing manufacturing process. Forward and inverse kinematics solutions are introduced to solve the joint space trajectories associated with the desired End Effector (EE) Cartesian space path. The performance of two controllers under the presence of model uncertainties is inspected through a simulation study; Non-Linear Feedback Control (NLFC) and Sliding Mode Control (SMC) are designed and tested over the required joint space trajectories and Cartesian space path. Results showed that NLFC achieved better results than SMC in terms of RMSE when model uncertainties were absent. However, when model uncertainties were introduced, SMC performance was more robust than NLFC. Simulation results are very encouraging towards using the SMC over the actual robotic arm.

Keywords: Non-Linear Feedback Control, Sliding Mode Control, four DOF (PRRR) robot

69 **Title: GPRS-Based Remote Sensing and Teleoperation of a Mobile Robot**

Author: Dr. Mohammed Mahdi Ali, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Abstract- The main objective of this research was to design and implement a remote sensing and monitoring system running on mobile robot with obstacle avoidance capability in unreachable area. A simple mobile robot prototype with onboard sensors has been designed and implemented to scan and monitor several variables in the surrounding environment. Teleoperation of such a mobile robot is a challenging task that requires an efficient interface and a reliable real-time robot control to avoid obstacles. The proposed system enables the user (base station) to send commands to the remote station (mobile robot), and receive scanned data and images from the environment through the internet and mobile DTMF signal. The proposed system hardware and software was implemented using PROTUS development software to obtain the suitable design parameters. Then, real experiments have been achieved to demonstrate the system performance including both the ultrasonic teleoperation of mobile robot navigation to avoid obstacles, and real-time sensing and monitoring in unreachable area.

Keywords: Keywords- Mobile Robot, Robot navigation, Remote sensing and monitoring, Wireless sensor networks, Obstacles avoidance

70 **Title: Design and Realization of a Multi-Robot System for Real-Time Sensing and Monitoring**

Author: Dr. Moahmmed Mahdi Ali, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Abstract— The main objective of this research is to design and realize a multi-robot system for real-time sensing and monitoring suitable for hazardous and/or unreachable environment. The proposed system has three mobile robots; main, rover and eye. Each mobile robot has its own embedded microcontroller and set of sensors. Wireless communications between local site and these mobile robots are achieved by WiFi, ZigBee and Bluetooth techniques, and can be accessed through the internet. Wireless teleoperation of these mobile robots is a challenging task that requires an efficient interface and a reliable real-time control algorithm to avoid obstacles. The proposed system enables the authorized operator to send commands to the mobile robots, and receive scanned data and images from the environment through the internet. The mechanical part of the remote station has been built after careful selection of the design parameters using CAD/CAM tools. While, the system hardware and software parts of the embedded controllers were implemented using PROTEUS development tool to obtain the suitable design parameters. Then, real experiments have been achieved to demonstrate the system performance including the wireless teleoperation of the three mobile robots, their navigation to avoid obstacles, and real-time sensing and monitoring.

Keywords: *Keywords- mobile robot; multi-robot system; remote sensing and monitoring; wireless sensor networks; obstacles avoidance.*

71 **Title: Computer Modeling and Study of Force Characteristics of Eccentric Drill Chuck**

Author: Dr. Hasan Al Dabbas, Published Year: 0

Faculty: Faculty of Engineering

Abstract: When clamping tool of various diameters on the eccentric cams - differently in contact with the tool and taper sleeve, which leads to a change in power characteristics and elastic - the stress state of the interacting elements in manufacturing technology, defining force characteristics can be used for various schemes and designs of wide-range eccentric drilling, milling chucks, analytical relationships can serve as a quantitative criterion for choosing the best options from a variety of synthesized cartridges various geometric rounds (design factors) . In order of succession and the creation of working technical documentation in CAD system Solid Works parametric computer model created consideration girth tool shank diameters from 0.5 to 10mm.

Keywords: *eccentric, chuck, computer modeling .*

72 **Title: Genetic –Morphological Approach to Creating Wide Range Drilling-Milling Chucks**

Author: Dr. Hasan Al Dabbas, Published Year: 0

Faculty: Faculty of Engineering

Abstract: The problem about creating new technical systems can be successfully solved in modern science by using a new methodological approach which includes systematic analysis, principles of evolution, morphological analysis, and other methods for searching technical solutions. This article deals with the synthesis of wide range drilling-milling chucks by new approach.

Keywords: *genetic-morphological approach; clamping chuck; forcing (emerging) steam; technical system.*

73

Title: A Moderated Hob Based Broadcasting Algorithm for MANETs**Author: Dr. Hasan Al Dabbas, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: The presence of new mobile computing devices rise the tendency to use ad hoc networks in which each device connects to its neighbor without the need to connect to a fixed infrastructure network. Broadcasting is sending data packet from a source node to the rest of nodes in the networks; it is characterized by no acknowledgement packets and no request or clear to send dialogue packets. Broadcasting suffer from redundant rebroadcast, contention and collision, these drawbacks lead to increase the delay and the number of dropped packets caused by contention (i.e. degrade in the quality of service). Anew distance based broadcasting algorithm is proposed to enhance broadcasting in wireless mobile ad hoc networks, this algorithm is analyzed and tested using GloMoSim network simulator, the simulated results are used to compare with another two distance based broadcast algorithms.

Keywords: MANETs, CWZ, BA, AODV, SNIR.

74

Title: PAPER reduction based on entropy wavelet transform for Sniffer Mobile Robot**Author: 10- Omar Daoud, Qadri Hamarsheh and Saleh Saraireh, Published Year: 2014****International Journal of Electronics and Communications- AEÜ, 68****Faculty: Faculty of Engineering**

Abstract: In this paper, the performance of wireless systems has been improved based on a proposition of a newpeak detection algorithm based on the entropy of the wavelet transforms [1] and to be imposed to theSniffer Mobile Robot (SNFRbot). This enhancement has been compared with a previously published workthat uses a predistortion neural network (PDNN) architecture has been imposed to the SNFRbot. More-over, the proposed method in this work has been applied to combat the Orthogonal Frequency DivisionMultiplexing (OFDM) systemâ€™s drawback; namely peak-to-average power ratio (PAPR). Generally, theproposed algorithm consists of three stages; firstly, reconstruction based on wavelet transform, secondly,predetermined thresholding, and thirdly, imposing moving filter. This algorithm is called Multiple-InputMultiple-Output (MIMO)-OFDM system based entropy wavelet transform and to be imposed to SNFRbotwork; SNFRbot-EWT.The performance of SNFRbot-EWT has been evaluated using a numerical analysis and a conductedsimulation. The results have been compared with the our previously published work, SNFRbot-EWTgives an improvement reach to around 30% for the same bandwidth occupancy, which will reduce thecost and the complexity of the transceiverâ€™s structure.

Keywords: MIMO-OFDM SNFRbot-EWT Wavelet Entropy PAPR

75

Title: PEAK DETECTION USING WAVELET TRANSFORM**Author: Omar Daoud, Qadri Hamarsheh and Saleh Saraireh, Published Year: 2014****International Journal of Computer Networks and Communications, 6****Faculty: Faculty of Engineering**

Abstract: A new work based-wavelet transform is designed to overcome one of the main drawbacks that found in the present new technologies. Orthogonal Frequency Division Multiplexing (OFDM)is proposed in the literature to enhance the multimedia resolution. However, the high peak power (PAPR) values will obstruct such achievements. Therefore, a new proposition is found in this work, making use of the wavelet transforms methods, and it is divided into three main stages; de-noising

stage, thresholding stage and then the replacement stage. In order to check the system stages validity; a mathematical model has been built and its checked after using a MATLAB simulation. A simulated bit error rate (BER) achievement will be compared with our previously published work, where an enhancement from 8×10^{-1} to be 5×10^{-1} is achieved. Moreover, these results will be compared to the work found in the literature, where we have accomplished around 27% PAPR extra reduction. As a result, the BER performance has been improved for the same bandwidth occupancy. Moreover and due to the de-noise stage, the verification rate has been improved to reach 81%. This is in addition to the noise immunity enhancement.

Keywords: MIMO-OFDM, PAPR, wavelet- eigen vector, de-noising

76 **Title: PWM Technique To Overcome The Effect of High PAPR in Wireless Systems**

Author: Dr. Omar Rawhi Daoud, Published Year: 2014

International Journal of Computer Networks and Communications, 6

Faculty: Faculty of Engineering

Abstract: Many current communication systems suffer from performance degradation due to the high sensitivity to high power peaks especially in the nonlinear devices. The author introduces a new concept based on the Pulse Width Modulation (PWM), namely MIMO-OFDM system based PWM (MO-PWM) to overcome this deficiency. Here, the peak-to-average power ratio (PAPR) problem in Orthogonal Frequency Division Multiplexing (OFDM) technique is used as a criterion to check the validity of the proposed work. Moreover, the proposed system work has been implemented over Field Programmable Gate Array (FPGA), which is designed to characterize both of the complexity and the speed issues. The systems performance based MO-PWM and validity have been checked based on a numerical analysis and a conducted simulation. The simulation results show that the MO-PWM can clearly reduce the PAPR values nevertheless the used OFDM systems' specifications, and gives a promising results over some techniques found in the literature, such as clipping, SLM and PTS under same bandwidth occupancy and system's specifications.

Keywords: MIMO, OFDM, Peak-to-Average Power Ratio, wavelet, Eigen vectors component.

77 **Title: An investigation of speech enhancement using wavelet filtering method**

Author: Khaled Daqrouq, Ibrahim N. Abu-Isbeih, Omar Daoud & Emad F. Khalaf, Published Year: 2010

International Journal of Speech Technology (IJST) (Springer Publication), 13 (2)

Faculty: Faculty of Engineering

Abstract: This paper investigates the utilization of wavelet filters via multistage convolution by Reverse Biorthogonal Wavelets (RBW) in high and low pass band frequency parts of speech signal. Speech signal is decomposed into two pass bands of frequency; high and low, and then the noise is removed in each band individually in different stages via wavelet filters. This approach provides better outcomes because it does not cut the speech information, which occurs when utilizing conventional thresholding. We tested the proposed method via several noise probability distribution functions. Subjective evaluation is engaged in conjunction with objective evaluation to accomplish optimal investigation method. The method is simple but has surprise high quality results. The method shows superiority over Donoho and Johnstone thresholding method and Birge- Massart thresholding strategy method.

Keywords: Wavelet filters · Speech signal · Enhancement · Thresholding · Objective evaluation

78

Title: Quality Evaluation of Reconstructed Biological Signals**Author: Ibrahim N. Abu-Isbeih, Published Year: 2009****American Journal of Applied Sciences (AJAS), 6(1)****Faculty: Faculty of Engineering**

Abstract: This research presents the use of wavelet transforms for reconstructed signal evaluation for biological signals. The method adapted on this research, is a new modeling technique and based on calculating the reconstruction error of the wavelet transform sub-signals that have different frequency bands and different deformation degree. The paper processes a special set of application in biomedical field, called Electrocardiogram (ECG) signal. Compression applied on the electrocardiogram (ECG) and speech signals. Discrete Wavelet Transformation (DWT) with the thresholding compression method was applied to test the proposed reconstruction evaluation method. The proposed algorithm technique gave an excellent result showing that, using wavelet transform is a suitable technique for reconstruction signal evaluation. Also, the presented method determined the exact place and location of deformation in the reconstruction signal.

Keywords: *Quality, ECG signals, speech signal, data compression, wavelet transform, discretewavelet transform*

79

Title: Arrhythmia Detection using Wavelet Transform**Author: Ibrahim N. Abu-Isbeih and Dr. Khaled Daqrouq, Published Year: 2007****The IEEE Region 8 EUROCON 2007 International Conference, Warsaw, Poland****Faculty: Faculty of Engineering**

Abstract: In this paper, a new method of arrhythmia classification is proposed, this method based on using the Continuous Wavelet Transform (CWT) for analyzing the ECG signal and extracting the desired parameters related to arrhythmia (Heart Rate Variability). Two models are used to simulate the natural signals of heart; these models are used for the assessment of ECG signal processing methods because they have the same characteristics of the natural signals. Another application is the simulation of some cardiac phenomena and abnormalities such as Normocardia, Bradycardia and Tachycardia. The proposed method gives sharp clear threshold between Normocardia, Bradycardia and Tachycardia.

Keywords: *Arrhythmia, wavelet transform, ECG model*

80

Title: Coverage Planning in 3G Multimedia Networks Based on Walsh Coding**Author: Ibrahim N. Abu-Isbeih, Omar Daoud and Omar Alani, Published Year: 2010****7th International Multi-Conference on Systems, Signals & Devices, SSD'10, Amman, Jordan****Faculty: Faculty of Engineering**

Abstract: Capacity in Wideband Code Multiple Access (WCDMA) systems is interference limited, it is also strongly linked with coverage. The greater the level of influx of users within the cell, the higher the interference and hence the lower the cell coverage becomes and vice versa. This is called Cell Breathing. In this paper a Walsh coding is used as a precoding stage to the Multiple-Input Multiple Output-Orthogonal Frequency Division Multiplexing (MIMO-OFDM) system. The results of this work are compared with a conventional work that is based on convolutional coding. This is in order to check its fitness to the current system structure and the enhancement of the E_b/N_0 , which will directly result in a better cell coverage and continued reliable services for the area of the cell as the load increases. Based on the simulation results, Walsh coding shows a slight improvement of complementary cumulative distribution function (CCDF). As a consequence, the MIMO-OFDM systemsâ€™

performance is improved comparing with the convolutionally coded MIMO-OFDM system. Thus, not only the Peak-to-Average Power Ratio (PAPR) is saved, but also the frequency spectrum efficiency is improved.

Keywords: Cell planning, OFDM, Cell coverage, MIMO, Coding

81 **Title: Improving wear resistance on Al332 Alloy matrix-Nano-Al₂O₃ particles reinforced composites**

Author: Prof. Adnan Dawood Mohammed, Published Year: 2014

Faculty: Faculty of Engineering

Abstract: The wear behavior of alumina particulate reinforced A332 aluminium alloy composites produced by a stir casting process technique were investigated. A pin-on-disc type apparatus was employed for determining the sliding wear rate in composite samples at different grain size (1 μ m, 12 μ m, 50 nm) and different weight percentage (0.05-0.1-0.5-1) wt% of alumina respectively. Mechanical properties characterization which strongly depends on microstructure properties of reinforcement revealed that the presence of (nano , micro) alumina particulates lead to simultaneous increase in hardness, ultimate tensile stress (UTS), wear resistances. The results revealed that UTS, Hardness, Wear resistances increases with the increase in the percentage of reinforcement of Al₂O₃ when compared to the base alloy A332. The wear rates of the composites were considerably less than that of the aluminum alloy at all applied loads with increasing percentage of reinforcement when compared to the base alloy A332.

Keywords: Aluminium matrix composites, wear resistance, Micro -Nano Al₂O₃ particles.

82 **Title: Evolution of the fronts of quasi-compressional and quasi-shear discontinuous waves in inhomogeneous transversely isotropic elastic media.**

Author: Dr. Nabil Wanas Musa, Published Year: 0

Faculty: Faculty of Engineering

Abstract: The problem about propagation and transformation of discontinuous wave fronts in transversally isotropic heterogeneous elastic media is considered. The techniques for construction of evolving system of rays and fronts are proposed. The cases of geometric singularities formation on the front surfaces are analyzed for different values of the elastic medium anisotropy and heterogeneity.

Keywords: elastic anisotropic medium, discontinuous wave, ray method, front bifurcation.

83 **Title: Film cooling experimental investigation for ramped-conical holes geometry**
Author: Dr. Assim. H. Yoosif, Dr. Kutaeba J. M. AL-Khishali, Falah F. Hatem
International Journal of Scientific & Engineering Research Vol 4, Issue 6, September 2013.

Author: Dr. Kutaeba J. M. AL-Khishali, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Abstract: The effect of introducing ramped-conical holes on film cooling performance has been investigated experimentally. Four models have been considered; model 1 consists of one row of cylindrical film cooling holes acting as the baseline case, model 2 consists of one row of single conical film cooling holes, model 3 consists of one row of single conical ramped-holes (upstream ramp with a backward-facing step), and model 4 consists of one row of double conical ramped-holes (upstream and downstream ramped-holes both with a backward-facing step). Detailed heat transfer coefficient and film effectiveness measurements are obtained

simultaneously using a single test transient IR thermography technique. The study is performed at a single mainstream Reynolds number based on free-stream velocity and film hole diameter of 13000 at three different coolant-to-mainstream blowing ratios of 0.5, 1.0, and 1.5. The results show that film effectiveness is greatly enhanced when using ramp due to improved two dimensional natures of the film and lateral spreading, the distribution of laterally average film cooling effectiveness along the x-axis show that the double ramped-holes model provides promising film cooling performance particularly at moderate and high blowing ratios

84 **Title: Photothermovoltaic effect in carbon nanotubes: En route toward junctionless infrared photocells and light sensors**

Author: Dr. Mones Omari, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Optically induced voltage was studied in carbon nanotube films configured as two-terminal resistive elements and operating as junctionless photocells in the infrared. The photovoltage is found to appear only for asymmetric/off-contact illuminations and the effect is explained based on photogenerated heat flow model. The engineered cell prototypes were found to yield electrical powers of ~30 pW while demonstrating improved conversion efficiency under high-flux illumination. The cell is also shown to act as uncooled infrared sensor with its dark-to-photocurrent ratio improving as temperature increases. The concept might enable nanotube's use in applications ranging from heat recycling to self-powered infrared sensors.

Keywords: carbon nanotubes, photocells, infrared sensors

85 **Title: Comment on: Photocurrent Amplification at Carbon Nanotube-Metal Contacts**

Author: Dr. Mones Omari, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Lien et al. (Adv. Mater. 2006, vol. 18, p. 98) reported on photocurrent generation in SWNT thin films suspended across metal electrodes at zero bias and the effect was attributed to the Schottky contacts formed at the nanotube-metal interfaces. By performing a set of independent experiments and tests on similarly engineered two-terminal devices and analyzing the results reported in said paper we show that the response is not associated with the contacts or temperature-induced conductance change (bolometric effect), but is instead caused by an optically induced thermovoltaic effect.

Keywords: single walled carbon nanotubes, thermovoltaic effect

86 **Title: Investigation of time-rated defect formation, infrared absorption and transport characteristics of single-walled carbon nanotubes wet-processed in phosphoric acid**

Author: Dr. Mones Omari, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Time-dependent wet-processing of HiPCo nanotubes in ~ 0.5 M phosphoric acid and its effect on the structural, transport, infrared light absorption and photoconduction characteristics have been studied. Nanotubes were treated for nominal time intervals of 1, 2 and 3 h. The treatment is found to be a two-step process that initially results in the removal/partial replacement of most pre-existing C-O, O-H and CH_x groups with phosphorous oxy and carbonyl groups. According to T-dependent current-voltage measurements, the differential conductance, G of

nanotube network varies with temperature as $\sim T_a$, with a exhibiting a slight increase as a result of the treatment, attributed to a slight increase in disorder and not doping effects. The nanotubes processed for three hours also show an order of magnitude improvement in photoconduction response time compared to that of untreated tubes, with growth/decay characteristic time constants approaching a sub-second range.

Keywords: carbon nanotubes, infrared response, acid processing, RAMAN, FTIR, photoconduction

87 **Title: Carbon Nanotube IR Photothermovoltaic Devices: Power, Fill Factor, and Transient Response**

Author: Dr. Mones Omari, **Published Year:** 0

Faculty: Faculty of Engineering

Abstract: The power output, fill factor (FF), and transient photoconduction characteristics of infrared photothermovoltaic devices comprising mainly semiconducting single-walled carbon nanotubes are studied as a function of incident optical power and temperature. Explicit analytical expressions for the electrical power and FF are derived and verified experimentally. An improvement in the figure of merit is found to counterbalance the effect of FF reduction on the output power under high illumination fluxes. The transient response is shown to be limited by the RC parameter and not by nanotube-associated heat transport processes.

Keywords: carbon nanotube IR photothermovoltaic devices, fill factor, incident optical power function, infrared photothermovoltaic devices, nanotube-associated heat transport processes, semiconducting single-walled carbon nanotubes, transient photoconduction characteristics, transient response

88 **Title: Formalization of existing PLC programs: A survey**

Author: Dr. Mohammed Bani Younis, **Published Year:** 2003

Faculty: Faculty of Engineering

Abstract: In recent years, the interest in the formalization of PLC programs increased. The paper provides a classification scheme for the works done in this field. This scheme includes the sources used for formalization, the level of the formalization process (i.e. the complexity of structure that could be handled by the approach), the aim of the formalization (Re-Engineering or Verification) and the formal model used to represent the formalized PLC program. The scheme is applied to several examples.

Keywords: PLC Programs, Formalization, Re-Engineering, Verification

89 **Title: Automatic Re-Implementation of PLC Programs**

Author: Dr. Mohammed Bani Younis, **Published Year:** 0

Faculty: Faculty of Engineering

Abstract: The manual re-implementation of PLC programs to a new hardware platform is often required to satisfy or to replace an outdated PLC new production requirements. This paper describes an approach for the re-implementation of existing PLC programs on the basis of formal methods in the form of Finite State Machines. This machine (FSM - Finite State Machines) presented in this approach in XML format, then it is converted into a PLC program in SFC (Sequential Function Chart) according to IEC 61131-3 standard. This program can then be processed by the new PLC controller.

Keywords: PLC, Formal Methods, Re-Implementation, XML

90

Title: Reverse engineering course at Philadelphia University in Jordan**Author: Dr. Mohammed Bani Younis, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: Reverse engineering (RE) is the process of testing and analysing a system or a device in order to identify, understand and document its functionality. RE is an efficient tool in industrial benchmarking where competitors' products are dissected and evaluated for performance and costs. RE can play an important role in the re-configuration and redesign of legacy and/or undocumented systems. It can also play a key role in helping students understand engineering products. This paper presents the Philadelphia University experience in constructing a RE course and integrating it within the engineering curricula. This paper can be used as a guide to other universities that wish to introduce RE to their curricula. The information provided in this paper covers the RE methodology for a system level, as well as mechanical, electronics and software levels. Finally, samples of student projects are presented in order to show the learning capabilities provided throughout the course.

Keywords: reverse engineering; education design; engineering design; students' projects

91

Title: Applying Reverse Engineering and its techniques on a Remote Controlled Toy Helicopter**Author: Dr. Mohammed Bani Younis, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: Reverse Engineering (RE) is the process of testing and analyzing a system or a device in order to identify, understand, and document its functionality. RE in education became vital because it allows students to understand product development steps and the working principles toward the product design. RE techniques learned during the class are applied to grasp the technical system features concerning the product. This paper presents a practical example of RE to a remote controlled toy helicopter. The aim of the RE performed on the product chosen is for the purpose of knowledge and experience. The information provided in this paper covers the RE methodology for the helicopter on the system level as well as the RE of mechanical, and electronics.

Keywords: Subtract and Operate; Functional Analysis System Techniques; Mechatronics System.

92

Title: Applying Image Processing Techniques on a Ball Collecting Robot**Author: Dr. Mohammed Bani Younis, Published Year: 0****Faculty: Faculty of Engineering**

Abstract: Image processing is the signal processing for which the input is an image (as defined in imaging science; such as a photograph or video frame), and the output of this operation may be a modified image or a set of parameters put together as a matrix in most cases. Image-processing defines the image in two dimensions and applies certain image processing techniques. In this paper, image processing techniques are implemented using Matlab for a ball collecting robot. The proposed robot has the ability to collect colored balls, and then to transfer them to a container at the end of the track. This operation includes also avoiding the other robots and obstacles used for the same purposes. The work in this paper provides a computer aided design (CAD) model for the robot and the results for used image processing techniques.

Keywords: Image processing; Mechatronic system; Robotic design.

93 **Title: Applying Image Processing Techniques on a Ball Collecting Robot**
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Keywords: *Image processing; Mechatronic system; Robotic design.*

94 **Title: Adaptive Distributed Inter Frame Space for IEEE 802.11 MAC Protocol**
Author: Dr. Mohammed Bani Younis, Published Year: 0
Faculty: Faculty of Engineering
Abstract: In this research, an Adaptive Distributed Inter Frame Space (ADIFS) has been proposed for IEEE 802.11 Medium Access Control (MAC) protocol. The aim of this approach is to improve Quality of Services (QoS) for IEEE 802.11 MAC protocol in single-hop wireless network. The proposed approach is based on traffic type, Collision Rate (CR), Collision Rate Variation (CRV) and Packet Loss Rate. These parameters are used to adjust the DIFS at runtime. The adjusted DIFS is employed to enhance service differentiation at the MAC layer in single-hop wireless networks. The proposed approach contributes to the enhancement of the average QoS for high priority traffic by 32.9% and 33.4% for the 5 and 10 connections, respectively. While the average QoS for the low priority traffic is improved by 14.3% and 18.2% for the 5 and 10 connections, respectively. The results indicate that, the proposed approach contributes in the enhancement of the QoS in wireless network.
Keywords: *DCF, Collision Rate, Packet Loss, Average Delay, ADIFS*

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Author: Dr. Mohammed Bani Younis, Published Year: 0
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96 **Title: Fast Power Loss Computation & Shunt Capacitance Insertion Using Fuzzy Logic Technique", American Journal of Applied Sciences Vol. 4, No. 1, P. 37- 41,**

USA (2007).

Author: Prof. Wagah Ferman Al-Azzawi, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Fast energy loss computation is implemented using supervisory control and data acquisition system (SCADA) with personal computer. Logic Control Array (LCA) and EPROM circuits are used to implement SCADA system and to measure the active and reactive power, then draw the daily load curves for residential commercial and industrial customers. LCA, EPROM and PC are used to simplify the electronic circuits, reduce the cost and speed up the computation time. An illustrative example was done to measure, store and monitor the active power, reactive power, load voltage, load current, power factor, and the shunt capacitors current. It is found that when 2.7 MVAR bank capacitor is inserted in the network the load current is decreased from 740.8A to 688.4A and the power factor is improved from 80% up to 93%, and led to add more loads on the network and release the feeder capacitor. A rule-based fuzzy decision maker has been designed and tested with the real data collected from Jordan using SCADA system. The calculated output is almost similar to that obtained from the first approach presented in this paper. The advantage of using fuzzy decision maker is its simplicity that can be implemented on a programmable logic device and can be programmed to improve the power factor.

Keywords: Energy loss computation, Power factor improvement, Fuzzy decision maker

97

Title: Enhancement of Adiabatic Film Cooling Effectiveness by Using Conical Shape Hole

Author: Dr. Kutaeba J. M. AL-Khishali, Published Year: 0

Faculty: Faculty of Engineering

Abstract: Film cooling is one of the methods used to protect the surfaces exposed to high-temperature flows, such as those exist in gas turbines. It involves the injection of coolant fluid (at a lower temperature than that of the main flow) to cover the surface to be protected. This injection is through holes that can have various shapes; simple shapes, such as those with straight cylindrical or shaped holes (included many holes geometry, like conical holes). The computational results show that immediately downstream of the hole exit, a horseshoe vortex structure consisting of a pair of counter-rotating vortices is generated. This vortex generation affected the distribution of film coolant over the surface being protected. The fluid dynamics of these vortices are dependent upon the shape of the film cooling hole, and blowing ratio, therefore the film coolant coverage which determines the film cooling effectiveness distribution and also has an effect on the heat transfer coefficient distribution. Differences in horseshoe vortex structures and in resultant effectiveness distributions are shown for cylindrical and conical hole cases for blowing ratios of 0.5 and 1. The computational film cooling effectiveness values obtained are compared with the existing experimental results. The conical hole provides greater centerline film cooling effectiveness immediately at the hole exit, and better lateral film coolant coverage away of the hole exit. The conical jet hole enhanced the average streamwise adiabatic film cooling effectiveness by 11.11% and 123.2% at BR= 0.5 and 1.0, respectively, while in the averaged lateral adiabatic in the spanwise direction, the film cooling effectiveness enhanced by 61.75% and 192.6% at BR= 0.5 and 1.0, respectively .

Keywords: Film cooling, effectiveness, conical holes, Enhancement

98

Title: Effect of Inlet Valve Variable Timing in the Spark Ignition Engine on Achieving Greener Transport

Author: Dr. Kutaeba J. AL-Khishali, Published Year: 0

Faculty: Faculty of Engineering

Abstract: The current emission legislations and the large concern about the environment produced very numerous constraints on both governments and car manufacturers. Also the cost of energy increase means a reduction in fuel consumption must be met, without largely affecting the current engine production and performance. It is the intension to contribute towards the development and pursuing, among others on variable valve timing (VVT), for improving the engine performance. The investigation of the effect of (IVO) and (IVC) to optimize engine torque and volumetric efficiency for different engine speeds was considered. Power, BMEP and BSFC were calculated and presented to show the effect of varying inlet valve timing on them for all cases. A special program used to carry out the calculations. The analysis of the results shows that the reduction of 10% of (IVO) angle gave an improvement of around 1.3% in torque, BSFC, and volumetric efficiency, while a 10% decrease in (IVC) caused a 0.1% reduction in power, torque, and volumetric efficiency.

Keywords: *Green transportation, inlet valve variable timing, performance, spark ignition engines.*

99 **Title: Effect of Varying Inlet Valve Throat Diameter at .Different IVO, IVC, and OVERLAP Angles on SI Engine Performance**

Author: *Dr. Kutaeba J. AL-Khishali, Published Year: 0*

Faculty: Faculty of Engineering

Abstract: the intension in this work is to contribute towards pursuing the development of on variable valve timing (VVT), for improving the SI engine performance. Further to a previous work, this investigation covers the effect of varying the inlet throat diameter and the IVO, IVC and the Overlap angle between IVO and EVC on engine performance at the design engine speed. Power, Torque, BMEP, BSFC and Volumetric Efficiency were calculated and presented to show the effect of varying valve timing on them for all the inlet throat diameters considered.

Keywords: *internal combustion engines, overlap angles, performance, variable valve timing*

100 **Title: Modeling the Effect of Variable Timing of the Exhaust Valves on SI Engine Emissions for Greener Vehicles**

Author: *Dr. Kutaeba J.M. Al-khishali, Published Year: 0*

Faculty: Faculty of Engineering

Abstract: The problem with fixed valve timing that the valve train is set by the automaker for peak efficiency running at a specific point in the engine's operating range. When the vehicle is moving slower or faster than this ideal operating point the engine's combustion cycle fails to properly burn the air/fuel mixture leading to considerably compromised engine performance and wastes fuel. Variable Valve Timing (VVT) is a solution developed to overcome this engine deficiency, dynamically altering the valve's opening and closing for optimal performance at any speed. The intension in this work is to contribute towards pursuing the development of variable valve timing (VVT) for improving the engine performance. This investigation covers the effect of exhaust valve opening (EVO), and closing (EVC) angle on engine performance and emissions. The aim is to optimize engine power and brake specific fuel consumption (BSFC) where the effect of engine speed has also been considered. Power, BMEP, BSFC, NO, and CO were calculated and presented to show the effect of varying valve timing on them for all the valve timing cases. The calculations of engine performance were carried out using the simulation and analysis engineering software: LOTUS", and engine emissions were

calculated using "ZINOX" program. Sensitivity analysis shows that the reduction of 10% of (EVO) angle gave a reduction of around 2.5% in power and volumetric efficiency, also a slight increase in nitrogen oxide (NO) and carbon monoxide (CO), while a 10% decrease in (EVC) causes around 1% improvement in Power. The effects of different (VVT) from the simulations are analyzed and compared with those in the reviewed literature.

Keywords: Variable Exhaust Valve Timing; Spark Ignition Engines; Performance; Emissions; Green Vehicles

101 **Title: Analysis of Flow Characteristics In Inlet And Exhaust Manifolds of Experimental Gasoline Combustion In A VCR Engine**

Author: Dr. Kutaiba J.M. AL-Khishali, Published Year: 0

Faculty: Faculty of Engineering

Abstract: exhaust manifolds of internal combustion engines is performed using a four-stroke variable compression ratio single cylinder gasoline engine. In the theoretical part a computer simulations of the flow field in the intake and exhaust systems as well as the cylinder cavity for the experimental data obtained in the gas exchange cycle program using the method of characteristics for the engine dimensions and timings used in the experimental study as well as the data obtained from the gas exchange cycle program for the sake of comparison and presentation of flow characteristic. In the experimental work, the compression ratio was varied from 7 to 11 at variable speed with constant throttle opening, where engine performance was obtained. Results of engine performance as well as pressure, temperature and velocity fields in the intake and exhaust systems obtained by the gas exchange cycle program using the method of characteristics are presented.

Keywords: Internal combustion engine, flow field in pipes, method of characteristic

102 **Title: Investigation Of Leading Edge Film Cooling Jets In A Cross Flow**

Author: Dr. Kutaiba J.M. Al-khishali, Published Year: 0

Faculty: Faculty of Engineering

Abstract: The thermal effect of the turbine blade film cooling and the penetration area of jets issuing at an angle into cross mainstream flow have been investigated numerically and experimentally. Experimental and numerical simulations have been introduced to simulate a discrete circle hole film cooling flow over a symmetrical airfoil representing turbine guide vanes surface. Several cases have been studied in the experimental work by using three-velocity ratio (0.5, 0.9, 1.3), and three different jet issuing angles, longitudinal injection angle (37.50 and 900) both with lateral injection angle (stagger angle = 00 and 450). Airfoil angle of attack has been changed during the experimental program throughout (00, 50, 100, and 150). Experimental investigations gave qualitative information about the penetration area and flow structure of the mixing flow at all cases and the results were used to verify the computation method and to select the best velocity ratios for the flow penetration, flow structure, and the thermal effect of cool jets. An accepted agreement between the experimental and computational results found from model (a) ($\beta=37.50$ and $\theta=00$) for velocity ratio (VR= 0.5) and blade angle of attack ($\alpha=00$). Computational results show hole rows spacing and issuing angle for maximum film cooling effectiveness (cooling efficiency)

Keywords: turbine blade, film cooling, penetration area, jet angle, mixing flow

103 **Title: Managers' Concern Regarding Employee Empowerment in Jordanian**

Public Hospitals

Author: *Dr. Afnan Sharif Saleh, Published Year: 2013*

Faculty: *Faculty of Engineering*

Abstract: This study is aimed at determining the extent of managers for the implementation of employee empowerment in Jordanian hospitals. A questionnaire was developed and distributed to a sample of 277 employees of Jordanian hospitals, with an overall response rate of 81.4%. This study concluded that Jordanian hospital managers are concerned about the implementation of employee empowerment practices. It is suggested that support and follow-up must be provided for employee empowerment practices through the MOH or the establishment of a neutral department dedicated to this purpose.

Keywords: *Empowerment, employee, hospital managers, Jordanian hospitals*

104

Title: Psychological Empowerment and Job Satisfaction in Jordanian Hospitals

Author: *Dr. Afnan Sharif Saleh, Published Year: 2013*

Faculty: *Faculty of Engineering*

Abstract: In recent years, empowerment has become a component of business thinking. Hospitals are important assets in Jordan and are attempting to improve their competitiveness by improving employee job satisfaction. This study empirically tested the impact of psychological empowerment on job satisfaction in Jordanian private hospitals. It was hypothesized that the dimensions of psychological empowerment (meaning, competence, self-determination and impact) have a positive impact on employee satisfaction in Jordanian hospitals. The study was designed to be descriptive and quantitative. A questionnaire was designed and distributed to a sample of 554 participants, resulting in a response rate of 78%. The researchers analyzed the collected data using a group of statistical methods, including frequencies, descriptive statistics, reliability analysis, testing data validity and regression tests. Among the most important findings of this study is that employees in Jordanian private hospitals perceive themselves as highly empowered and experience a high level of satisfaction. In addition, the results indicated that 56% of the variation in employee satisfaction results from the implementation of psychological empowerment. The results also supported the proposition that psychological empowerment leads to higher satisfaction in Jordanian hospitals. The study recognizes the need to continue the implementation of psychological empowerment.

Keywords: *psychological empowerment, satisfaction, employees, hospitals, Jordan*

105

Title: Workplace Violence and Hospital Initiatives

Author: *Dr. Afnan Sharif Saleh, Published Year: 2014*

Faculty: *Faculty of Engineering*

Abstract: Workplace violence (WPV) has become an important fact in the world today and is a serious public health issue that is associated with significant and pernicious health outcomes. The current study was conducted in 2014 at Bashir Hospital in Amman, Jordan to examine both the features of WPV in a Jordanian public hospital and the actions undertaken by the hospital to cope with WPV. A mixed qualitative and quantitative methodology was used to generate the study data. The study found that the hospital environment is marked by violence, that healthcare providers were exposed to multiple forms of violence, that the most common form of violence consisted of verbal abuse and that the hospital has not adopted any international or local standards to help create a violence-free environment. The main recommendation of this study is to urgently apply appropriate engineering and management standards to help reduce WPV in hospitals.

Keywords: Workplace violence, Public hospital, Engineering initiatives, Management

106 **Title: Mechanical Characteristic of concentric and Eccentric Drilling Cutting Tool**

Author: Dr. Hasan Al Dabbas, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: In this paper cutting movement of the tilted planetary drilling is investigated. For instance, the orbital drilling strategy might be acknowledged as one of these arrangements. In any case, this system can't abstain from machining with focus of cutting device and obliges high establishment cost. The main limitation of this method is the large difference between the diameter of the created hole and the diameter of the tool. In the paper geometrical improvement of the tool, spherical end tool has been successfully employed to facilitate electrolyte flow in the machining zone.

Keywords: concentric , eccentric , Drilling Phase , electrolyte circulation

107 **Title: WHIRL INTERACTION OF A DRILL BIT WITH THE BORE-HOLE BOTTOM**

Author: Dr. Hasan Al Dabbas, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: This paper deals with the theoretic simulation of a drill bit whirling under conditions of its contact interaction with the bore-hole bottom rock plane. The bit is considered to be an absolutely rigid ellipsoidal body with uneven surface. It is attached to the lower end of a rotating elastic drill string. In the perturbed state, the bit can roll without sliding on the bore-hole bottom, performing whirling vibrations (the model of dynamic equilibrium with pure rolling when maximum cohesive force does not exceed the ultimate Coulombic friction). To describe these motions, a nonholonomic dynamic model is proposed, constitutive partial differential equations are deduced. With their use, the whirling vibrations of oblong and oblate ellipsoidal bits are analyzed, the functions of cohesive (frictional) forces are calculated. It is shown that the system of elastic drill string and ellipsoidal bit can acquire stable or unstable whirl modes with approaching critical Eulerian values by the parameters of axial force, torque and angular velocity. The analogy of the found modes of motions with ones of the Celtic stones is established. It is shown that the ellipsoidal bits can stop their whirling vibrations and change directions of their circumferential motions in the same manner as the ellipsoidal Celtic stones do. As this takes place, the trajectories of the oblate ellipsoidal bits are characterized by more complicated paths and irregularities.

Keywords: deep drilling; ellipsoidal bits; nonholonomic dynamics; Celtic stones; instability; forward and backward whirling motions.

108 **Title: Transformation of seismic discontinuous waves by hyperboloid interfaces in anisotropic elastic media**

Author: Dr. Hasan Al Dabbas, Published Year: 2014

Faculty: Faculty of Engineering

Abstract: In this paper, interaction of discontinuous waves with hyperboloid heterogeneities in anisotropic elastic media is investigated. It is shown that the interactions are accompanied by formation of reflected and refracted quasi-longitudinal and quasi-shear discontinuous waves which can be focused or scattered by elastic "mirrors" and "lenses" depending on their geometric outlines and acoustical properties. The set up problem solutions can be used for discovering the

most and least seismically hazardous zones in the earth crust and for interpretation of geophysical data about geological rock structures.

Keywords: *Anisotropic media; Discontinuous waves; Elastic mirrors and lenses; Scattering*

109

Title: Identification and analysis of hydrostatic transmission system

Author: Dr. Saber Abd Rabbo and Dr. Tarek Tutunji, Published Year: 2008

Faculty: Faculty of Engineering

Abstract: The dynamic behavior of hydro-static transmission (HST) systems is studied experimentally and theoretically to formulate a linearized mathematical model of the HST system and a recursive identification model is then proposed. A computer-controlled test rig is developed and the system state responses are measured. The results obtained from the experimental work and the linearized models are used to build a recursive identification model in order to identify the system under study. Furthermore, comparisons among the experimental, simulated, and identified results are presented. These results show that recursive identification models are powerful tools that can be used for the identification and analysis of HST. Finally, parameter variations of the volume displacement and the motor torque are introduced to the system in order to study their effect on pressure and hydraulic motor speed.

Keywords: *RPEM, ARMA, HST*

110

Title: On-line identification and control of pneumatic servo drives via a mixed-reality environment

Author: Dr. Ashraf Saleem, Dr. Saber Abdrabbo and Dr. Tarek Tutunji, Published Year: 2008

Faculty: Faculty of Engineering

Abstract: This paper presents a method to identify and control electro-pneumatic servo drives in a real-time environment. Acquiring the system's transfer function accurately can be difficult for nonlinear systems. This causes a great difficulty in servo-pneumatic system modeling and control. In order to avoid the complexity associated with nonlinear system modeling, a mixed-reality environment (MRE) is employed to identify the transfer function of the system using a recursive least squares (RLS) algorithm based on the auto-regressive moving-average (ARMA) model. Online system identification can be conducted effectively and efficiently using the proposed method. The advantages of the proposed method include high accuracy in the identified system, low cost, and time reduction in tuning the controller parameters. Furthermore, the proposed method allows for online system control using different control schemes. The results obtained from the on-line experimental measured data are used to determine a discrete transfer function of the system. The best performance results are obtained using a fourth-order model with one-step prediction.

Keywords: *On-line identification, Auto-regressive moving-average, Pneumatic servo drive, Mixed-reality environment*

111

Title: Speaker identification using vowels features through a combined method of formants, wavelets, and neural network classifier

Author: Dr. Khaled Daqrouq and Dr. Tarek Tutunji, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: This paper proposes a new method for speaker feature extraction based

on Formants, Wavelet Entropy and Neural Networks denoted as FWENN. In the first stage, five formants and seven Shannon entropy wavelet packet are extracted from the speakers' signals as the speaker feature vector. In the second stage, these 12 feature extraction coefficients are used as inputs to feed-forward neural networks. Probabilistic neural network is also proposed for comparison. In contrast to conventional speaker recognition methods that extract features from sentences (or words), the proposed method extracts the features from vowels. Advantages of using vowels include the ability to recognize speakers when only partially-recorded words are available. This may be useful for deaf-mute persons or when the recordings are damaged. Experimental results show that the proposed method succeeds in the speaker verification and identification tasks with high classification rate. This is accomplished with minimum amount of information, using only 12 coefficient features (i.e. vector length) and only one vowel signal, which is the major contribution of this work. The results are further compared to well-known classical algorithms for speaker recognition and are found to be superior.

Keywords: *Speaker verification and identification Wavelet packet Neural networks Formants*

112 **Title: Identification and cascade control of servo-pneumatic system using Particle Swarm Optimization**

Author: *Dr. Ashraf Saleem, Dr. Bashar Taha, Tarek Dr. Tutunji, and Dr. Ahmad Al-Qaisia, Published Year: 2015*

Faculty: *Faculty of Engineering*

Abstract: This paper presents a cascade control methodology for pneumatic systems using Particle Swarm Optimization (PSO). First, experimental data is collected and used to identify the servo-pneumatic system where an Auto-Regressive Moving-Average (ARMA) model is formulated using PSO algorithm. Then, cascaded Proportional-Integral-Derivative (PID) controller with PSO tuning is proposed and implemented on real system using Hardware-In-the- Loop (HIL). The identified model is validated experimentally and the performance of the cascaded-PID controller is tested under various conditions of speed variation. Experimental results show that cascaded-PID with PSO tuning performs better than single-PID, especially in disturbance rejection (a practical challenge in industrial pneumatic systems). Results also show that cascaded-PID with PSO-tuning performs better than cascaded-PID with self-tuning in the transient and steady-state responses.

Keywords: *System identification Particle Swarm Optimization Servo-pneumatic system Cascaded control PID control*

113 **Title: A methodology for identification and control of electro-mechanical actuators**

Author: *Dr. Tarek A. Tutunji and Dr. Ashraf Saleem, Published Year: 2015*

Faculty: *Faculty of Engineering*

Abstract: Mechatronic systems are fully-integrated engineering systems that are composed of mechanical, electronic, and computer control sub-systems. These integrated systems use electro-mechanical actuators to cause the required motion. Therefore, the design of appropriate controllers for these actuators are an essential step in mechatronic system design. In this paper, a three-stage methodology for real-time identification and control of electro-mechanical actuator plants is presented, tested, and validated. First, identification models are constructed from experimental data to approximate the plants' response. Second, the identified model is used in a simulation environment for the purpose of designing a suitable controller. Finally, the designed controller is applied and tested on the real plant through Hardware-in-the-

Loop (HIL) environment

Keywords: *System identification, Hardware-in-the-Loop, Electro-mechanical actuators, Mechatronics*

114 **Title: PAPR reduction based on entropy wavelet transform for SnifferMobile Robot**

Author: *Dr. Qadri Hamarsheh, Published Year: 2014*

Faculty: *Faculty of Engineering*

Abstract: In this paper, the performance of wireless systems has been improved based on a proposition of a new peak detection algorithm based on the entropy of the wavelet transforms [1] and to be imposed to the Sniffer Mobile Robot (SNFRbot). This enhancement has been compared with a previously published work that uses a predistortion neural network (PDNN) architecture has been imposed to the SNFRbot. More-over, the proposed method in this work has been applied to combat the Orthogonal Frequency Division Multiplexing (OFDM) system's drawback; namely peak-to-average power ratio (PAPR). Generally, the proposed algorithm consists of three stages; firstly, reconstruction based on wavelet transform, secondly, predetermined thresholding, and thirdly, imposing moving filter. This algorithm is called Multiple-Input Multiple-Output (MIMO)-OFDM system based entropy wavelet transform and to be imposed to SNFRbot work; SNFRbot-EWT. The performance of SNFRbot-EWT has been evaluated using a numerical analysis and a conducted simulation. The results have been compared with the our previously published work, SNFRbot-EWT gives an improvement reach to around 30% for the same bandwidth occupancy, which will reduce the cost and the complexity of the transceiver's structure.

Keywords: *MIMO-OFDM, SNFRbot-EWT, Wavelet, Entropy, PAPR*

115 **Title: Enhancing DVH BER Based OFDM Systems**

Author: *Qadri Hamarsheh and Omar Daoud, Published Year: 2015*

Journal of Communications technology and Electronics, © Pleiades Publishing, Vol. 60, No. 8

Faculty: *Faculty of Engineering*

Abstract: Due to the need for enhancing the wireless systems performance, a new technique, and over the last decades, has been imposed to such systems, namely Orthogonal Frequency Division Multiplexing (OFDM). In order to overcome one of the main OFDM drawbacks a new proposal has been investigated, which could limit the usage of such system in the nonlinear devices. Peak to Average Power Ratio (PAPR) problem comes as a result of using Fast Fourier Transform (FFT) stage, where the input 2^N signals and after the process could be added together in the same phase. In this algorithm some modifications have been made over a previously published, where the wavelet entropy understanding has been imposed to be the judge for the PAPR consideration. In the previous published work, when a wavelet technique was proposed to DeNoise OFDM symbols and Replace the high PAPR and named by DORP. This is attained by making use of an adaptive threshold to allocate the affected samples, which are amended according to the surrounding ones. In the Modified DORP (MDORP), the wavelet transform is used to reconstruct the affected OFDM symbol with PAPR based on their entropies. A MATLAB simulation has been made to verify and validate the numerical model that is derived to investigate the systems performance. Furthermore, the achieved results were compared to either our previously published work or to the work that found in the literature. However, the simulation results show BER systems improvement under the same systems' conditions, an additional transceivers complexity has been added. This will leave a

space for further improvement in future. Furthermore, the MDORP gives a noise immunity and verification rate up to 85%.

Keywords: OFDM, high peak power, wavelet, entropy

116

Title: PEAK DETECTION USING WAVELET TRANSFORM

Author: Dr. Qadri Hamarsheh, Published Year: 2014

Faculty: Faculty of Engineering

Abstract: A new work based-wavelet transform is designed to overcome one of the main drawbacks that found in the present new technologies. Orthogonal Frequency Division Multiplexing (OFDM) is proposed in the literature to enhance the multimedia resolution. However, the high peak power (PAPR) values will obstruct such achievements. Therefore, a new proposition is found in this work, making use of the wavelet transforms methods, and it is divided into three main stages; de-noising stage, thresholding stage and then the replacement stage. In order to check the system stages validity; a mathematical model has been built and its checked after using a MATLAB simulation. A simulated bit error rate (BER) achievement will be compared with our previously published work, where an enhancement from 8×10^{-1} to be 5×10^{-1} is achieved. Moreover, these results will be compared to the work found in the literature, where we have accomplished around 27% PAPR extra reduction. As a result, the BER performance has been improved for the same bandwidth occupancy. Moreover and due to the de-noise stage, the verification rate has been improved to reach 81%. This is in addition to the noise immunity enhancement.

Keywords: MIMO-OFDM, PAPR, wavelet- eigen vector, de-noising

117

Title: MIMO-OFDM Systems Performance Enhancement Based Peaks Detection Algorithm

Author: Dr. Qadri Hamarsheh, Published Year: 2013

Faculty: Faculty of Engineering

Abstract: This work proposes a new algorithm to enhance the performance of the speaker verification over the communication systems based Multiple-Input Multiple-Output (MIMO) - Orthogonal Frequency Division Multiplexing (OFDM) techniques. The algorithm mainly tackles and overcomes the effect of the high Peak-to-Average Power Ratio problem that is found in OFDM systems, MIMO-OFDM combination has been developed to meet the rapidly increment in the users demand such as the ubiquitous transmission, imposing new multimedia applications and wireless services. In this algorithm, wavelets techniques have been used to denoise the affected OFDM symbol by high PAPR values. After that and based on adaptive threshold method the local maxima and minima will be determined and replaced by the average of them and their surrounding neighbors; Denoise OFDM and Replace PAPR (DORP). A system performance investigation process will be accomplished based on both of numerical method and MATLAB simulation. Moreover, a comparison has been made to check the validity of our proposition either with our previously published work or with the literature. Although, the achieved results show that the proposed work has lower PAPR values; an additional complexity has been added to transceiver's structure. Moreover, and as a result to the comparison with the conventional systems, the bit error rate (BER) performance has been improved for the same bandwidth occupancy. As a validity process a comparison has been made with the current values found in the literature and we have achieved around 30% PAPR extra reduction. That is in addition to around 90% verification rate and noise immunity.

Keywords: MIMO, OFDM, Peak-to-Average Power Ratio, wavelet, Eigen vectors

component.

118 **Title: Speaker Verification over MIMO-OFDM Systems based on Artificial Intelligence Techniques**

Author: Dr. Qadri Hamarsheh, Published Year: 2012

Faculty: Faculty of Engineering

Abstract: In this work, an enhancement of a previously published work that tackles the use of automatic speaker verification (ASV) techniques in the Beyond Third generation (B3G) cellular systems has been proposed. The new proposition has been studied to overcome the effect of the Peak-to-Average Power Ratio (PAPR), which is a vital problem that found in the Orthogonal Frequency Division Multiplexing (OFDM) techniques, where a powerful combination between two main technologies; Multiple-Input Multiple-Output (MIMO) and OFDM has been developed to meet the rapidly increment in the users demand such as the ubiquitous transmission, imposing new multimedia applications and wireless services. The work space has been divided into three main areas; firstly, reducing the ASV complexity by selecting the weight of the text independent speakers based on Self-Organizing Map (WSOM) Neural Network (NNT), secondly, using the Eigen values/vector extracting features techniques as a pre-processing one to enhance the orthogonality, and finally proposing a new algorithm to combat the effect of the PAPR in the MIMO-OFDM systems. In this algorithm, wavelets techniques have been used to Denoise the affected OFDM symbol by high PAPR values. After that and based on adaptive threshold method the local maxima and minima will be determined and replaced by the average of them and their surrounding neighbors; Denoise OFDM and Replace PAPR (DORP). A system performance investigation process will be accomplished based on both of numerical method and MATLAB simulation. Moreover, a comparison has been made to check the validity of our proposition with our previously published work. Although, the achieved results show that the proposed work has lower PAPR values; an additional complexity has been added to transceiver's structure. Moreover, and as a result to the comparison with the conventional systems, the bit error rate (BER) performance has been improved for the same bandwidth occupancy. Our simulation results showed that around 28% extra reduction in PAPR over current values in the literature, it can be achieved depending on the system type. Moreover, two different investigation and verifications techniques have been used in this work; Gaussian mixture model based method (GMMWPE) and K-Means clustering based method (KMWPE). A promising verifications result has been showed for verifications rate; around 91% and for noise immunity.

Keywords: MIMO, OFDM, Peak-to-Average Power Ratio, Self-Organizing map, Wavelet, Eigen vectors.

119 **Title: Wavelet Entropy Algorithm to Allocate the Extreme Power Peaks in WiMax Systems**

Author: Dr. Qadri Hamarsheh, Published Year: 2014

Faculty: Faculty of Engineering

Abstract: This work proposes a solution to overcome the effect for one of the main drawbacks of these days' wireless systems, where Multiple-Input Multiple-Output (MIMO)- Orthogonal Frequency Division Multiplexing (OFDM) combinations has been used. High peak-to-average power ratio (PAPR) arises after the OFDM stage and reduces the performance of the used nonlinear devices. Therefore, a new stage has been imposed between the MIMO and OFDM block. It is based on the entropy meaning of the wavelet transformation to trigger a proposed thresholding criterion and reconstruct the OFDM signal. As a result, the probability of high PAPR

appearance will be limited and reduced; a promising result over our recently published work has been conducted; 15-25% extra reduction. This work could be denoted by MIMO-OFDM based on Entropy Wavelet Transform (MO-EWT) systems. The MO-EWT validity has been checked based on either numerical analysis or conducted simulation based on MATLAB; where 80% improvement of reducing the high PAPR has been achieved over the literature. These results have been reached using the same environment conditions and at additional cost and complexity of the transceivers structure.

Keywords: *Thresholding, Wavelet Entropy, MIMO, OFDM, PAPR*

120 **Title: Enhancing the BER of MIMO-OFDM Systems for Speaker Verification**

Author: *Dr. Qadri Hamarshah, Published Year: 2013*

Faculty: *Faculty of Engineering*

Abstract: in this work a new algorithm has been proposed to improve the wireless systems that are compatible with the current new technologies. Therefore, Denoise Orthogonal Frequency Division Multiplexing (OFDM) symbols and Replace the high Peak-to-Average Power Ratio (PAPR); (DORP) has been modified. In DORP, wavelets techniques have been used to denoise the affected OFDM symbol by high PAPR values. After that and based on adaptive threshold method the local maxima and minima will be determined and replaced by the average of them and their surrounding neighbors. The algorithm mainly tackles and overcomes the effect of the high Peak-to-Average Power Ratio problem that is found in OFDM systems, MIMO-OFDM combination has been developed to meet the rapidly increment in the users demand such as the ubiquitous transmission, imposing new multimedia applications and wireless services. A system performance investigation process will be accomplished based on both of numerical method and MATLAB simulation. Moreover, a comparison has been made to check the validity of our proposition either with our previously published work or with the literature. Although, the achieved results show that the proposed work gives an improvement of the BER; an additional complexity has been added to transceiver's structure. Moreover, and as a result to the comparison with the conventional systems, the bit error rate (BER) performance has been improved for the same bandwidth occupancy. As a validity process a comparison has been made with the current values found in the literature and we have achieved around 27% PAPR extra reduction. That is in addition to around 81% verification rate and noise immunity.

Keywords: *MIMO, OFDM, Peak-to-Average Power Ratio, wavelet, Eigen vectors component.*

121 **Title: Design of a cache system controller for processors using FPGA**

Author: *N. Halasa, A. Titinchi, Published Year: 2010*

Faculty: *Faculty of Engineering*

Abstract: A modified technique for ASM minimization using GALs in digital systems design

Keywords: *ASM GALs*

122 **Title: Distribution of Some Heavy Metals Pollution caused by Al- Daura Refinery in The Surrounded Region**

Author: *Dr. Riyad Al-Anbary ,Dr. Mohammed M. M. Al-Iessa, Mr. Mohammed Amer, Published Year: 2011*

Faculty: Faculty of Engineering

Abstract: Due to the higher increase in the oil industry activities in Iraq, since there are a little information of the environmental status of the areas around the refinery locations, and the concerns of a possible environmental pollution that will cause health and life threats to living organisms, this study was carried out. To understand the status of heavy metals pollution in areas inside and surrounding Al-Daura refinery activities, (17) testing locations were chosen, ten locations outside the refinery and seven locations inside it. One additional location was chosen in a rural (control) area, in the University of Baghdad, to compare between the heavy metals concentration in the study area and a sample from the rural area not affected by the pollution. The soil samples have been taken from (5 and 60 cm) depth from the top surface of the soil. Three samples were taken from each depth for each location to take an average of results. All the samples of soil were taken during the period from Dec/2010 to Feb/2011. The experimental work has been includes the heavy metals concentrations, such as Zinc, Nickel, Lead and Cadmium, have been measured at each selected depth for each testing locations. The results indicate that the mean concentration of Zn and Ni is (62.4 µg/g) and (100.5 µg/g) respectively and this values exceeded the mean allowable value by (Alloway, 1995; Kabata-Pendias and Pendias, 1992). The most concentrations of Zn, Ni and Pb, with some exceptions, accumulate at the top soil and decrease with the depth except Cd.

Keywords: Soil Pollution

123

Title: A Preliminary Investigation of skirted Foundations

Author: Dr. Namir Al-Saoudi, Dr. Mohammed M. M. Al-Iessa, Published Year: 1999

Faculty: Faculty of Engineering

Abstract: The behaviour of skirted strip model footings founded on beds of uniform sands is investigated. The load - settlement relationships are determined for strip model footings with skirt depth to footing width ratio (DB) ranging from 0 to 1. The results revealed that there is a significant increase in the bearing failure loads with increasing D/B ratio and this increase was more pronounced when the sand was in the dense state rather than in the loose state. The effect of particle size (fine and coarse particles), on the failure loads was minimal.

Keywords: soil, skirted footings, sand

124

Title: Ordinary and Encased Stone Columns at Two Different Relative Densities

Author: Dr. Namir A-Saoudi, Dr. Mohammed M. M. Al-Iessa, Miss Sara Emad, Published Year: 2010

Faculty: Faculty of Engineering

Abstract: Stone columns technique is most commonly used in increasing bearing capacity, reduces and controls the compressibility and accelerates the rate of consolidation of soft saturated clay. During the last four decades, the technique has been utilized worldwide and proved successful results. Several modifications have been proposed to increase the efficiency of this technique such as addition of additives, use of special patterns of reinforcements, encasing the stone columns with geonet or geogrid to provide extra confinement that enhances the bearing capacity and reduces the settlement drastically without compromising its effect as a drain. The present paper focuses on the behavior of soft saturated clay reinforced with ordinary and geogrid encased stone columns. The investigation was performed both experimentally through small scale models and through numerical techniques. The influence of relative density of the back fill material and the presence of the encasement are the main parameters investigated. Ordinary stone columns revealed

an increase of 20% in the carrying capacity when the relative density of the backfill stone aggregates increased from 23% to 71%, furthermore the efficiency of the encasement was more pronounced at lower relative density.

Keywords: *numerical analysis, geogrid encasement, bearing improvement ratio, soft clay, stone columns, relative density*

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Title: IMPROVING MICROSTRUCTURE AND MECHANICAL PROPERTIES OF AL-A332-ALLOY REINFORCED AL₂O₃ MICRO AND NANO COMPOSITES FABRICATED BY STIR CASTING

Author: *IBTIHAL A. MAHMOOD, ADNAN DAWOOD MOHAMMED and RAWNAQ AHMED MOHAMMED, Published Year: 2014*

Faculty: *Faculty of Engineering*

Abstract: Aluminium matrix composites (AMCs) reinforced with micro and nano-sized Al₂O₃ particles are widely used for high performance applications such as automotive, military, and aerospace and electricity industries because of their improved physical and mechanical properties. The major problem in fabricating metal matrix composites by liquid phase is the poor readability which leads to the nonuniform distribution of the particles. In order to improve the microstructure and mechanical properties of composite, firstly improve the wettability and distribution of reinforcement particles within the matrix. Three steps were applied in stir casting process to avoid agglomeration and segregation of particles. The process included heat treatment of micro and nano Al₂O₃ particles, injection of heat-treated particles within the molten A332 aluminium alloy by inert argon gas and stirring the melt at suitable speed. In the present work, nano and micro-composites (A332/Al₂O₃) with different weight percent of particles were fabricated by stir-casting techniques. Micro structural characterization was investigated by optical (OP) and scanning electron microscopy (SEM). Tensile, hardness tests were carried out in order to identify mechanical properties of the composites. The results of micro structural study revealed uniform distribution, grain refinement and low porosity in micro and nano-composite specimens. The mechanical results showed that the addition of alumina (micro and nano) led to the improvement in yield strength, ultimate tensile strength, and hardness. It was indicated that type of fabrication process and particle size were the effective factors influencing on the mechanical properties. Decreasing alumina particle size and using steps of stir casting method- process obtained the best mechanical properties.

Keywords: *metal-matrix composite-nano Al₂O₃- stir casting*

126

Title: The Estimation of Random Response of a Coupled Cylinder-Cone System Using Statistical Energy Analysis

Author: *Adnan Dawood Mohammed, Published Year: 2011*

Faculty: *Faculty of Engineering*

Abstract: A composite, coupled, thin cylindrical-conical shell system made of polyester resin reinforced by uniformly distributed, chopped, E-glass is analyzed using Statistical Energy Analysis (SEA). Response displacement estimate of the two subsystems are obtained as result of the excitation of the cylindrical part by a broadband white noise of constant spectral density function. The paper is an attempt to study the validity of the SEA hypothesis as applied to coupled, built-up structures. This is carried out by the comparison of SEA response estimates of the coupled system in different 1/3rd octave frequency bands with those obtained from Finite Element method. The outcome of this work shows that SEA is a powerful tool for the vibration analysis of coupled systems at high frequencies when the number of interacting coupled resonant modes is high. Percentage error obtained from the

comparison of results drops sharply as one goes further in frequency. This paper recommends that the user of SEA must always be aware of the uncertainty of the results obtained. The uncertainty may arise from the improper selection of subsystems, coupling loss factors, and the number of interacting resonant modes of the coupled system.

Keywords: *Statistical Energy Analysis (SEA), Finite Element method (FEM)*

127

Title: Development of a four arms viscoelastic damper and its application to a heavy floor vibration due to walking excitation

Author: *Adnan Dawood Mohammed, Published Year: 2010*

Faculty: *Faculty of Engineering*

Abstract: High levels of unwanted vibrations are normally occur in light, and (or) long span floor systems due to human activities such as walking or jumping. It causes annoyance and discomfort to the occupants. Hence, rectification measures would be required to minimize floor vibrational displacement amplitudes. This work is concerned with the development of a new innovative passive viscoelastic four arms damper. The mission of this damper is to reduce floor vibration. The damper is tuned to the fundamental frequency of a vibrating concrete floor of 4.4 Hz. A transient, finite element numerical analyses are performed on the coupled floor-four arms damper system and on the uncoupled systems to monitor and to compare the transient responses due to walking excitation. Similar analysis is done on the floor when the latter is coupled to a single arm viscoelastic damper having the same mass ratio. The single arm damper has been recently developed in a small laboratory scale by the author of this work. A reduction factor of 1.7 in the floor vibrational amplitude is obtained when the single arm damper is attached to the floor while a 1.8 reduction factor is observed when the new damper is attached. The reduction factors obtained are considered to be excellent results for heavy concrete floors applications.

Keywords: *Floor vibrations, viscoelastic damper, four-arm damper, heavy concrete floors.*

128

Title: Coupling between rectangular panel modes and acoustical modes in rectangular cavity

Author: *Adnan D. Mohammed, Saffa H. Abdul - Rahman, Hassan H. Mahdi, Mahmood A. Hassan, Published Year: 2008*

Faculty: *Faculty of Engineering*

Abstract: The response of structure to internal sound in an enclosure has received a considerable attention from designers because of the induced stresses in the structure from acoustic excitation. The main aim of this research was to investigate the modal interaction between structural modes and acoustical modes using different coupled configurations and evaluation of the response of the structure theoretically and experimentally. Another objective was to investigate the effect of damping, thickness, material properties, boundary condition on the radiation efficiency. The analysis contained the prediction of energy transfer between acoustic and the structural systems employing the well known coupled oscillatory theory. A system consists of a flexible rectangular (simply supported and simply clamped) panel, which forms one wall of rigid rectangular box, is analyzed analytically. The acoustic space is excited by a random source and the results of averaged radiation efficiency from the panel were predicted in different 1/3 octave frequency bands. Acceptable agreement between experimental and theoretical results is observed from the model of panel cavity. The results of this work show that the radiation efficiency, increases with increasing the thickness of the panel, and decreases with increasing the damping of the structure and acoustic space. The results also show that the radiation

efficiency of brittle material is higher than that of ductile material; it is observed that the boundary condition of the structure has great effect on the radiation efficiency. The response of the simply clamped panel is higher than that of simply supported panel.

Keywords: *Coupling, acoustical modes, structural modes and rectangular cavity.*

129

Title: Optimal design of graphite/epoxy composite laminate plates under cryogenic environment. Numerical and experimental investigations

Author: *M. J. Jweeg, Adnan. D. Mohammed and M. Faidthallah, Published Year: 2006*

Faculty: *Faculty of Engineering*

Abstract: The current study includes two parts, the first one consists of testing specimens under cryogenic environment of graphite / epoxy laminate plates such as polymer – enhanced, graphite reinforced cementitious composite laminate plates, with different number of layers, aspect ratios and ply angles of graphite fibers, to achieve a mechanical properties of the above composite plates. The second part of this paper includes description of how finite element and experimental optimal design of modal analysis can be used to characterize the dynamic behavior of plates made from polymer – enhanced, graphite reinforced cementitious composite materials under cryogenic environment. The material characteristics obtained from the experimental investigations are used for the analysis of composite plates have showed that, the mechanical properties of the said composite plates experimentally and theoretically in comparing with the results of references[2]. In this paper a good agreement is obtained between finite element and experimental modal analysis which can be used to characterize the dynamic behavior of plates made from polymer – enhanced, graphite reinforced cementitious composite materials of laminate plates under cryogenic environment and a good conformability between the finite element and experimental model analysis of the dynamic characteristics results of the said plates of this paper, with the results of reference[5].

Keywords: *Composite laminate, cryogenic, optimal design of plates, finite element method,*

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Title: A STUDY OF THE EFFECT OF SEMI-ANGLE OF CONE ON THE VIBRATION CHARACTERISTICS OF CYLINDRICAL-CONCOUPLED SHELL STRUCTURE

Author: *Muhsin J. Jweeg, Adnan D. Mohammed, Mohsin A. Al-Shamari, Published Year: 2012*

Faculty: *Faculty of Engineering*

Abstract: In this work, the effect of variation of semi-angle of the conical part on the vibration characteristics of cylindrical-conical coupled structure is investigated. The shell is made of polyester resin reinforced by continuous E-glass fibers. The case is analyzed experimentally and numerically for orthotropic shell structures. The experimental program is conducted by exciting the fabricated structure by an impact hammer and monitoring the response using an attached accelerometer for different semi-angles of the conical part. Software named SIGVIEW is used to perform the signal processing on the acquired signal in order to measure the natural frequencies and the corresponding mode shapes. The numerical investigation is achieved using ANSYS (Finite Element software) which was verified by the experimental results. Good agreement is achieved when comparing the experimental and numerical results. The maximum deviation in results was found to be (5.9%). The maximum relative nodal rotational and translational amplitudes associated with the first normal mode of the orthotropic and isotropic shells are noted for the structure of semi-angle of cone of 45o

Keywords: *Coupled, Cylindrical-Conical, Orthotropic, Frequency*

131 **Title: Optimum Design for a Passive Tuned Mass Dampers Using Viscoelastic Materials**

Author: *Ibrahim Saidi, Adnan D Mohammed, Emad F Gad, John L Wilson, Published Year: 2007*

Faculty: *Faculty of Engineering*

Abstract: High levels of vibrations can occur in floor systems due to excitation from human activities such as walking and aerobics. In building floors, excessive vibration is generally not a safety concern but a cause of annoyance and discomfort. Rectification measures for excessive vibrations in existing floor may include structural modifications to increase the floor stiffness or addition of damping. While structural stiffening can be easily designed and the corresponding effect be accurately predicted, it is often not practical due to space limitations or associated construction disruptions. The addition of mechanical dampers can be more practical and cost effective for floors with low damping, but there are very limited proprietary systems available and they are difficult to design from first principles. This paper forms part of a research project which aims to develop an innovative cost effective Tunes Mass Damper (TMD) using viscoelastic materials. Generally, a TMD consists of a mass, spring, and dashpot which is attached to a floor to form a two-degree of freedom system. TMDs are typically effective over a narrow frequency band and must be tuned to a particular natural frequency. The paper provides a detailed methodology for estimating the required parameters for an optimum TMD for a given floor system. The paper also describes the process for estimating the equivalent viscous damping of a damper made of viscoelastic material.

Keywords: *Floor vibrations, viscoelastic materials, tuned mass dampers*

132 **Title: Development of a Viscoelastic Tuned Mass Damper for FloorVibration applications**

Author: *I. Saidi, A. D. Mohammed, E. F. Gad, J. L. Wilson, N. Haritos, Published Year: 2008*

Faculty: *Faculty of Engineering*

Abstract: In recent years, due to changes in construction methods, human activities such as walking, dancing and aerobics have become major sources of excessive, induced floor vibrations. Excessive vibration in building floors is generally not a safety concern but a cause of annoyance and discomfort. Rectification measures for excessive vibrations in existing floors may include structural modifications to increase the floor stiffness or the addition of damping. While structural stiffening can be easily designed and the corresponding effect be accurately predicted, it is often not practical due to space limitations or associated construction disruptions. The addition of mechanical dampers can be more practical and cost effective for floors with low damping, but there are very limited proprietary systems available and they are difficult to design from first principles. This paper forms part of a research project which aims to develop a new cost effective Tune Mass Damper (TMD) using viscoelastic materials. A TMD consists of a mass, spring, and dashpot which is attached to a floor to form a two-degree of freedom system. TMDs are typically effective over a narrow frequency band and must be tuned to a particular natural frequency. A new innovative prototype of a viscoelastic damper has been developed and used for the retrofitting of a steel simply supported beam. Results for the effectiveness and sensitivity of the viscoelastic damper are presented in detail. The experimental results are validated numerically by an FE model. It is shown that the developed viscoelastic damper is quite efficient in reducing floor vibrations and it is

not highly sensitive to changes in the properties of the coupled floor.

Keywords: *Dampers-Viscoelastic materials-Floor vibration*

133 **Title: Application Studies for Reducing the Harmful Vibrations on Blades of High and Low Pressure Stages of Steam Turbines**

Author: *Safaa H. Abdulrahman, Mohammed A. S. Salih, Adnan D. Mohammed,*
Published Year: *2008*

Faculty: *Faculty of Engineering*

Abstract: In this work the dynamic behavior of blade disc - Turbo rotor - Bearing system is investigated analytically using the transfer matrix method, also the analysis apply the finite element method (Ansys Package) choosing the brick type element, for comparison of the results. The major aim of this paper are to study the effects of varying the temperature, fluid flow impact on the blades surface; losing a fraction of the blade mass to have unbalance in system; blade root flexibility and centrifugal force along the blade length; gyroscopic moments, damping and stiffness values of bearings on the dynamic behavior of the blade disc – Turbo rotor – Bearing system.

Keywords: *Turbo rotor, Bearing system, Brick Element*

134 **Title: AN APPROACH FOR FORMING SPUR GEAR TOOTH PROFILE**

Author: *Safaa H. Abdulrahman, Adnan D. Mohammed, Published Year: 2008*

Faculty: *Faculty of Engineering*

Abstract: Due to high working speed requirement in industry of rotating components, gear design development become quite noticeable and rapid in the vicinity of engineering parameters which become to have a large effect on its performance. In this work the spur gear of straight tooth is chosen because of its wide usage in industry, also an equation for joining the involute profile and fillet curve is generated. Variation effect on the shape of tooth profile forming is studied. A suggested method for generating tooth profile is obtained and a computer program is written for drawing the involute and trochoid curves. The results obtained from the new method are the true continuous involute and trochoid curves in comparison with those obtained from Mechanical Desk software which are approximated curves fitted results.

Keywords: *tooth, gear, trochiod, involute*

135 **Title: A Novel Deployable Open Ends Support Reflector**

Author: *MUHSIN J. JWEEJ, ADNAN D. MOHAMMED, NABIL N. SWADI, Published Year: 2008*

Faculty: *Faculty of Engineering*

Abstract: This paper presents an improved deployable reflector concept for an Earth observation mission that requires a low-cost L-band Synthetic Aperture Radar (SAR) satellite. The required reflector shape is an offset parabolic cylinder with an arc length of 7.888 m and a width of 3.2 m. A novel hollow solid structural concept is proposed that comprises curved surfaces formed from thin sheets of carbon-fiber-reinforced-plastic (CFRP) connected by flexible hinges along the edges. This proposed structure has very high stiffness-to-weight-ratio, because of its thin-walled box-type construction. A preliminary design of the full-scale structure in deployed configuration, which has an estimated mass 22.5 kg and 18.665 kg and fundamental natural frequency of 0.72 Hz and 0.64 Hz before and after the optimization analysis respectively, is presented in the paper. This is 3.5 to 4.2 times lighter than the traditional reflector structure, made from lightweight curved panels with self-locking

hinges. A detailed study of a quarter-scale technology demonstrator made of 0.6mm thick thermoplastic (nylon), including design, manufacture and testing is also presented.

Keywords: *Reflectors-Deployable-Vibrations*

136 **Title: Transformation of seismic discontinuous waves by hyperboloid interfaces in anisotropic elastic media**

Author: *Nabil W. Musa, a V. I. Gulyayev b, G. M. Ivanchenko c, Yu. A. Zaets b, Hasan Aldabasa, Published Year: 2014*

Faculty: *Faculty of Engineering*

Abstract: Abstract. In this paper, interaction of discontinuous waves with hyperboloid heterogeneities in anisotropic elastic media is investigated. It is shown that the interactions are accompanied by formation of reflected and refracted quasi-longitudinal and quasi-shear discontinuous waves which can be focused or scattered by elastic "mirrors" and "lenses" depending on their geometric outlines and acoustical properties. The set up problem solutions can be used for discovering the most and least seismically hazardous zones in the earth crust and for interpretation of geophysical data about geological rock structures. Key words: Anisotropic media; Discontinuous waves; Elastic mirrors and lenses; Scattering.

Keywords: *Key words: Anisotropic media; Discontinuous waves; Elastic mirrors and lenses;*

137 **Title: Mechanical Characteristic of concentric and Eccentric Drilling Cutting Tool**

Author: *Hasan AL Dabbas, Nabil M Musa, Mohammad Quqazeh., Published Year: 2015*

Faculty: *Faculty of Engineering*

Abstract: Abstract In this paper cutting movement of the tilted planetary drilling is investigated For instance, the orbital drilling strategy might be acknowledged as one of these arrangements. In any case, this system cannot abstain from machining with focus of cutting device and obliges high establishment cost The main limitation of this method is the large difference between the diameter of the created hole and the diameter of the tool. In the paper geometrical improvement of the tool, spherical end tool has been successfully employed to facilitate electrolyte flow in the machining zone

Keywords: *Key words: concentric, eccentric, Drilling Phase, electrolyte circulation.*

138 **Title: Modeling and Identification of a Four-Bar Linkage Mechanism Driven by a Geared DC Motor**

Author: *Tarek A. Tutunji, Mohammad Salah, Ahmad Al-Jarrah, Anas Ahmad, Rabei Alhamdan, Published Year: 2015*

Faculty: *Faculty of Engineering*

Abstract: Four-bar linkage mechanisms are popular systems that are used in a wide range of applications in the industry. However, it is not easy to model and control these mechanisms because parameters such as friction, damping, and stiffness are difficult to measure. Thus, there is a need to develop methods to facilitate the modeling and control of such systems. In this paper, identification methods are investigated for the purpose of estimating and predicting the nonlinear dynamics of these mechanisms. Linear parametric models and neural networks models are studied and applied to identify the dynamics of an experimental four-bar linkage

mechanism, driven by geared DC motor, via recording and collecting real-time input/output signals for different operating profiles. This data is then used to optimize the parameters of both linear models and neural network models in order to identify the system behavior. The identification models are tested in MATLAB simulation and their responses are compared with experimental data. Even though a high-order linear model was able to capture the plant's behavior, the neural network model provided better accuracy in mimicking the nonlinear behavior of the four-bar linkage mechanism. The presented work provides appropriate model for a four-bar linkage mechanism that can be used to design controllers for the described mechanism.

Keywords: *System Identification, Nonlinear Systems, Four-Bar Linkage Mechanism, Neural Network Models, ARX Models, Mechatronics*

139 **Title: Reverse engineering course at Philadelphia University in Jordan**
Author: Mohammad BaniYounis* and Tarek Tutunji, Published Year: 2011
Faculty: Faculty of Engineering

Abstract: Reverse engineering (RE) is the process of testing and analysing a system or a device in order to identify, understand and document its functionality. RE is an efficient tool in industrial benchmarking where competitors' products are dissected and evaluated for performance and costs. RE can play an important role in the re-configuration and redesign of legacy and/or undocumented systems. It can also play a key role in helping students understand engineering products. This paper presents the Philadelphia University experience in constructing a RE course and integrating it within the engineering curricula. This paper can be used as a guide to other universities that wish to introduce RE to their curricula. The information provided in this paper covers the RE methodology for a system level, as well as mechanical, electronics and software levels. Finally, samples of student projects are presented in order to show the learning capabilities provided throughout the course.

Keywords: *reverse engineering; education design; engineering design; students' projects*

140 **Title: Mechatronic system design course for undergraduate programmes**
Author: Ashraf Saleem, Tarek Tutunji and Lutfi Al-Sharif, Published Year: 2011
Faculty: Faculty of Engineering

Abstract: Technology advancement and human needs have led to integration among many engineering disciplines. Mechatronics engineering is an integrated discipline that focuses on the design and analysis of complete engineering systems. These systems include mechanical, electrical, computer and control subsystems. In this paper, the importance of teaching mechatronic system design to undergraduate engineering students is emphasised. The paper offers the collaborative experience in preparing and delivering the course material for two universities in Jordan. A detailed description of such a course is provided and a case study is presented. The case study used is a final year project, where students applied a six-stage design procedure that is described in the paper.

Keywords: *mechatronics education; design procedure; student projects*

141 **Title: An Undergraduate Mechatronics Project Class at Philadelphia University, Jordan: Methodology and Experience**
Author: Tarek A. Tutunji, Ashraf Saleem, and Saber Abd Rabbo, Published Year: 2009

Faculty: Faculty of Engineering

Abstract: Mechatronics is a branch of engineering whose final product should involve mechanical movements controlled by smart electronics. The design and implementation of functional prototypes are an essential learning experience for the students in this field. In this paper, the guidelines for a successful mechatronics project class are presented, evaluated, and discussed. Furthermore, the paper introduces a general mechatronic system design methodology that should equip students to carry out a successful mechatronics project in their undergraduate training. Three student projects at Philadelphia University, Jordan, are examined in detail, with descriptions of their goals, design, and implementation.

Keywords: *Course evaluation, course structure, design methodology, mechatronic systems, student projects.*

142 **Title: Innovative Wind Turbine Selection Method Using Modified Weibull Probability Function**

Author: *Mahmoud Hammad · and Laith Batarseh ·, Published Year: 2015*

Faculty: *Faculty of Engineering*

Abstract: In this work, a three-year wind data for some sites in Jordan was analyzed. Two sites showed highly promising potential. Both predicted more than 1.0 MWh/m².y. This work modified the probability function of Weibull – Hiester and Pennel to produce more accurate potential speed values for the wind. Results showed that this modification enhanced energy potential by 30%. The interaction of wind turbine performance data with site wind data was then discussed. The yearly output energy of different machines was the objective function for an optimization process with rating velocity (V_r) as the main variable. The resulted optimum energy was found to depend on the two variables of the Wiebull function. Optimum V_r was found to range from 4.2 to 5.6 for the sites considered. The optimum V_r can be used as a selection parameter for the best suitable turbine.

Keywords: *wind energy*

143 **Title: Numerical investigation of fully developed laminar flow in irregular annular ducts: Triangular–circular combinations**

Author: *M. Ebaid, O. Haddad and L. Batarseh, Published Year: 2014*

Faculty: *Faculty of Engineering*

Abstract: The aim of this study is to reduce the required pumping energy by obtaining accurately the friction factor - Reynolds number product (fRe) of the steady fully developed laminar flow in annular ducts. The study is focused on the annular region between equilateral triangular and circular ducts under all possible combinations. For this purpose, the governing equations are solved using high order finite element method. For regular annuli, it is found that higher values of area ratio lead to monotonic increase in (fRe) value, with (fRe)(max) = (24, 42.67,96) at the respective values of (D-h)= (0.5,0.75,1) regardless of the particular geometry. For irregular annuli, higher values of area ratio lead to an increase followed by a decrease in (fRe) value, with (fRe)(max) = (79.631,35.392,19.921) at the respective values of (D-h) = (0.5, 0.75, 1) for the (CT) case, and correspondingly (fRe)(max) = (91.02,40.45,22.85) for the (TC) case. On the other hand, it is found that (fRe) value inversely proportional with the hydraulic diameter (D-h). For all cases considered in this study, the largest (fRe) at the representative values (AR) = 30% is found for the (CC) case with (fRe)(max) = 95.43 whereas the smallest (fRe) is found for the (CT) case with (fRe)(min), = 17.544. More importantly, irregular annuli outperformed the regular annuli and thus are recommended to replace the classical regular annuli currently used in double duct heat exchangers. This in turn will significantly decrease

the pumping energy required in such applications in industry.

Keywords: *irregular annuli*

144 **Title: Permeability Effect on Sound Wave Propagation in Saturated Porous Layer Laid Over Flat Plate**

Author: *Laith Batarseh and Hamzeh Mustafa Duwairi, Published Year: 2011*

Faculty: *Faculty of Engineering*

Abstract: In this research, the effect of varying permeability on none – isentropic sound wave propagation in porous layer laid over flat plate was under investigation. The continuity, momentum and energy equations were derived, linearized and solved respectively by using the hydrodynamic / acoustic splitting method, the suitable variational solution and Euler – Lagrange approach. The effects of viscosity and thermal gradient were involved. The media was assumed to be formed by spherical particles with small diameter. The permeability was varied exponentially by varying the particle diameter and applying Carman – Kozeny relation to relate porosity and particle diameter to permeability. Both attenuation and phase velocity were found for both cases of stationary and movable flow situations. It was found that the effective parameters on propagation constant are: initial value of particle diameter (D_{p0}), initial value of porosity (ϵ_0) and the mean Mach number (M). Both initial values of porosity and particle diameter have retarding effects on attenuation and enhancement effects on the phase velocity for all wave types. It is also found that as the flow velocity increases, attenuation for both forward and hydrodynamic waves decreases and the phase velocity increases while the opposite occurs for the backward wave where the attenuation increases and the phase velocity decreases.

Keywords: *sound waves, porous media, permeability*

145 **Title: ISENTROPIC SOUND PROPAGATION ANALYSIS AND OPTIMIZATION OVER FLAT PLATE OF SATURATED POROUS MEDIA WITH VARIABLE PERMEABILITY**

Author: *Laith Batarseh and Hamzeh Mustafa Duwairi, Published Year: 2011*

Faculty: *Faculty of Engineering*

Abstract: The problem of sound propagation over flat plate of porous media was investigated at both stationary and movable flow conditions with a simple geometrical interfere where the permeability is assumed to be exponentially decaying in the normal direction and the thickness is optimized according to the maximum attenuation. It is found that the main parameters affect the propagation process are: - porosity; ϵ , static permeability; K_0 and the steady flow Mach number; M . In addition, it is found that the new interfere of the permeability can improve the attenuation of sound wave when it is combined with the porosity and steady flow parameters beside the minimum required thickness. Also, the minimum required thickness depends on static permeability, porosity and flow state

Keywords: *porous media, sound waves*

146 **Title: Nonlinear Time Dependent Finite Element Analysis of Reinforced Concrete Beams and Columns**

Author: *Saad Ali A-Ta'an and Sameer Sadi Yakoob, Published Year: 2013*

2nd Scientific Engineering Conference , Mosul University, Iraq

Faculty: *Faculty of Engineering*

Abstract: Creep and shrinkage of concrete are considered to be the most important factors that affect the long term behaviour of reinforced and prestressed concrete members. In this study a nonlinear time dependent finite element analysis of

reinforced concrete beams and columns is presented. Plane frame element with composite layer system is used to represent the concrete and the reinforcing steel with an additional axial degree of freedom used at the mid length of the frame element to model the strain variation across the element length. An incremental – iterative scheme based on Newton – Raphson’s method is used to solve the nonlinear equations of equilibrium depending on the displacement criterion to check the convergence of the solution. The nonlinear behaviour of concrete in compression, cracking, yielding of steel and geometric nonlinearity were taken into account. Time dependent effects (creep and shrinkage) of concrete were calculated using empirical equations that depends on the creep and shrinkage calculated from ACI Committee (209) recommendations for ordinary concrete. The predicted time dependent deflection using the adopted numerical procedure together with the materials constitutive relationships, showed good agreement with the experimental results of beams and columns made with low, medium and high strength concrete.

Keywords: *Beam, column, creep, deflection, finite element, shrinkage.*

147 **Title: Softened Truss Model Theory for the Analysis of Fibre Reinforced Concrete Deep Beams and Corbels**

Author: *Saad Ali Al-Ta'an and Nadwa Al-Husaini, Published Year: 2014*

Faculty: *Faculty of Engineering*

Abstract: Reinforced concrete members may be subjected to axial load, bending moment, shear and torsion. However the behaviour of these members under shear or combined shear and torsion is a complex phenomenon. In this study the softened truss model theory is applied for the analysis of fibre reinforced concrete deep beams and corbels. The theory is more promising than the strut and tie model which satisfies the equilibrium conditions and to some extent materials constitutive relationships. While this theory, considers the equilibrium, compatibility, materials constitutive relationships and the degrading effect of the diagonal tension cracks on the compressive strength of cracked reinforced concrete element when subjected to biaxial compression-tension stresses. The previously developed algorithms for the analysis were modified by incorporating the effect of short discrete steel fibres on the behaviour and strength of concrete subjected to shear. Fibre reinforced concrete deep beams and corbels were analyzed using the adopted algorithm and materials constitutive relationships. The predicted effects of the shear span / depth ratio, volume fraction of steel fibres and the longitudinal steel ratio on the shear strength of fibre reinforced concrete deep beams and corbels showed good agreement with published experimental results.

Keywords: *Corbel, deep beam, reinforced concrete, shear, softened truss, steel fibres.*

148 **Title: Analysis of Fibre Reinforced Concrete Deep Beams Using the Strut and Tie Model**

Author: *Saad Ali Al-Ta'an and Ahmed Faize Nathim, Published Year: 2014*

Faculty: *Faculty of Engineering*

Abstract: The present study aimed at evaluating the adequacy of the strut and tie model which was proposed by the ACI Code (318-11), AASHTO, FIB recommendations and an Equation proposed by Narayanan and Darwish for predicting the shear strength of fibre reinforced concrete deep beams. The four methods were applied to 68 fibre reinforced concrete deep beams whose geometrical, materials and experimental results were previously published. The collected test results cover a wide range of the variables that affect the shear strength of fibre reinforced concrete deep beams, like the shear span to effective

depth ratio which varied from 0.29 to 1.91, concrete compressive strength from 18.2 to 54.9 MPa and steel fibres volume percentage from 0.25 to 1.25. Ten of the beams were loaded with one concentrated load at the midspan section and the others were loaded with two points loads. The ACI Code (318-11), AASHTO LRFD, FIB recommendations underestimated the shear strength of the investigated fibre reinforced concrete deep beams. Since these recommendations are for conventional reinforced concrete deep beams, the effect of steel fibres has to be incorporated in the materials properties affecting the shear strength of fibre reinforced concrete deep beams. On the other hand the equation proposed by Narayanan and Darwish overestimated the shear strength of the investigated fibre reinforced concrete deep beams. A realistic prediction method is therefore required so that it can be used as a design guide.

Keywords: Deep beams, fibres, reinforced, strut, tie.

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Title: PREDICTION OF SHEAR STRENGTH OF STEEL FIBRE REINFORCED CONCRETE BEAMS

Author: Saad Ali Al-Ta'an and Rafal Nahidh Wadie, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: Shear failure is brittle and is initiated by diagonal tensile stresses created in the tension zone. Designers usually avoid this type of failure by using shear reinforcement. Due to their ability in enhancing the tensile strength of concrete, restraining and retarding cracks and increasing the shear friction resistance, steel fibres can replace the conventional and sometimes laborious shear reinforcement specially in thin members. This paper review some of the available equations for the prediction of cracking and shear strength of fibre reinforced concrete beams. The equations were applied to 44 beams to predict the first crack shear stress and 100 beams to predict the shear strength. A method is proposed to predict the first crack and shear strength of fibre reinforced concrete beams. The proposed methods proved their superiority over the previously proposed methods. It was statistically shown that the tensile strength of concrete affect the cracking shear stress more than the shear strength which is more effected by the shear span / effective depth. The contribution of the steel fibres to the shear strength is more than that at the onset of first shear cracking.

Keywords: Cracking, fibres, prediction, shear, steel, strength.

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Title: PREDICTION OF THE TORSIONAL STRENGTH OF STEEL FIBRE REINFORCED CONCRETE MEMBERS

Author: Saad Ali Al-Ta'an and Rafal Nahidh Anay , Published Year: 2015

Faculty: Faculty of Engineering

Abstract: Torsion failure is of a brittle type and is initiated by shear stresses created over the whole cross-section and exceeds the tensile strength of concrete. Designers usually avoid this type of failure by using torsional reinforcement. Due to their ability in enhancing the tensile strength of concrete, restraining and retarding cracks, increasing the shear friction resistance and imparting ductility, steel fibres can replace the conventional and sometimes laborious torsional reinforcement specially in thin members. This paper review the available equations for the prediction of the torsional strength of fibre concrete members and those for the torsional strength of fibre reinforced concrete members. A method was then proposed to predict the torsional strength of fibre reinforced concrete members which assumed to be composed of three components; strength provided by plain concrete before cracking, strength provided by the steel fibres after cracking and the torsional strength provided by the torsional reinforcement. The proposed method was applied to 25

previously tested fibre reinforced concrete members and showed good agreement with the experimental results. More experimental data are required to refine the proposed method which can be used as a design guide.

Keywords: *Cracking, fibres, prediction, steel, strength, torsion.*

151 **Title: Strut and Tie Model for the Analysis of Fibre Reinforced Concrete Deep Beams**

Author: *Saad Ali Al-Ta'an and Ahmed Faize Nathim, Published Year: 2015*

Faculty: *Faculty of Engineering*

Abstract: Shear failure is the most probable mode of failure for reinforced concrete deep beams. This failure is mainly controlled by the compressive strength of the struts in the strut and tie shear strength prediction model. The strength of the strut is controlled by many parameters among which is the efficiency factor of the concrete compressive strength. Different values of this factor are recommended by researchers and international codes of practice for conventional concrete. For fibrous concrete, this factor is influenced by the presence of steel fibres. In this study, an efficiency factor for concrete in struts of fibre reinforced concrete deep beams is derived from the test results of 68 fibre reinforced concrete deep beams. It is shown that this factor depends on the fibres reinforcing index, the web reinforcement ratio and the shear span to effective depth ratio. The predicted shear strength using this efficiency factor gave closer match to the experimental results with higher accuracy than the methods proposed by Narayanan and Darwish or the strut and tie models proposed by some codes of practice.

Keywords: *Deep beams, efficiency factor, fibres, strut, tie.*

152 **Title: FLEXURAL ANALYSIS OF REINFORCED FIBROUS CONCRETE SLABS**

Author: *Azad Mohammed, Sa'ad Al-Ta'an , and Hisham Al-Hassani, Published Year: 2013*

Faculty: *Faculty of Engineering*

Abstract: Flexural analysis of fibrous concrete rectangular slabs with or without skeletal steel reinforcement was carried out in this study. The analysis depends on simple calculation steps for deriving moment– curvature relationship utilizing the idealized stress-strain relations in compression and in tension for the constitutive slab materials. The load– deflection relationship is then calculated based on the classical plate theory results for the case of orthotropic simply supported rectangular slab. Comparison of the calculated and the experimental load-deflection curves showed good agreement.

Keywords: *Curvature, Deflection, Moment, Slab, Steel fibres.*

153 **Title: Identification of Quadcopter Hovering Using Experimental Data**

Author: *Iyad M. Salameh, Emad M. Ammar, and Tarek A. Tutunji, Published Year: 2015*

Faculty: *Faculty of Engineering*

Abstract: Obtaining the plants' mathematical models using physical laws is essential in the development and design of suitable controllers. However, sometimes these models can be complex, inaccurate, or difficult to find. In such cases, mathematical models can be build using experimental data that approximate the real system's behavior. The quadcopter is one such example where the relationship between its inputs and outputs is nonlinear, complex, and dependent on several difficult to measure parameters. In this paper, a quadcopter is assembled, tested, and used in

several flight experiments where the Input-Output (I/O) data is collected and used to develop accurate mathematical models of the quadcopter for hovering operation. Auto-Regressive with eXogenous (ARX) based models, for both Single-Input Single-Output (SISO) and Multi-Input Multi-Output (MIMO), are developed and analyzed. Results show that the developed models provide good accuracy when compared to the experimental measurements.

Keywords: *System identification, quadcopter, UAV, ARX, RLS.*

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Title: Mechatronic System Design Project: A 3D Printer Case Study

Author: Range Kayfi, Dana Ragab and Tarek A. Tutunji, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: A mechatronics project for designing a 3D printer prototype is discussed. The project work is part of a senior students' project class and is used as a case study to highlight the success of developing a fully-integrated engineering system that incorporates a mechanical plant, electronics, drivers, embedded controllers, and software interface. The project objective is to realize a 3D printer prototype with relatively simple design. The described work can be used as an educational reference for proper mechatronics design and as a hobbyist reference for designing desktop 3D printers.

Keywords: *3D printer; Mechatronics systems; Engineering education; Embedded control*

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Title: MATLAB Toolbox Implementation and Interface for motion control of KUKA KR6- R900-SIXX robotic manipulator

Author: Hani Elshatarat, Rolf Biesenbach, Mohammad Bani Younus, Tarek A. Tutunji, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: MATLAB Toolbox functions and communication tools are developed, interfaced, and tested for the motion control of KUKA KR6-R900-SIXX.. This KUKA manipulator has a new controller version that uses KUKA.RobotSensorInterface s KUKA.RobotSensorInterface package to connect the KUKA controller with a remote PC via UDP/IP Ethernet connection. This toolbox includes many functions for initialization, networking, forward kinematics, inverse kinematics and homogeneous transformation.

Keywords: *Robot Manipulators; KUKA; MATLAB; motion control; mechatronic systems*

156

Title: Research Methodology Course for Mechatronics Masters Program

Author: Tarek A. Tutunji, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: The development and implementation of a Research Methodology course for a Masters' program in mechatronics engineering is provided. The course was developed during the TEMPUS-JIML project, that involved a consortium of eight international universities, and the course was implemented at Philadelphia University in Jordan. The course material was divided into five parts: Literature review, thesis proposal, modeling and simulation, engineering experiments, and research papers. The material for each part was gathered from many resources and is summarized in this paper. An evaluation of the course outcomes shows that the course was successful in developing the students' research skills.

Keywords: *Research Methodology; Mechatronics; Engineering Education*

157

Title: Stress Distribution at the Corners of Three Equal Spans T-Beam Continuous Skew Bridge and the Effect of Number of Spans on These Stresses

Author: Abdallah Odeibat, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: ABSTRACT Skewed bridges are commonly used structure; this study has investigated the effect of skew angle on the stresses affecting corners of three equal spans T-beams continuous skew bridge and the effect of number of spans on these stresses. Nine three-dimensional finite element models with skew angles between (zero and 70°) with span length of (25m) were modeled using CSI Bridge software, all models were subjected to AASHTO HL-93 loading specifications. Analysis results showed that stresses on deck slab and corners increase with the increase of skew angle; transverse moments could be calculated by AASHTO approximate methods and should be multiplied by the proper fold value from tables in chapter four, where longitudinal moments reaches (72%) of transverse moments. Due consideration should be taken to torsional moments at end zones, where they reaches (82%) of transverse moments with extension of (0.34L) from supports at obtuse corners and (53%) with extension of (0.26L) at acute corners. Moreover, results show that maximum positive and negative bending moments in girders decrease with increase of skew angle, and the location of maximum positive moments moves toward obtuse corners supports in exterior and interior girders. However, shear forces increase with increase of skew angle except near acute corners in exterior and first interior girders; where shear forces decrease with increase of skew angle. Whereas; results also show that as skew angle increase, reactions increase at obtuse corners and decrease at acute corners, where maximum reaction values were concentrated interior girders supports. Comparing this study results with previous study of two-span bridge results, it shows an alternate effect of number of spans on deck slab stresses, girders moments and shear and reaction forces.

Keywords: Skew, bridge, corners, continuous, angle

158

Title: The comparative analysis and investigation of the modulation techniques for broadband radio networks.

Author: Mohammad Khasan Ali Samur, Published Year: 2010

Faculty: Faculty of Engineering

Abstract: In the article comparative analysis of the perspective modulation techniques for broadband radio networks is carried out. The graphical results of the MBOK modulation modeling are shown. The probabilities of packet error transmitting are estimated for one and multiple spatially distributed antennas receiving

Keywords: The comparative analysis and investigation of the modulation techniques for broadband radio networks.

159

Title: THE PROBLEM WITH THE USE OF CLOCK Code division multiplexing With direct expansion SPECTRUM

Author: Mohammad hasan Ali Samour, Published Year: 2008

Faculty: Faculty of Engineering

Abstract: The principles and features of code division multiple access with direct sequence spread spectrum are considered in this article. The results of modelling synchronous data receiving are shown in this article.

Keywords: The results of modelling synchronous data receiving are shown in this article

160

Title: simulating of code sequences properties and modulation methods in radio interfaces of broadband mobile communication

Author: Mohammad hasan Ali Samour, Published Year: 2011

Faculty: Faculty of Engineering

Abstract: their structural and parametric optimization and improvement of existing methods of planning, given the coverage and quality issues in radiocompatibility sharing of radio resources. In this work the strategies of planning and development of modern mobile communication systems are analyzed. Investigation of specificity and properties of orthogonal code sequences used into radio interfaces of broadband mobile communication system UMTS was carried out. An analytical model based on the formulas for selection of orthogonal code sequences by analysis of their auto-, mutual correlation and noise properties were proposed. A multicriterion optimization of structures and parameters of the broadband mobile communication systems was carried out, a graphical results obtained allow to draw conclusions about the possibility of radio interfaces and system structure improving through the use of new types of orthogonal code sequences and the method of structural and parametric mutual optimization of broadband radio communication networks with regard to types of channel code sequences sets, location, number of base stations and power transmitters. The application for the implementation of broadband CDMA systems radio interfaces a sets of combinations with selected code sequences such as Gold and Walsh with the best correlated and noise properties can increase the signal-noise ratio in radiochannel up to 7dBp mutually reduce transmitter power up to 2%, decrease the distance between transmitters, increase their number up to 8%, which allows to increase the density of coverage or speed for one subscriber. The method of spatial optimization of radio systems by their radio frequency compatibility with help of graphical-analytical simulating the spatial location and parameters of data transfer centers working in the same spectral range was developed.

Keywords: *broadband mobile communications, WCDMA, structural and parametric optimization of radio networks, orthogonal code sequences, optimization of broadband radio interfaces*

161

Title: "A high performance data integrity assurance based on the determinant technique"... Future Generation Computer Systems, Elsevier, Volume 27, Issue 5, May 2011, Pages 614-619

Author: Jasim A Ghaeb, Published Year: 2011

Faculty: Faculty of Engineering

Abstract: Data integrity is an important aspect of storage and network security. The reality is that no security strategy is achieved without assuring data integrity. Data assurance provides reliability which is a prerequisite for most computer systems and network applications. This paper proposes a new technique for improving the detection of data integrity violations. The proposed technique is based on the Check Determinant Factor (CDF) in measuring data integrity assurance. It involves appending of a Determinant Factor (DF) for each data matrix before storing or transmitting the series of data. This DF is recomputed at the retrieved stage to ensure data integrity. Simulation results show that the new method outperforms the traditional methods such as Hamming code and RAID methods.

Keywords: *Data integrity Error detection Security Storage integrity File system*

162

Title: "Enhancing Cache Performance Based on Improved Average Access Time"... ICCISE 2012: International Conference on Computer, Communication and Information Sciences, and Engineering, Paris, France, 2012.

Author: Jasim A Ghaeb, Published Year: 2012

Faculty: Faculty of Engineering

Abstract: A high performance computer includes a fast processor and millions bytes of memory. During the data processing, huge amount of information are shuffled between the memory and processor. Because of its small size and its effectiveness speed, cache has become a common feature of high performance computers. Enhancing cache performance proved to be essential in the speed up of cache-based computers. Most enhancement approaches can be classified as either software based or hardware controlled. The performance of the cache is quantified in terms of hit ratio or miss ratio. In this paper, we are optimizing the cache performance based on enhancing the cache hit ratio. The optimum cache performance is obtained by focusing on the cache hardware modification in the way to make a quick rejection to the missed line's tags from the hit-or miss comparison stage, and thus a low hit time for the wanted line in the cache is achieved. In the proposed technique which we called Even- Odd Tabulation (EOT), the cache lines come from the main memory into cache are classified in two types; even line's tags and odd line's tags depending on their Least Significant Bit (LSB). This division is exploited by EOT technique to reject the miss match line's tags in very low time compared to the time spent by the main comparator in the cache, giving an optimum hitting time for the wanted cache line. The high performance of EOT technique against the familiar mapping technique FAM is shown in the simulated results.

Keywords: Caches, Cache performance, Hit time, Cache hit ratio, Cache mapping, Cache memory.

163

Title: "Progressive decrement PWM algorithm for minimum mean square error inverter output voltage"... Energy Conversion and Management, Elsevier, Volume 52, Issue 11, October 2011, Pages 3309-3318.

Author: Jasim A Ghaeb, Published Year: 2011

Faculty: Faculty of Engineering

Abstract: The paper proposes two modulation techniques for the power inverter. These new techniques are named Progressive Decrement PWM Algorithm (PDPA) and Progressive Increment PWM Algorithm (PIPA). Both techniques take the determined original pulse-width of an inverter operation and split it to many pulses. In the PDPA technique, the largest width is given to the middle pulse and the width of the boundary pulses is reduced progressively starting from the first boundary-pulse toward the last boundary-pulse. In the PIPA technique, there is a gradual increment instead of decrement. The two techniques have been proved that it can maintain the original pulse-width of the inverter operation. The new approach PDPA extends the central pulse and shrinks the exterior pulses, leading to an inverter output cycle close to the sinusoidal form of fewer harmonic contents. Simulation results are performed to evaluate the performances of the proposed techniques: PDPA and PIPA and to compare them with the well known methods. The main contribution of the proposed PDPA technique is that it provides a better performance for the most harmonic orders compared to the well established sinusoidal PWM technique.

Keywords: Energy conversion, Switching techniques, Converters, PWM inverters.

164

Title: , "An optimum PWM technique to maximize the continuity of inverter output "... INEE Conference: ENERGY, ENVIRONMENT, DEVICES, SYSTEMS, COMMUNICATIONS, COMPUTERS, EUROPEMENT, Venice, Italy, March 8-9-10, 2011.

Author: Jasim A Ghaeb, Published Year: 2011

Faculty: Faculty of Engineering

Abstract: New varied-pulse-width technique (VPW) for a high performance power inverter has been presented in this paper. The VPW technique improves the inverter output voltage in the way to produce an output cycle of a less discontinuity and fewer harmonic contents. In VPW technique, the original pulse-width of an inverter operation is divided into multiple pulses of variable widths per half cycle. The division of an original single-pulse of width (δ) into number of pulses (p) per half cycle produces uniform pulses of width (σ). Increasing the pulse-width for some pulses and decreasing the same amount of width from other pulses, result in variable-width pulses. To maintain the same operation for the inverter, the adding and subtracting of pulse-widths for the pulses must be equivalent. Due to the software ability of modifying the number of pulses per half cycle and their widths, the VPW technique provides an inverter operation with less generation of harmonics. Test results are presented to examine the performance of VPW technique and to compare it with the performance of the conventional methods.

Keywords: PWM inverter, Energy conversion, Power converters, PWM control, power processor.

165 **Title: Effects of Handoffs on the Performance of Cellular Systems Using Simulation**

Author: Nada Al-Khatib, Published Year: 2005

Faculty: Faculty of Engineering

Abstract: One important performance factor in Cellular systems is the Handoffs. As the handoffs increases, the overhead on the system increases and simultaneously for a fraction of a second two channels will be reserved for one user and this will reduce the overall systems capacity. In this paper, the time of holding two channels during handoff execution in synchronous and asynchronous handoff was found and the effects of different aspects of handoffs on systems capacity are calculated for various situations by using simulation. It is shown that in small cell up to 16 % of capacity reduction could result due to high handoffs rates. Therefore, reducing probability of handoffs will enhance the system's capacity

Keywords: Communications, Engineering, Simulation, Performance analysis, Global, probabilistic, Handoff, Handover, system capacity

166 **Title: Channel Estimation for OFDM FFT/DWT in Multi-Carrier Modulation used in Wireless Telemedicine**

Author: Nada.N. Khatib, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: This paper proposes an OFDM system to be used in the ECG Patient Monitoring System (ECG-PMS) for wireless telemedicine applications. The system needs a level of transmitted power at the patient site, and achieves a high BER performance at the hospital base station. This achieved by implementing a wavelet-based OFDM system that uses channel estimation based on the improved Data-Aided technique called Forward Error Correction coding Decoded Pseudo Pilot (FDPP). The performance of wavelet-based OFDM systems and Discrete Fourier Transform (DFT)-based OFDM system using FDPP-based as well as Hard Decision Pseudo Pilot channel estimation techniques are compared. The system model was studied using MATLAB software in which the average BER was addressed for randomized data, and the difference between the transmitted and received signals provide a measure of the ECG signal quality. A better BER performance achieved by using OFDM-DWT(haar) system than OFDM_FFT system, thus our system requirements achieved successfully

Keywords: OFDM, ECG-PMS, DA, FDPP, HDPP, ECG

167 **Title: Delay Analysis for Packet Trains in Computer Communications**
Author: Ihab Joudeh, Published Year: 1992
Faculty: Faculty of Engineering
Abstract: Delay Analysis for Packet Trains in Computer Communications
Keywords: Delay Analysis for Packet Trains in Computer Communications

168 **Title: Exploitation the Waste Energy in Hybrid Cars to Improve the Efficiency of Solar Cell Panel as an Auxiliary Power Supply**
Author: wagah Al-Azzawi, Published Year: 2015
Faculty: Faculty of Engineering
Abstract: Abstract— Hybrid car is an excellent solution to recover wasted energy in conventional cars. This reduces the use of global fuel consumption; therefore, help to preserve the environment from extra pollution. In this work the wasted heat energy from the exhaust system is utilized based on Peltier effect. Thermoelectric cooler (TEC) and thermoelectric generator (TEG) modules are used to cool down and improve the efficiency of a solar panel fixed on the roof of a car. Using both TEG modules mounted on the exhaust system and TEC modules mounted on solar panel will collectively cool down the solar panel. It is shown by MATLAB simulation that solar panel efficiency is improved using such cooling down the panel. The efficiency was approximately doubled when the temperature difference was greater than 80 OC. A proposed model of the combination of TEG and TEC modules for appropriate use with photovoltaic panel in hybrid applications is presented in this work. Calculations of the amount of output electric power that generated from TEG on the exhaust and amount of temperature dissipated from photovoltaic panel to the heat sink were carried out; in addition, an estimate of the solar panel efficiency improvement was calculated
Keywords: Keywords— PV solar cell; TEG and TEC; Hybrid cars.

169 **Title: Advanced approach for indoor identification and tracking using smart floor and pyroelectric infrared sensors**
Author: Ibrahim Al-Naimi, Published Year: 2014
ICICS14, Irbid, Jordan
Faculty: Faculty of Engineering
Abstract: Research concern has been specified on automatic identification and tracking of people within the home environment to support smart home services. Although various approaches have been proposed to deal with this problem, solutions still remain untackled due to various reasons (e.g. user acceptance). The aim of this paper is to develop and implement an advanced approach that is able to accurately detect, identify, and track people within appropriate smart home environment. A novel approach for human identification and tracking within smart home environment is proposed. The proposed approach combined PIR sensors and floor pressure through unique designed integration strategy aiming to unite the advantages of the two sensor types and overcome their limitations.
Keywords: Smart home pyroelectric infrared (PIR) sensor smart floor

170 **Title: Indoor Identification and Tracking Using Advanced Multimodal Approach**
Author: Ibrahim Al-Naimi, Published Year: 2015
ISMA15, University of Sharjah, UAE
Faculty: Faculty of Engineering

Abstract: Significant research efforts have been directed toward human identification and tracking approaches as an infrastructure for supporting innovative smart home services. Even though various approaches have been proposed to tackle this problem, solutions still remain elusive due to various reasons. The aim of this paper is to develop and implement an advanced approach to detect and identify persons within opportune and calm smart home environment. A novel multimodal approach is proposed for non-tagged human identification and tracking. Smart floor and pyroelectric infrared sensors are combined through unique integration strategy to extract explicit information indicating a person's body surface area. This information significantly improved the identification accuracy. Data processing in the proposed approach has divided into different stages including: pattern segmentation and generation, features extraction, feature fusion, and pattern classification. Test cases were designed and carried out to test and evaluate the feasibility and effectiveness of the proposed approach.

Keywords: Smart home, pyroelectric infrared (PIR) sensor, multimodal approach, identification and tracking

171

Title: Multimodal Approach for Non-Tagged Indoor Identification and Tracking Using Smart Floor and Pyroelectric Infrared Sensors

Author: Ibrahim Al-Naimi, Published Year: 2015

International Journal of Computational Science and Engineering, 9

Faculty: Faculty of Engineering

Abstract: Research concern has been directed toward automatic identification and tracking of people within the home environment to support smart home services such as care services for elderly and disadvantaged people to enable and prolong their independent living. Although various approaches have been proposed to deal with this problem, solutions still remain untackled due to various reasons (e.g. user acceptance). The aim of this paper is to develop and implement an advanced approach that is capable to accurately detect, identify, and track people within appropriate smart home environment to be used as infrastructure for various application domains. A novel multimodal approach for non-tagged human identification and tracking within smart home environment is proposed. The proposed approach combined Pyroelectric infrared (PIR) sensors and floor pressure through unique designed integration strategy aiming to merge the advantages of the two sensor types and overcome their limitations.

Keywords: Smart home, multimodal approach, pyroelectric infrared (PIR) sensor, and smart floor.

172

Title: " Individual Character Comparison Technique for Improving the Internal Memory Performance"...British Journal of Mathematics & Computer Science , 12(3): 1-13, 2016.

Author: Jasim A Ghaeb, Published Year: 2016

British Journal of Mathematics & Computer Science , 12(3): 1-13

Faculty: Faculty of Engineering

Abstract: The efficiency of the cache mapping technique depends on how the cache lines are organized and the way that is used to look for and hit the target cache line. In this paper, an efficient technique is proposed to obtain a significant improvement in average hit time of a line in the cache. The paper presents Distributive Comparison Approach (DCA) that significantly minimizes the hit time and improve cache hit ratio. The efficient of DCA is based on how the cache lines are compared and picked up the coveted one leading to a low cache hit ratio. In DCA, the cache line is assigned by multi tags where each individual tag is only one character. Then,

instead of one line tag of complete characters per a comparison cycle, the comparator is flushed by multi tags of different lines in the cache. Also the cache lines that are come from the main memory classified into two groups; even and odd line's tags to reject the unwanted lines form the multi-tag comparison. These two procedures practically speed up the repelling of misfit tagged lines and consequently the hitting of the target line in the cache. Simulation results show that the DCA outperforms well-known mapping techniques including FAMT and SMT.

Keywords: Cache memory; memory hierarchy; cache hit ratio; tw o-level memory; cache mapping.

173

Title: QUANTITATIVE ASSESSMENT OF THE STABILITY OF SLOPES

Author: Prof. Dr. Yousef Masannat, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: Extended Abstract Summary: Slopes susceptible to landslides pose serious threats to human life as well as to engineering structures. After extensive study and analysis of 44 landslides that occurred in different geologic formations at different locations in Jordan, a new geologic criterion called Slope Stability Index, SSI, is proposed for the quantitative assessment of the stability of slopes. In addition to the Rock Mass Rating (RMR), suggested by Bieniawski (1, 2) and the Slope Mass Rating (SMR) suggested by Romana (3) and adjusted by the author, new parameters related to slake durability of slope material, the height and geometry of the slope, the prevailing environmental and drainage conditions, and the paleogeologic history of the study area are introduced in this new criterion. This criterion is believed to give a good assessment of the relative stability of slopes along the routes of highways and at the sites of major engineering projects. It also assists geotechnical engineers in preparing landslides hazard zoning maps. It has been noticed that most landslides occurred in the areas that suffered from a highly disturbed paleogeological history. In these areas the rock strata are often highly fractured and with open joints oriented in unfavorable orientations. Landslides are more common in geologic formations dominated by highly plastic clayey marls and shales. These highly plastic interbeds often form the pre-existing planes along which rejuvenation of landslides occur. The steep and unfavorable orientation of the rock beds with respect to highway cuts often lead to landslides. This is particularly true when the plastic interbeds of marl and shale are daylighted due to open unsupported excavations. It has also been noticed that most landslides occurred in the years with intense rainfalls, and in the areas with poor surface and subsurface drainage conditions. Slope failures are also very common in air-slaking materials like marls, shales, and mudstones particularly when subjected to cycles of wetting and drying. The formation of the Jordan Rift Valley that contributed to the development of the steep slopes on its both sides is considered as a major cause to the instability of slopes overlooking the Jordan Valley. Most of the landslides occur in Naur and Fuheis formations along the plastic clayey marl beds mostly dipping westward towards the Jordan Valley. The application of the suggested stability assessment approach on 12 areas (mainly along highway routes) that suffered from landslides gave SSI values ranging between 14 and 27 (unstable to critical). Adjacent slopes that didn't experience landslides but showed minor instability features (cracks, bulging, tilting of retaining structures...etc.) had SSI values ranging between 26 and 52 i.e. critical to fair stability. Thus, this new criterion could well be used as a good indicator to the relative stability of slopes.

Keywords: Slopes, Stability, Landslides, Assessment, Geology

174

Title: An efficient FPGA design for speeding up cache LRU replacement

algorithm

Author: *Nasser Halasa, Published Year: 2016*

the International Multi-Conference on Systems, Signals & Devices, Leipzig, Germany

Faculty: *Faculty of Engineering*

Abstract: Abstract: Although the LRU replacement algorithm is realizable in principle for cache memory management, but it is of little use to the operating system designer if there is no hardware implementation for it. This paper presents an implementation using FPGA technique to achieve the LRU algorithm in hardware. The design shows an excellent improvement in speeding up the response of the LRU algorithm for the Hit/Miss cache requests. Moreover, the FPGA facilities grant us the flexibility to work with different cache memory sizes and to keep track of long access history. For the validation of the proposed approach we have used Xilinx ISE 9.2i for simulation and synthesis purposes. The prescribed design was implemented in Verilog.

Keywords: *Cache memory, FPGA, LRU*

175

Title: Performance of Probabilistic Broadcasting of Dynamic Source Routing Protocol

Author: *Sultan M. Al-Rushdan, Published Year: 2011*

The Fourth International Conference on Communication Theory, Reliability, and Quality of Service, Budapest, Hungary

Faculty: *Faculty of Engineering*

Abstract: Blind flooding have been proposed to perform route discovery operations in Mobile Ad-hoc Networks as an early method, but it suffers from a serious problem related to the broadcast storm problem. Several probabilistic approaches have been proposed to overcome this problem, such as fixed probabilistic, adjusted probabilistic and smart probabilistic schemes. This paper investigates the use of probability with Dynamic Source Routing Protocol (DSR) algorithm to overcome the broadcast storm problem. The paper investigates issues regarding the implementation and integration of probability in DSR algorithm and how it can be improved. Simulation results show that the new scheme provides good results in performance levels by taking in consideration the status of the network density (sparse versus dense networks).

Keywords: *Source Routing, Probabilistic Flooding, Fixed Probability, Broadcasting*

176

Title: Ubiquitous Robotics for Knowledge-based Auto-configuration System within Smart Home Environment

Author: *Mustafa Al-khawaldeh, Published Year: 2016*

ICICS, Irbid-Jordan

Faculty: *Faculty of Engineering*

Abstract: The present paper is anchored in the area of Embedded System and Robot and Ambient Intelligent which considered in the ICICS 2016. The wide availability of services and devices within contemporary smart home environments make their management a challenging and rewarding task. Maintaining complex smart home systems throughout their lifecycle entails considerable resources and effort. These challenges have stimulated the need for dynamic auto-configurable services amongst such distributed systems. Although significant research has been directed towards achieving auto-configuration, none of the existing solutions is sufficient to achieve auto-configuration within smart home environments. This research aims to devise methods to automate the activities associated with customised service delivery for dynamic home environments by exploiting recent advances in the field of ubiquitous robotics and Semantic Web technologies. It

introduces a novel approach called the Knowledge-based Auto-configuration Ubiquitous Robotics for Smart Home Environments, which utilises the Sobot to achieve auto-configuration of the system. A proof-of-concept testbed has been designed, implemented and validated via several case studies.

Keywords: *Smart home, ubiquitous robotics, and Semantic Web.*

177

Title: Path Tracking Control of a Mobile Robot using Fuzzy Logic

Author: Dr. Mohammed Mahdi Ali, Published Year: 2016

Faculty: Faculty of Engineering

Abstract: Abstract - Recently, the study and development of the mobile robot is considered as a very important issue for many researchers. This is because the wide range of mobile robot applications in real life. One of the most important mobile robot tasks is the control of its navigation in tracking its predefined path. This also need a good capability in avoiding any static or dynamic obstacles that the mobile robot face in its route until reaching its destination. The difficulty in finding a good mathematical model for the mobile robot used in this research "Robotino® from Festo company" made the decision to use fuzzy logic to design a controller capable to introduce a safe Robotino® navigation. Fuzzy logic controller needs information about Robotino® features and behavior in order to build its rule base which are inspired from human experience in such application. These rules can be easily programmed to bring out an efficient controller. Sugeno algorithm is implemented which the experiments results validated its efficiency. Fuzzy logic controller with 153-fuzzy rule is used for controlling the Robotino® path tracking issue, while another fuzzy logic controller with 27-fuzzy rule is applied for the Robotino® obstacle avoidance feature. Matlab is used as a tool to implement the two proposed fuzzy controllers. Many real-time experiments have been conducted in the Faculty of Engineering research laboratory at Philadelphia University. Results reflect the good abilities of the proposed controllers.

Keywords: *Mobile Robot, Robotino®, Path Tracking, Obstacle Avoidance, Fuzzy Logic Controller.*

178

Title: A Simulation Study of Multi-Disciplinary Position Control Methods of Robot Arm D.C Motor

Author: Dr. Mohammed Mahdi Ali, Published Year: 2016

IEEE - SSD16, Germany

Faculty: Faculty of Engineering

Abstract: This paper presents a simulation study using different control strategies to control the position of robot arm DC motor. Fixed field DC motor mathematical model is applied using certain parameters settings. A state feedback pole placement, Fuzzy Logic, Multi-Layer Perceptron (MLP) Neural Network, and the conventional PID control theories have been applied successfully. Matlab simulink work space is used in the simulation. Almost the same controlled output responses are obtained with a different transient responses speed.

Keywords: *Robot Arm, DC Motor, Pole Placement Fuzzy Logic, Neural Networks, PID controller.*

179

Title: Obstacles Avoidance for Omnidirectional Mobile Robot Using Line Trajectory Adaptation

Author: Dr. Mohammed Mahdi Ali, Published Year: 2016

IEEE - SSD16, Germany

Faculty: Faculty of Engineering

Abstract: This paper presents an algorithm which is designed based on the adaptation of Straight-Line Equation parameters in order to detect and avoid both static and dynamic obstacles. A real-time measurement is collected making use of the already built-in nine infrared sensors along with the added ultrasonic sensor to increase the obstacle recognition range. The related control actions coming from the executing of the control algorithm are used to force the mobile robot movement through its three drive units to reach destination safely. This has been achieved by updating the required distance and orientation angle. The experimental results showed the effectiveness of the proposed algorithm in the sense of avoiding obstacles without collision and reaching the goal with minimum position error.

Keywords: Obstacle avoidance, Mobile Robot, Straight-Line Equation adaptation, Infrared sensors, Ultrasonic sensor.

180

Title: Evaluation of dynamic current testing for CMOS domino circuits

Author: Anis Nazer, **Published Year:** 2005

IEEE International Workshop on Defect Based Testing, Palm Springs, CA

Faculty: Faculty of Engineering

Abstract: Transient current (iDDT) refers to the current drawn from the power supply during the transient switching of CMOS gates. Testing based on the transient current can detect many of the defects that can occur in ICs, such as resistive opens, which may not be detected by traditional voltage testing or by Leakage current (I DDQ) testing methods. A major set back for IDDQ testing methods is the increased leakage currents in today's ICs. Thus iDDT based testing has been often investigated as an alternative or supplement to (IDDQ) testing. Little work has focused on iDDT testing for domino circuits. In this thesis, we propose a method for testing domino CMOS circuits using the transient power supply current. The method is based on monitoring the peak value of the transient current. This peak varies considerably with process variations, so each process has different thresholds; this problem will be addressed by proposing a normalization procedure that allows us to use a single threshold for all processes. We present also a test vector generation algorithm for testing large domino circuits. We evaluate the effectiveness of this testing method by simulation on various domino circuits of different sizes. We develop and implement a partitioning technique to improve the fault coverage of the test method when used with large circuits. The algorithm divides the circuit into different clusters where each cluster is fed by a different power supply branch. We also provide an automation system to simplify the process of generating the simulation files, injecting the defects in the circuit, running the simulations, storing the simulations output, processing the output signals, and finally gathering and analyzing the results.

Keywords: iddt testing, VLSI testing, Domino circuit testing

181

Title: Cloud Computing Security Enhancement by Using Mobile PIN Code

Author: Ali Alkhaldeh, **Published Year:** 2015

Journal of Computers , 11

Faculty: Faculty of Engineering

Abstract: The proliferation of internet users is increasing rapidly as a result of network growth in technology (wired and wireless) in recent years, cloud computing services has gained attention in the scientific and industrial communities. Cloud computing provides a flexible and cost effective services for consumers and companies through offering services, resources and infrastructure for providers. Cloud computing is a sub-domain of computer network so security issues are a challenge for cloud computing spread, there are many security issues and concerns

appear while using cloud services. Protecting data from threats and attacks is the most challenging tasks nowadays, since people and companies stores confidential data in the cloud. The purpose of this paper is focus on granting and authenticating data, while these data are transferred over cloud to gain the trust from the provider.

Keywords: *Cloud computing, PIN code, security, mobile computing.*

182 **Title: A Simulation Study of Multi-Disciplinary Position Control Methods of Robot Arm D.C Motor**

Author: *Ali Alkhwaleh, Published Year: 2016*

IEEE - SSD16, Germany

Faculty: *Faculty of Engineering*

Abstract: This paper presents a simulation study using different control strategies to control the position of robot arm DC motor. Fixed field DC motor mathematical model is applied using certain parameters settings. A state feedback pole placement, Fuzzy Logic, Multi-Layer Perceptron (MLP) Neural Network, and the conventional PID control theories have been applied successfully. Matlab simulink work space is used in the simulation. Almost the same controlled output responses are obtained with a different transient responses speed.

Keywords: *Robot Arm, DC Motor, Pole Placement Fuzzy Logic, Neural Networks, PID controller.*

183 **Title: Fault Diagnosis in Internal Combustion Engines Using Extension Neural Network**

Author: *Yousef A. Shatnawi, Published Year: 2013*

Industrial Electronics, IEEE, 61

Faculty: *Faculty of Engineering*

Abstract: The internal combustion engine (ICE) is a special type of reciprocating and rotating machine which is an essential part of every automobile and industry in our modern life. Various faults frequently encounter this machine and cause significant losses. Thus, in this paper, we propose an effective and automated technique to diagnose the faults. Unlike the existing methods in this field, the emitted sound signal of the "ICE" is exploited as the information carrier of the faults, wavelet packet decomposition is used as the feature extraction tool, and finally, extension artificial neural network is used for the classifications of the extracted features. The extension neural network (ENN) consists of just the input layer and the output layer. This simple structure of the "ENN" enhances the performance compared to the traditional neural networks and enables us to easily insert any new information, like a new fault or new feature. Therefore, "ENN" is adaptive for new information by just adding new nodes without affecting the previously built network. The results of the proposed method show the effectiveness and the high recognition rate in classifying different faults.

Keywords: *Internal Combustion Engine, Extension Neural Network, Wavelets*

184 **Title: Amman's Land Typology: The Importance of Site Characteristics on the Delivery of Sustainable Buildings**

Author: *Sonia Al-Najjar, Published Year: 2013*

Journal of Civil Engineering and Architecture, 7

Faculty: *Faculty of Engineering*

Abstract: Amman's land typology is characterized by hilly slopes, and this presents challenges and opportunities for architects and designers aiming at delivering

sustainable buildings. The research focuses on the importance of any site's given criteria, mainly its slope and topography on the delivery of sustainable buildings. Amman city consists broadly of two main types of buildings, apartment buildings and villas, by studying each type of building with regard to its environmental context on a given site in the city, the research seeks to identify the sustainable variables that site topography delimit or facilitate, using a set of attributes for each building type. The main objective of this research is to highlight the sustainable approach for building on sloped sites throughout the building project life-cycle in general, and to set a sustainability framework for designers during the initial design phase in particular. A number of case studies for both types of buildings are studied and analysed, and conclusions are given based on syntheses of available data from literature review or case analysis. At the end, the research provides a mechanism for the development of guidelines for sustainable and passive viability on preferred buildings orientation in hilly areas with regard to local climatic data.

Keywords: *Sustainable building, topography, sloped sites, sustainable design guidelines.*

185

Title: The Effect of Cultural Values of Children Visualization in Defining their Houses the Case of Amman City

Author: *Sonia Al-Najjar, Published Year: 2013*

Jökull Journal, 5

Faculty: *Faculty of Engineering*

Abstract: This paper deals with the visualization of the people in relation to their environment. As a study, it deals with both cultural and social change. The migrants and their children were the subject of these observations, which preceded the research and choice of sample for the case study. The observations listed below have been obtained from Palestinian settlements, Jabal El-Hussein camp, as far as the first generation of migrants and their children's are concerned. The comparison between the two generations gives a clear idea of the cultural systems that organized the camp. Also, the comparison shows the cultural habits that create the spaces in family's houses.

Keywords: *Visualization, Cultural Habits, Environmental Spaces, Migrants, Housing*

186

Title: Transforming Amman: Displaced Iraqis Impact on Architecture and Urban Form

Author: *Sonia Al-Najjar, Published Year: 2013*

Australian Journal of Basic and Applied Sciences, 7

Faculty: *Faculty of Engineering*

Abstract: It has become common to observe that the spatial and social displacement of people has been accelerating around the world at a fast pace. Displacement provokes disruptions and shifts of meanings and conventions. Architecture can function as a receptacle, as an instrument, or as staging of displacement. Sometimes, architecture manages to generate possibilities to turn contradiction into ambivalence. In this regard, cultural representations of memory, migration and migrant experiences provide fruitful points of departure for the development of new theoretical concepts of place and belonging that have direct effect on built architecture and urban form. Jordan has received two primary waves of Iraqi refugees; the first arrived after the 1991 Gulf War. Many of these Iraqis were middle class, including doctors, intellectuals, and teachers. Since the start in 2003 of the war in Iraq, increasing numbers of Iraqi nationals have left their homes for different parts of Iraq or have taken residence in neighbouring countries, particularly Jordan and Syria. Iraqi refugees and migrants in Jordan represent a large sector of society;

this research looks into the current architecture or urbanisms of displacement which took place in the city of Amman as a result of Iraqi migration into the city. So, this research proposes a theoretical framework to examine the effects of Iraqi migration on urban form and urbanism in the city of Amman. The authors look at four agencies of impact (movement of capital, people, information, and culture) and their effects. These consequences, the authors suggest, are expressed in the configuration of urban space, urban form, and urbanism in Amman. The goal of the research is to offer a critical framework for studying the impact of migration and refugees on third world cities urban form.

Keywords: *Displacement, Iraqi Refugees, Amman City, Identity, Urban Form*

187

Title: Challenges and Opportunities Presented by Amman's Land Topography on Sustainable Buildings

Author: *Sonia Al-Najjar, Published Year: 2012*

Third International Conference on Construction In Developing Countries (ICCIDC-III), Bangkok - Thailand

Faculty: *Faculty of Engineering*

Abstract: Amman's land typology is characterized by hilly slopes, and this presents challenges and opportunities for architects and designers aiming at delivering sustainable buildings. The research focuses on the importance of any site's given criteria; mainly its slope and topography on the delivery of sustainable buildings. Amman city consists broadly of two main types of buildings; apartment buildings and villas, by studying each type of building with regard to its environmental context on a given site in the city; the research seeks to identify the sustainable variables that site topography delimit or facilitate, using a set of attributes for each building type. The main objective of this research is to highlight the sustainable approach for building on sloped sites throughout the building project life-cycle in general, and to set a sustainability framework for designers during the initial design phase in particular. A number of case studies for both types of buildings are studied and analyzed, and conclusions are given based on syntheses of available data from literature review or case analysis. At the end, the research provides a mechanism for the development of guidelines for sustainable and passive viability on preferred buildings orientation in hilly areas with regard to local climatic data.

Keywords: *Sustainable Building, Topography, Sloped Sites, Sustainable Design Guidelines*

188

Title: People's Perception and Behavior Patterns in Amman's Public Parks and Plazas

Author: *Sonia Al-Najjar, Published Year: 2005*

Alexandria Engineering Journal, 44

Faculty: *Faculty of Engineering*

Abstract: This study aims to research the behavioral patterns in the various areas public parks and major urban plazas of the Greater Amman area. During the past 40 years, studies have focused on the identification of architectural and urban patterns and the artistic aspects of urban design. Conversely, this research aims to identify the behavior and needs of the users by introducing the hypothesis that the behavioral patterns in any designed space relies on the designers personal perceptions and understanding of the behavioral and usage patterns of the individuals within it, the understanding of which positively reflects on both the spatial qualities and the individuals perception of it. To test the previous hypothesis, two urban plazas were selected, the Al-Hussien Sukaina Park located in a middle-income residential commercial district and the "Culture A venue" in a high-income

commercial district. Through analytical studies and the utilization of questionnaires, the research concludes an overall preference of the simplicity of the former over the complexity of the design concept and elements of the latter

Keywords: *Landscape, Urban Design, Plaza, Park, Public Space*

189

Title: The Effect of Mould Preheating on the Microstructure and Mechanical Properties of the Vertical Centrifugal Castings of Al-Si Alloy

Author: *Samir Akta*, Mahmoud Kachit**, Hanan Hijazy***, Published Year: 2012*

Res. J. of Aleppo Univ., Engineering Science

Faculty: *Faculty of Engineering*

Abstract: In this research vertical centrifugal casting of 336 Al-Si alloy which has been cast in a steel mould at rotation speed of 1000rpm. the effect of mould preheating on the microstructure and mechanical properties has studied. The results show that the mould preheating leads to reduction in porosity, and relatively coarsening of microstructure such as grain size, primary Silicon and metallic particles appeared as a result of solidification rate reduction which affected the mechanical properties negatively. Experimental results show that there is no noticeable effect on microstructure and mechanical properties through the cross section of the cast in the preheating mould

Keywords: *Al-Si alloys, Vertical centrifugal casting, mould preheating,*

190

Title: Effect of Mould Rotation Speed on Mechanical Properties of Aluminium Vertical Centrifugal Castings

Author: *Samir Akta*, Mahmoud Kachit**, Hanan Hijazy***, Published Year: 2012*

Res. J. of Aleppo Univ. , Engineering Science

Faculty: *Faculty of Engineering*

Abstract: An analysis of the most important features that occur in mechanical properties due to the rotational speed is made Vertical centrifugal casting experiments were conducted for commercial aluminium castings at different rotational speeds (200, 450 and 1000 rpm) A comparison of mechanical properties of specimens obtained by both centrifugal casting technique and gravity casting technique is made. The results show that centrifugal casting technique gave better mechanical properties than traditional gravity casting. Also, Increasing rotation speed leads to increasing yield stress, tensile strength and hardness specially in the low rotation speed range (until 450 rpm) but to less extent at high rotation speed (greater than 450 rpm). Finally, Increasing rotation speed reduces grain size and metallic particles size. no changing in mechanical properties within the casting, according to the relative position from where the specimen is taken from the casting

Keywords: *Vertical centrifugal casting, mechanical properties, rotation speed*

191

Title: Fabrication of Polycrystalline Shape Memory Alloys Cu-Zn-Al and Study of the Microscopic and Mechanical Properties of Austenitic and Martensitic Phases

Author: *Abdul Monaim Jesry*, Mahmoud Kachit**, Published Year: 2008*

R. J. of Aleppo Univ. , Engineering Science

Faculty: *Faculty of Engineering*

Abstract: Shape memory alloys is metallic materials that change form with temperature by occurrence of diffusionless transformation (martensitic transformation). While temperature and form of usage must be at high temperature and the initial form respectively (austenitic phase), the temperature and form of

mounting/demounting must be the base temperature and the transitory form respectively (martensitic phase). These alloys is used, more and more, for engineering (robot, shock absorber), domestic and medical applications. The alloys Cu-Zn-Al is one of the more important shape memory alloys, but the method of fabrication and the study of microscopic and mechanical properties are subjects that needs more researches. The present paper is a step towards deeper understanding of such alloys. For reproducibility of the results two samples of the alloy Cu-21Zn-6Al were fabricated and had been studied. Martensitic phase was the result from quenching of the samples, whereas a structure constitutes of two phases α (soft) and γ (brittle) had been result from annealing. Martensitic phase get the form of needle-like orientated differently to each other. The grains of the two phase's structure have homogeneous form and distribution. The study of the mechanical behaviour show that the deformation at the rupture of the martensitic phase is twice bigger than the two phase's structure, and that the mechanical stresses are 45% less than the two phase's structure. Moreover, the study proved the negative effect of the grain boundaries on the mechanical behaviour of the martensitic phase. These results prove the possibility of the fabrication of these alloys and the determination of their mechanical and structural properties, which can contribute to the start of local fabrication of such alloys.

Keywords: Shape Memory Alloys, Cu-Zn-Al, Austenitic and Martensitic Phases

192

Title: Effect of Rotation Speed on Grainometry of Aluminum – Silicon Powder Centrifugally Atomized

Author: M. KACHIT *, M. ABDALLA *, *Published Year: 2015*

R. J. of Aleppo Univ. , Engineering Sci

Faculty: Faculty of Engineering

Abstract: In this study, aluminum - silicon (7% Si) alloy powder was produced by centrifugal atomization technic. Centrifugal atomization machine with a vertical axis of rotation was used, the rotated disk is 50cm in diameter, and the maximal rotational speed is up to 6000rpm. During this research, the effect of the rotation disk speed on the properties of resulting powder (average particle size, particle size distribution, compressibility and flowability) was studied. Five speeds were chosen ranging between 1200rpm and 6000rpm. The experimental results showed that, with increasing rotation disk speed, the average particle size and the flowability of powder decreases, whereas the compressibility increases. Consequently, the speed of sintering increases, allowing access to best properties of final products. We have also developed during this study a mathematical model that allows the calculation of the particle size of aluminum powder in relationship with the rotation disk speed. The model use the balance of forces acting on the liquid droplet before it freezes. This study showed that the mathematical and experimental values are close. This allows the use of this mathematical model to predict the average particle size of centrifuged powder in relationship with the rotational speed of the disk. In both cases, experimental and mathematical, the average particle size decrease in the range of low rotation speeds greater than in the range of high rotation speeds.

Keywords: centrifugal atomization, compressibility, average particle size, particle size distribution

193

Title: Define the Optimal Conditions of Hot-Pressing Process of Pure Aluminum powder

Author: K. AL JEBAWI* , M. KACHIT*, *Published Year: 2014*

Res. J. of Aleppo Univ., Engineering Scien

Faculty: Faculty of Engineering

Abstract: The hot-pressing process of pure aluminum powders in the solid state, otherwise pressure-assisted sintering, is studied as an alternative way to the melt-compression or injection molding processes. The purpose of the work is to optimize the parameters of the hot-pressing process with regard to temperature, pressure and time. Temperature is the most sensitive parameter of the process and hot-pressing at temperature close to diffusion structural in solid state before melting turned out to be necessary for an efficient welding of the powder particles, as judged from mechanical properties. The pressure applied should be so grand to overcome the intern friction between the powder particles and to realize the plastic deformations in grains joins, as judged from mechanical behavior of sintered piece. The time of the hot-pressing process is the parameter which will be experimentally defined during this work. During this work, a protocol of hot-pressing process including optimal temperature, pressure and time of this process, has been determined.

Keywords: *Sintering, hot-pressing, Aluminum, Mechanical Properties, protocol, Shaping.*

194

Title: Probabilistic Approach for Reactive Power Compensation

Author: Ayman Agha , Published Year: 1999

Dirasat, Engineering Sciences, Volume 26 No.2

Faculty: Faculty of Engineering

Abstract: A Probabilistic approach, which deals with the application, of shunt capacitors to the industrial distribution feeder is presented in details in this paper. The method is based on a probabilistic technique for reactive power compensation, especially in the industrial branches where the induction motors are considered as the most of loads. The economic benefits in the monthly electricity bills effected from the power factor improvement and the reduction of the kVA maximum demand are addressed. An analytical method, based on statistical approach model, depends on the monthly consumption of the reactive power is presented. The capital and installation costs of applying compensating capacitors are taken into consideration. This paper aims to present a method for determining the optimum size of capacitors to achieve the maximum benefits in money saving to avoid the penalty of power factor. The method is suitable, in particular, for consumers who have to implement the necessary measure to improve the power factor in their premises at their own cost to avoid an additional pay on their electricity bill. Test results are presented which illustrate the effectiveness of the proposed method.

Keywords: *Power Factor Improvement, Reactive Power Compensation, Maximum Demand Reduction.*

195

Title: VAR Planning for Radial Distribution System

Author: Ayman Agha, Published Year: 2001

Faculty: Faculty of Engineering

Abstract: A method based on heuristic technique with the possibility of "Decision-Making" during the optimization procedure for reactive volt ampere (VAR) planning and real power and energy loss reduction in the distribution system is presented. It simply starts by defining the nodes, which can be candidates for reactive power compensation. The compensating capacitors are allocated at those nodes that have the maximum impact in the real power and energy loss reduction. The objective function represents a realistic cost of the reactive power planning. An illustrative numerical test demonstrates the applying of the method, taking into account the capital and installation costs of the capacitors.

Keywords: *VAR planning. Reactive power compensation. Energy loss reduction.*

196

Title: Economic Discussion on Power Factor Penalties Tariff**Author: Ayman Agha, Nabeel Tawalbeh, Published Year: 2007****7th Cigrre Regional Conference 2007, (JOA099), Amman – Jordan****Faculty: Faculty of Engineering**

Abstract: The over whole electricity bill elements is investigated. The analysis is based on the consumption of the electrical energy and the power factor penalty. The formulated model is well-suited to the medium industrial consumers' tariff where the banality due to the low power factor is applied. The economic benefits attended from the shifting of the power factor penalty's category to another category and the reduction in pay of the electricity bills is expressed. The extra amount of active energy required to adjust the ratio of the power factor penalty is calculated, while the system equipment capacity is considered. A new flat rate for the power factor penalty factor category is constructed. This paper aims to express the benefits in money saving acquired by shifting the power factor category from the higher rate to the lower one in order to reduce the penalty in pay for the monthly electricity bill. This attitude is suitable, in particular, for consumers who have not yet installed capacitors banks in their premises to improve the power factor or if the compensation amount does not cover whole load period. Case studies illustrating the utilization of the proposed approach were presented.

Keywords: Power Factor Penalty, Electrical Energy Tariff, Energy Tariff Structure.

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Title: Reducing the Power Factor Penalty of the Industrial Sector Due to Jordanian Tariff**Author: Nabeel Tawalbeh, Ayman Agha, Published Year: 2007****The European Multidisciplinary Society for Modeling and Simulation Technology, (METH 01) ., Malta****Faculty: Faculty of Engineering**

Abstract: In industrial plants, where usually operate under various electrical loads with various power factor (PF), the normal encountered PF varies in general between 0, 50 and 0,75. In Jordan, the Electricity Regulatory Commission (ERC), basing on the tariffs structure impose a penalties on the consumers of the electrical energy whose the average value of the PF becomes lower than a certain value, the additional payments to the electricity bills as penalties are stated in special tariffs. To maintain the average value of the PF within a certain category limit and to reduce the penalties, the consumption of the active energy (E_p) shall be controlled. This can be done by consuming an extra amount of active Energy (EEX), without changing pattern of the reactive power consumption.

Keywords: Power Factor Penalty, Reducing Power Factor Penalty, Power Factor Penalty in Jordan

198

Title: Electrical Energy Commercial losses - Problems & Solutions**Author: Ayman Agha, Published Year: 2008****Electricity Regulatory Commission Electrical Workshop - 2008, Amman - Jordan****Faculty: Faculty of Engineering**

Abstract: To obtain the best possible economic benefits from the electric power system, all generations, transmissions, distributions and the end users should operate their facilities at high efficiency. The higher the efficiency the lower the electrical energy losses (EEL). The purpose of this paper is to highlight the importance of the EEL on the total system efficiency. The definition of EEL that are taking place in electrical system (ES) with a special spotlighting on the commercial losses (CL) will be discussed. The examples showing the influence of the measuring

units' accuracy and the effect of shifting in the billing Period on the total EEL will be demonstrated. This paper illustrates the components of the EEL, both technical and commercial with a special focusing on the CL, their types, values, and impacts on the overall performance of the ES. The analysis of the CL including the black losses (thefts) for the Jordanian ES in the last decade will be investigated and evaluated. The evaluation of the EEL is used as a base for developing a strategy to strive for minimizing the misuse of electrical energy (EE). This paper tries to furnish answers to the questions: where, how and up to which value we can minimize the commercial (black) losses in Jordanian ES.

Keywords: *Electrical Energy Commercial losses. Verifications of the Black Losses. The Losses of Electrical Energy in Jordan.*

199

Title: Supplying Energy for Green Village System

Author: Ayman Agha, Amer Agha, Published Year: 2013

International Conference on Renewable Energy and its Future in the Arab World 2013, (ICREFAW Conference 2013)., Amman, Jordan

Faculty: Faculty of Engineering

Abstract: The aim of the this paper is to use the renewable energy to supply a village/small city (named Green Village "GV") with the required amount of energy in order to reduce the Fossil resources of energy used till now, to prevent pollution of the environment and global warming, which have recently been imposing serious threats to the world. The renewable energy resources considered to produce electricity for the GV are; the geothermal power generator, the wind turbines and photovoltaic system. However, will use geothermal for heating - cooling and a solar for hot water. The Connection diagram is showing the GV Electrical System and how it is connected to one bus system. The proposed solution in this paper could look to be difficult to apply in whole at this moment and might be seems as a dream, but even though such dream could be achievable at due time in the future.

Keywords: *Green Village, Renewable Energy System, Renewable Energy resources*

200

Title: Statistical Approach for the Analyses of Energy System Losses in Jordan

Author: Nabeel Tawalbeh, Ayman Agha, Published Year: 2005

7th Middle Eastern Simulation Multiconference "MESM 2005", Porto – Portugal

Faculty: Faculty of Engineering

Abstract: A method based on a statistical approach is presented in this paper. The regression analysis is used to evaluate, predict, and for the planning of the electrical energy data. Two regression models are used, linear and logarithmic. While both of them are suitable for electrical energy data, they are not acceptable for the analysis of the energy losses in percentage form. The level of change between the regression models is utilized to determine the relationship between the variables of interest. The proposed method is applied to the NEPCO data. Numerical examples and discussions are given to illustrate the effectiveness of the proposed method.

Keywords: *Model Analysis, Regression, Forecasting, Approximation Statistical Analysis, Energy Modeling Management*

201

Title: Commercial losses in Jordanian Electrical System

Author: Ayman Agha, Audih Alfaoury , Published Year: 2016

2016 13th International Multi-Conference on Systems, Signals & Devices (SSD) - Conference on Power Systems & Smart Energies., Leipzig , Germany.

Faculty: Faculty of Engineering

Abstract: The economic benefit from the electric power system is obtained when all generations, transmissions, distributions and the end users are operating at their high efficiency. The higher efficiency tends to lower electrical energy losses. This paper concentrates on the electrical energy losses (ΔE) of the electrical system (ES), both the technical losses (ΔET) and the economical losses (ΔEC), their types, values, and their impacts on the overall performance of the (ES), with a special focusing on (ΔEC) and black losses "thefts" (ΔEBI). In this paper, the analysis of the (ΔE) in Jordanian (ES) for the period (2008–2014) including the (ΔEC) and (ΔEBI) is investigated and evaluated in details, the achieved results are compared to the works previously done in [1], where the losses analyses for the period (1998-2007) has been conducted and presented. This paper tries to furnish answers to the questions: where; how and up to which value we can minimize the economical losses (ΔEC)? What is the economic influence of (ΔEC) in money (JD)? Finally, conclusions and recommendations on the achieved results are introduced and discussed.

Keywords: Economical losses, electricity thefts, electrical losses in Jordanian network.

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Title: الخصائص الشكلية لعمارة المساجد المعاصرة في ضوء مفهوم الطوبولوجية

Author: Nawar Mahdi and Saba Mahdi, Published Year: 2015

Faculty: Faculty of Engineering

Abstract: تعد دور العبادة ، ومنها المساجد الإسلامية ، من أهم وأقوى المؤسسات المعمارية النمطية على مر العصور ، وهي تلعب دورا رئيسيا في اكساب المدينة الإسلامية هويتها بما تحمله من اراث شكلي رمزي عال ، مفعم بالقيم الاعتبارية. ومع تمكن التقنية الرقمية ودخولها في عملية التصميم المعماري بمختلف مستوياتها ، شهدت عمارة المساجد ظهور نماذج جديدة أضيفت إلى الخزين المعماري لهذا النمط . مما يستدعي مراجعة هذا الجديد وتحديد التحولات الشكلية التي يقدمها وما تقترحه هذه التحولات من خصائص. يهتم البحث باستكشاف ما بقي ملازما من مكونات شكلية في نمط عمارة المساجد ، وما انحسر منها ، ورصد كفاءات توظيفها في هذا العصر في ضوء مفهوم الطوبولوجية في العمارة ، حيث يعمد البحث الى استقراء ودراسة مجموعة من النماذج المعاصرة ، ومقارنتها بما مر به النمط من تطورات فيما يخص مكوناته الشكلية . نشر في : مجلة الهندسة / الصادرة عن كلية الهندسة - جامعة بغداد -بغداد -العراق . المجلد 21 . العدد 1 - 2015 . الصفحات 30 - 54 (البحث محمي بحقوق النشر لصالح المجلة)

Keywords: تصميم المساجد المعاصرة ، انماط المساجد ، الهندسة الطوبولوجية ، مكونات المسجد

203

Title: Current Control to Improve COP of Thermoelectric Generator and Cooler for PV Panel Cooling

Author: Wagah Al-azawi, Published Year: 2016

SSD16, Liebzeg

Faculty: Faculty of Engineering

Abstract: Hybrid car is an excellent solution to recover wasted energy in conventional cars. This reduces the use of global oil consumption; therefore, preserve the environment from extra pollution. In this work, the wasted heat energy from the exhaust system is utilized based on Peltier effect. Thermoelectric cooler (TEC) and thermoelectric generator (TEG) module are used to cool down and improve the efficiency of a solar panel fixed on car's roof. Using both TEG modules mounted on the exhaust system and TEC modules mounted on solar panel will ultimately cool down the solar panel. It is shown by MATLAB simulation that solar panel efficiency is improved by such cooling down the panel. The efficiency is increased by more than 60% when the temperature gradient is greater than 80 OC. A proposed model combination of TEG and TEC modules for optimal use of photovoltaic panel in hybrid applications is presented in this work. Calculations of the output electric power that is generated from TEGS on the exhaust and amount of heat dissipated from photovoltaic panel to the heat sink are performed. The main contribution is the derivation of mathematical model for current control that drives

the TEG module to power the TEC module to achieve the optimal current to improve the coefficient of performance (COP).

Keywords: *Index Terms – Thermoelectric cooler, thermoelectric generator, solar energy, heat sink, coefficient of performance.*

204 **Title: Parametric System Identification using Neural Networks**

Author: *Tarek A. Tutunji, Published Year: 2016*

Faculty: *Faculty of Engineering*

Abstract: Neural networks are used in many applications such as image recognition, classification, control and system identification. However, the parameters of the identified system are embedded within the neural network architecture and are not identified explicitly. In this paper, a mathematical relationship between the network weights and the transfer function parameters is derived. Furthermore, an easy-to-follow algorithm that can estimate the transfer function models for multi-layer feedforward neural networks is proposed. These estimated models provide an insight into the system dynamics, where information such as time response, frequency response, and pole/zero locations can be calculated and analyzed. In order to validate the suitability and accuracy of the proposed algorithm, four different simulation examples are provided and analyzed for three-layer neural network models

Keywords: *Neural network; Transfer functions; System identification; System response; ARMA models*

205 **Title: Coverage Planning in 3G Multimedia Networks Based on Walsh Coding**

Author: *O. Al-Ani, O. Daoud, and Ibrahim N. Abu-Isbeih, Published Year: 2012*

Transactions on Systems, Signals & Devices, Issues on Communications and Signal Processing, vol. 7, no.3

Faculty: *Faculty of Engineering*

Abstract: Capacity in Wideband Code Multiple Access (WCDMA) systems is interference limited, it is also strongly linked with coverage. The greater the level of influx of users within the cell, the higher the interference and hence the lower the cell coverage becomes and vice versa. This is called Cell Breathing. In this paper a Walsh coding is used as a precoding stage to the Multiple-Input Multiple Output-Orthogonal Frequency Division Multiplexing (MIMO-OFDM) system. The results of this work are compared with a conventional work that is based on convolutional coding. This is in order to check its fitness to the current system structure and the enhancement of the E_b/N_0 , which will directly result in a better cell coverage and continued reliable services for the area of the cell as the load increases. Based on the simulation results, Walsh coding shows a slight improvement of complementary cumulative distribution function (CCDF). As a consequence, the MIMO-OFDM systems' performance is improved comparing with the convolutionally coded MIMO-OFDM system. Thus, not only the Peak-to-Average Power Ratio (PAPR) is saved, but also the frequency spectrum efficiency is improved.

Keywords: *Cell planning, OFDM, Cell coverage, MIMO, Coding.*

206 **Title: Prove the Harm of Cell Phone via Biological Experiments**

Author: *1. Ibrahim N. Abu-Isbeih, Abdel-Rahman Al-Qawasmī & Nid'a Al-Shaf'i, Published Year: 2016*

Research Journal of Pharmaceutical, Biological and Chemical Sciences (RJPBCS), 7(3)

Faculty: Faculty of Engineering

Abstract: This paper highlighted the problem of the adverse effects of the mobile phone on human health. The main aim is to prove that cell phone has an adverse impact on people's health; many experiments were conducted to demonstrate that cell phone cause damages in the genetic material, moreover it is one of the principal reasons for brain cancer, and it has many other effects on human cells. Out of the experiments we concluded that mobile phone emit microwave signals, and these harmful signals have an ability to penetrates inside human body heating up our cells, this lead to increase blood flow within the cells, causing the growth of abnormal cells which is the cancer cells.

Keywords: Human health, mobile phone, effect on human health, cell phone and human health.

207 **Title: Enhancing the Performance of OFDM Systems-Based PAPR Reduction**
Author: Omar Daoud, Qasdri Hamarsheh and Ahlam Damati, Published Year: 2016

International Journal of Circuits, Systems and Signal Processing, vol. 10, pp. 333-8,

Faculty: Faculty of Engineering

Abstract: In this work a comparison has been made among different proposed algorithms in order to improve the performance of a power consumption wireless network. They are used to combat one of the Orthogonal Frequency Division Multiplexing (OFDM) technique drawbacks, which are considered as a key technique in enhancing the new era of wireless systems' quality of service (QoS). Therefore, three different propositions have been investigated and covered by this work and classified as; linear coding based, wavelet transformation based, PWM based. Furthermore, a MATLAB program has been run to check their performance and covers two different criteria; the curves of CCDF and the SER curves. This is in order to reduce the Peak-to-Average Power Ratio (PAPR) effect

Keywords: OFDM, PAPR, Linear Coding, Wavelet, PWM

208 **Title: Properties of Fresh and Hardened High Strength Steel Fibers Reinforced Self-Compacted Concrete**
Author: Saad A. AlTaan, Wail N. Al-Rifaie, and Khalid A. Al-Neimee, Published Year: 2016

Fourth international conference on sustainable construction materials and technologies, 7-12 August, 2016., Las Vegas, USA

Faculty: Faculty of Engineering

Abstract: Properties of fresh and hardened high strength steel fibrous self-compacted concrete were studied in this investigation. One reference high strength self-compacted concrete mixture is used, with five percent (by weight of cement) silica fume and eight percent of the cement replaced by limestone powder. Three steel fibers percentages by volume of concrete are used (0.4, 0.8, and 1.2). The used steel fibers were a shelled Harex type with irregular cross-section, equivalent diameter of 0.93 mm, and 32 mm long. Super plasticizer was used to improve the workability and flow ability of the mixes. The test results showed that the presence of steel fibers decrease the flow ability, and increase the time of spreading, segregation, and passing ability of the fresh concrete. For the three fibers percentages used, the properties of fresh concrete were within the recommended specifications for the self-compacted concrete. The test results showed that the self-compacted concrete exhibited an early strength development rate more than that for plain normal concrete due to the presence of the fine materials. As for normal

concrete, the test results showed also that the increase in the splitting strength is more than the increase in the compressive strength due to the presence of the steel fibers and this attributed to the different failure mechanism of the two tests. The brittle mode of failure of the high strength unreinforced specimens changed to a ductile one due to the presence of the steel fibres.

Keywords: *Compression, fresh, hardened, high strength, self-compacted, splitting, steel fibres, strength.*

209

Title: Efficiency Enhancement Based On Allocating Bizarre Peaks

Author: *Qadri Hamarsheh, O. R. Daoud, M. M. Ali and A. A. Damati, Published Year: 2016*

International Journal of Wireless & Mobile Networks (IJWMN), Vol. 8, No. 4

Faculty: *Faculty of Engineering*

Abstract: A new work has been proposed in this paper in order to overcome one of the main drawbacks that found in the Orthogonal Frequency Division Multiplex (OFDM) systems, namely Peak to Average Power Ratio (PAPR). Furthermore, this work will be compared with a previously published work that uses the neural network (NN) as a solution to remedy this deficiency. The proposed work could be considered as a special averaging technique (SAT), which consists of wavelet transformation in its first stage, a globally statistical adaptive detecting algorithm as a second stage; and in the third stage it replaces the affected peaks by making use of moving average filter process. In the NN work, the learning process makes use of a previously published work that is based on three linear coding techniques. In order to check the proposed work validity, a MATLAB simulation has been run and has two main variables to compare with; namely BER and CCDF curves. This is true under the same bandwidth occupancy and channel characteristics. Two types of tested data have been used; randomly generated data and a practical data that have been extracted from a funded project entitled by ECEM. From the achieved simulation results, the work that is based on SAT shows promising results in reducing the PAPR effect reached up to 80% over the work in the literature and our previously published work. This means that this work gives an extra reduction up to 15% of our previously published work. However, this achievement will be under the cost of complexity. This penalty could be optimized by imposing the NN to the SAT work in order to enhance the wireless systems performance.

Keywords: *Orthogonal Frequency Division Multiplexing, Neural Network, Linear Codes, Wavelet, Moving Average Filter.*

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Title: Enhancing the Performance of OFDM Systems-Based PAPR Reduction

Author: *Omar Daoud, Qadri Hamarsheh and Ahlam Damati, Published Year: 2016*

INTERNATIONAL JOURNAL OF CIRCUITS, SYSTEMS AND SIGNAL PROCESSING, Volume 10

Faculty: *Faculty of Engineering*

Abstract: In this work a comparison has been made among different proposed algorithms in order to improve the performance of a power consumption wireless network. They are used to combat one of the Orthogonal Frequency Division Multiplexing (OFDM) technique drawbacks, which are considered as a key technique in enhancing the new era of wireless systems' quality of service (QoS). Therefore, three different propositions have been investigated and covered by this work and classified as; linear coding based, wavelet transformation based, PWM based. Furthermore, a MATLAB program has been run to check their performance and covers two different criteria; the curves of CCDF and the SER curves. This is in

order to reduce the Peak-to-Average Power Ratio (PAPR) effect.

Keywords: OFDM, PAPR, Linear Coding, Wavelet, PWM.

211 **Title: Enhancing the Odd Peaks Detection in OFDM Systems Using Wavelet Transforms**

Author: Ahlam Damati, Omar Daoud, and Qadri Hamarsheh, **Published Year:** 2016

International Journal of Communications, Network and System Sciences, vol. 9, no. 7

Faculty: Faculty of Engineering

Abstract: This work aims to study the effect of unwanted peaks and enhance the performance of wireless systems on the basis of tackling such peaks. A new proposition has been made based on wavelet transform method and its entropy. Signals with large peak-to-average power ratio (PAPR) will be examined such as the ones that are considered as the major Orthogonal Frequency Division Multiplexing (OFDM) systems drawbacks. Furthermore, aspatial diversity Multiple-Input Multiple-Output (MIMO) technology is used to overcome the complexity addition that could arise in our proposition. To draw the best performance of this work, a MATLAB simulation has been used; it is divided into three main stages, namely, MIMO-OFDM symbols' reconstruction based on wavelet transform, a predetermined thresholding formula, and finally, moving filter. This algorithm is called Peaks' detection based Entropy Wavelet Transform; PD-EWT. Based on the simulation, and under some constrains such as the bandwidth occupancy and the complexity structure of the transceivers, a peak detection ratio has been achieved and reaches around 0.85. Comparing with our previously published works, the PD-EWT enhances detection ratio for 0.25 more peaks.

Keywords: Wavelet Transform, Entropy, MIMO, OFDM, PAPR

212 **Title: OFDM Systems Performance Enhancement**

Author: Omar Daoud, Qadri Hamarsheh and Ahlam Damati, **Published Year:** 2015

IEEE SSD'15, 12th International Multi-Conference on Systems, Signals & Devices, Mahdia, Tunisia

Faculty: Faculty of Engineering

Abstract: in this work a comparison among different proposed algorithms has been done to check the performance improvements for current wireless technologies. Orthogonal Frequency Division Multiplexing (OFDM) technique is one of the main techniques that are uses to enhance the quality of service (QoS) for beyond third generation (B3G) systems. This is in order to meet the rapidly increased of multimedia users demand. This comparison includes three previous propositions that were made to enhance the OFDM performance; work based on linear coding techniques, work based on wavelet transform and work based on PWM. All these propositions have been made to combat the effect of high Peak-to-Average Power Ratio (PAPR).

Keywords: OFDM, PAPR, wavelet, linear coding, PWM.

213 **Title: The Application of Three Level NPC Converter for Wind Power Generator**

Author: Firas Obeidat, Li Yongdong, and Xu Lie, **Published Year:** 2012

2012 IEEE 7th International Power Electronics and Motion Control Conference - ECCE Asia, Harbin, China

Faculty: Faculty of Engineering

Abstract: This paper presents the control of a three level back to back converter with Permanent Magnet Synchronous Machine (PMSM). Field Oriented Control (FOC) is used to control the speed and the current of PMSM. Space Vector Pulse Width Modulation (SVPWM) is used to control the Three Level Rectifier and the Three Level Voltage Source Inverter. The simulation tests of the system have been developed based on Simulink/Matlab.

Keywords: Wind Turbine; Three phase Three Level Converter; PMSM; SVPWM.

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Title: Simulation of Grid Connected HVDC Offshore Wind Farm Topologies

Author: Firas Obeidat, Xu Lie, and Li Yongdong, Published Year: 2013

The 10th IEEE International Conference on Power Electronics and Drive Systems (PEDS2013), Kitakyushu, Japan

Faculty: Faculty of Engineering

Abstract: This paper presents two topologies to connect HVDC offshore wind farm into the grid, the offshore part consists of five units; in the first topology, each unit contains a permanent magnet synchronous generator (PMSG) connected to a three level neutral point clamped converter (3L-NPC) to control the generator speed by using a maximum power point tracking (MPPT) control. The offshore platform consists of a half bridge connected in series to balance the voltage between the units and to collect the voltage in order to get the desired DC voltage. In the second topology, each unit contains a PMSG connected to 3-phase/3-phase matrix converter (MC) to control the generator speed by using a MPPT control. The offshore platform consists of a three phase High Frequency Transformer (HFT); the primary of each phase of the transformer connected to one phase from each unit. The secondary of the transformer connected to three phase diode bridge rectifier to get HVDC. The HVDC cable is used to transfer power from the offshore side to the onshore side. A Modular Multilevel Converter (MMC) is used in the onshore side to convert the voltage from DC to AC voltage and to integrate the offshore wind farm into the Grid.

Keywords: PMSG, MPPT, 3L-NPC, Half Bridge, Matrix Converter, HFT, MMC, HVDC Offshore Wind Farm.

215

Title: Reliability Prediction of PV Inverters Based on MIL-217F N2

Author: Firas Obeidat and Roger Shuttleworth, Published Year: 2015

42nd IEEE Photovoltaic Specialists Conference (42nd IEEE PVSC), New Orleans, USA

Faculty: Faculty of Engineering

Abstract: This paper initially discusses the reliability of a 250W Photovoltaic (PV) micro inverter. Using the bill of materials the reliabilities of the main, gate drive, power supply, current and voltage sensing and microprocessor circuits were investigated, and the failure rate and Mean Time Between Failure (MTBF) calculated. The sum of component failure rates equals the complete PV micro inverter failure rate. To account for temperature effects the component failure rate was calculated for each inverter operating temperature, and multiplied by the percentage occurrence of this operating temperature to obtain a weighted failure rate. A similar procedure was used to calculate the failure rate for the main circuits of a 4.6kW & a 4.5kW multi-string inverter. All calculations are based on MIL-17F N2 method.

Keywords: Failure rate, MIL-HDBK-217F N2, PV micro inverter, PV multi string inverter, Reliability prediction.

216

Title: Grid-Connected Multilevel Topology for HVDC Offshore Wind Farm**Author: Firas Obeidat, Xu Lie, and Li Yongdong, Published Year: 2013***Electric machines and Control,**Faculty: Faculty of Engineering*

Abstract: This paper presents a topology to connect HVDC offshore wind farm into the grid; the offshore part consist of five units, each one contains permanent magnet synchronous generator (PMSG) connected to a three level neutral point clamped converter (3L-NPC) which works as a rectifier to control the generator speed by using a maximum power point tracking (MPPT) control. The offshore platform consists of a half bridge connected in series to balance the voltage between units and to collect the voltage in order to get the desired DC voltage. The HVDC cable will be used to transfer power from the offshore side to the onshore side. A Modular Multilevel Converter (MMC) is used in the onshore side to convert the voltage from DC to AC voltage and to connect the offshore wind farm into the Grid.

Keywords: PMSG; 3L-NPC; Half Bridge; MMC; Series DC Wind Farm.

217

Title: Grid-Connected Multilevel Topology for HVDC Offshore Wind Farm Based on MFT**Author: Firas Obeidat, Xu Lie, and Li Yongdong, Published Year: 2013***. Power Electronics Technology Journal,**Faculty: Faculty of Engineering*

Abstract: This paper presents a new topology to connect HVDC offshore wind farm into the grid; the offshore part consist of five units, each unit contain permanent magnet synchronous generator (PMSG) connected to 3-phase/3-phase matrix converter (MC) to control the generator speed by using a MPPT control. The offshore platform consists of a three phase Medium Frequency Transformer (MFT) and a three phase Modular Multilevel Converter (MMC); the primary of each phase of the transformer connected to one phase from each unit. The secondary of the transformer connected to three phase MMC to get High Voltage DC (HVDC). The HVDC cable will be used to transfer power from the offshore side to the onshore side. Five levels MMC is used in the onshore side to control the DC voltage and to connect the offshore wind farm into the Grid by converting the HVDC to HVAC.

Keywords: PMSG; Three Phase Matrix Converter; MFT; MMC; Series DC Wind Farm

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Title: Landfill area estimation based on integrated waste disposal options and solid waste forecasting using modified ANFIS model**Author: Mohammad K. Younes, Z.M. Nopiah , N.E. Ahmad Basri , H. Basri ,****Mohammed F.M. Abushammala, Mohammed Y. Younes, Published Year: 2016***Faculty: Faculty of Engineering*

Abstract: Solid waste prediction is crucial for sustainable solid waste management. The collection of accurate waste data records is challenging in developing countries. Solid waste generation is usually correlated with economic, demographic and social factors. However, these factors are not constant due to population and economic growth. The objective of this research is to minimize the land requirements for solid waste disposal for implementation of the Malaysian vision of waste disposal options. This goal has been previously achieved by integrating the solid waste forecasting model, waste composition and the Malaysian vision. The modified adaptive neural fuzzy inference system (MANFIS) was employed to develop a solid waste prediction model and search for the optimum input factors. The performance of the model was evaluated using the root mean square error (RMSE) and the coefficient of determination (R²). The model validation results are as follows: RMSE for training = 0.2678, RMSE for testing = 3.9860 and R² = 0.99. Implementation of the Malaysian

vision for waste disposal options can minimize the land requirements for waste disposal by up to 43%.

Keywords: *Solid waste forecasting; Adaptive neuro-fuzzy inference system; Landfill area estimation; Area conservation*

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Title: Use of a Combination of MRSS-ANP for Making an Innovative Landfill Siting Decision Model

Author: *Mohammad K. Younes, N. E. Ahmad Basri, Z. M. Nopiah, H. Basri, and Mohammed F.M. Abushammala, Published Year: 2015*

Mathematical Problems in Engineering, 2015

Faculty: *Faculty of Engineering*

Abstract: Landfill siting is a complex, multicriteria decision-making problem that needs an extensive evaluation of environmental, social, land use, and operational criteria. Integration of a median ranked sample set (MRSS) and an analytic network process (ANP) has been implemented to rank the associated criteria and select a suitable landfill site. It minimizes the uncertainty and the subjectivity of human judgments. Four groups of experts with different backgrounds participated in this study, and each group contained four experts. The respondent preferences were ranked in a 4-by-4 matrix to obtain the judgment sets for the MRSS. These sets were subsequently analyzed using ANP to obtain the priorities in the landfill siting criteria. The results show that land topology and distance from surface water are the most influential factors, with priorities of 0.18 and 0.17, respectively. The proposed integrated model may become a promising tool for the environmental planners and decision makers.

Keywords: *Solid waste management, multi criteria decision making, median ranked set sample, Analytical network process*

220

Title: Prediction of municipal solid waste generation using nonlinear autoregressive network

Author: *Mohammad K. Younes & Z. M. Nopiah & N. E. Ahmad Basri & H. Basri & Mohammed F. M. Abushammala & K. N. A. Maulud, Published Year: 2015*

Environmental monitoring and assessment, 12

Faculty: *Faculty of Engineering*

Abstract: Most of the developing countries have solid waste management problems. Solid waste strategic planning requires accurate prediction of the quality and quantity of the generated waste. In developing countries, such as Malaysia, the solid waste generation rate is increasing rapidly, due to population growth and new consumption trends that characterize society. This paper proposes an artificial neural network (ANN) approach using feedforward nonlinear autoregressive network with exogenous inputs (NARX) to predict annual solid waste generation in relation to demographic and economic variables like population number, gross domestic product, electricity demand per capita and employment and unemployment numbers. In addition, variable selection procedures are also developed to select a significant explanatory variable. The model evaluation was performed using coefficient of determination (R^2) and mean square error (MSE). The optimum model that produced the lowest testing MSE (2.46) and the highest R^2 (0.97) had three inputs (gross domestic product, population and employment), eight neurons and one lag in the hidden layer, and used Fletcher-Powell's conjugate gradient as the training algorithm.

Keywords: *Solid waste forecasting . Artificial neural network . Solid waste management . ANN forecasting*

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Title: Integrating approach to size and site at a sanitary landfill in Selangor state, Malaysia

Author: Mohammad Khairi Younes, Noor Ezlin Ahmad Basri, Zulkifli Mohammad Nopiah, Hassan Basri, Mohammed Abushammala, Khairul Nizam Abdul Maulud, Published Year: 2015

Environmental Engineering Research, 20(3)

Faculty: Faculty of Engineering

Abstract: Solid waste production increases due to population and consumption increments. Landfill is the ultimate destination for all kinds of municipal solid waste; and is the most convenient waste disposal method in developing countries. To minimize investment and operational costs and society's opposition towards locating landfills nearby, proper landfill sizing and siting are essential. In this study, solid waste forecasting using Autoregressive Integrating Moving Average (ARIMA) was integrated with government future plans and waste composition to estimate the required landfill area for the state of Selangor, Malaysia. Landfill siting criteria were then prioritized based on expert's preferences. To minimize ambiguity and the uncertainty of the criteria prioritizing process, the expert's preferences were treated using integrated Median Ranked Sample Set (MRSS) and Analytic Hierarchy Process (AHP) models. The results show that the required landfill area is 342 hectares and the environmental criteria are the most important; with a priority equal to 48%.

Keywords: AHP, ARIMA, Environmental criteria priorities, MRSS, Solid waste generation

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Title: Solid waste forecasting using modified ANFIS modeling

Author: Mohammad K. Younes, Z.M. Nopiah, N.E. Ahmad Basri, H. Basri, Mohammed F.M. Abushammala & Maulud K.N.A., Published Year: 2015

Faculty: Faculty of Engineering

Abstract: Solid waste prediction is crucial for sustainable solid waste management. Usually, accurate waste generation record is challenge in developing countries which complicates the modelling process. Solid waste generation is related to demographic, economic, and social factors. However, these factors are highly varied due to population and economy growths. The objective of this research is to determine the most influencing demographic and economic factors that affect solid waste generation using systematic approach, and then develop a model to forecast solid waste generation using a modified Adaptive Neural Inference System (MANFIS). The model evaluation was performed using Root Mean Square Error (RMSE), Mean Absolute Error (MAE) and the coefficient of determination (R²). The results show that the best input variables are people age groups 0-14, 15-64, and people above 65 years, and the best model structure is 3 triangular fuzzy membership functions and 27 fuzzy rules. The model has been validated using testing data and the resulted training RMSE, MAE and R² were 0.2678, 0.045 and 0.99, respectively, while for testing phase RMSE = 3.986, MAE = 0.673 and R² = 0.98. Implications: To date, a few attempts have been made to predict the annual solid waste generation in developing countries. This paper presents modeling of annual solid waste generation using Modified ANFIS, it is a systematic approach to search for the most influencing factors and then modify the ANFIS structure to simplify the model. The proposed method can be used to forecast the waste generation in such developing countries where accurate reliable data is not always available. Moreover, annual solid waste prediction is essential for sustainable planning.

Keywords: Solid waste forecasting . Artificial intelligence . ANFIS

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Title: Modeling of methane oxidation in landfill cover soil using an artificial neural network**Author: Mohammed F.M. Abushammala , Noor Ezlin Ahmad Basri , Rahmah Elfithri , Mohammad K. Younes & Dani Irwan, Published Year: 2014****Journal of the Air & Waste Management Association, 64****Faculty: Faculty of Engineering**

Abstract: Knowing the fraction of methane (CH₄) oxidized in landfill cover soils is an important step in estimating the total CH₄ emissions from any landfill. Predicting CH₄ oxidation in landfill cover soils is a difficult task because it is controlled by a number of biological and environmental factors. This study proposes an artificial neural network (ANN) approach using feedforward backpropagation to predict CH₄ oxidation in landfill cover soil in relation to air temperature, soil moisture content, oxygen (O₂) concentration at a depth of 10 cm in cover soil, and CH₄ concentration at the bottom of cover soil. The optimum ANN model giving the lowest mean square error (MSE) was configured from three layers, with 12 and 9 neurons at the first and the second hidden layers, respectively, log-sigmoid (logsig) transfer function at the hidden and output layers, and the Levenberg-Marquardt training algorithm. This study revealed that the ANN oxidation model can predict CH₄ oxidation with a MSE of 0.0082, a coefficient of determination (R²) between the measured and predicted outputs of up to 0.937, and a model efficiency (E) of 0.8978. To conclude, further developments of the proposed ANN model are required to generalize and apply the model to other landfills with different cover soil properties. Implications: To date, no attempts have been made to predict the percent of CH₄ oxidation within landfill cover soils using an ANN. This paper presents modeling of CH₄ oxidation in landfill cover soil using ANN based on field measurements data under tropical climate conditions in Malaysia. The proposed ANN oxidation model can be used to predict the percentage of CH₄ oxidation from other landfills with similar climate conditions, cover soil texture, and other properties. The predicted value of CH₄ oxidation can be used in conjunction with the Intergovernmental Panel on Climate Change (IPCC) First Order Decay (FOD) model by landfill operators to accurately estimate total CH₄ emission and how much it contributes to global warming.

Keywords: methane oxidation, landfill methane, ANN,

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Title: Investigation of Solid Waste Characterization, Composition and Generation Using Management of Environmental Systems in Zarqa, Jordan**Author: MOHAMMAD K. YOUNES, N. ZULKIFLI, B. NADI, NOOR EZLIN AHMAD BASRI, HASSAN BASRI , MOHAMMED F.M. ABUSHAMMALA and KHALDOUN SHATANAWI, Published Year: 2013****Asian Journal of Chemistry, 17****Faculty: Faculty of Engineering**

Abstract: Municipal solid waste management is a critical environmental challenge facing the development. Solid waste (SW) characteristics change with time due to changes in the population's consumption and lifestyle. Characterization of SW helps the decision makers take the sustainable actions. This is the first study that introduces integrated solid waste management principles in Zarqa. The results indicate that the total SW generation is approximately 299 tons/day, with a generation rate of 0.69 kg/ capita per day. By 2030, it is expected to reach 446 tons/day, with a generation rate of ca. 0.75 kg/capita per day. The organic fraction is 48.9 %, while the other main components like paper and cardboard and plastics are 13.3 and 15.2 %, respectively. The heat content is between 2,121 and 2,905 kcal/kg. A high organic content requires special considerations for waste handling and disposal. Moreover, it gives preference to composting over other heat recovery techniques.

Keywords: *Solid waste management, Solid waste characterization, Solid waste generation.*

225 **Title: Methane oxidation in landfill cover soils: a review**
Author: *Mohammed F.M. Abushammala, Noor Ezlin Ahmad Basri, Dani Irwan and Mohammad K. Younes, Published Year: 2015*
Asian Journal of Atmospheric Environment, 8
Faculty: Faculty of Engineering
Abstract: Migration of methane (CH₄) gas from landfills to the surrounding environment negatively affects both humankind and the environment. It is therefore essential to develop management techniques to reduce CH₄ emissions from landfills to minimize global warming and to reduce the human risks associated with CH₄ gas migration. Oxidation of CH₄ in landfill cover soil is the most important strategy for CH₄ emissions mitigation. CH₄ oxidation occurs naturally in landfill cover soils due to the abundance of methanotrophic bacteria. However, the activities of these bacteria are influenced by several controlling factors. This study attempts to review the important issues associated with the CH₄ oxidation process in landfill cover soils. The CH₄ oxidation process is highly sensitive to environmental factors and cover soil properties. The comparison of various biotic system techniques indicated that each technique has unique advantages and disadvantages, and the choice of the best technique for a specific application depends on economic constraints, treatment efficiency and landfill operations.
Keywords: *Methane emissions, Methane oxidation, Mitigation, Methanotrophic bacteria, Cover soils*

226 **Title: Medium term municipal solid waste generation prediction by autoregressive integrated moving average**
Author: *Mohammad K. Younes, Z. M. Nopiah, Noor Ezlin A. Basri, and Hassan Basri, Published Year: 2014*
Statistical and Operational Research International Conference , Malaysia
Faculty: Faculty of Engineering
Abstract: Generally, solid waste handling and management are performed by municipality or local authority. In most of developing countries, local authorities suffer from serious solid waste management (SWM) problems and insufficient data and strategic planning. Thus it is important to develop robust solid waste generation forecasting model. It helps to proper manage the generated solid waste and to develop future plan based on relatively accurate figures. In Malaysia, solid waste generation rate increases rapidly due to the population growth and new consumption trends that characterize the modern life style. This paper aims to develop monthly solid waste forecasting model using Autoregressive Integrated Moving Average (ARIMA), such model is applicable even though there is lack of data and will help the municipality properly establish the annual service plan. The results show that ARIMA (6,1,0) model predicts monthly municipal solid waste generation with root mean square error equals to 0.0952 and the model forecast residuals are within accepted 95% confident interval.
Keywords: *Solid Waste Forecasting , ARIMA , Solid Waste Management , Solid Waste Generation*

227 **Title: Priorities determination using novel analytic hierarchy process and median ranked sample set, case study of landfill siting criteria**

Author: Mohammad K. Younes, Z. M. Nopiah, N. E. Ahmad Basri, and H. Basri,
Published Year: 2015

**the Second International Statistical Conference 2014 (ISM II), Kuantan-Malaysia
Faculty: Faculty of Engineering**

Abstract: Integrating environmental, social, political, and economical attributes enhances the decision making process. Multi criteria decision making (MCDM) involves ambiguity and uncertainty due to various preferences. This study presents a model to minimize the uncertainty and ambiguity of human judgments by means of integrating the counter stakeholders with median ranked sample set (MRSS) and Analytic hierarchy process (AHP). The model uses landfill site selection as a MCDM problem. Sixteen experts belong to four clusters that are government, private, institution, and non-governmental organisations participated and their preferences were ranked in four by four matrix. Then the MRSS and the AHP were used to obtain the priorities of landfill siting criteria. Environmental criteria have the highest priority that equals to 48.1% and the distance from surface water, and the faults zones are the most important factors with priorities equal to 18% and 13.7% respectively. In conclusion, the hybrid approach that integrates counter stakeholders MRSS, and AHP is capable of being applied to complex decision making process and its outputs are justified.

Keywords: Multi Criteria Decision Making, Analytic Hierarchy Process, Ranked Sample Set, landfill Site Selection

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Title: IMAGES OF ROUND BAGHDAD: AN ANALYSIS OF RECONSTRUCTIONS BY ARCHITECTURAL HISTORIANS

Author: Saba Sami AL-ALI , Nawar Sami AL-ALI, **Published Year:** 2016

Faculty: Faculty of Engineering

Abstract: This paper examines the architectural renderings of the round city of Baghdad built by the Abbasid caliph Abu Ja'far al-Mansur as visualized by archaeologists and historians. Although nothing of the historic city has survived, descriptions by Arab and Persian authors have provided a guide to its appearance. From an architectural perspective, the work of Ernst Herzfeld and K.A.C. Creswell may be considered the most significant. A study of the details of their architectural drawings reveals inconsistencies with the written descriptions. Reconstructions by other scholars are also examined with special reference to the work of Jacob Lassner. The focus is on the first faṣīl (intervallum) and raḥba (entrance courtyard), the majālis (audience halls) over the four city gates, the maṣ'ad (gangway) to the audience halls, the ṭaqāt (arcades) and finally the caliph's palace and the congregational mosque, to suggest a revised reconstruction of al-Mansur's Baghdad. Paper was published in : IRAQ - Journal of the : British Institute for the Study of Iraq BISI . Volume 78 . 2016 , pp 137 - 157 . Published online: 20 October 2016 , Cambridge University Press CUP . (Paper is copyright protected in favor of BISI)

Keywords: Round Baghdad

229

Title: WHIRL INTERACTION OF A DRILL BIT WITH THE BORE-HOLE BOTTOM

Author: Nabil Wanas Musa, **Published Year:** 2015

Modern Mechanical Engineering, 5

Faculty: Faculty of Engineering

Abstract: This paper deals with the theoretic simulation of a drill bit whirling under conditions of its contact interaction with the bore-hole bottom rock plane. The bit is considered to be an absolutely rigid ellipsoidal body with uneven surface. It is attached to the lower end of a rotating elastic drill string. In the perturbed state, the bit can roll without sliding on the bore-hole bottom, performing whirling vibrations

(the model of dynamic equilibrium with pure rolling when maximum cohesive force does not exceed the ultimate Coulombic friction). To describe these motions, a nonholonomic dynamic model is proposed, constitutive partial differential equations are deduced. With their use, the whirling vibrations of oblong and oblate ellipsoidal bits are analyzed, the functions of cohesive (frictional) forces are calculated. It is shown that the system of elastic drill string and ellipsoidal bit can acquire stable or unstable whirl modes with approaching critical Eulerian values by the parameters of axial force, torque and angular velocity. The analogy of the found modes of motions with ones of the Celtic stones is established. It is shown that the ellipsoidal bits can stop their whirling vibrations and change directions of their circumferential motions in the same manner as the ellipsoidal Celtic stones do. As this takes place, the trajectories of the oblate ellipsoidal bits are characterized by more complicated paths and irregularities. Key words: deep drilling; ellipsoidal bits; nonholonomic dynamics; Celtic stones; instability; forward and backward whirling motions.

Keywords: *deep drilling; ellipsoidal bits; nonholonomic dynamics; Celtic stones; instability; forward and backward whirling motions.*

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Title: The Use of Genetic Approach to the kinematics of Cutting

Author: Nabil Wanas Musa, Published Year: 2016

World Journal of Mechanics, 6

Faculty: Faculty of Engineering

Abstract: This article deals with the use of an interdisciplinary approach to modelling and creation of a complex technical system of different physical nature in relation to the kinematics of cutting and shaping. The professor of the National Technical University of Ukraine Kuznetsov Iu.N, proposed the approach based on generalization of knowledge, methodological basis of which is the theory of evolution of the systems and methods of genetic analysis and synthesis. For generalization of the knowledge in the fundamental sciences is based on the principles of a limited number of elementary generic structures with the introduction of the gene concept. The modelling and synthesis of kinematic cutting schemes are providing the efficiency and viability of genetic and morphological approach. The material point, which can interact with other material points in space and time, simulating anthropogenic system of different origin, is introduced as a material object.

Keywords: *genetic approach, kinematics of cutting, technical system, rotary motion, material point*

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Title: Characteristics and Analysis for Mechanical Instrumentation Used to Measure Fluid Viscosity

Author: Mohammad Quqazeh, Hasan .A.Aldabbas, Monzer.M. Krishan, Nabil Musa, Published Year: 2016

International Journal of Innovative Science and Modern Engineering (IJISME), 4

Faculty: Faculty of Engineering

Abstract: The task of development of the measurement procedure and the general-purpose control equipment which can allow us to analyze fluid rheological properties and to ascertain the dependence of the stress tensor of the sample on the deformation tensor over a wide range of strain rates is urgent nowadays. At the same time the question of providing the continuous inspection of the product properties under the condition of high precision and measuring automation is a matter of principle.

Keywords: *viscosimeter, measuring automation.*

232 **Title: An Agent Based Security Engine for Privacy Preserving in Personalized Search**

Author: Ali T. Al - khwaldeh, Published Year: 2016

International Conference on Trends in Computing and Information Technology (ICTCIT 2016), Istanbul

Faculty: Faculty of Engineering

Abstract: Time synchronization is very important for the data communication in the wireless network systems. Time synchronization is the main factor which has to be considered in wireless networking. The problem of time synchronization often results in delay of data transmission and reception. The synchronization problem occurs during the signal propagation time, sending time, receiving time and accessing time. The two main wireless sync protocols are Timing-sync Protocol for Sensor Networks (TPSN) and Reference Broadcast Synchronization (RBS). This paper focuses on the synchronization problems that occur in wireless data communication and analysis between the two synchronization protocols. This paper will also provide the solutions for the delay in data communication.

Keywords: Medium Access Control (MAC), Timing-sync Protocol for Sensor Networks (TPSN), Reference Broadcast Synchronization (RBS), Wireless Sensor Networks (WSN).

233 **Title: Synthesis of Magnetorheological Fluids and Their Applications in Brake**

Author: Ahmed Ateyat, Published Year: 2016

Faculty: Faculty of Engineering

Abstract: In this current research work we made study on vibration reduction possibilities of magnetorheological fluids in various magnetic fields and various concentrations of suspension particles. The experimentation of magnetorheological fluid applied in mechanical and physical transmission and even shock absorbing dampers, gives us visual representation of the behaviour of their magical fluid.

Keywords: Magnetorheological fluids, magnetic particles, MR synthesis, MR Brake.

234 **Title: Power Peaks Allocation based on Averaging-Adaptive Wavelet Transform**

Author: Dr. Qadri Hamarshah, Published Year: 2016

INTERNATIONAL JOURNAL OF CIRCUITS, SYSTEMS AND SIGNAL PROCESSING , Volume 10

Faculty: Faculty of Engineering

Abstract: a One of Orthogonal Frequency Division Multiplexing deficiency has been taken into consideration in this work. A proposition has been made to tackle the Peak to Average Power Ratio (PAPR) problem. The proposed work will be based on a special averaging adaptive wavelet transformation (SAAWT) process. It will be compared with two main works that has been published previously; a neural network (NN)-based and a special averaging technique (SAT)-based. In the NN work, the learning process makes use of a previously published work that is based on three linear coding techniques. The proposed work (SAAWT) consists of three main stages; extracting the needed features, de-noising and the optimization criterion. SAAWT has an enhancement over the SAT that will take the noise clearance enhancement into its consideration. It uses 136880 different combinations of de-noising parameters that are experimentally computed to get the most efficient result with respect to the MSE, SNR and PSNR values. A MATLAB simulation-based of such works has been made in order to check the proposition performance. In this simulation, both of the BER and CCDF curves have been taken into consideration. Furthermore, the bandwidth and channel behaviors have been remain constant. Moreover, two kinds of data have been imposing to this simulation; a random data

that is generated randomly by making use of the MATLAB features and a practical data that have been extracted from a funded project entitled by ECEM. From the previously published work the SAT shows promising results in reducing the PAPR effect reached up to 75% over the work in the literature and over the NN-based work. Under the cost of increasing complexity, SAAWT gives further reduction over the SAT reaches up to 6%. This drawback will be examined in the future work.

Keywords: *Orthogonal Frequency Division Multiplexing, Neural Network, Linear Codes, De-noising Parameters, Wavelet, Moving Average Filter.*

235 **Title: Vascular resistance estimation in renal hemodynamics using a time-varying windkessel model**

Author: *Mohammad Abu-Naser, Published Year: 2005*

International Conference on Acoustics, Speech, and Signal Processing, USA

Faculty: *Faculty of Engineering*

Abstract: In studies of the dynamics of renal vascular response to blood pressure variations, measurements of pressure and flow rate are typically utilized to characterize a dynamic response with pressure as input and flow as output. However, the primary regulatory effect is the adjustment of vascular resistance, so that a record of a resistance time series would better serve as the regulated output. Toward this goal, a technique is developed for estimating the parameters of a three-element, time-varying Windkessel model of the renal vasculature that enables resistance estimation. The method is described, analyzed, and applied to renal pressure/flow data from rats.

Keywords: *Vascular resistance measurement, Hemodynamics, renal vasculature*

236 **Title: Convergence properties of adaptive estimators of time-varying linear systems using basis functions**

Author: *Mohammad Abu-Naser, Published Year: 2006*

Digital Signal Processing Workshop, USA

Faculty: *Faculty of Engineering*

Abstract: The estimation of time-varying linear systems using a basis function approach has been applied in various fields such as equalization of mobile radio channels and in estimation of dynamics in biological systems. Typically, time-varying finite impulse response system models have been employed with recursive least squares or least mean squares adaptation. In this paper the convergence properties of these and other adaptive algorithms employed in this setting are formulated. The use of time-varying ARMA models is also included in the framework that is examined. The relation of the prediction error with the parameter error and the system regressor is exposed, indicating that a previously analyzed class of adaptive algorithms is appropriate for these problems. The convergence of this class of algorithms is dependent on a persistent excitation condition on system signals and a passivity condition on a system operator. Requirements for system regressors to be persistently exciting are derived for the time-varying linear system identification using basis functions, and the relevant operator conditions are described.

Keywords: *Adaptive algorithm, Parameter estimation, Convergence*

237 **Title: Convergence of Adaptive Estimators of Time-Varying Linear Systems using Basis Functions: Continuous Time Results**

Author: *Mohammad Abu-Naser, Published Year: 2007*

International Conference on Acoustics, Speech, and Signal Processing, USA

Faculty: Faculty of Engineering

Abstract: The convergence properties of adaptive filtering algorithms are investigated in situations where the optimal filter is modeled as a time-varying linear system whose parameters are expanded over basis functions. This type of model is one approach when parameters cannot be considered as slowly varying, and is appropriate for modeling certain mobile radio channels and in the identification of the dynamics of vascular autoregulation in kidneys. Appropriate adaptive algorithms are developed in a continuous-time setting, and the local convergence of these algorithms is studied. Conditions for convergence are shown to include an excitation condition on the algorithm regressor and a passivity condition on an algorithm operator. The excitation conditions are interpreted in terms of system signals and the parameter basis functions using previously established results in the discrete-time case. A test for the passivity condition is developed whose application is presented via an illustrative example.

Keywords: Adaptive algorithm, Parameter estimation, Convergence

238

Title: Fundamental Issues in the Stability of Adaptive IIR Filters

Author: Mohammad Abu-Naser, Published Year: 2009

Digital Signal Processing Workshop, USA

Faculty: Faculty of Engineering

Abstract: Adaptive IIR filter analysis is more complicated than for the FIR case because (a) some algorithm signals are generated by the adaptive filter itself, and (b) the prediction error relates to the adapted parameters via a filtering operation. Averaging analyses of stability address the first issue by linearization about the convergence point, and the second by using passivity of the error operator. However, published results do not fully account for signal dynamics in the linearization, nor have initial conditions in the passivity analysis been considered. This paper addresses these gaps. Our motivation to revisit these broadly applicable issues is for analyzing recently developed adaptive algorithms that have application to biological systems.

Keywords: IIR filters, Algorithm design and analysis, Stability analysis

239

Title: Embedding Mixed-Reality Laboratories into E-Learning Systems for Engineering Education

Author: Kasim M. Al-Aubidy, Published Year: 2013

International Conference on E-Learning and Blended Education (ICELBE2013), Jordan

Faculty: Faculty of Engineering

Abstract: E-learning, virtual learning and mixed reality techniques are now a global integral part of the academic and educational systems. They provide easier access to educational opportunities to a very wide spectrum of individuals to pursue their educational and qualification objectives. These modern techniques have the potentials to improve the quality of the teaching and learning process and elevate its performance to higher standards. Furthermore, e-learning in conjunction with mixed reality techniques can reduce the cost of higher education at both institutional and individual learner levels. In this paper, the focus will be on teaching-learning of applied science such as engineering. These studies demand special requirements, such as acquiring specific technical skills and practices through training. Our objective in this paper is the explanation and design of remote laboratories in mixed-reality mode. Decision making and evaluation of performance using fuzzy logic will be embedded in the proposed design.

Keywords: e-learning, engineering education, virtual labs, remote labs, mixed-

reality, fuzzy decision making.

240

Title: DVB-T Systems Speaker Verifications Performance

Author: 1- Omar Daoud, Qadri Hamarsheh, and Ahlam Damati, Published Year: 2016

Faculty: Faculty of Engineering

Abstract: In this work, a popular broadcasting standard's performance has been checked, namely Handheld Digital Video Broadcasting (DVB-T). DVB-T facilitates the digital television transmission by making use of handheld receivers, which uses the Orthogonal Frequency Division Multiplexing (OFDM) technique as a modulation technique. This performance has been examined by proposing different techniques to overcome one of the main OFDM drawbacks namely Peak-to-Average Power Ratio (PAPR) problem. Two main factors have been used in order to check the PAPR enhancements; BER curves and CCDF curves. The proposed work consists of three different stages; de-noising the signal by making use of the wavelet transformation; the odd peaks detecting criterion based on a globally statistical adaptive method; and the moving average filters to replace the affected peaks. A MATLAB simulation test has been performed under the same bandwidth occupancy of the speaker verification-based systems; 15% extra PAPR enhancements achieved and further 25% extra BER enhancements over the previous published work.

Keywords: --

241

Title: Power Peaks Allocation Based on Averaging-Adaptive Wavelet Transform

Author: 2- Qadri Hamarsheh, Omar Daoud, Mohammed Ali, and Ahlam Damati , Published Year: 2016

Journal of Circuits, Systems, and Signal Processing, 10

Faculty: Faculty of Engineering

Abstract: One of Orthogonal Frequency Division Multiplexing deficiency has been taken into consideration in this work. A proposition has been made to tackle the Peak to Average Power Ratio (PAPR) problem. The proposed work will be based on a special averaging adaptive wavelet transformation (SAAWT) process. It will be compared with two main works that has been published previously; a neural network (NN)-based and a special averaging technique (SAT)-based. In the NN work, the learning process makes use of a previously published work that is based on three linear coding techniques. The proposed work (SAAWT) consists of three main stages; extracting the needed features, de-noising and the optimization criterion. SAAWT has an enhancement over the SAT that will take the noise clearance enhancement into its consideration. It uses 136880 different combinations of de-noising parameters that are experimentally computed to get the most efficient result with respect to the MSE, SNR and PSNR values. A MATLAB simulation-based of such works has been made in order to check the proposition performance. In this simulation, both of the BER and CCDF curves have been taken into consideration. Furthermore, the bandwidth and channel behaviors have been remain constant. Moreover, two kinds of data have been imposing to this simulation; a random data that is generated randomly by making use of the MATLAB features and a practical data that have been extracted from a funded project entitled by ECEM. From the previously published work the SAT shows promising results in reducing the PAPR effect reached up to 75% over the work in the literature and over the NN-based work. Under the cost of increasing complexity, SAAWT gives further reduction over the SAT reaches up to 6%. This drawback will be examined in the future work.

Keywords: --

242

Title: Efficiency Enhancement based on Allocating Bizarre Peaks**Author: Qadri Hamarsheh, Omar Daoud, Mohammed Ali, and Ahlam Damati, Published Year: 2016****Faculty: Faculty of Engineering**

Abstract: A new work has been proposed in this paper in order to overcome one of the main drawbacks that found in the Orthogonal Frequency Division Multiplex (OFDM) systems, namely Peak to Average Power Ratio (PAPR). Furthermore, this work will be compared with a previously published work that uses the neural network (NN) as a solution to remedy this deficiency. The proposed work could be considered as a special averaging technique (SAT), which consists of wavelet transformation in its first stage, a globally statistical adaptive detecting algorithm as a second stage; and in the third stage it replaces the affected peaks by making use of moving average filter process. In the NN work, the learning process makes use of a previously published work that is based on three linear coding techniques. In order to check the proposed work validity, a MATLAB simulation has been run and has two main variables to compare with; namely BER and CCDF curves. This is true under the same bandwidth occupancy and channel characteristics. Two types of tested data have been used; randomly generated data and a practical data that have been extracted from a funded project entitled by ECEM. From the achieved simulation results, the work that is based on SAT shows promising results in reducing the PAPR effect reached up to 80% over the work in the literature and our previously published work. This means that this work gives an extra reduction up to 15% of our previously published work. However, this achievement will be under the cost of complexity. This penalty could be optimized by imposing the NN to the SAT work in order to enhance the wireless systems performance.

Keywords: --

243

Title: EMBEDDING MIXED-REALITY LABORATORIES INTO E-LEARNING SYSTEMS FOR ENGINEERING EDUCATION**Author: KASIM M. AL-AUBIDY and MUNTHER N. AL-TIKRITI, Published Year: 2013*****i-manager's Journal of Educational Technology, Vol. 9, No. 4*****Faculty: Faculty of Engineering**

Abstract: E-learning, virtual learning and mixed reality techniques are now a global integral part of the academic and educational systems. They provide easier access to educational opportunities to a very wide spectrum of individuals to pursue their educational and qualification objectives. These modern techniques have the potentials to improve the quality of the teaching and learning process and elevate its performance to higher standards. Furthermore, e-learning in conjunction with mixed reality techniques can reduce the cost of higher education at both institutional and individual learner levels. In this paper, the focus will be on teaching-learning of applied science such as engineering. These studies demand special requirements, such as acquiring specific technical skills and practices through training. In this paper is the explanation and design of remote laboratories in mixed-reality mode. Decision making and evaluation of performance using fuzzy logic will be embedded in the proposed design.

Keywords: E-learning, Engineering Education, Virtual Labs, Remote Labs, Mixed-Reality, Fuzzy Decision Making.

244

Title: Enhancing the Performance of OFDM Systems-Based PAPR Reduction**Author: Omar Daoud, Qadri Hamarsheh and Ahlam Damati, Published Year: 2016**
Journal of Circuits, Systems, and Signal Processing, 10

Faculty: Faculty of Engineering

Abstract: In this work a comparison has been made among different proposed algorithms in order to improve the performance of a power consumption wireless network. They are used to combat one of the Orthogonal Frequency Division Multiplexing (OFDM) technique drawbacks, which are considered as a key technique in enhancing the new era of wireless systems' quality of service (QoS). Therefore, three different propositions have been investigated and covered by this work and classified as; linear coding based, wavelet transformation based, PWM based. Furthermore, a MATLAB program has been run to check their performance and covers two different criteria; the curves of CCDF and the SER curves. This is in order to reduce the Peak-to-Average Power Ratio (PAPR) effect

Keywords: --

245 **Title:** Enhancing the Odd Peaks Detection in OFDM Systems Using Wavelet Transforms

Author: Ahlam Damati, Omar Daoud, and Qadri Hamarsheh, **Published Year:** 2016

International Journal Communications, Network, and System Science, 9

Faculty: Faculty of Engineering

Abstract: This work aims to study the effect of unwanted peaks and enhance the performance of wireless systems on the basis of tackling such peaks. A new proposition has been made based on wavelet transform method and its entropy. Signals with large peak-to-average power ratio (PAPR) will be examined such as the ones that is considered as the major Orthogonal Frequency Division Multiplexing (OFDM) systems drawbacks. Furthermore, a spatial diversity Multiple-Input Multiple-Output (MIMO) technology is used to overcome the complexity addition that could arise in our proposition. To draw the best performance of this work, a MATLAB simulation has been used; it is divided into three main stages, namely, MIMO-OFDM symbols' reconstruction based on wavelet transform, a predetermined thresholding formula, and finally, moving filter. This algorithm is called Peaks' detection based Entropy Wavelet Transform; PD-EWT. Based on the simulation, and under some constrains such as the bandwidth occupancy and the complexity structure of the transceivers, a peak detection ratio has been achieved and reaches around 0.85. Comparing with our previously published works, the PD-EWT enhances detection ratio for 0.25 more peaks

Keywords: --

246 **Title:** Wavelet Transformation method to allocate the OFDM signals peaks

Author: Omar Daoud, Qadri Hamarsheh and Ahlam Damati, **Published Year:** 2016
IEEE SSD'16, 13th International Multi-Conference on Systems, Signals & Devices, Germany

Faculty: Faculty of Engineering

Abstract: This work makes use of the entropy in order to propose a wavelet transformation algorithm to detect the odd peaks. Furthermore, this algorithm has been used to enhance the Orthogonal Frequency Division Multiplexing (OFDM) system performance based on combatting the peak-to-average power ratio (PAPR) problem. Three main stages are used to fulfill the process requirements; OFDM signal transformation based on the wavelet structure, thresholding process based on a predetermined criterion, and the filtration stage based on the moving filter. The proposed algorithm performance has been checked and validated not just numerically but also by a MATLAB conducted simulation. Furthermore, to check the simulation results, a comparison has been made to the literature; and shows

promising results under the same bandwidth occupancy and systems limitations

Keywords: --

247 **Title: OFDM Systems Performance Enhancement**

Author: Omar Daoud Qadri Hamarsheh and Ahlam Damati , **Published Year:** 2015
IEEE SSD'15, 12th International Multi-Conference on Systems, Signals & Devices,, Tunisia

Faculty: Faculty of Engineering

Abstract: In this work a comparison among different proposed algorithms has been done to check the performance improvements for current wireless technologies. Orthogonal Frequency Division Multiplexing (OFDM) technique is one of the main techniques that are used to enhance the quality of service (QoS) for beyond third generation (B3G) systems. This is in order to meet the rapidly increased demand of multimedia users. This comparison includes three previous propositions that were made to enhance the OFDM performance; work based on linear coding techniques, work based on wavelet transform and work based on PWM. All these propositions have been made to combat the effect of high Peak-to-Average Power Ratio (PAPR)

Keywords: --

248 **Title: Hard Decision-Based PWM for MIMO-OFDM radar**

Author: Omar Daoud, **Published Year:** 2015

Communications and Networks, 7

Faculty: Faculty of Engineering

Abstract: For the purpose of target localization, Multiple Input Multiple Output-Orthogonal Frequency Division Multiplexing (MIMO-OFDM) radar has been proposed. OFDM technique has been adopted in order to allow simultaneous transmission and reception of a set of multiple narrowband orthogonal signals at orthogonal frequencies. Although multi-carrier systems such as OFDM support high data rate applications, they do not only require linear amplification but also they complicate the power amplifiers design and increase power consumption. This is because of high peak-to-average power ratio (PAPR). In this work, a new proposition has been made based on the Pulse Width Modulation (PWM) to enhance the MIMO-OFDM radar systems' performance. In order to check the proposed systems performance and its validity, a numerical analysis and a MATLAB simulation have been conducted. Nevertheless of the system characteristics and under same bandwidth occupancy and system's specifications, the simulation results show that this work can reduce the PAPR values clearly and shows capable results over the ones in the literature

Keywords: --

249 **Title: Enhancing DVB-H BER based OFDM systems**

Author: Qadri Hamarsheh and Omar Daoud, **Published Year:** 2015

Journal of Communications technology and Electronics, 60

Faculty: Faculty of Engineering

Abstract: Due to the need for enhancing the wireless systems performance, a new technique, and over the last decades, has been imposed to such systems, namely Orthogonal Frequency Division Multiplexing (OFDM). In order to overcome one of the main OFDM drawbacks a new proposal has been investigated, which could limit the usage of such system in the nonlinear devices. Peak-to-Average Power Ratio (PAPR)

problem comes as a result of using Fast Fourier Transform (FFT) stage, where the input 2N signals and after the process could be added together in the same phase. In this algorithm some modifications have been made over a previously published, where the wavelet entropy understanding has been imposed to be the judge for the PAPR consideration. In the previous published work, when a wavelet technique was proposed to De-Noise OFDM symbols and Replace the high PAPR and named by DORP. This is attained by making use of an adaptive threshold to allocate the affected samples, which are amended according to the surrounding ones. In the Modified-DORP (M-DORP), the wavelet transform is used to reconstruct the affected OFDM symbol with PAPR based on their entropies. A MATLAB simulation has been made to verify and validate the numerical model that is derived to investigate the systems performance. Furthermore, the achieved results were compared to either our previously published work or to the work that found in the literature. However, the simulation results show BER systems improvement under the same systems' conditions, an additional transceivers complexity has been added. This will leave a space for further improvement in future. Furthermore, the M-DORP gives a noise immunity and verification rate up to 85%

Keywords: --

250 **Title: Wavelet Entropy algorithm to allocate the extreme power peaks in WiMax systems**

Author: Qadri Hamarsheh, Omar Daoud, and Saleh Saraireh, Published Year: 2014

International Journal of interactive Mobile Technologies, 8

Faculty: Faculty of Engineering

Abstract: This work proposes a solution to overcome the effect for one of the main drawbacks of these days' wireless systems, where Multiple-Input Multiple-Output (MIMO)-Orthogonal Frequency Division Multiplexing (OFDM) combinations has been used. High peak-to-average power ratio (PAPR) arises after the OFDM stage and reduces the performance of the used nonlinear devices. Therefore, a new stage has been imposed between the MIMO and OFDM block. It is based on the entropy meaning of the wavelet transformation to trigger a proposed thresholding criterion and reconstruct the OFDM signal. As a result, the probability of high PAPR appearance will be limited and reduced; a promising result over our recently published work has been conducted; 15-25% extra reduction. This work could be denoted by MIMO-OFDM based on Entropy Wavelet Transform (MO-EWT) systems. The MO-EWT validity has been checked based on either numerical analysis or conducted simulation based on MATLAB; where 80% improvement of reducing the high PAPR has been achieved over the literature. These results have been reached using the same environment conditions and at additional cost and complexity of the transceivers structure

Keywords: --

251 **Title: Wavelet Transform Basis to Detect the Odd Peaks**

Author: Ahlam Damati, Omar Daoud, and Qadri Hamarsheh, Published Year: 2014

”, IEEE SSD'14, 11th International Multi-Conference on Systems, Signals & Devices, Spain

Faculty: Faculty of Engineering

Abstract: The performance of wireless systems has been studied on the basis of tackling the unwanted peak. A wavelet transform method was used for this purpose. Specifically, this proposition has been applied to combat the large peak-to-average

power ratio (PAPR), which is one of the major Orthogonal Frequency Division Multiplexing (OFDM) system's drawbacks Furthermore, Multiple-Input Multiple-Output (MIMO) technology also imposed to enhance the wireless systems performance. To draw the best performance of this work, a MATLAB simulation has been used and it is divided into three main stages; MIMO-OFDM symbols' reconstruction based on wavelet transform, then a predetermined thresholding formula that is used, and finally, imposing moving filter. This algorithm is called Peaks' detection based Entropy Wavelet Transform; PDEWT. Moreover, a numerical analysis also used to check its validity. Based on our simulation and under some constrains such as the bandwidth occupancy and the complexity structure of the transceivers, a peak detection ratio has been achieved and reaches around 85%. Comparing to our previously published works, the PD-EWT enhances the detection ratio for 25% more peaks.

Keywords: --

252 **Title: MIMO-OFDM Systems Performance Enhancement Based Peaks Detection Algorithm**

Author: 15- Omar Daoud, Qadri Hamarsheh and Wael Al-Sawalmeh, Published Year: 2013

International Journal of interactive Mobile Technologies, 7

Faculty: Faculty of Engineering

Abstract: This work proposes a new algorithm to enhance the performance of the speaker verification over the communication systems based Multiple-Input Multiple-Output (MIMO) - Orthogonal Frequency Division Multiplexing (OFDM) techniques. The algorithm mainly tackles and overcomes the effect of the high Peak-to-Average Power Ratio problem that is found in OFDM systems, MIMO-OFDM combination has been developed to meet the rapidly increment in the users demand such as the ubiquitous transmission, imposing new multimedia applications and wireless services. In this algorithm, wavelets techniques have been used to denoise the affected OFDM symbol by high PAPR values. After that and based on adaptive threshold method the local maxima and minima will be determined and replaced by the average of them and their surrounding neighbors; Denoise OFDM and Replace PAPR (DORP). A system performance investigation process will be accomplished based on both of numerical method and MATLAB simulation. Moreover, a comparison has been made to check the validity of our proposition either with our previously published work or with the literature. Although, the achieved results show that the proposed work has lower PAPR values; an additional complexity has been added to transceiver's structure. Moreover, and as a result to the comparison with the conventional systems, the bit error rate (BER) performance has been improved for the same bandwidth occupancy. As a validity process a comparison has been made with the current values found in the literature and we have achieved around 30% PAPR extra reduction. That is in addition to around 90% verification rate and noise immunity.

Keywords: ---

253 **Title: OFDM Peak Detection Algorithm based on Wavelet Transform**

Author: Saleh S. Saraireh, Qadri J. Hamarsheh and Omar Daoud, Published Year: 2013

European Journal of Scientific Research, 101

Faculty: Faculty of Engineering

Abstract: This work proposes a new peak detection algorithm based on the entropy of the wavelet transforms. Moreover, this work has been applied to combat one of

the major Orthogonal Frequency Division Multiplexing (OFDM) system's drawbacks; namely peak-to-average power ratio (PAPR). The proposed algorithm is divided into three main stages; reconstruction based on wavelet transform, predetermined thresholding, and imposing moving filter. This algorithm is called OFDM system based Entropy Wavelet Transform (O-EWT). The O-EWT performance and validity have been checked based on a numerical analysis and a conducted simulation. As a comparison with the techniques found in the literature, O-EWT gives promising results reach to around 80% improvement for the same bandwidth occupancy, which is attained at the cost of introducing additional complexity to the transceiver's structure

Keywords: ---

254 **Title: Enhancing the BER of MIMO-OFDM Systems for Speaker Verification**
Author: Omar Daoud, Qadri Hamarsheh and Wael Al-Sawalmeh, Published Year: 2013

IEEE SSD'13, 10th International Multi-Conference on Systems, Signals & Devices, Tunisia

Faculty: Faculty of Engineering

Abstract: In this work a new algorithm has been proposed to improve the wireless systems that are compatible with the current new technologies. Therefore, Denoise Orthogonal Frequency Division Multiplexing (OFDM) symbols and Replace the high Peak-to-Average Power Ratio (PAPR); (DORP) has been modified. In DORP, wavelets techniques have been used to denoise the affected OFDM symbol by high PAPR values. After that and based on adaptive threshold method the local maxima and minima will be determined and replaced by the average of them and their surrounding neighbors. The algorithm mainly tackles and overcomes the effect of the high Peak-to-Average Power Ratio problem that is found in OFDM systems, MIMO-OFDM combination has been developed to meet the rapidly increment in the users demand such as the ubiquitous transmission, imposing new multimedia applications and wireless services. A system performance investigation process will be accomplished based on both of numerical method and MATLAB simulation. Moreover, a comparison has been made to check the validity of our proposition either with our previously published work or with the literature. Although, the achieved results show that the proposed work gives an improvement of the BER; an additional complexity has been added to transceiver's structure. Moreover, and as a result to the comparison with the conventional systems, the bit error rate (BER) performance has been improved for the same bandwidth occupancy. As a validity process a comparison has been made with the current values found in the literature and we have achieved around 27% PAPR extra reduction. That is in addition to around 81% verification rate and noise immunity

Keywords: ---

255 **Title: Coverage Planning in 3G Multimedia Networks Based on Walsh Coding**
Author: O. Al-Ani, O. Daoud, and Ibrahim N. Abu-Isbeih, Published Year: 2012
Transactions on Systems, Signals & Devices, Issues on Communications and Signal Processing, 7

Faculty: Faculty of Engineering

Abstract: Capacity in Wideband Code Multiple Access (WCDMA) systems is interference limited, it is also strongly linked with coverage. The greater the level of influx of users within the cell, the higher the interference and hence the lower the cell coverage becomes and vice versa. This is called Cell Breathing. In this paper a Walsh coding is used as a precoding stage to the Multiple-Input Multiple Output-

Orthogonal Frequency Division Multiplexing (MIMO-OFDM) system. The results of this work are compared with a conventional work that is based on convolutional coding. This is in order to check its fitness to the current system structure and the enhancement of the Eb/N0, which will directly result in a better cell coverage and continued reliable services for the area of the cell as the load increases. Based on the simulation results, Walsh coding shows a slight improvement of complementary cumulative distribution function (CCDF). As a consequence, the MIMO-OFDM systems' performance is improved comparing with the convolutionally coded MIMO-OFDM system. Thus, not only the Peak-to-Average Power Ratio (PAPR) is saved, but also the frequency spectrum efficiency is improved.

Keywords: ---

256 **Title: Enhancing The MIMO-OFDM Radar Systems Performance Using GA**
Author: O. Daoud, A. Damati and W. Al-Sawalmeh, Published Year: 2012
Transactions on Systems, Signals & Devices, Issues on Communications and Signal Processing, 7

Faculty: Faculty of Engineering

Abstract: This paper proposes a new peak-to-average power ratio (PAPR) reduction method for a multiple-input multiple-output (MIMO)-orthogonal frequency division multiplexing (OFDM) systems based on a genetic algorithm (GA). It has been introduced to be compatible with Radar systems, where the GA was used to optimize the MIMO-OFDM symbols in such way that could improve the system's performance. During this work, there was a comparison that has been stated among three systems; original radar system, radar system-based MIMO-OFDM and radar system-based MIMO-OFDM uses GA. Finally, a range of simulation results are provided to demonstrate the superiority of the proposed scheme, since it is showed an enhancement in the coverage distance besides reducing the PAPR effects.

Keywords: --

257 **Title: SPEAKER VERIFICATION OVER MIMO-OFDM SYSTEMS BASED ON AI**
Author: Omar Daoud, Qadri Hamarsheh and Wael Al-Sawalmeh, Published Year: 2012

International Journal of Computer and Communications, 6

Faculty: Faculty of Engineering

Abstract: In this work, an enhancement of a previously published work that tackles the use of automatic speaker verification (ASV) techniques in the Beyond Third generation (B3G) cellular systems has been proposed. The new proposition has been studied to overcome the effect of the Peak-to-Average Power Ratio (PAPR), which is a vital problem that found in the Orthogonal Frequency Division Multiplexing (OFDM) techniques, where a powerful combination between two main technologies; Multiple-Input Multiple-Output (MIMO) and OFDM has been developed to meet the rapidly increment in the users demand such as the ubiquitous transmission, imposing new multimedia applications and wireless services. The work space has been divided into three main areas; firstly, reducing the ASV complexity by selecting the weight of the text independent speakers based on Self-Organizing Map (WSOM) Neural Network (NNT), secondly, using the Eigen values/vector extracting features techniques as a pre-processing one to enhance the orthogonality, and finally proposing a new algorithm to combat the effect of the PAPR in the MIMO-OFDM systems. In this algorithm, wavelets techniques have been used to Denoise the affected OFDM symbol by high PAPR values. After that and based on adaptive threshold method the local maxima and minima will be determined and replaced by the average of them and their surrounding neighbors; Denoise OFDM and Replace PAPR (DORP). A

system performance investigation process will be accomplished based on both of numerical method and MATLAB simulation. Moreover, a comparison has been made to check the validity of our proposition with our previously published work. Although, the achieved results show that the proposed work has lower PAPR values; an additional complexity has been added to transceiver's structure. Moreover, and as a result to the comparison with the conventional systems, the bit error rate (BER) performance has been improved for the same bandwidth occupancy. Our simulation results showed that around 28% extra reduction in PAPR over current values in the literature, it can be achieved depending on the system type. Moreover, two different investigation and verifications techniques have been used in this work; Gaussian mixture model based method (GMMWPE) and K-Means clustering based method (KMWPE). A promising verifications result has been showed for verifications rate; around 91% and for noise immunity.

Keywords: ---

258 **Title: WIRELESS CELLULAR SYSTEMS PERFORMANCE IMPROVEMENT BASED ON NEURAL NETWORK**

Author: Omar Daoud and Mohammed Mahdi, Published Year: 2012

International Journal of Communications, 6

Faculty: Faculty of Engineering

Abstract: In this paper, a neural network (NN) part has been imposed to overcome a previously mitigated drawback that is found in Orthogonal Frequency Division Multiplex technology (OFDM) systems. In the learning process we make use of the results obtained from the previously published work to reduce the Peak to Average Power Ratio (PAPR) problem based on different linear coding techniques. The proposed technique shows that an improvement in the OFDM technology performance has been achieved based on reducing the system's complexity. Moreover, the reduction percentage of the PAPR compared to the previously published one; which combats the PAPR based on Low Density Parity Check (LDPC), turbo coding and convolutional coding has been attained exactly. Our simulation results show that 15% reduction in PAPR over current values in the literature can be achieved depending on the system's type. This is in addition to that the use of NN reduces the overall OFDM system's complexity. This is because that in the proposed technique the system does not need to send extra data to recombine the processed OFDM symbols at the receiver side. Thus, the performance improvement could be attained.

Keywords: ---

259 **Title: POWER CONVERSION ENHANCEMENT OF CDS/CDTE SOLAR CELL INTERCONNECTED WITH TUNNEL DIODE**

Author: Wagah Mohammed, Omar Daoud and Munther Al-Tikriti, Published Year: 2012

Circuits and Systems, 3

Faculty: Faculty of Engineering

Abstract: One of the most promising solar cell devices is cadmium telluride (CdTe) based. These cells however, have their own problems of stability and degradation in efficiency. Measurements show that CdS/CdTe solar cell has high series resistance which degrades the performance of solar cell energy conversion. Both active layers (CdS and CdTe) had been fabricated by thermal evaporation and tested individually. It was found that CdS window layer of 300 nm have the lowest series resistance with maximum light absorption. While 5 - 7 μm CdTe absorber layer absorbed more than 90% of the incident light with minimum series resistance. A complete CdS/CdTe solar

cell was fabricated and tested. It was found that deposited cell without heat treatment shows that the short circuit current increment decreases as the light intensity increases. This type of deposited cell has low conversion efficiency. The energy conversion efficiency was improved by heat treatment, depositing heavily doped layer at the back of the cell and minimizing the contact resistivity by depositing material with resistivity less than $1 \text{ m}\Omega\text{cm}^2$. All these modifications were not enough because the back contact is non-ohmic. Tunnel diode of CdTe (p++)/CdS (n++) was deposited in the back of the cell. The energy conversion efficiency was improved by more than 7%.

Keywords: ---

260 **Title: Performance Improvement of wavelet packet transform over fast Fourier transform in Multiple-Input Multiple-Output Orthogonal Frequency Division Multiplexing systems**

Author: O. Daoud, **Published Year:** 2012

IET Communications, 6

Faculty: Faculty of Engineering

Abstract: This study presents a proper way to improve the multiple-input multiple-output orthogonal frequency division multiplexing (OFDM) system by proposing a new tackling method to reduce the peak-to-average power ratio (PAPR). It is attained by reconstructing the fast Fourier transform block in the OFDM based on the wavelet packet transform, called forward wavelet frequency division multiplexing. In addition, a new pre-processing technique has been introduced to increase the orthogonality among the tested data which is based on imposing the eigenvalues/eigenvector extracting features. Numerical and simulation results show that the combination between the new structure of OFDM transceivers and the pre-processing block has lower PAPR values. It is compared with the conventional OFDM structures and showed that the bit error rate performance has been improved for the same bandwidth occupancy, which is attained at the cost of introducing additional complexity to the transceiver's structure. The simulation results show that 6'60' reduction in PAPR over current values in the literature can be achieved depending on the system type.

Keywords: ---

261 **Title: OPTICAL OFDM QoS IMPROVEMENT BASED ON WAVELET PACKET TRANSFORM**

Author: O. Daoud and A. Damati, **Published Year:** 2012

IEEE SSD'12, 9th International Multi-Conference on Systems, Signals & Devices, gERMANY

Faculty: Faculty of Engineering

Abstract: An optical Orthogonal Frequency Division Multiplexing (OFDM) has been proposed based on Wavelet packet transform (WF-O-FDM). In this paper, a performance investigation has been made to check the validity of the proposed work. This investigation has been made based on two crucial factors, BER and the Complementary Cumulative Distribution Function (CCDF). A MATLAB based simulation has been taking over to examine this performance and to compare it with conventional OFDM that is based on FFT. The extracted results show that the WF-O-FDM depicts an improvement of the BER for the same optical bandwidth occupancy, while the Peak to Average Power Ratio (PAPR) values has been reduced for about 85% compared with the conventional one.

Keywords: ---

262

Title: SELF-ORGANIZING MAP WEIGHTS AND WAVELET PACKET ENTROPY FOR SPEAKER VERIFICATION**Author: K.Daqrouq, A. Al-Qawasmi, O. Daoud and W. Al-Sawalmeh, Published Year: 2012****INTERNATIONAL JOURNAL OF CIRCUITS, SYSTEMS AND SIGNAL PROCESSING, 6****Faculty: Faculty of Engineering**

Abstract: With the growing trend toward distant security verification systems for telephone banking, biometric security measures and other remote access applications, Automatic Speaker Verification (ASV) has attracted a great attention in recent years. The complexity of ASV system and its verification time depends on the number of feature vector elements. Therefore, in this paper, we concentrate on optimizing dimensionality of feature space by selecting the weights of Self-Organizing Map (WSOM) Neural Network (NNT) for text-independent speaker verification system. This is accomplished by decreasing the number of feature vector elements of individual speaker obtained by using wavelet packet (WP) Shannon, Sure, and log energy in conjunction with energy indices (1020 elements) to 64 elements by WSOM. To investigate the performance of the proposed WSOM and wavelet packet entropies (SOMWPE) method, two other verification methods are proposed: Gaussian mixture model based method (GMMWPE) and K-Means clustering based method (KMWPE). The results indicated that a better verification rate for the speaker-speaker system was accomplished by SOMWPE. Better result was achieved (94.34%) in case of the speaker-imposter verification system. In case of white Gaussian noise (AWGN), it was observed that the SOMWPE system is generally more noise-robust than GMMWPE and KMWPE systems.

Keywords: ---

263

Title: THE USE OF WAVELET ENTROPY IN CONJUNCTION WITH NEURAL NETWORK FOR ARABIC VOWELS RECOGNITION**Author: W. Al-Sawalmeh, K. Daqrouq and O. Daoud, Published Year: 2011****WESEAS Transaction on Signal Processing, 7****Faculty: Faculty of Engineering**

Abstract: In this research paper, Arabic vowels recognition system using very promising techniques; wavelet packet transform (WT) with entropy and neural network was presented. Trying to enhance the recognition process, three types of entropies were applied for the wavelet packet (WP) of the speech signals. Moreover, different levels of WP were used in order to enhance the efficiency of the proposed work until level 7. To classify among the feature vectors; a probabilistic neural network (PNN) were used. A MATLAB program was used to build the model of the proposed work to show the powerfulness of 96.77% identification rate. This is due to that the functions of features extraction and classifications are performed using the entropy, wavelet packet and neural networks.

Keywords: ---

264

Title: WAVELET ENTROPY AND PROBABILISTIC NEURAL NETWORK FOR ARABIC VOWELS RECOGNITION**Author: W. Al-Sawalmeh, K. Daqrouq and O. Daoud, Published Year: 2011****the 7th Jordanian International Electrical and Electronics Engineering Conference Proceedings (JIEEE), , Jordan****Faculty: Faculty of Engineering**

Abstract: This work tackles the arabic vowels recognition using very promising technique; wavelet packet transform (WPT)with entropy and neural network. Trying

to enhance the recognition process, three types of entropies were applied for the wavelet packet (WP) of the speech signals. Moreover, different levels of WP were used in level 7. To classify among the feature vectors; a probabilistic neural networks (PNN) were used. A MATLAB program is used to build the model of the proposed work to show the powerfulness of 96.77% identification rate. This is due to that the function of feature extraction and classifications are performed using the entropy, wavelet packet and neural networks.

Keywords: ---

265

Title: IMPROVING THE OFDM-BASED DVB-T SYSTEMS PERFORMANCE

Author: O. Daoud and Abdel Rahman Qawasmj, Published Year: 2010

Transactions on Systems, Signals & Devices, Issues on Communications and Signal Processing, 5

Faculty: Faculty of Engineering

Abstract: This paper proposes a new peak-to-average power ratio (PAPR) reduction method for a multiple-input multiple-output (MIMO)-orthogonal frequency division multiplexing (OFDM) systems based on a genetic algorithm (GA). In this proposition we have combined a previously published work with the genetic algorithm to enhance both of the PAPR reduction ratios and computational load that are found in the literature. During this work, there was a comparison that has been stated among three techniques that were proposed to overcome the PAPR drawback; original Partial Transmit Sequence (PTS) technique, previously published work based on the linear coding and a modified version that combines the linear coding with GA. Finally, a range of simulation results are provided to demonstrate the superiority of the proposed scheme.

Keywords: ---

266

Title: Evaluating the NGN Performance based on Duplicate Transmission of Voice Packets

Author: Mousa Al-Akhras and O. Daoud, Published Year: 2010

”, IEEE SSD’10, 7th International Multi-Conference on Systems, Signals & Devices, Jordan

Faculty: Faculty of Engineering

Abstract: Capacity in Wideband Code Multiple Access (WCDMA) systems is interference limited, it is also strongly linked with coverage. The greater the level of influx of users within the cell, the higher the interference and hence the lower the cell coverage becomes and vice versa. This is called Cell Breathing. In this paper a Walsh coding is used as a precoding stage to the Multiple-Input Multiple Output-Orthogonal Frequency Division Multiplexing (MIMO-OFDM) system. The results of this work are compared with a conventional work that is based on convolutional coding. This is in order to check its fitness to the current system structure and the enhancement of the Eb/No, which will directly result in a better cell coverage and continued reliable services for the area of the cell as the load increases. Based on the simulation results, Walsh coding shows a slight improvement of complementary cumulative distribution function (CCDF). As a consequence, the MIMO-OFDM systems’ performance is improved comparing with the convolutionally coded MIMO-OFDM system. Thus, not only the Peak-to-Average Power Ratio (PAPR) is saved, but also the frequency spectrum efficiency is improved.

Keywords: ---

267 **Title: An Investigation of Speech Enhancement Using Wavelet Filtering Method**
Author: Khaled Daqrouq, Ibrahim N. Abu-Isbeih, Omar Daoud & Emad F. Khalaf,,
Published Year: 2010
International Journal of Speech Technology (IJST), 13
Faculty: Faculty of Engineering
Abstract: In The robustness to noise in speaker identification systems is improved by applying Continuous Wavelet Transform (CWT). In this work, essential speaker features are used to investigate the identification accuracy in non-stationary signals. These features are extracted using Mel Frequency Cepstral Coefficients (MFCC) and CWT for speech signals. In order to classify extracted features, a Feed Forward Back Propagation Neural Network (FFBNN) is imposed, since it gives better classification accuracy over conventional methods. A simulation program used to test the performance of the proposed method at certain level of SNR (-6dB), showed a classification ratio equal to 99.7%.
Keywords: --

268 **Title: Speaker Identification System-Based Mel Frequency and Wavelet Transform using Neural Network**
Author: Wael Al-Sawalmeh, K. Daqrouq, O. Daoud, and Abdel Rahman Qawasmi ,
Published Year: 2010
European Journal of Scientific Research, 41
Faculty: Faculty of Engineering
Abstract: In this paper, the Orthogonal Frequency Division Multiplexing- Free Access Technique (OFDM-FAT) system's performance is checked over two different channels using Gold sequenced input data. This performance is checked through the BER investigation of an OFDM system-based BPSK and 16QAM modulation techniques. The overall system is simulated to analyze the system's performance.
Keywords: ---

269 **Title: An OFDM Free Access Technique Using Gold Sequence**
Author: Abdel Rahman Qawasmi and O. Daoud, Published Year: 2009
European Journal of Scientific Research, 37
Faculty: Faculty of Engineering
Abstract: This paper suggests a new approach for speaker feature extraction, based on experimental and the theoretical approaches that addressed this issue. A combination between the Discrete Wavelet Transform (DWT) and logarithmic Power Spectrum Density (PSD) is used (which illustrates the speaker formants), where Approximation DWT sub-signals that represent a low pass filter is utilized. The approximation sub-signals indicate low frequency signal levels. Taking in consideration that the speaker features are in low frequency, this approach proposes a more efficient method in speaker recognition rate, i.e., higher accuracy. K-means algorithm is proposed for features classification. Instead of conventional methods, that calculate the distances between points and centroid to locate each class, and to label a speaker, this paper proposes a new method, that utilizes the average of sums of point-to-centroid distances in the 1-by-K vector. Ultimately, the attained results show considered performance in classification, which reaches about 94% classification rate.
Keywords: ---

270 **Title: K-means Clustering Algorithm for Wavelet Transform Speaker**

Identification System

Author: *K. Daqrouq, Emad Khalaf, O. Daoud, and A. Al-Qawasmi, Published Year: 2009*

Third Mosharaka International Conference on Communications, Signals and Coding (MIC-CSC2009), Jordan

Faculty: *Faculty of Engineering*

Abstract: This work investigates to improve the robustness of the speaker identification systems based on a modified version of Principal Component Analysis (PCA) and Continuous Wavelet Transform (CWT). Therefore, this work proposes a robust feature extraction method based on MPCA instead of Mel Frequency Cepstral Coefficient (MFCC) that is used in the literature, which is based on converting the common Eigen matrix from two dimensional into a one dimensional one. A simulation program has been built to proof the given mathematical model for the proposed work. At a certain SNR level of the CWT (6dB) the achieved improvement in the classification process was approximately 7.3% (85-92.3%) over the previously published work that was based on the MFCC with CWT.

Keywords: ---

271

Title: Modified PCA Speaker Identification Based System Using Wavelet Transform and Neural Networks

Author: *O. Daoud, Abdel Rahman Qawasmi, and Khalid daqrouq, Published Year: 2009*

International Journal of Recent Trends in Engineering, 2

Faculty: *Faculty of Engineering*

Abstract: In this paper, a predistortion neural network (PDNN) architecture has been imposed to the Sniffer Mobile Robot (SNFRbot) that is based on spatial multiplexed wireless Orthogonal Frequency Division Multiplexing (OFDM) transmission technology. This proposal is used to improve system performance by combating one of the main drawbacks that is encountered by OFDM technology; Peak-to-Average Power Ratio (PAPR). Simulation results show that using PDNN resulted in better PAPR performance than the previously published work that is based on linear coding, such as Low Density Parity Check (LDPC) codes and turbo encoding whether using flat fading channel or a Doppler spread channel.

Keywords: ---

272

Title: MIMO-OFDM -Based Robotic Mobile System performance analysis

Author: *O. Daoud and O. Al-ani, Published Year: 2009*

International Journal of interactive Mobile Technologies, 3

Faculty: *Faculty of Engineering*

Abstract: A Low-Density-Parity Check (LDPC) encoder design is presented to effectively reducing Peak to Average Power Ratio (PAPR) problem in Orthogonal Frequency Division Multiplex technology (OFDM) which is the one behind modern handheld television. In addition the Multiple-Input Multiple-Output (MIMO) antennas technology is implemented to solve reception problem, and to further improve the performance of the system. This paper shows that the efficiency of the previously published PAPR reduction techniques has improved when using a powerful error correcting codes. Two different linear codes have been used to examine MIMO-OFDM systems performance; low density parity check (LDPC) and convolutional encoding. The proposed technique shows reduced PAPR compared to the previously proposed techniques which combat the PAPR, such as Selective mapping, Golay sequences, Cyclic coding, clipping and filtering; and multiple signal representation. Our simulation results show that 70% reduction in PAPR over current values in the

literature can be achieved depending on the system type. Moreover, the designed LDPC shows a performance near to that of the Quasi-cyclic LDPC codes in the literature.

Keywords: DOI: 10.3991/ijim.v3s2.923

273 **Title: PAPR Reduction by Linear Coding Techniques for MIMO-OFDM System's Performance Improvement: Simulation and Hardware Implementation**

Author: O. Daoud and O. Al-ani, Published Year: 2009

The European Journal of Scientific Research, 36

Faculty: Faculty of Engineering

Abstract: European terrestrial digital video broadcasting (DVB-T) standard has been launched based on the well known modulation technique; Orthogonal Frequency Division Multiplexing (OFDM), which when used in conjunction with channel coding is known as COFDM. This paper will show the efficiency of COFDM in different DVB-T environments based on a compliant DVB-T simulation. An efficiency performance study of COFDM systems-based DVB-T over three different channels has introduced. During this study, there were two different channel coding schemes used with two different coding rates, in addition to the use of two different modulation techniques. Also, using a strong modulation technique, such as 16QAM, will show better performance than the less power ones, such as the QPSK.

Keywords: ---

274 **Title: MIMO-OFDM System's Performance Using LDPC Codes for a Mobile Robot**

Author: O. Daoud and O. Al-ani, Published Year: 2009

The First International ICST Conference on Communications Infrastructure, Systems and Applications in Europe, EuropeComm09, UK

Faculty: Faculty of Engineering

Abstract: This work deals with the performance of a Sniffer Mobile Robot (SNFRbot)-based spatial multiplexed wireless Orthogonal Frequency Division Multiplexing (OFDM) transmission technology. The use of Multi-Input Multi-Output (MIMO)-OFDM technology increases the wireless transmission rate without increasing transmission power or bandwidth. A generic multilayer architecture of the SNFRbot is proposed with low power and low cost. Some experimental results are presented and show the efficiency of sniffing deadly gazes, sensing high temperatures and sending live videos of the monitored situation. Moreover, simulation results show the achieved performance by tackling the Peak-to-Average Power Ratio (PAPR) problem of the used technology using Low Density Parity Check (LDPC) codes; and the effect of combating the PAPR on the bit error rate (BER) and the signal to noise ratio (SNR) over a Doppler spread channel.

Keywords: DOI: http://dx.doi.org/10.1007/978-3-642-11284-3_9

275 **Title: Efficient Performance of COFDM-Based DVB-T**

Author: O. Daoud and Abdel Rahman Qawasmi, Published Year: 2009

IEEE SSD'09, 6th International Multi-Conference on Systems, Signals & Devices,, Tunisia

Faculty: Faculty of Engineering

Abstract: European terrestrial digital video broadcasting (DVB-T) standard has been launched based on the well known modulation technique; Orthogonal Frequency Division Multiplexing (OFDM), which when used in conjunction with channel coding is known as COFDM. This paper will show the efficiency of COFDM in different DVB-T

environments based on a compliant DVB-T simulation. An efficiency performance study of COFDM systems-based DVB-T over three different channels has introduced. During this study, there were two different channel coding schemes used with two different coding rates, in addition to the use of two different modulation techniques. Also, using a strong modulation technique, such as 16QAM, will show better performance than the less power ones, such as the QPSK.

Keywords: DOI: 10.1109/SSD.2009.4956809

276

Title: Peak to Average Power Ratio Reduction Technique for MIMO/OFDM Systems

Author: O. Daoud and O. Al-ani, Published Year: 2009

International Journal of Mobile Communications, 7

Faculty: Faculty of Engineering

Abstract: Convolutional coding has been classically used in channel coding to provide forward Error Correction (FEC) capability to the system by adding some carefully designed redundant information to the data being transmitted through the channel. However, in this work, we use convolutional codes for a different purpose: the reduction of the Peak-to-Average Power Ratio (PAPR) in an Orthogonal Frequency Division Multiplexing (OFDM) system by utilizing these codes as spreading codes. This is an alternative to turbo coding and Low-Density Parity Check (LDPC) codes, which have been used for the same purpose in our previous works. The PAPR is a major drawback in most multicarrier communication techniques such as OFDM. OFDM consists of lots of independent modulated subcarriers; as a result, the amplitude of such a signal can have very large values. These large peaks increase the amount of intermodulation distortion, resulting in an increase in the error rate. The PAPR of an OFDM signal can be reduced in several ways: Selective Mapping (SLM), Golay sequences, cyclic coding, clipping and filtering and multiple signal representation techniques. Our results show that using LDPC coding in mitigating PAPR led to a 6%–60% reduction in this ratio, which is better than our proposed work based on either turbo coding or convolutional coding and the SLM and clipping techniques in the literature.

Keywords: DOI: <http://dx.doi.org/10.1504/IJMC.2009.025535>

277

Title: Use of LDPC to improve the MIMO-OFDM systems performance

Author: O. Daoud, Published Year: 2008

IEEE SSD'08, 5th International Multi-Conference on Systems, Signals & Devices, Jordan

Faculty: Faculty of Engineering

Abstract: evolution of the mobile telephony, However it suffers from Peak to Average Power Ratio (PAPR). It is a problem for broadcast engineers in many different applications. Non-linearities can cause severe out-of-band radiation when confronted with high PAPRs. Previous work has shown that the application of coding just before the transmission frontend can help alleviate this effect. This paper presents a design for a Low Density Parity Check (LDPC) code that achieves a good error correction performance and is used to lower the PAPR in a Multiple Input Multiple Output Orthogonal Frequency Division Multiplex System. The paper will detail the results of software simulations, verified through hardware simulations that show that further reductions in PAPR can be achieved over previous work in this field. Finally, this paper will show that PAPR reduction can be achieved by employing LDPC coding prior to Modulation.

Keywords: DOI: 10.1109/SSD.2008.4632778

278 **Title: Improving MIMO-OFDM-based DVB-H systems performance using LDPC codes**

Author: O. Daoud and S. Linfoot, Published Year: 2008

**ISCE 2008, IEEE International Symposium on Consumer Electronics, Portugal
Faculty: Faculty of Engineering**

Abstract: Handheld devices are becoming more and more popular across the world although there are often still reception problems. To solve these reception issues, technology such as multiple antenna systems are being investigated. One drawback to such systems is that of Peak to Average Power Ratio – an effect where out of band radiation can cause distortions in the transmitted stream especially where combined with Orthogonal Frequency Division Multiplex (the technology behind modern hand-held television). This paper will show that by combining powerful error correction coding (in this case the low density parity check), it is possible to lower the peak to average power ratio with minimal increase in complexity.

Keywords: DOI: [10.1109/ISCE.2008.4559560](https://doi.org/10.1109/ISCE.2008.4559560)

279 **Title: A new Turbo Coding Approach to reduce the Peak-to-Average Power Ratio of a Multi-Antenna-OFDM**

Author: M Al-Akaidi, O. Daoud, and S. Linfoot, Published Year: 2007

**International Journal of Mobile Communications, 5
Faculty: Faculty of Engineering**

Abstract: A systematic procedure for a new approach to reducing the high Peak-to-Average Power Ratio (PAPR) of OFDM using Turbo Coding is described in this paper. Part of the produced symbol from the turbo coding process with low PAPR is sent instead of the original OFDM symbol, whilst the rest is sent through different antenna(s). This technique can support different types of modulation and coding techniques, and offers better results in both the CCDF and the BER than the conventional techniques currently proposed for this purpose, such as the clipping technique and the PTS technique, which presented by computer simulations.

Keywords: DOI: <http://dx.doi.org/10.1504/IJMC.2007.012399>

280 **Title: Reducing the Peak-to-Average Power Ratio Using Turbo Coding**

Author: M Al-Akaidi and O. Daoud, Published Year: 2006

**IEE Proceeding Communications, 153
Faculty: Faculty of Engineering**

Abstract: Due to the susceptibility to the peak-to-average power ratio (PAPR) on the Orthogonal Frequency Division Multiplexing (OFDM) systems, we introduce a novel approach based on Turbo Coding to improve OFDM (PAPR) performance. In this work, we show that our technique is still applicable even when different types of modulation methods and coding rates are used. Moreover, it gives better performance comparing to the conventional techniques currently in use (such as the clipping technique and the Partial Transmit Sequence (PTS) technique).

Keywords: DOI: [10.1049/ip-com:20060061](https://doi.org/10.1049/ip-com:20060061)

281 **Title: MIMO-OFDM-based DVB-H systems: A Hardware design for a PAPR reducing technique**

Author: M Al-Akaidi, O. Daoud, and J. Gow, Published Year: 2006

**IEEE Transaction on Consumer Electronics, 52
Faculty: Faculty of Engineering**

Abstract: Digital Video Broadcasting—Handheld (DVB-H) is the technology driving

mobile TV, which uses Orthogonal Frequency Division Multiplexing (OFDM) systems with Multiple-Input Multiple-Output technology (MIMO). These mobile communication systems have a promising future of supporting high data rate transmissions for both video and data. However, since the OFDM systems are sensitive to the peak-to-average power ratio (PAPR) problem, this work proposes a new technique (Novel Technique to Reduce the PAPR based on Turbo coding (NTRPT)), based on the turbo encoding technology, to reduce the PAPR effects for MIMO-OFDM-based DVB-H systems. This technique has been implemented and validated in hardware. It can support different types of modulation and coding techniques, and offers better results in reducing the PAPR than the conventional techniques currently proposed for this purpose, such as the clipping technique and the Partial Transmit Sequence (PTS) technique, presented here using computer simulations.

Keywords: DOI: 10.1109/TCE.2006.273134

282 **Title: MIMO-OFDM channel modeling and performance**

Author: O. Daoud, M Al-Akaidi and J. Ivins, *Published Year: 2006*

", the 8th International Middle Eastern Multiconference on Simulation and Modelling (MESM2006), , Egypt

Faculty: Faculty of Engineering

Abstract: This paper presents a systematic derivation of the channel capacity of MIMO channel to help in understanding the effect of spatial multiplexing on the MIMO channel, such as reducing the capacity and the BER, if spatial correlation is high. This effect will be found for some of the Space Division Multiplexing (SDM) algorithms, namely, Zero Forcing (ZF) and Minimum Mean-Square Error (MMSE).

Keywords: ---

283 **Title: The Capability of Reducing the PAPR by Turbo Coding**

Author: O. Daoud, M Al-Akaidi and J. Ivins, *Published Year: 2005*

the 7th International Middle Eastern Multiconference on Simulation and Modelling (MESM2005), Portugal

Faculty: Faculty of Engineering

Abstract: This paper presents an new algorithm for reduction the Peak-to- Average power Ration (PAPR) through the joint use of turbo coding and choosing the combination of the bits that gives the best reduction for the PAPR. Indeed, the new technique shows that the PAPR can be reduced in spite of the changing of different system parameters, such as, the mapping techniques and the MIMO encoders.

Keywords: ---

284 **Title: Performance Analysis of OFDM by optimizing PAPR**

Author: O. Daoud, M Al-Akaidi and J. Ivins, *Published Year: 2005*

6th International Conference on 3G and Beyond (3G2005), The IEE Savoy Palace, UK

Faculty: Faculty of Engineering

Abstract: This paper proposes an new technique to optimize the PAPR. It is based on increasing the OFDM symbol period by using a coding technique and then transforming the encoded symbol to be in parallel blocks. One of these blocks, which contain the lowest PAPR, will join the original signal, while the others will be sent as extra information. This information will be extracted in the receiver to recover the original symbol. Mathematical calculations show that increasing Orthogonal Frequency Division Multiplexing (OFDM) symbol period can reduce the Peak to

Average Power Ratio (PAPR) OF ORTHOGONAL FREQUENCY DIVISION MULTIPLEXED SIGNALS. This benefit is achieved due to the inverse relationship between the total number of subcarriers and the PAPR.

Keywords: ----

285 **Title: Improving the QoS for the 3rdG and Beyond Systems**

Author: O. Daoud and M Al-Akaidi, Published Year: 2004

London Communications Symposium (LCS2004),, University of College London, London, UK

Faculty: Faculty of Engineering

Abstract: Many generations have been developed and still a big challenge for the researcher to meet the Quality of service (QoS) in different applications. As the demand to meet the QoS of high-quality multimedia application is increasing, the development of the future generation (4G) wireless and mobile communication systems must be based on powerful technologies. To meet the 4G robustness while we trying to increase the Bandwidth (BW). The use of Orthogonal Frequency Division Multiplexing (OFDM) permits an efficient use of the BW by allowing overlapping between the orthogonal subcarriers. It decreases the cost of the equalization techniques by enabling it in the frequency domain, and combats the effect of multipath channels by dividing the whole channel into a lot of flat subchannels. The use of Multi-Input Multi-Output (MIMO) provides a spatial diversity in the fading environments. So it can be based on the combination of the OFDM, and MIMO systems. This paper we will illustrate the main features for the above two systems, and mentioned the main problem that faces the researchers and the proper techniques that are used to solve these problems

Keywords: ---

286 **Title: Reducing PAPR by Utilization of LDPC CODE**

Author: O. Daoud and O. Al-ani, Published Year: 2009

IET Communication Proceedings, 3

Faculty: Faculty of Engineering

Abstract: Peak to Average Power Ratio (PAPR) is a major drawback in most multi-carrier communication techniques such as Orthogonal Frequency Division Multiplex System. OFDM consists of lots of independent modulated subcarriers, as a result the amplitude of such a signal can have very large values. These large peaks increase the amount of intermodulation distortion resulting in an increase in the error rate. The PAPR of an OFDM signal can be reduced in several ways. Selective mapping Golay sequences, Cyclic coding, clipping and filtering and multiple signal representation techniques. In this work we improve the performance of the OFDM system by using Low Density Parity Check codes as an alternative to turbo coding in mitigating the PAPR problem which has been used in our pervious works. We present the design for the proposed (LDPC) code technique that achieves good error correction performance and is used to lower the PAPR in a Multiple Input Multiple Output OFDM System. Our simulation results show that 6-60 reduction in PAPR over current values in the literature can be achieved depending on the system type.

Keywords: DOI: 10.1049/iet-com.2008.0344

287 **Title: Enhancing the Performance of Speaker Verifications-Based DVB-T Systems**

Author: Omar Daoud, Qadri Hamarsheh and Ahlam Damati , Published Year:

2017

14th International Multi-Conference on Systems, Signals & Devices, Morocco
Faculty: Faculty of Engineering

Abstract: Terrestrial Digital Video Broadcasting (DVB-T) is considered as one of the main two popular broadcasting standards, which facilitates the transmission of digital television in handheld receivers. In this work, a comparison will be held to enhance the mobile communications performance. This work aims to reduce the effect of a major problem found in the Orthogonal Frequency Division Multiplexing (OFDM) technique, namely Peak-to-Average Power Ratio (PAPR) problem; one of the main drawbacks of. Two main factors will be the main factor of this comparison; BER curves and CCDF curves. This work combined three different stages together; wavelet transformation in order to remove the noise from the signal; a globally statistical adaptive detecting algorithm; and replacing the affected peaks with a moving average filter process. At the same bandwidth occupancy of the speaker verification-based systems, the simulation has been run and shows additional enhancement in both of CCDF and BER curves; an extra 15% reduction is achieved in the essence of PAPR and around 25% extra noise immunity

Keywords: --

288

Title: Weighted parametric model identification of induction motors with variable loads using FNN structure and NN2TF algorithm

Author: Tarek A. Tutunji, Published Year: 2017

Faculty: Faculty of Engineering

Abstract: Induction motors exhibit nonlinear behavior and are difficult to model. Furthermore, load disparities cause speed variations and therefore predicting the motor's response is challenging. In this paper, Feedforward Neural Networks (FNN) are used to model induction motors at two load levels (i.e. no-load and full-load). The two FNN models are then transformed into Auto-Regressive Moving-Average (ARMA) models using a new NN2TF algorithm. A weighted parametric model is then formulated by combining both ARMA models to provide appropriate transfer functions at different loads ranging from no-load to full-load. In order to validate the developed model, experimental data (with voltage/speed as input/output) is collected from an induction motor plant at five different load levels and used to test the proposed model. Simulation results show that the estimated model produce dynamic responses that follow the experimental data with good accuracy, regardless of the load.

Keywords: System identification; ARMA models; Neural networks; Robust design; Induction motors

289

Title: The Effectiveness of CDMA and TDMA using Spread Spectrum Digital Communication Systems with M-ary FSK

Author: Abdel-Rahman Al-Qawasmi & Ibrahim N. Abu-Isbeih, Published Year: 2008

i-manager's Journal on Future Engineering & Technology, 3 (2)

Faculty: Faculty of Engineering

Abstract: In this paper the effectiveness of code division multiple access (CDMA) and time division multiple access (TDMA) multiplexing using M-ary Frequency Shift Keying (MFSK) is considered. The approach is based on the comparison between these two types by calculating the bit rate, noise immunity and the transmitted power of Digital Communication System (DCS). The use of Wide-band CDMA instead of TDMA in Spread Spectrum Digital Communication Systems (SSDCS) using Spread Spectrum Signals (SSS) increases the bit rate and decreases the noise immunity of the system. This decrease can be compensated by increasing the transmitted power

(signal –to- noise ratio, SNR).

Keywords: Effectiveness, Spread Spectrum System, CDMA and TDMA Transmissions, Transmitted Power, Noise Immunity

290

Title: Speaker Identification Wavelet Transform Based Method

Author: Ibrahim N. Abu-Isbeih, Khaled Daqrouq, Wael Al-Sawalmeh & Abdel-Rahman Al-Qawasmi, **Published Year: 2008**

5th International Multi-Conference on Systems, Signals Devices, SSD'08, Amman, Jordan

Faculty: Faculty of Engineering

Abstract: One of the most important signal processing method in Digital Signal Processing discipline is Speaker Identification Method (SIM). Because of the difficult nature of speech signals and their fast variation with time, the wavelet transform is used to reduce the complexity of such signals. In this paper two identification methods are presented based on Continuous Wavelet Transform CWT. The first method is the male and female identification method and the second is the SIM. The obtained results showed a high recognition rate about 98%, which makes the speaker identification wavelet transform based method to be very important in digital security systems applications.

Keywords: Continuous wavelet transforms, Wavelet transforms, Discrete wavelet transforms, Transforms, Speech, Approximation methods, Speaker recognition

291

Title: QRS Complex Detection Based on Symmlets Wavelet Function

Author: Khaled Daqrouq, Ibrahim N. Abu-Isbeih and Abdel-Rahman Al-Qawasmi, **Published Year: 2008**

5th International Multi-Conference on Systems, Signals and Devices , Amman, Jordan

Faculty: Faculty of Engineering

Abstract: The wavelet functions (mother and its scaled version) are used as orthonormal functions for representing another functions in discrete wavelet transform (DWT) and continuous wavelet transform (CWT). Locating ECG parameters (fiducial points) like QRS complex, ST-segment, R-R interval, J point, iso-electric level, R peak and onset and offset of QRS complex and T wave is very important for diagnosis many cardiological diseases. The irregularity of ST-segment is considered electro-physiologically significant because it is an indicator of an imbalance myocardial oxygen supply and in myocardial ischemia or infarction. QRS complex and R-R interval have had very essential role in indicating and measuring heart rate variability.

Keywords: Wavelet Transform, ECG Signal, QRS Complex Detection

292

Title: Speech Signal Enhancement using Neural Network and Wavelet Transform

Author: Khaled Daqrouq & Ibrahim N. Abu-Isbeih, **Published Year: 2009**

6th International Multi-Conference on Systems, Signals & Devices, SSD'09, Tunisia

Faculty: Faculty of Engineering

Abstract: Speech enhancement is concerned with the processing of corrupted or noisy speech signal in order to improve the quality or intelligibility of the signal. Our goal is to enhance speech signal corrupted by noise to obtain a clean signal with higher quality. However, the presence of noise in speech signals will contribute to a high degree of inaccuracy in a system that requires speech processing. This idea of

noise cancellation for the speech signal was processed through the neural networks. Three methods were tested: 1. The adaptive linear neuron (ADALINE). 2. Feed Forward Neural Network Enhancement Method FFNN 3. Wavelet Transform and Adaline Enhancement Method. The results obtained showed high quality due to fast processing and high signal-noise-ratio. The tested signal was enhanced 10 dB by Adaline, 3 dB by FFNN and 8 dB by Wavelet Transform and Adaline Enhancement Method.

Keywords: Discrete wavelet transform, Speech signal, Neural network

293 **Title: Manchester-Coded Minimum Shift Keying (MCMSK)**

Author: Ibrahim N. Abu-Isbeih, Published Year: 2017

ADVANCED ELECTRICAL AND ELECTRONICS ENGINEERING AND SCIENTIFIC JOURNAL (AEEESJ), 1

Faculty: Faculty of Engineering

Abstract: Minimum (frequency) Shift Keying (MSK) is a spectrally efficient modulation scheme compared with other constant envelope modulation schemes. However, its main sidelobe can be of some worry in digital data transmission, particularly over nonlinear channels. Therefore, it is practically of interest to search for pulse shaping schemes, largely proposed through baseband pulse shaping to reduce sideband power, which in turn reduces out-of-band interference between signal carriers in adjacent frequency channels. In this paper a pulse shaping method based on a Manchester coded signaling is proposed to be used in MSK-type signaling. A methodology is proposed for comparing the MCMSK with MSK; and the proposed pulse shaping does not attain improvement in spectral efficiency over straight MSK, for the same channel bandwidth. The fractional out-of-band power and error rate performance are used to compare the behavior of the system under the new proposed technique. The obtained results reveal that the application of Manchester-coded signaling in MSK attains good improvement in symbol synchronization; but the spectral and power efficiencies are less than that of MSK.

Keywords: Minimum Shift Keying (MSK), Pulse Shaping, Manchester Code, MCMSK.

294 **Title: PV Inverters Reliability Prediction**

Author: Firas Obeidat and Roger Shuttleworth, Published Year: 2017

World Applied Sciences Journal, 35 (2)

Faculty: Faculty of Engineering

Abstract: This paper initially discusses the reliability of a 250W Photovoltaic (PV) micro inverter. Using the bill of materials the reliabilities of the main, gate drive, power supply, current and voltage sensing and microprocessor circuits were investigated and the failure rate and Mean Time Between Failure (MTBF) calculated. The sum of component failure rates equals the complete PV micro inverter failure rate. To account for temperature effects the component failure rate was calculated for each inverter operating temperature and multiplied by the percentage occurrence of this operating temperature to obtain a weighted failure rate. A similar procedure was used to calculate the failure rate for the main circuits of a 4.6kW & a 4.5kW multi-string inverter. All calculations are based on MIL-217F N2 method.

Keywords: Failure rate, MIL-HDBK-217F N2, PV micro inverter, PV multi string inverter, Reliability prediction.

295 **Title: Effects of features of graphite nodules on stress concentration in nodular graphite cast iron material under multi-axial loading**

Author: Adnan D. Mohammed and Mahmoud Kachit, Published Year: 2017
International Journal of Applied Engineering Research, 12
Faculty: Faculty of Engineering

Abstract: This research is concerned with the determining of best configuration features of graphite nodules, (spherical or elliptical in shape), embedded in cast iron matrix, that contribute in reducing the stress concentration. Experimental and numerical studies were carried out to satisfy the aims. Results show that the plane of stress concentration and thusly the critical planes of cracking and propagation are perpendicular to the loading axis. X-Ray tomography demonstrated that cracks appear to take the path of high-density nodules. The stress concentration increments as the nodule size increments, yet this tendency is clearer when the size is smallest. The effect of the intensity of applied stress on the came about stress concentration is profoundly noticed in the case of large size nodules. The stress concentration increases rapidly as the inter-distance displays little values. The stress concentration decreases as the dimension ratio of the elliptical nodule increases. It has minimum value when the ellipse long dimension is aligned with the axis of applied stress. However, it is maximum when the orientation angle is about 90° .

Keywords: nodular cast Iron, spherical graphite nodules, elliptical graphite nodules, stress concentration, multi-axial loading.

296

Title: ELASTIC BENDING DEFORMATION OF THE DRILL STRINGS IN CHANNELS OF CURVE WELLS

Author: Nabil Musa, Published Year: 2017
Modern Mechanical Engineering, 7
Faculty: Faculty of Engineering

Abstract: The problem about identification of elastic bending of a drill string in a curve wells based on the theory of flexible curved rods and the direct inverse problems of drill string bending in the channels of curvilinear bore-holes are stated. The problems are solved which determine the resistance forces and moments during performing ascending-descending operations in curvilinear bore-holes with trajectories of the second order curve shapes. The sensitivity of the resistance forces relative to geometric parameters of the bore-hole axial line trajectories is analyzed.

Keywords: Curvilinear drilling; elastic bending; curve well; circular friction; ; Resistance forces

297

Title: Enhancing the Performance of Speaker Verifications-Based DVB-T Systems

Author: Omar Daoud, Qadri Hamarsheh, Ahlam Damati, Published Year: 2017
Faculty: Faculty of Engineering

Abstract: Terrestrial Digital Video Broadcasting (DVB-T) is considered as one of the main two popular broadcasting standards, which facilitates the transmission of digital television in handheld receivers. In this work, a comparison will be held to enhance the mobile communications performance. This work aims to reduce the effect of a major problem found in the Orthogonal Frequency Division Multiplexing (OFDM) technique, namely Peak-to-Average Power Ratio (PAPR) problem; one of the main drawbacks of. Two main factors will be the main factor of this comparison; BER curves and CCDF curves. This work combined three different stages together; wavelet transformation in order to remove the noise from the signal; a globally statistical adaptive detecting algorithm; and replacing the affected peaks with a moving average filter process. At the same bandwidth occupancy of the speaker verification-based systems, the simulation has been run and shows additional

enhancement in both of CCDF and BER curves; an extra 15% reduction is achieved in the essence of PAPR and around 25% extra noise immunity.

Keywords: OFDM, PAPR, wavelet, entropy, average filters, signal processing.

298 **Title: Diagnosability of Programmable Logic Controller**

Author: M. Bani Younis and A-B. Mesmar, **Published Year:** 2017

Faculty: Faculty of Engineering

Abstract: The diagnosis problem of Programmable Logic Controllers used to control industrial processes is an important research track. This paper introduces the use of slicing methods on programmable logic controller's code. The used method enables better navigation of the program variables. These variables are mainly the inputs/outputs field devices installed on the plant. The Instruction List programming language is chosen to determine the software feasibility and applicability of the slicing method. The sliced program is exploited for the debugging purposes. An evaluation about the methods and techniques used for the Diagnosability are also provided in the scope of this paper. A case study is provided to ease the understanding of the used slicing technique.

Keywords: PLC; Program Slicing; Debugging; Diagnosability

299 **Title: Network Coding for Wireless Sensor Network cluster over Rayleigh Fading Channel, Finite State Markov Chain**

Author: Dr Mohammad Alhihi, **Published Year:** 2017

International Conference on Management and Information Technology (ICMIT), Kiev, Ukraine

Faculty: Faculty of Engineering

Abstract: Network Coding (NC) is confirmed to be power and bandwidth efficient technique, because of the less number of transmitted packets over the network. Wireless Sensor Network (WSN) is usually power limited network application, and in many scenarios it is power and bandwidth limited application. The proposed scenario in this paper applies the advantages of NC over WSN to obtain such power and bandwidth efficient WSN. We consider a WSN (or its cluster) that consists of M nodes that transmit equal-length information packets to a common destination node D over wireless Rayleigh block-fading channel where the instantaneous SNR is assumed to be constant over a single packet transmission period. Finite-State packet level Markov chain (FSMC) model is applied to give the channel more practical aspect. The simulation results show that applying NC over the WSN cluster improved the channel bandwidth significantly by decreasing the number of the Automatic Repeat Request (ARQ), resulting to improving the power consumption significantly. The results are collected for different transmission distances to evaluate the behavior to the proposed scenario in regard with the bath losses effect. Key-words: Rayleigh Fading Channel, Network Coding, Finite-Stage Markov Chain

Keywords: Rayleigh Fading Channel, Network Coding, Finite-Stage Markov Chain.

300 **Title: Network Coding for Wireless Sensor Network Cluster over Rayleigh Fading Channel: Finite State Markov Chain**

Author: Alhihi Mohammad , **Published Year:** 2017

, Vol.10 No.1

Faculty: Faculty of Engineering

Abstract: Network Coding (NC) is confirmed to be power and bandwidth efficient technique, because of the less number of transmitted packets over the network.

Wireless Sensor Network (WSN) is usually power limited network application, and in many scenarios it is power and bandwidth limited application. The proposed scenario in this paper applies the advantages of NC over WSN to obtain such power and bandwidth efficient WSN. To take the advantages of NC over the one of the most needed applications i. e. , WSN, we come up to what this paper is discussing. We consider a WSN (or its cluster) that consists of M nodes that transmit equal-length information packets to a common destination node D over wireless Rayleigh block-fading channel where the instantaneous SNR is assumed to be constant over a single packet transmission period. Finite-State packet level Markov chain (FSMC) model is applied to give the channel more practical aspect. The simulation results showed that applying NC over the WSN cluster improved the channel bandwidth significantly by decreasing the number of the Automatic Repeat Request (ARQ), resulting in improving the power consumption significantly. The results are collected for different transmission distances to evaluate the behavior to the proposed scenario with regard to the bath losses effect.

Keywords: Rayleigh Fading Channel, Network Coding, Finite-Stage Markov Chain

301 **Title: The Methods of True Allocation of Resorces of Infocommunication Networks**

Author: Mohammad Abdelhadi (Alhaj Moh`d) Alhihi, Mohammad Hasan Ali Samur , **Published Year: 2013**

2013 12th International Conference on the Experience of Designing and Application of CAD Systems in Microelectronics,

Faculty: Faculty of Engineering

Abstract: The paper proposed a dynamic model of the structural-functional synthesis of transport telecommunication network (TCN). The model provides a consistent solution for problems of the choice of topology and channels bandwidth in TCN, flow distribution, and determine the order of connection fees to the nodes of the TCN. Development of model allowed to formulate the task of structurally-functional synthesis of TCS in the form of the mathematical task of optimum control.

Keywords: CADSM,(TCN)

302 **Title: Network Coding Cooperation Performance Analysis in Wireless Network over a Lossy Channel, M Users and a Destination Scenario**

Author: Mohamed El-Hihi1, Hani Attar1, Ahmed A. A. Solyman2, Lina Stankovic3 , **Published Year: 2016**

Faculty: Faculty of Engineering

Abstract: Network coding (NC), introduced at the turn of the century, enables nodes in a network to combine data algebraically before either sending or forwarding them. Random network coding has gained popularity over the years by combining the received packet randomly before forwarding them, resulting in a complex Jordan Gaussian Elimination (JGE) decoding process. The effectiveness of random NC is through cooperation among nodes. In this paper, we propose a simple, low-complexity cooperative protocol that exploits NC in a deterministic manner resulting in improved diversity, data rate, and less complex JGE decoding process. The proposed system is applied over a lossy wireless network. The scenario under investigation is as follows: M users must send their information to a common destination D and to exchange the information between each others, over erasure channels; typically the channels between the users and the destination are worse than the channels between users. It is possible to significantly reduce the traffic among users and destination, achieving significant bandwidth savings, by combining packets from different users in simple, deterministic ways without resorting to

extensive header information before being forwarded to the destination and the M users. The key problem we try to address is how to efficiently combine the packets at each user while exploiting user cooperation and the probability of successfully recovering information from all users at D with $k < 2M$ unique linear equations, accounting for the fact that the remaining packets will be lost in the network and there are two transmission stages. Simulation results show the behaviour for two and three transmission stages. Our results show that applying NC protocols in two or three stages decreases the traffic significantly, beside the fact that the proposed protocols enable the system to retrieve the lost packets rather than asking for ARQ, resulting in improved data flow, and less power consumption. In fact, in some protocols the ARQ dropped from the rate 10^{-1} to 10^{-4} , because of the proposed combining algorithm that enables the nodes to generate additional unique linear equations to broadcast rather than repeating the same ones via ARQ. Moreover, the number of the transmitted packets in each cooperative stage dropped from $M(M-1)$ to just M packets, resulting to $2M$ packets instead $2(M^2-1)$ when three stages of transmission system are used instead of one stage (two cooperative stages).

Keywords: Coding, Cooperative System, Erasure Channel, Diversity

303

Title: Refugee Impacts in Hosting Countries- Solid waste Management in Amman city as a Case Study

Author: Mohammad K. Younes, Ghassan A. Al-Dulaimi, **Published Year:** 2017
5th International Conference on Waste Management, Ecology and Biological Sciences (WMEBS-2017), Istanbul- Turkey

Faculty: Faculty of Engineering

Abstract: Solid waste management is a major challenge for societies especially in the developing countries. For municipalities solid waste management consumes more than half of the allocated financial resources. However, the number of immigrants has been increased rapidly in the recent years due to political instability around the world. Sudden population increase due to immigration will confuse the decision making process and overburden the current infrastructure. Thus there is a great demand to develop a scientific approach to absorb such sudden increments and to properly develop future plans. In addition, most of the immigrants hosting societies are developing countries, that are classified as poor to mid income countries which overburdens them. This study aims to highlight and analysis the impacts of immigration on the solid waste management in the hosting communities. In addition, it will make recommendations to minimize the refugee impacts. In order to collect the data for estimating the human and financial impacts an internet research and stakeholders interviews were performed. Solving the political conflicts under the umbrella of the United Nation and giving the support for the people in their home countries will minimize the immigration movements thus reduces the refugee impacts.

Keywords: Solid Waste Management, Refugee and Solid Waste, Refugee Impacts on Solid Waste

304

Title: Researching the Impact of Parameters of the Developed Routing Models on Network Performance

Author: Mohammad Alhihi, **Published Year:** 2017

Faculty: Faculty of Engineering

Abstract: Abstract Nowadays, it is hard to imagine work without applying the principle of computer networks, and every day the requirement for high-quality network maintenance is increasing. In order to have a high-quality network; always optimize QoS through the optimization of routing protocols is required. In this paper,

the scientific task of optimizing routing processes in hybrid telecommunication networks with guaranteed quality of service is solved by developing models and methods of adaptive routing. To develop methods, a system of Telecommunications network (TN) mathematical models was constructed at the levels of its morphological and functional descriptions. We used a weighted oriented graph as a structural model. Formalization of the main indicators of the network operation efficiency is carried out, which are the network performance (or its derivatives – relative and normalized performances) and indicators of the degree of use of network resources – buffer memory capacities of nodes and bandwidth of the transmission paths. In this paper, an experimental study of the developed models and routing methods was carried out in order to verify their adequacy, evaluate the effectiveness, and develop practical recommendations. The scheme of experiment, focusing on the investigation of processes occurring in the network while solving routing tasks (data gathering, RT processing, distribution, and implementation), is proposed.

Keywords: *routing protocols, QoS, RT processing*

305 **Title: The effects of deposition parameters on CdS thin films optoelectronic properties**

Author: *Wagah Ferman Mohamad, Published Year: 2017*

**Seventh International Conference On Advances in Computing, Electronics and Electrical Technology – CEET, Official Web link: www.ceet.theired.org ,
Kullampour**

Faculty: *Faculty of Engineering*

Abstract: Cadmium sulfide CdS has band gap of 2.42 eV, which is suitable as window material for thin film to fabricate solar cell. It has high absorption coefficient and acceptable conversion efficiency in addition to its low cost. Many samples are prepared using vacuum evaporation techniques with different deposition parameters. Hall Effect, resistivity and optoelectronic measurements are conducted on the fabricated samples. The analysis of the results indicates that the optoelectronic properties, namely photogenerated current are dependent on the thickness, substrate temperature and deposition rate.

Keywords: *Cadmium sulfide thin films, optoelectronic. Hall effects, resistivity, photogenerated current, thermal deposition.*

306 **Title: Decreasing of Traffic Delay With Intellegent Transportation System**

Author: *Ghssan Suleiman, Published Year: 2017*

“SEVENTH INTERNATIONAL CONFERENCE ON ADVANCES IN CIVIL AND STRUCTURAL ENGINEERING - CSE 2017”, kuala Lumpor Malaysia

Faculty: *Faculty of Engineering*

Abstract: Abstract This study investigated the effect of speed management and ramp metering on traffic delay along arterials in Istanbul-Turkey. Urban arterial congestion is a recurring problem that affects urban traffic flow. Data were collected along 5-7 km long westbound approach arterial from the Anatolian side of Istanbul to the bridge initiated a study to investigate methods to mitigate congestion through traffic management and improved traffic flow. A micro simulation model based on traffic data using VISSIM software package suggested the applicability of traffic speed management along the existing infrastructure to relieve congestion and provide flow stability. Simulation was conducted along five hour which is the period of recorded data from 6:30 to 11:30 Am. The results indicated that the speed management could decreased traffic delay by an approximate 8% of delay from the existing value of 242 s/vehicle at 36 km/h to 202 s/vehicle at 65 km/h speed limits. Also, there were about of 17% increase in the total number of served vehicles from

23 844 vehicles/5 h to 28 244 vehicle/5 h. On the other hand, the optimum cycle time for ramp metering signal was 18 second. Applying of ramp metering strategy for 18 second cycle time led to 13,3% reduction in delay and 6.3 % increasing in flow speed. Finally, if ramp metering and speed management are applied together, the average delay is reduced to 188 seconds / vehicle from 242 s/vehicle (reduction in average delay by 25%). Also, average speed was increased by a 13% increase (from 36 to 41 km / h and).

Keywords: *Congestion, speed management, ramp metering, interchange, delay, micro simulation*

307 **Title: Evaluation of BOD and DO for Diyala River by Using Stream Water Quality Model**

Author: *د. غسان أدهم الدليمي*, **Published Year: 2017**

International Journal of Environmental Science and Development, Vol. 8, No. 8, August 2017, 8

Faculty: Faculty of Engineering

Abstract: Abstract—This paper was studied the biochemical parameter (BOD5) and (DO) for Diyala River (Iraq) which regard significant tributary for the Tigris River. Water samples have been collected from Diyala River along different points between Baquba to Al-Zafarana and were analyzed for various water quality parameters during low flow season (November). The study involves application of stream water quality model QUAL2K model to simulate and predict the dissolved oxygen (DO) and biochemical oxygen demand (BOD5) profiles for Diyala River in a stretch of 251 kilometer. Model output showed that DO in the entire river was within limit of not less than 4 mg/L. For Carbonaceous Biochemical Oxygen Demand CBOD, the entire river may be divided into three main reaches; first one is extended from Kalar City (0 km) to Jalawla (46 km) and have CBOD concentration of 2 mg/L , the second reach has CBOD range (2–4) mg/L in which begins from Sadiyah city and extend to near Buhriz city city(168km), the third reach extends from Khan Bani Saad city to Al-Zafaraniah (251km) in the south east of Baghdad city confluence point with Tigris River which has CBOD concentrations of more than 5mg/L.

Keywords: *OD, COD, Diyala river.*

308 **Title: First stage Cooperative Network Coding for Wireless Sensor Network**

Author: Dr. Hani Attar, Published Year: 2017

Engineering and Technology Research Group, UK London

Faculty: Faculty of Engineering

Abstract: Abstract: Network Coding (NC) and cooperation network are two well-joint technologies, as NC tents to combine data for different transmitters, so, each transmitter help in transmitting other nodes in the network, which is what cooperative technique does so, i., e., Cooperative NC (CoNC) is defined as combining different users' data in a way that users help each others to transmit and receive their data. The proposed work is applying CoNC in the first stage in a deterministic manor to gain some benefits from this useful technique. Applying CoNC over the first stage requires sending the packets in two halves rather than one full half where CoNC is applied in the second half. The proposed CoNC protocol is applied over Wireless Sensor Network (WSN), resulting to better bandwidth and less power consumption with better Packet Error Probability () for the proposed WSN. The proposed scenario is for N nodes of WSN cluster that exchange data over an erasure channel. The proposed protocol provides the ability for the network to lose one packet between each couple of users (N packets over the whole network) in the first stage, resulting to decrease the Automatic Request (ARQ) significantly in the first stage.

Keywords: Network coding, half-stage transmission and Packer Error Probability

309 **Title: Assessment of Potable Water Quality in Baghdad City, Iraq**

Author: دكتور غسان ادهم الدليمي, **Published Year:** 2017

Air, Soil and Water Research, Volume 10: 1–5

Faculty: Faculty of Engineering

Abstract: ABSTRACT: Safe drinking water is crucial for the well-being of current and future generations. This study aims to evaluate the quality of potable water in Baghdad city. Furthermore, this study compares the quality of tap and bottled water. Baghdad city was divided into 4 districts based on the water source, and 40 water samples were collected from each district. Moreover, the most popular bottled water brands were sampled and compared with the tap water samples. The quality of the analyzed potable water samples varied based on the water source. The total dissolved solid (TDS) levels exceed the palatable (>600 ppm) water levels in some districts. In addition, the concentration of sulfate was relatively high in both tap and bottled water and ranged from 200 to 330 ppm. The bottled water quality was within the acceptable limits set by the World Health Organization, but the TDS levels were relatively high. The hardness, Cl⁻, Pb²⁺, and bacteria contents in both tap and bottled water were within the standard limits. Finally, it is important to conduct radio logical analyses in the future to investigate the effect of wars on Iraqi water resources.

Keywords: Bottled water, tap water, water quality analysis

310 **Title: IMPROVING WASTEWATER QUALITY FROM SEPTIC TANK SYSTEM BY USING A CHEAP AND SIMPLE SECONDARY TREATMENT METHOD**

Author: دكتور غسان الدليمي, **Published Year:** 2013

IJCIET, Volume 4, Issue 6, N

Faculty: Faculty of Engineering

Abstract: Most of farms and suburban areas in Iraq don't have a sanitary sewer system network; most of these areas depend upon on-site wastewater treatment which called (septic tank), in this system wastewater flows from the household sewage lines into an underground septic tank which drains the effluents into the subsoil layers. In recent years fresh water become scarce most of agricultural land in the north of Baghdad city that depend upon rainfall become barren land, so the reuse of wastewater for irrigation purposes become one of strong options. In general septic tank work as small treatment plant in which the main treatment process will achieve especially primary treatment and portion of secondary treatment. In this research developed a process of secondary treatment in field by using a simple aeration tank depends on a cheap and low electricity consumption motor to improve wastewater quality, many of laboratory experiments have been execute results from this research shows a palpable improves in wastewater quality ranged from 25% to 30% with respect to biological properties while for the physical properties the improves of waste water quality range from 20% to 23%, results shows also a palpable improves in wastewater quality (physical & biological) with low discharge values.

Keywords: Septic tank, cheap secondary treatment

311 **Title: EVALUATION OF RUNOFF DEPTH FOR AL-ADEEM RIVER BASIN BY USING REMOTE SENSING TECHNIQUE AND GIS INTEGRATION**

Author: د. غسان أدهم الدليمي, **Published Year:** 2014

IJCIET, Volume 4, Issue 6,

Faculty: Faculty of Engineering

Abstract: The aim of this study is to determine runoff depth for Al-adeem river basin in north eastern part of Iraq by using remote sensing and Geographic information system (GIS) integration. Various data sets were used such as Landsat7-ETM satellite image, 1:25000 standard topographic map and soil map data. The basin area and physical characteristics of the studied area such as slope and aspect maps were determined with the help of DEM (Digital Elevation Model) by using Global Mapper 11 software. Supervised classification process was used in this research to drive the land cover map by using ERDAS 8.4 program. A hydrological model US Soil Conservation Service method or (SCS) method was used to determine curve numbers and runoff depth distribution on the entire studied basin. Results obtained from this research coincide with varying morphology of studied basin. High runoff depth obtained in the middle parts of the basin that consist mainly from soil with low infiltration rate (clayey soil) and pasture land cover that has an ability of high retention. Low runoff depth obtained in the north parts of the basin that consist mainly from soil with high infiltration rate (course sand and gravel soils) and shrub land cover that has an ability of low retention.

Keywords: Runoff depth, ERDAS, SCS Model

312 **Title: BOD and DO modeling for Tigris River at Baghdad city portion using QUAL2K model**

Author: د. غسان أدهم الدليمي, **Published Year: 2013**

Journal of Kerbala University, Vol. 11 No.3 Scienti

Faculty: Faculty of Engineering

Abstract: This study was conducted within Baghdad portion of Tigris River, which is significant due to the presence of various drains joining the river. Water samples have been collected from Tigris River along different points between Alfahama to Al-Zafarania and were analyzed for various water quality parameters during low flow season (November). The study involves application of QUAL2K model to simulate and predict the dissolved oxygen (DO) and biochemical oxygen demand (BOD5) profiles of Tigris River in a stretch of 49.97 kilometer. Remote sensing & GIS technique (ERDAS 9.2 & Global Mapper 11) used in this study as supported software to provide some QUAL2K input data related to the river geometric parameter. The simulation results were verified and showed that the predicted values were in agreement with the measured values. Model output showed that DO in the entire river was within limit of not less than 4 mg/L. For CBOD, the entire river may be divided into three reaches; first one is extended from Alfahama (0 km) to Alkadhmiah (9 km) and have CBOD concentration of 2 mg/L and the second reach has CBOD range (2–4) mg/L in which begins from Alkadhmiah and extend to near Aldora refinery. The third reach extends from Aldora refinery to Al-Zafaraniah (49.97) in the south before river confluence with Diyala River which has CBOD concentrations of more than 4 mg/L. The most polluted zone in the river located downstream of Aldora refinery and extend to the last segment due to the industrial discharge of pollutants to the river. Two strategies were suggested to control the level of CBOD in the river. First strategy suggest that the CBOD of the discharged effluent from industries should not exceed at least 50 mg/L to keep the CBOD of the entire river within limits of not more than 4 mg/L. While the second strategy does not give significant results in which the level of CBOD increase even with reduction in the pollution load (point source).

Keywords: Septic tank, cheap secondary treatment

313 **Title: Assessment of Potable Water Quality in Baghdad City, Iraq**

Author: Ghassan Adham AL-Dulaimi and Mohammad Khairi Younes, Published Year: 2017

Air, Soil and Water Research, 10

Faculty: Faculty of Engineering

Abstract: Safe drinking water is crucial for the well-being of current and future generations. This study aims to evaluate the quality of potable water in Baghdad city. Furthermore, this study compares the quality of tap and bottled water. Baghdad city was divided into 4 districts based on the water source, and 40 water samples were collected from each district. Moreover, the most popular bottled water brands were sampled and compared with the tap water samples. The quality of the analyzed potable water samples varied based on the water source. The total dissolved solid (TDS) levels exceed the palatable (>600 ppm) water levels in some districts. In addition, the concentration of sulfate was relatively high in both tap and bottled water and ranged from 200 to 330 ppm. The bottled water quality was within the acceptable limits set by the World Health Organization, but the TDS levels were relatively high. The hardness, Cl⁻, Pb²⁺, and bacteria contents in both tap and bottled water were within the standard limits. Finally, it is important to conduct radiological analyses in the future to investigate the effect of wars on Iraqi water resources.

Keywords: Bottled water, tap water, water quality analysis

314

Title: A New Algorithm for Reactive Power Compensation in Industrial Plant

Author: Ayman Agha, Published Year: 2016

Jordan Journal of Electrical Engineering (JJEE), Volume 2, Number 3,

Faculty: Faculty of Engineering

Abstract: This paper presents a method based on Lagrange multipliers for capacitor banks allocation at industrial plant networks. The aim of compensation is to avoid penalties in (JD/\$) raised on electricity bills due to low power factor and to minimize the power losses at the plant's network. Capacitor banks will be allocated at the main board (MB) as a fixed type and at secondary distribution boards (SDB) as a regulated type. For this regard, a mathematical formulation of the problems along with concentrates has been established and solved. The "equivalent consumed active energy" amount is calculated based on a newly devolved equation for finding the "equivalent working time" which leads to calculating the total amount of reactive power compensation. The proposed method is applied to the data extracted from the monthly electricity bill of an industrial plant network. A numerical example and discussion have been introduced to illustrate the effectiveness of the proposed method.

Keywords: Reactive power compensation. Power factor improvement. Power loss reduction. Lagrange multipliers

315

Title: A Dynamic Approach to Linear Statistical Electrical Energy losses Analyses (Comparative Case Study)

Author: Ayman Agha, Audih Alfaoury, Published Year: 2017

WSEAS TRANSACTIONS on SYSTEMS, Volume 16, 2017

Faculty: Faculty of Engineering

Abstract: System dynamics have been used for the planning of different sectors in the electric power industry. In the last decade, the number of new suppliers/consumers entered into the electric power system is rapidly increasing; they are respectively the renewable energy and electric cars. This necessitates a mechanism to estimate the demand for electricity in the near future as per as to evaluate and forecast the situation in the power system. The amounts of generation, transmission,

and distribution have been modeled in the form of regression equations depicting the system. The developed methodology is based on system dynamics and a new concept of trend index is introduced. The data of the Jordanian electric power system for the period (2001-2016) has been investigated and analyzed. The analyzed period is divided into two equal periods, the first (2001-2008); is to perform a comparative study of the status and the performance of the power system. However, the second period (2009-2016); is used to investigate the trends of the electrical power system. Numerical examples illustrating the effectiveness of the proposed method are presented. Discussion, conclusions, and recommendations on the accuracy of the achieved results are also introduced.

Keywords: *Dynamic Analysis, Trend Index, Energy Losses Analysis, Electrical Losses in Jordanian Power*

316 **Title: Solar Panels Cleaning Frequency for Maximum Financial Profit**

Author: *Mohammad Abu-Naser, Published Year: 2017*

Open Journal of Energy Efficiency, 6

Faculty: *Faculty of Engineering*

Abstract: Allowing the dust to accumulate on solar panels without adequate cleaning leads to huge monetary losses. Proper judgment of when to call for washing of solar panels is a compromise between gross costs of cleaning the panels and how much reduction in efficiency of solar panels can be tolerated. In this paper, we derive a formula for the optimal number of days between cleaning cycles of a solar array by minimizing the cost of cleaning the array and the lost revenue from the unclean panels. The formula will aid in deciding cleaning periods based on the environment in which the solar panels are installed and cost incurred from undertaking the washing process.

Keywords: *Dust Deposition, PV Efficiency Degradation, Optimal Cleaning Cycle*

317 **Title: A New Approach for Load Loss Factor Estimation in Electrical Distribution Networks**

Author: *Ayman Agha, Published Year: 2017*

Faculty: *Faculty of Engineering*

Abstract: This paper presents a new approach for the estimation of the load loss factor. This factor is essential to calculate the electrical energy losses in electrical power distribution networks. The represented approach can estimate the loss factor, especially for those distribution lines which their load profile has tedious to repetition and routine character like in industrial plants or for any other objects with similar load profile. A mathematical formulation of the problem has been developed and solved. The equivalent working hours (T (eq.)) are calculated based on a newly derived equation. The (T(eq.)) value leads to determine the amount of electrical energy losses in distribution lines. A numerical example and discussion have been presented to illustrate the significance of the proposed method.

Keywords: *Load loss factor. Equivalent working hours. Electrical energy losses*

318 **Title: Determining the Optimum Number of Paths for Realization of Multi-path Routing in MPLS-TE Networks**

Author: *Mohammad Alhihi, Published Year: 2017*

TELKOMNIKA, 15

Faculty: *Faculty of Engineering*

Abstract: Multi-Protocol Label Switching for Traffic Engineering (MPLS-TE)

technology is an intelligent and advanced tool for handling traffic through the core networks and implementing new services based on virtual transport. Since MPLS-TE combines channel and network layer mechanisms, network administrators can optimally integrate and allocate the traffic loads while maintaining the speed of technologies such as Asynchronous Transfer Mode (ATM) technology. In this paper, the problem of the developed algorithm of multi-path routing which allows us to determine the optimum number of independent shortest paths is theoretically solved. In details, the article proposes a way for finding the set of shortest paths using Dijkstra's algorithm, and then determination of the maximum flow for each of the shortest paths based on the mathematical concepts and finally, introducing the solution of the multi-criteria optimization problem for a set of shortest paths. According to our approach, optimizing the use of resources in the core networks is possible with using the MPLS-TE technology.

Keywords: *Communication Networks, Multi-Protocol Label Switching (MPLS), Traffic Engineering (TE), Routing Protocols, Next Generation Networks (NGNs)*

319 **Title: Using the Clonal Selection Algorithm for the Synthesis of the Topological Structure for Data Network**

Author: *Mohammad Alhihi, Published Year: 2017*

Jordan Journal of Electrical Engineering, 3

Faculty: *Faculty of Engineering*

Abstract: Abstract— A Genetic Algorithm (GA) is a high-level procedure applied to find, generate or select a good solution for an optimization problem, usually in imperfect or limited computation capacity, based on the Evolutionary Algorithms (EA). In this paper, we propose a clonal selection algorithm for the synthesis of a data transmission network topology, which unlike former works, depends on the model cost to determine the optimality value which solves the problem of distributing information flows in a network, and abilities of communication channels (available channel capacity). The proposed genetic synthesis algorithm solves the optimizing criteria, taking into account the optimal trade-off between the network dependability and cost. Finally, the algorithm was applied over the Jordanian cities where each city represents an algorithm node. The outcome of this application shows the gained improvement of the proposed algorithm.

Keywords: *Clonal selection algorithm, Evolutionary algorithms, Genetic algorithm, Optimizing criteria*

320 **Title: Practical Routing Protocol Models to Improve Network Performance and Adequacy**

Author: *Mohammad Alhihi, Published Year: 2017*

Journal of Computer and Communications, 5

Faculty: *Faculty of Engineering*

Abstract: The telecommunications network has become an essential facility of our daily life, which is the reason why a good number of the recent researches are directed to it. In this paper, the performance of routing protocols for selected network and the optimum way of utilizing the network resources is proposed, through improving the routing method protocols to obtain the most accurate communication models, which give the best network performance, taking into consideration that the protocol time interval to recalculate the future routing step is agreed to be our performance criteria, which is then used to determine the total amount of incoming traffic normalized at the best network performance with respect to the network capacity as well. Moreover, adaptive routing evaluation methods have been mathematically investigated in this work for telecommunication networks (TN), more

precisely, developing the infrared radiation (IR) routing methods for hybrid TN applications, in terms of implementation conditions at a certain guaranteed quality of service, where we give a particular interest in analyzing routing methods based on the fact that the distribution information is contained in the routing variables, rather than in the state variables. The protocol that deals with the unbalanced traffic distribution over TN nodes has been investigated in this paper as well, and simulation results show good progress in the proposed protocol over the traditional protocols.

Keywords: *Telecommunications Network, Routing Protocols, Hybrid Network*

321 **Title: Setting an Optimization Problem of Distributing Traffic Across Multiple Independent Paths**

Author: *Mohammad Alhihi , Published Year: 2017*

Faculty: *Faculty of Engineering*

Abstract: Communication network development is considered as an urgent need for the world. The proposed work in this paper is to solve the problem of the traffic engineering, using the multi-path routing mechanisms by applying a developed algorithm includes a multi-criteria optimization procedure to define the optimal number of paths. The values of the maximum flow and multi-path delay are used as partial criteria; however, a set of particular criteria can be extended when needed to ensure the required quality of service.

Keywords: *Routing Protocols, QoS, TN, hybrid network, traffic engineering, traffic distribution, path delay, the Dijkstra's algorithm*

322 **Title: PRE-REQUISITES FOR SMART LOSSY COMPRESSION OF NOISY REMOTE SENSING IMAGES**

Author: *Mohammad Alhihi, Published Year: 2018*

journal *Telecommunications and radio engineering,*

Faculty: *Faculty of Engineering*

Abstract: Remote sensing images are usually subject to compression for their further transmission, storage and dissemination. Because of lossy nature of compression, resulting images appear distorted. Degradations of image quality due to compression depend on noisy input image, a type and intensity of noise, and used image coder. To control image degradations, for a given coder, one should predict compression performance to be able to properly choose coder parameter(s). In this paper, we present pre-requisites for such a controlled lossy compression of noisy remote sensing images. The main attention is paid to image coders which are based on discrete cosine transform, due to relatively simple adaptation of its main parameter, quantization step, for controlling the effect of compression.

Keywords: *lossy compression; noisy image; remote sensing; image coding*

323 **Title: Method of Distribution Network Resources after Restoration, the Networks MPLS-TE Use of Various Telecommunications Technologies to Construct Backbone Networks**

Author: *Mohammad Alhihi, Published Year: 2017*

Int. J. Communications, Network and System Sciences, 10

Faculty: *Faculty of Engineering*

Abstract: The modern telecommunication system is characterized by the rapid improvement of information and communication technologies, such as the improvement in the data rate, power consumption and Quality of Service (QoS).

Based on this development, the next generation network (NGN) is shaped. The NGN is represented by a packet transport network demarcated functions and services. To provide transport functions in NGN, using Multi-Protocol Label Switching (MPLS) technology, there are two main problems, which are multipath routing and traffic distribution, which are what this paper works with. Accordingly, this paper proposes a solution to these two problems using optimization procedures to find the shortest path Dijkstra and Bellman-Ford, which is characterized by a high-speed-oriented selection of a single shortest path between the source and the destination, based on several selected criteria related to the optimal use of the network resources. Solving the information flow distribution problems in large number of nodes network applying salesman procedure or having NP-completeness, causes significant time delay, which means that the proposed solution is not suitable for real time applications. Accordingly, for real time applications, there is a need to move to other methods based on the use of several independent shortest paths.

Keywords: QoS, NGN, MPLS, Routing Protocols, Backbone Networks, BER, PEP

324

Title: Operating Task Redistribution in Hyperconverged Networks

Author: Mohammad Alhihi, Mohammad Reza Khosravi, Published Year: 2018

International Journal of Electrical and Computer Engineering (IJECE), 10

Faculty: Faculty of Engineering

Abstract: In this article, a searching method for the rational task distribution through the nodes of a hyperconverged network is presented in which it provides the rational distribution of task sets towards a better performance. Using new subsettings related to distribution of nodes in the network based on distributed processing, we can minimize average packet delay. The distribution quality is provided with using a special objective function considering the penalties in the case of having delays. This process is considered in order to create the balanced delivery systems. The initial redistribution is determined based on the minimum penalty. After performing a cycle (iteration) of redistribution in order to have the appropriate task distribution, a potential system is formed for functional optimization. In each cycle of the redistribution, a rule for optimizing contour search is used. Thus, the obtained task distribution, including the appeared failure and success, will be rational and can decrease the average packet delay in the hyperconverged networks. The effectiveness of our proposed method is evaluated by using the model of hyperconverged support system of the university E-learning provided by V. N. Karazin Kharkiv National University. The simulation results based on the model clearly confirm the acceptable and better performance of our approach in comparison to the classical approach of task distribution.

Keywords: Redistribution, Hyperconvergence, E-learning, Penalty, Distributed Processing

325

Title: Economic Evaluation of Transformer Selection in Distribution Systems

Author: Ayman Agha , Published Year: 2018

Faculty: Faculty of Engineering

Abstract: This paper presents an approach to determine the total owning cost (TOC) of transformers. Different assumptions are introduced by discounting the transformer cost and/or the losses cost, using either A and B loss coefficients or the idea of annuity factor. Moreover, the paper presents a comparative study between different cases under different presumptions to evaluate the transformer's TOC. The obtained results confirm that the proposed approach equips the decision-maker with valuable and trustable criteria to select the proper transformer(s) based on the proposed practical cost criteria. The presumptions of the proposed cost criteria influence

economic evaluation. The TOC of the transformer is also illustrated. Finally, the proposed approach cost criteria were illustrated through a numerical example. The obtained results have been summarized and discussed.

Keywords: *Losses coefficients, total owning cost, transformer economics, transformer losses.*

326 **Title: Investigation on torsional vibration of drill strings in cylindrical cavities of vertical bore-hole with liquid medium**

Author: *Nabil Musa, Published Year: 2018*

International Journal of Mechanical and Production engineering research and development, Vol. 8, Issue 3,

Faculty: Faculty of Engineering

Abstract: This paper deals with the torsional vibration of a drill string in a vertical cylindrical cavity of a bore-hole with liquid medium. The mechanical interaction models of the drill string with viscous liquid are considered. In the paper to describe the vibrations of the drill string bit with allowance made for viscous friction, the nonlinear differential equation with partial derivatives is used. The oscillation scheme of torsional auto-vibration of homogeneous drill string in the form of oscillation pendulum is stated. It was founded, that the properties of the liquid medium in which the rotating column, lead to a small range of angular velocity value, which are generated during the self-oscillation.

Keywords: *vertical bore-holes, auto-vibration, stationary oscillations, rotational motions dynamic viscosity.*

327 **Title: Static And Dynamic Analysis Of Bevel Gear Set**

Author: *Nabil Musa, Published Year: 2017*

IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE), Volume 14, Issue 5

Faculty: Faculty of Engineering

Abstract: Abstract: This paper presents a static and dynamic simulation and analysis of the bevel gear set using Solidworks software, stress, strain, deformation, reactions and torque are calculated. Dimensions and materials of the bevel gears are important factors in determining the values of stress, strain, and displacement. The change in angular velocity and torque applied also change the values of stress, strain, and displacement of the bevel gear.

Keywords: *Keywords: Bevel gears, static, dynamic, stress, strain, deformation, solidworks.*

328 **Title: Critical buckling of drill strings in cylindrical cavities of inclined bore-holes.**

Author: *Nabil Musa, Published Year: 2016*

Journal of Mechanics Engineering and Automation 6 (2016) 25-38, vol.6

Faculty: Faculty of Engineering

Abstract: Abstract Notwithstanding the fact that the problem of drill string buckling (Eulerian instability) inside the cylindrical cavity of an inclined bore-hole attracts attention of many specialists, it is far from completion. This peculiarity can be explained by the complexity of its mathematic model which is described by singularly perturbed equations. Their solutions (eigen modes) have the shapes of boundary effects or buckles (harmonic wavelets) localized in zones of the bore-hole that are not specified in advance. Therefore, the problem should be stated in the domain of

entire length of the drill string or in some separated part including an expected zone of its buckling. In the paper, a mathematic model for computer analysis of incipient buckling of a drill string in cylindrical channel of an inclined bore-hole is elaborated. The constitutive equation is deduced with allowance made for action of gravity, contact, and friction forces. Computer simulation of the drill string buckling is performed for different values of the bore-hole inclination angle, its length, friction coefficient, and clearance. The eigen values (critical loads) are found and eigen modes (modes of stability loss) are constructed. The numerical results for the case when the inclination angle equals friction angle coincide with ones obtained analytically.

Keywords: *Keywords: deep drilling, inclined bore-holes, drill strings, stability, singularly perturbed problem.*

329

Title: TRANSFORMATION OF DISCONTINUOUS WAVE FRONTS IN ELASTIC

Author: Nabil Musa, Published Year: 2008

International Journal of Mechanical Engineering and Technology (IJMET), Volume 9, Issue 7,

Faculty: Faculty of Engineering

Abstract: In this paper, the problem of interaction of a discontinuous wave with the heterogeneity between two elastic isotropic media with different density parameters is considered. The research object is non-stationary wave with strong discontinuity generated in non-homogeneous elastic medium. The work aims to investigate the diffraction of the discontinuous wave in an interface between two anisotropic media and analysis of received results depending on the anisotropy parameters values. The research method considered is the zeroth approximation of the ray method. The simulation processes of mechanical interaction of elastic discontinuous waves with interfaces between rock media with different properties (particularly, anisotropy parameters) is proposed. The results of the simulation, showed that, the discontinuous wave transformation in the interface planes, not only wave polarization and front geometry can be changed, also the wave intensity can be increased or decreased. This type of the wave diffraction can be accompanied by essential change of the wave intensity in different zones of the wave front. The work results can be implemented for the design of construction of structures, transport and mine destination with the aim of their seismic protection and their screening from action of discontinuous waves generated by different technical failures.

Keywords: *shielding, discontinuous waves, anisotropic layered media, elastic medium, ray method.*

330

Title: Selecting the Affected Factors on Pavement Distress Problems Using Analytical Hierarchy Process [AHP]

Author: Mohammad younes, Published Year: 2018

International Journal of Engineering & Technology, 7

Faculty: Faculty of Engineering

Abstract: This study describes the implementation of analytical hierarchy process [AHP] in pavement multi-criteria selection problem solving. The practice of expressing flexible pavement distress priority is widely accepted. However, an insistent demand exists for a technique that allows decision makers to determine their priorities, rational weights of the importance of pavement distress priority and the ranking of these factors. In this study, AHP is adopted in selecting the best level of distress in flexible pavements in Malaysia as an example of a tropical region. Knowledgeable and experienced experts in flexible pavement maintenance at jabatan kerja raya [JKR] and Kumpulan Ikram Sdn Bhd [IKRAM] were interviewed; as

pairwise comparisons, their inputs were structured. Four criteria are set as follows: cracking, surface defects, surface deformations and patching and potholes. These criteria developed into a few other sub-criteria. Results show that cracking is the most significant factor [0.5500], followed by surface deformations [0.2300], patching and potholes [0.1600] and surface defects [0.0600]. Thus, cracking has the most significant distress among the four factors.

Keywords: *Analytic hierarchy process; Flexible pavement; Pavement maintenance; Pavement deterioration*

331 **Title: Modelling CO₂ and NO_x on signalized roundabout using modified adaptive neural fuzzy inference system model**

Author: *Mohammad younes, Published Year: 2018*

Environmental Engineering Research , 23(1)

Faculty: *Faculty of Engineering*

Abstract: Air quality and pollution have recently become a major concern; vehicle emissions significantly pollute the air, especially in large and crowded cities. There are various factors that affect vehicle emissions; this research aims to find the most influential factors affecting CO₂ and NO_x emissions using Adaptive Neural Fuzzy Inference System (ANFIS) as well as a systematic approach. The modified ANFIS (MANFIS) was developed to enhance modelling and Root Mean Square Error was used to evaluate the model performance. The results show that percentages of CO₂ from trucks represent the best input combination to model. While for NO_x modelling, the best pair combination is the vehicle delay and percentage of heavy trucks. However, the final MANFIS structure involves two inputs, three membership functions and nine rules. For CO₂ modelling the triangular membership function is the best, while for NO_x the membership function is two-sided Gaussian.

Keywords: *Air pollution, Air quality index, ANFIS, Traffic congestion, Transportation emissions*

332 **Title: LFG EMISSION AND CH₄ OXIDATION MEASUREMENTS IN A TROPICAL CLIMATE: SPATIAL AND SEASONAL VARIATIONS**

Author: *Mohammad younes, Published Year: 2018*

JOURNAL OF SOLID WASTE TECHNOLOGY AND MANAGEMENT, 44(2)

Faculty: *Faculty of Engineering*

Abstract: Landfill gas (LFG) emissions and methane (CH₄) oxidation were investigated in a landfill located in tropical climate in Malaysia to measure spatial and seasonal variations in CH₄ and carbon dioxide (CO₂) emissions, the capacity of CH₄ oxidation in the landfill cover soil, seasonal variation of CH₄ oxidation, and the impact of CH₄ oxidation on composition of LFG emissions. The measurements were conducted within eight months during the rainy and dry seasons. CH₄ and CO₂ emissions were measured using a fabricated static flux chamber. The averages of CH₄ and CO₂ emissions were determined using the geospatial average (g/m²/d) with lesser error. The combination of the gas concentrations (CH₄ and CO₂) below the cover soil and the surface CH₄ and CO₂ fluxes at four stations were utilized to determine the average CH₄ oxidation capacity (%). The results of the study showed that CH₄ and CO₂ emissions were not spatially uniform and ranged from 0 to 1,602 g/m²/d and 5 to 2,753 gm⁻² d⁻¹ in both seasons. In addition, higher CH₄ and CO₂ emissions and lower CH₄ oxidation capacity were observed in the rainy season in contrast to the dry season.

Keywords: *CH₄ oxidation, landfill cover soils, LFG emission, seasonal variation, spatial variation, methane oxidation*

333 **Title: Evaluation of Wastewater Bio-filtration Using Activated Carbon Filter Made from Date Pits**

Author: Mohammad younes, Published Year: 2018

A&WMA's 111th Annual Conference & Exhibition , Hartford, Connecticut; USA

Faculty: Faculty of Engineering

Abstract: Wastewater treatment using Biological filter is an emerging technology. Nowadays, date palm (*Phoenix dactylifera*) production and processing are increasing all over the world due to its nutrition content. Date pit is one of the most important date processing by product and it represents around 10% of fruit weight. This study aims to evaluate the feasibility of using a date pit's activated carbon in a biological filter to enhance the bio-filtration process and reduce the concentration of chemical oxygen demand (COD) in the effluent water. A date pits pyrolysis was implemented to produce a charcoal activated carbon, and then it has been crushed and activated by heat. Finally, three filtration columns were prepared, one with silica sand only, the second is with silica sand and commercial coconut activated carbon and the third is with silica sand and date pit activated carbon. The date pits filter shows relatively better performance of COD and pH removal. However, more research and tests are recommended on larger scale. Moreover, further test and analysis are required to determine the optimum dosage and particle size.

Keywords: *solid waste management, date pits*

334 **Title: Effect of steel fibers on the developed stresses in deformed headed bar**

Author: SAAD ALI AL-TAAN, Published Year: 2015

7th International conference on fibre concrete , Czeck Republic

Faculty: Faculty of Engineering

Abstract: This investigation studied the effect of steel fibres on the developed stress in headed bars. One concrete mix is used with a weight proportions of (1:1.7:3:0.45;cement:sand:gravel and water cement ratio respectively) and gave a minimum cylinder strength of 37.5 MPa. The variables included three bars sizes (10, 12 and 16 mm), embedment depths(50, 55, 60, 65, 95 and 100 mm,) three plane dimensions of a 10 mm thick square steel head (20×20, 25×25 and 30×30 mm) welded to the bars, and the steel fibres volume percentage (0.4,0.8 and 1.2). The steel fibres were of the Harex type with irregular cross section, 16 mm long and an equivalent aspect ratio of 19.64. The test results showed that the developed stress in the bars increased with the embedment depth and with the steel fibres percentage considerably, while the used dimensions of the square steel head does not affect the steel stress significantly. The failure mode of the concrete specimens was sudden and brittle while that of the fibrous concrete specimens showed a gradual and ductile mode of failure.

Keywords: *Embedment, fibres, headed reinforcement, pullout, stress.*

335 **Title: HIGHLIGHTS ON THE (1987 - 1989) RESTORATION OF THE OTTOMAN'S AL - QUSHLAH BUILDING**

Author: Nawar Sami Mehdi AL-ALI, Published Year: 2017

Faculty: Faculty of Engineering

Abstract: Al-Qushlah is a monumental building, situated on the bank of the river Tigris in old Baghdad. It dates back to the nineteenth century Ottoman period, and reflects a hybrid between the Ottoman traditions and European methods in architecture. The building had a major attempt of rehabilitation in 1987 - 1989. This attempt is the main subject of this paper . The argument is based on a recognition of the different parts of the building , and accepting the fact that they are a result of an overlaid additions and modifications of several periods. The paper aims to

demonstrate how the re -designing process was integrated with the process of restoration, to fulfill the goal of rehabilitating. (Published in the hard copy of the conference book, Paper is copyright protected in favor of the publisher of the conference book. Conference name: International Congress - Preserving Transcultural Heritage: Your Way or My Way?: questions on authenticity, identity, and patrimonial proceedings in the safeguarding of architectural heritage created in meeting of cultures. 05th - 08th of July 2017 University of Lisbon , Lisbon, Portugal)
Keywords: *Ottoman; Redesign; Restoration; Rehabilitation; Baghdadi.*

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Title: Re-shaping ' The Private for the Public' concept in Traditional Courtyards: a case study in the Traditional Center of Baghdad.

Author: Nawar Sami Mehdi AL-ALI , Saba Sami Mehdi AL-ALI, Published Year: 2018

Faculty: Faculty of Engineering

Abstract: Abstract The paper presents the case of two preserved/revitalized Ottoman buildings: Al-Qushlah and the Public Courts. Both are located in the traditional center of Baghdad, in a mixed-use area. Since their construction was during the 19th century, they housed different state bodies, and their ample geometrical courtyards were of restricted uses. The two buildings also witnessed major rehabilitation between the years 1987 – 1994 in an attempt to preserve their aesthetic and historical values, and reuse them with respect to these values, but they remained without any remarkable involvement in the Baghdadi life. After the political and military events of 2003, then the end the disturbance of 2006, and under an emerging public tendency toward engaging the area with cultural activities, especially on Fridays, both buildings were opened to public during the year 2013, granting access to their courtyards, and then partial access to the indoor spaces. Different groups of civil societies, activists, artists, poets and writers, gather and hold their activities within the courtyards of these two buildings. This new tendency reshaped the inherent relationship between (the private and the public) of the Islamic traditional courtyards in public buildings (e.g. Mosques, Khans, Madrassas) within the urban life, and presented a new conception for such relationship, in these two buildings. This paper demonstrates how the main concept of (the Private) and (the Public) has changed for the courtyards of the Ottoman Al-Qushlah and The Courts buildings, due to the new change in urban life. This change flipped the traditional basics, turning (the private for the public), and brought the flow of the walking crowd from the surrounding area into these two open spaces. This change filled the courtyards with a joyful atmosphere, which extended gradually to the indoor spaces. The courtyards transformed to be extensions for the urban spaces rather than extensions to their own buildings, in a situation of a reversed functionality. The attention was shifted from the appreciation of the buildings themselves to their courtyards. The paper investigates, through spatial analysis, this conversion, showing how these two buildings failed to be active in the Baghdadi life for two decades after their restoration, until this transformation. The study tracks down the evolvement of the two courtyards through the history of the area and their buildings and compares between their current conditions versus the traditional conception of courtyards in the Public buildings in Baghdad. The study involves an analysis of the function type, movement flow and spatial characteristics, and suggests a new strategy to consider the Baghdadi public courtyard type, from a different perspective, to maintain the old fabric of the historical center of Baghdad. (Published online in the Conference website:<https://eauh2018.ccmgs.it/> Conference name : E.A. U. H. - Rome 2018 : Urban Renewal and Resilience August 29 - September 01, 2018)

Keywords: *Urban; Baghdadi courtyard; Mutannabi; Saray; Functionality; Public space; Quishla; Qishlaq.*

Title: Recomposing Fragments: The case of the Reinvention of al-Khulafaa Mosque in Baghdad

Author: Saba Sami Mehdi AL-ALI, Nawar Sami Mehdi AL-ALI, Published Year: 2018

Faculty: Faculty of Engineering

Abstract: When The Iraqi architect Mohamed Makiya (1914-2015) was commissioned in 1961 to build a mosque in the old commercial center of Baghdad, near the 13th century minaret of Suq al-Ghazl, the only element left of the al-Khulafaa Abbasid Mosque which stood there several centuries ago. The design problem he faced was threefold: first, the question of how to deal with, and preserve, this remaining historical fragment; second, how to evoke the memory of the famous Abbasid mosque with its unknown architecture totally lost due to historical events, and third, how to deal with the complicated site facts of restricted area, openness to a grand modernist street, and a surrounding of organic fabric of traditional Suqs (markets) . The paper investigates the above mentioned issues starting with the architectural style of the new created mosque in relation to the old minaret and the Abbasid style. The argument reveals that by relying on classical Islamic vocabulary, articulated with modernist concrete elements at different scales, the architect reinterpreted the Abbasid mosque type not as a totality, but as fragments that surround, complement and converse with the historical element he had in-situ, reinventing a new architectural totality, a new mosque type, but still reminiscent of its precedent. (Published online in the Conference website: <https://eauh2018.ccmgs.it/> Conference name : E.A. U. H. - Rome 2018 : Urban Renewal and Resilience August 29 - September 01, 2018)

Keywords: Mohammed Makiya, Baghdad Historical Center, Al-Khulafaa Mosque, Types of mosques, Minaret of Suq el-Ghazl

Title: A STUDY OF THE EFFECTS OF LOADING AMPLITUDE AND INDUCED STRESS RATIO ON FATIGUE LIFE OF A NODULAR GRAPHITE CAST IRON STRUCTURE UNDERGOING MULTI-AXIAL PROPORTIONAL CYCLIC LOADING

Author: Adnan Dawood Mohammed & Mahmoud Kachit, Published Year: 2018

International Journal of Mechanical and Production Engineering Research and Development (IJMPERD) , Vol. 8, Issue 4, Aug

Faculty: Faculty of Engineering

Abstract: The influence of loading conditions on fatigue life and stress concentration, on ferritic nodular graphite cast iron material, undergoing multi-axial proportional cyclic loading, is investigated experimentally and numerically. The studies are conducted under a controlled maximum amplitude stress (induced Von Mises stress) of 158 Mpa which is close to the fatigue limit of the studied material. Good agreements are reported between numerical and experimental results. It is found that fatigue life and Von Mises stress concentration depend strongly on cyclic loading amplitude ratio 'R'. Fatigue life is less for proportional loading than for simple torsion or simple axial loading. The ultimate number of cycles, in the studied interval of 'R' (-1 to +1), increases in a linear fashion. It has a minimum value at R equals to -1. This effect is directly related to the maximum Von Mises stress. The latter increases in a linear fashion as R increases from -1 to +1, and exhibits a maximum value at R equals to -1. Also, it is found that fatigue life and Von Mises stress are highly dependent on the induced stress ratio (σ/τ). Von Mises stress increases as stress ratio increases. In a reverse manner, fatigue life increases slowly as the ratio τ/τ_{τ} increases. This result concludes the strong effect, on fatigue life, of the presence of the axial load within the multi-axial cyclic loading. In fact, axial loading favors the mode I crack which propagates rapidly perpendicularly to the

axis of axial loading.

Keywords: *Fatigue Life, Ferritic Nodular Graphite Cast Iron, Multi-Axial Loading, Von Mises Stress*

339 **Title: Microscopic model analysis of $^{11}\text{Li} + p$ elastic scattering at 62, 68.4, and 75 MeV/nucleon**

Author: *Hasan M. Maridi, Published Year: 2009*

Physical Review C, 79, 014612

Faculty: *Faculty of Engineering*

Abstract: $^{11}\text{Li}+p$ elastic scattering data at three energies, 62, 68.4, and 75 MeV/nucleon, are analyzed with density-dependent M3Y and KH effective nucleon-nucleon (NN) interactions in the framework of the single folding model. The parameters of the density-dependent term are adjusted to fulfill saturation of nuclear matter. The optical potentials (OP's) and cross sections are calculated using four model densities of ^{11}Li , G (one-parameter Gaussian), GG (Gaussian-Gaussian), GO (Gaussian- oscillator), and the COSMA (cluster orbital shell model approximation). Comparative studies are performed for real, imaginary, and spin-orbit potentials with the phenomenological and microscopic forms. The microscopic volume and surface imaginary potentials are constructed from both the renormalized folded potentials and their derivatives. The sensitivity of the differential cross section to the four densities is tested. It is found that the $^{11}\text{Li}+p$ elastic scattering cross sections depend strongly upon the behavior of the corresponding potentials. The GG and GO densities obtained from analyzing the data, using Glauber multiple scattering theory at high energies, give good results at energies below 100 MeV/nucleon in the framework of the folding model. The OP's calculated in the microscopic form using few parameters give good agreement with the data. Thus, it is not necessary to introduce a large number of arbitrary fitting parameters as done in the phenomenological and semimicroscopic OP's. The KH effective interaction successfully describes $^{11}\text{Li}+p$ elastic scattering as the popular M3Y interaction. The obtained results of the reaction cross section are in good agreement with previous calculations.

Keywords: *Mass and neutron distributions, Elastic proton scattering, Elastic scattering*

340 **Title: Elastic scattering and breakup effect analysis of $^{11}\text{Be}+^{12}\text{C}$ at 38.4 MeV/nucleon**

Author: *Hasan M. Maridi, Published Year: 2009*

Physical Review C, 79, 064608

Faculty: *Faculty of Engineering*

Abstract: $^{11}\text{Be}+^{12}\text{C}$ elastic-scattering data at 38.4 MeV/nucleon has been analyzed using the optical model. The optical potential is calculated in the framework of the double folding model using M3Y effective nucleon-nucleon interaction. Different models of ^{11}Be density are tested and the model that does not include the halo structure gives poor fitting with data. The breakup effect is studied by introducing a complex dynamical polarization potential (DPP) that is added to the "bare" potential. The DPP is taken in different forms that have been obtained from simple phenomenological, semiclassical approximation, and microscopic methods. The simple phenomenological DPP is related to the semiclassical approximation method. The sensitivity of the differential and reaction cross sections to these polarization potentials is tested. The microscopic DPP that has been constructed from the derivative of the folding potential describes the breakup effect well. It gives an explicit justification for the long range of the polarization potential.

Keywords: Mass and neutron distributions, Optical and diffraction nuclear models, Elastic scattering, Nucleus-Nucleus scattering

341 **Title: Proton scattering of helium isotopes using an energy-dependent folded potential**

Author: Hasan M. Maridi, **Published Year:** 2018

AIP Conference Proceedings, 1976, 020004

Faculty: Faculty of Engineering

Abstract: The proton elastic scattering data on helium isotopes at different energies are analyzed using the folding optical model with the distorted wave born approximation. The obtained results of the differential and the reaction cross sections are in good agreement with the available experimental data. The volume integrals of the best-fit OP parts have systematic energy dependencies, and they are parameterized in empirical formulas. Then, the energy dependence of the OP is determined from the parameterization of the volume integrals.

Keywords: Proton Elastic Scattering, Volume Integral, Optical Potential, Reaction Cross Section, helium isotopes, Nuclear Reactions

342 **Title: Energy-dependent microscopic optical potential for p+9Be elastic scattering**

Author: Hasan M. Maridi, **Published Year:** 2016

AIP Conference Proceedings, 1742, 030011

Faculty: Faculty of Engineering

Abstract: The p+9Be elastic scattering at an energy range up to 200 MeV/nucleon is analyzed using the single-folding model. The density- and isospin-dependent M3Y-Paris nucleon-nucleon (NN) interaction is used for the real part and the NN-scattering amplitude of the high-energy approximation for the imaginary one. The analysis reveals that the cross-section data are reproduced well at energies up to 100 MeV/nucleon by use of the partial-wave expansion. For higher energies, the eikonal approximation give results better than the partial-wave expansion calculations. The volume integrals of the optical-potential parts have systematic energy dependencies, and they are parameterized in empirical formulas.

Keywords: Elastic Scattering, Volume Integral, Optical Potential, Beryllium Nucleus, Nuclear Reactions

343 **Title: Analysis of proton scattering of stable and exotic light nuclei using an energy-dependent microscopic optical potential**

Author: Hasan M. Maridi, **Published Year:** 2016

EPJ Web of Conferences , 107, 08007

Faculty: Faculty of Engineering

Abstract: The proton elastic scattering off the 9,10,11,12Be isotopes at a wide energy range from 3 to 200 MeV/nucleon is analyzed using the optical model with the partial-wave expansion method. The microscopic optical potential (OP) is taken within the single-folding model. The density- and isospin-dependent M3YParis nucleon-nucleon (NN) interaction is used for the real part and the NN-scattering amplitude of the highenergy approximation for the imaginary one. The cross-section data are reproduced well at energies up to 100 MeV/nucleon by use of the partial-wave expansion. For higher energies, the eikonal approximation is successfully used. The volume integrals of the OP parts have systematic energy dependencies and they can be parameterized as functions of energy. From these parametrization,

an energy-dependent OP can be obtained.

Keywords: Proton Elastic Scattering, Volume Integral, Optical Potential, Beryllium Isotopes, Nuclear Reactions

344 **Title: Analysis of proton-9,10,11,12Be scattering using an energy-, density-, and isospin-dependent microscopic optical potential**

Author: Hasan M. Maridi, Published Year: 2014

Physical Review C, 90, 034615

Faculty: Faculty of Engineering

Abstract: The proton elastic scattering of 9,10,11,12Be isotopes at a wide energy range from 3 to 200 MeV/nucleon is analyzed using the optical model with the partial-wave expansion method. The microscopic optical potential (OP) is taken within the single-folded model. The density- and isospin-dependent M3Y-Paris nucleon-nucleon (NN) interaction is used for the real part and the NN-scattering amplitude of the high-energy approximation is used for the imaginary one. The surface contribution to the imaginary part is included. The analysis reveals that the partial-wave expansion with this microscopic OP reproduces well the basic scattering observables at energies up to 100 MeV/nucleon. For higher energies, the eikonal approximation with the same OP gives results better than the partial-wave expansion calculations. The volume integrals of the OP parts have systematic energy dependencies, and they are parameterized in empirical formulas. In addition, the volume integral's parametrizations determine the true energy dependence for the depths of the OP parts. The study of increasing the number of neutrons for a given isotope shows that the imaginary volume integrals and reaction cross sections depend on the matter radii of the scattered nuclei. Further, they are found to have larger values for the halo nucleus scattering ($^{11}\text{Be}+p$) than those for the scattering of their isotopes.

Keywords: Elastic proton scattering, Optical and diffraction nuclear models, Nuclear reaction

345 **Title: Energy-dependent microscopic optical potential for scattering of nucleons on light nuclei**

Author: Hasan M. Maridi, Published Year: 2014

European Physical Journal A, 50, 106

Faculty: Faculty of Engineering

Abstract: We present an energy-dependent microscopic optical model potential for elastic scattering of nucleons on light nuclei. The single-folding model is used for the real part of the optical potential (OP), while the imaginary part is derived within the high-energy approximation theory. The energy dependence of the OP is determined from the parameterization of the volume integrals those calculated from the best-fit OP that fit the experimental data of the cross sections and analyzing powers. This energy-dependent OP is successfully applied to analyze the proton elastic scattering of 4,6,8He, 6,7Li, and 9,10Be nuclei at low and intermediate incident energies up to 200MeV/nucleon.

Keywords: Elastic Scattering, Volume Integral, Optical Potential, Nuclear Reaction Cross Section, Stable and Exotic Nuclei

346 **Title: Microscopic study on proton elastic scattering of helium and lithium isotopes at energy range up to 160 MeV/nucleon**

Author: Hasan M. Maridi, Published Year: 2014

EPJ Web of Conferences , 66, 03025

Faculty: Faculty of Engineering

Abstract: The proton elastic scattering data on 4,6,8 He and 6,7,9,11Li nuclei at energies below 160 MeV/nucleon are analyzed using the optical model. The optical potential (OP) is taken microscopically, with few and limited fitting parameters, using the single folding model for the real part and high-energy approximation (HEA) for the imaginary one. Clear dependencies of the volume integrals on energy and rms radii are obtained from the results. The calculated differential and the reaction cross sections are in good agreement with the available experimental data. In general, this OP with few and limited fitting parameters, which have a systematic behavior with incident energy and matter radii, successfully describes the proton elastic scattering data with stable and exotic light nuclei at energies up to 160 MeV/nucleon.

Keywords: *Proton Elastic Scattering, Volume Integral, Optical Potential, Reaction Cross Section, Helium and Lithium Isotopes*

347

Title: Elastic interaction of protons with stable and exotic light nuclei

Author: Hasan M. Maridi, Published Year: 2013

Physical Review C, 88, 064602

Faculty: Faculty of Engineering

Abstract: The proton elastic-scattering data on 4,6,8He and 6,7,9,11Li nuclei are analyzed over a wide range of incident energies below 160 MeV/nucleon using the single-folding optical model. The real part of the folding optical potential (OP) is calculated using the M3Y nucleon-nucleon interaction and microscopic densities. The Green's function Monte Carlo density is used for the stable nuclei, whereas the large-scale shell model density is used for the exotic nuclei. The high-energy approximation calculation is used for the volume imaginary OP. The spin-orbit and surface imaginary parts of the OP are constructed from the derivatives of the real and volume imaginary parts of the folded potentials, respectively. The volume integrals of the OPs are studied, and it is found that they show clear dependencies on energy and root-mean-square radii. Hence, it can be considered an important constraint for the choice of the optical potential. A new empirical formula is assumed and successfully applied for the real volume integrals. The obtained results of the differential and the reaction cross sections are in good agreement with the available experimental data. In general, this OP with few and limited fitting parameters, which have systematic behavior with incident energy, successfully describes the proton elastic-scattering data with stable and exotic light nuclei at energies below 160 MeV/nucleon.

Keywords: *Elastic proton scattering, Elastic scattering, Mass and neutron distributions, Optical and diffraction nuclear models*

348

Title: Elastic Microscopic study on proton elastic scattering of light exotic nuclei at energies below than 100 MeV/nucleon

Author: Hasan M. Maridi, Published Year: 2012

European Physical Journal A, 48, 154

Faculty: Faculty of Engineering

Abstract: The proton elastic scattering data on some light exotic nuclei, namely, 6, 8He, 9, 11Li, and 10, 11, 12Be, at energies below than 100MeV/nucleon are analyzed using the single folding optical model. The real, imaginary, and spin-orbit parts of the optical potential (OP) are constructed only from the folded potentials and their derivatives using M3Y effective nucleon-nucleon interaction. These OP parts, their renormalization factors and their volume integrals are studied. The surface and spin-orbit potentials are important to fit the experimental data. Three model densities

for halo nuclei are used and the sensitivity of the cross-sections to these densities is tested. The imaginary OP within high-energy approximation is used and compared with the single folding OP. This OP with few and limited fitting parameters, which have systematic behavior with incident energy, successfully describes the proton elastic scattering data with exotic nuclei.

Keywords: *Elastic Scattering, Optical Potential, Exotic Nuclei, Halo Nuclei*

349

Title: **Predicting sanitary landfill leachate generation in humid regions using ANFIS modeling**

Author: *Taher Abunama & Faridah Othman & Mohammad K. Younes, Published Year: 2018*

Environmental monitoring and assessment, 190(10)

Faculty: *Faculty of Engineering*

Abstract: Landfill leachate is one of the sources of surface water pollution in Selangor State (SS), Malaysia. Leachate volume prediction is essential for sustainable waste management and leachate treatment processes. The accurate estimation of leachate generation rates is often considered a challenge, especially in developing countries, due to the lack of reliable data and high measurement costs. Leachate generation is related to several variable factors, including meteorological data, waste generation rates, and landfill design conditions. Large variations in these factors lead to complicated leachate modeling processes. The aims of this study are to determine the key elements contributing to leachate production and then develop an adaptive neural fuzzy inference system (ANFIS) model to predict leachate generation rates. Accuracy of the final model performance was tested and evaluated using the root mean square error (RMSE), the mean absolute error (MAE), and the correlation coefficient (R). The study results defined dumped waste quantity, rainfall level, and emanated gases as the most significant contributing factors in leachate generation. The best model structure consisted of two triangular fuzzy membership functions and a hybrid training algorithm with eight fuzzy rules. The proposed ANFIS model showed a good performance with an overall correlation coefficient of 0.952.

Keywords: *Landfill leachate . Input optimization . ANFIS modeling system . Sanitary landfill*

350

Title: **DVB-T Systems Speaker Verifications Performance**

Author: *1- Omar Daoud, Qadri Hamarsheh, and Ahlam Damati, Published Year: 2016*

Faculty: *Faculty of Engineering*

Abstract: In this work, a popular broadcasting standard's performance has been checked, namely Handheld Digital Video Broadcasting (DVB-T). DVB-T facilitates the digital television transmission by making use of handheld receivers, which uses the Orthogonal Frequency Division Multiplexing (OFDM) technique as a modulation technique. This performance has been examined by proposing different techniques to overcome one of the main OFDM drawbacks namely Peak-to-Average Power Ratio (PAPR) problem. Two main factors have been used in order to check the PAPR enhancements; BER curves and CCDF curves. The proposed work consists of three different stages; de-noising the signal by making use of the wavelet transformation; the odd peaks detecting criterion based on a globally statistical adaptive method; and the moving average filters to replace the affected peaks. A MATLAB simulation test has been performed under the same bandwidth occupancy of the speaker verification-based systems; 15% extra PAPR enhancements achieved and further 25% extra BER enhancements over the previous published work.

Keywords: --

Title: Efficiency Enhancement based on Allocating Bizarre Peaks

Author: Qadri Hamarsheh, Omar Daoud, Mohammed Ali, and Ahlam Damati,
Published Year: 2016

Faculty: Faculty of Engineering

Abstract: A new work has been proposed in this paper in order to overcome one of the main drawbacks that found in the Orthogonal Frequency Division Multiplex (OFDM) systems, namely Peak to Average Power Ratio (PAPR). Furthermore, this work will be compared with a previously published work that uses the neural network (NN) as a solution to remedy this deficiency. The proposed work could be considered as a special averaging technique (SAT), which consists of wavelet transformation in its first stage, a globally statistical adaptive detecting algorithm as a second stage; and in the third stage it replaces the affected peaks by making use of moving average filter process. In the NN work, the learning process makes use of a previously published work that is based on three linear coding techniques. In order to check the proposed work validity, a MATLAB simulation has been run and has two main variables to compare with; namely BER and CCDF curves. This is true under the same bandwidth occupancy and channel characteristics. Two types of tested data have been used; randomly generated data and a practical data that have been extracted from a funded project entitled by ECEM. From the achieved simulation results, the work that is based on SAT shows promising results in reducing the PAPR effect reached up to 80% over the work in the literature and our previously published work. This means that this work gives an extra reduction up to 15% of our previously published work. However, this achievement will be under the cost of complexity. This penalty could be optimized by imposing the NN to the SAT work in order to enhance the wireless systems performance.

Keywords: --

Title: Enhancing DVB-H BER based OFDM systems

Author: Qadri Hamarsheh and Omar Daoud, **Published Year:** 2015

Journal of Communications technology and Electronics, 60

Faculty: Faculty of Engineering

Abstract: Due to the need for enhancing the wireless systems performance, a new technique, and over the last decades, has been imposed to such systems, namely Orthogonal Frequency Division Multiplexing (OFDM). In order to overcome one of the main OFDM drawbacks a new proposal has been investigated, which could limit the usage of such system in the nonlinear devices. Peak-to-Average Power Ratio (PAPR) problem comes as a result of using Fast Fourier Transform (FFT) stage, where the input 2N signals and after the process could be added together in the same phase. In this algorithm some modifications have been made over a previously published, where the wavelet entropy understanding has been imposed to be the judge for the PAPR consideration. In the previous published work, when a wavelet technique was proposed to De-Noise OFDM symbols and Replace the high PAPR and named by DORP. This is attained by making use of an adaptive threshold to allocate the affected samples, which are amended according to the surrounding ones. In the Modified-DORP (M-DORP), the wavelet transform is used to reconstruct the affected OFDM symbol with PAPR based on their entropies. A MATLAB simulation has been made to verify and validate the numerical model that is derived to investigate the systems performance. Furthermore, the achieved results were compared to either our previously published work or to the work that found in the literature. However, the simulation results show BER systems improvement under the same systems' conditions, an additional transceivers complexity has been added. This will leave a space for further improvement in future. Furthermore, the M-DORP gives a noise

immunity and verification rate up to 85%

Keywords: --

353

Title: Enhancing the BER of MIMO-OFDM Systems for Speaker Verification

Author: Omar Daoud, Qadri Hamarsheh and Wael Al-Sawalmeh, Published Year: 2013

IEEE SSD'13, 10th International Multi-Conference on Systems, Signals & Devices, Tunisia

Faculty: Faculty of Engineering

Abstract: In this work a new algorithm has been proposed to improve the wireless systems that are compatible with the current new technologies. Therefore, Denoise Orthogonal Frequency Division Multiplexing (OFDM) symbols and Replace the high Peak-to-Average Power Ratio (PAPR); (DORP) has been modified. In DORP, wavelets techniques have been used to denoise the affected OFDM symbol by high PAPR values. After that and based on adaptive threshold method the local maxima and minima will be determined and replaced by the average of them and their surrounding neighbors. The algorithm mainly tackles and overcomes the effect of the high Peak-to-Average Power Ratio problem that is found in OFDM systems, MIMO-OFDM combination has been developed to meet the rapidly increment in the users demand such as the ubiquitous transmission, imposing new multimedia applications and wireless services. A system performance investigation process will be accomplished based on both of numerical method and MATLAB simulation. Moreover, a comparison has been made to check the validity of our proposition either with our previously published work or with the literature. Although, the achieved results show that the proposed work gives an improvement of the BER; an additional complexity has been added to transceiver's structure. Moreover, and as a result to the comparison with the conventional systems, the bit error rate (BER) performance has been improved for the same bandwidth occupancy. As a validity process a comparison has been made with the current values found in the literature and we have achieved around 27% PAPR extra reduction. That is in addition to around 81% verification rate and noise immunity

Keywords: ---

354

Title: Enhancing the Odd Peaks Detection in OFDM Systems Using Wavelet Transforms

Author: Ahlam Damati, Omar Daoud, and Qadri Hamarsheh, Published Year: 2016

International Journal Communications, Network, and System Science, 9

Faculty: Faculty of Engineering

Abstract: This work aims to study the effect of unwanted peaks and enhance the performance of wireless systems on the basis of tackling such peaks. A new proposition has been made based on wavelet transform method and its entropy. Signals with large peak-to-average power ratio (PAPR) will be examined such as the ones that is considered as the major Orthogonal Frequency Division Multiplexing (OFDM) systems drawbacks. Furthermore, a spatial diversity Multiple-Input Multiple-Output (MIMO) technology is used to overcome the complexity addition that could arise in our proposition. To draw the best performance of this work, a MATLAB simulation has been used; it is divided into three main stages, namely, MIMO-OFDM symbols' reconstruction based on wavelet transform, a predetermined thresholding formula, and finally, moving filter. This algorithm is called Peaks' detection based Entropy Wavelet Transform; PD-EWT. Based on the simulation, and under some constrains such as the bandwidth occupancy and the complexity structure of the

transceivers, a peak detection ratio has been achieved and reaches around 0.85. Comparing with our previously published works, the PD-EWT enhances detection ratio for 0.25 more peaks

Keywords: --

355 **Title: Enhancing the Performance of OFDM Systems-Based PAPR Reduction**
Author: Omar Daoud, Qadri Hamarsheh and Ahlam Damati, Published Year: 2016
Journal of Circuits, Systems, and Signal Processing, 10

Faculty: Faculty of Engineering

Abstract: In this work a comparison has been made among different proposed algorithms in order to improve the performance of a power consumption wireless network. They are used to combat one of the Orthogonal Frequency Division Multiplexing (OFDM) technique drawbacks, which are considered as a key technique in enhancing the new era of wireless systems' quality of service (QoS). Therefore, three different propositions have been investigated and covered by this work and classified as; linear coding based, wavelet transformation based, PWM based. Furthermore, a MATLAB program has been run to check their performance and covers two different criteria; the curves of CCDF and the SER curves. This is in order to reduce the Peak-to-Average Power Ratio (PAPR) effect

Keywords: --

356 **Title: Enhancing the Performance of Speaker Verifications-Based DVB-T Systems**

Author: Omar Daoud, Qadri Hamarsheh and Ahlam Damati , Published Year: 2017

14th International Multi-Conference on Systems, Signals & Devices, Morocco

Faculty: Faculty of Engineering

Abstract: Terrestrial Digital Video Broadcasting (DVB-T) is considered as one of the main two popular broadcasting standards, which facilitates the transmission of digital television in handheld receivers. In this work, a comparison will be held to enhance the mobile communications performance. This work aims to reduce the effect of a major problem found in the Orthogonal Frequency Division Multiplexing (OFDM) technique, namely Peak-to-Average Power Ratio (PAPR) problem; one of the main drawbacks of. Two main factors will be the main factor of this comparison; BER curves and CCDF curves. This work combined three different stages together; wavelet transformation in order to remove the noise from the signal; a globally statistical adaptive detecting algorithm; and replacing the affected peaks with a moving average filter process. At the same bandwidth occupancy of the speaker verification-based systems, the simulation has been run and shows additional enhancement in both of CCDF and BER curves; an extra 15% reduction is achieved in the essence of PAPR and around 25% extra noise immunity

Keywords: --

357 **Title: MIMO-OFDM Systems Performance Enhancement Based Peaks Detection Algorithm**

Author: 15- Omar Daoud, Qadri Hamarsheh and Wael Al-Sawalmeh, Published Year: 2013

International Journal of interactive Mobile Technologies, 7

Faculty: Faculty of Engineering

Abstract: This work proposes a new algorithm to enhance the performance of the

speaker verification over the communication systems based Multiple-Input Multiple-Output (MIMO) - Orthogonal Frequency Division Multiplexing (OFDM) techniques. The algorithm mainly tackles and overcomes the effect of the high Peak-to-Average Power Ratio problem that is found in OFDM systems, MIMO-OFDM combination has been developed to meet the rapidly increment in the users demand such as the ubiquitous transmission, imposing new multimedia applications and wireless services. In this algorithm, wavelets techniques have been used to denoise the affected OFDM symbol by high PAPR values. After that and based on adaptive threshold method the local maxima and minima will be determined and replaced by the average of them and their surrounding neighbors; Denoise OFDM and Replace PAPR (DORP). A system performance investigation process will be accomplished based on both of numerical method and MATLAB simulation. Moreover, a comparison has been made to check the validity of our proposition either with our previously published work or with the literature. Although, the achieved results show that the proposed work has lower PAPR values; an additional complexity has been added to transceiver's structure. Moreover, and as a result to the comparison with the conventional systems, the bit error rate (BER) performance has been improved for the same bandwidth occupancy. As a validity process a comparison has been made with the current values found in the literature and we have achieved around 30% PAPR extra reduction. That is in addition to around 90% verification rate and noise immunity.

Keywords: ---

358

Title: OFDM Peak Detection Algorithm based on Wavelet Transform

Author: Saleh S. Saraireh, Qadri J. Hamarsheh and Omar Daoud, Published Year: 2013

European Journal of Scientific Research, 101

Faculty: Faculty of Engineering

Abstract: This work proposes a new peak detection algorithm based on the entropy of the wavelet transforms. Moreover, this work has been applied to combat one of the major Orthogonal Frequency Division Multiplexing (OFDM) system's drawbacks; namely peak-to-average power ratio (PAPR). The proposed algorithm is divided into three main stages; reconstruction based on wavelet transform, predetermined thresholding, and imposing moving filter. This algorithm is called OFDM system based Entropy Wavelet Transform (O-EWT). The O-EWT performance and validity have been checked based on a numerical analysis and a conducted simulation. As a comparison with the techniques found in the literature, O-EWT gives promising results reach to around 80% improvement for the same bandwidth occupancy, which is attained at the cost of introducing additional complexity to the transceiver's structure

Keywords: ---

359

Title: OFDM Systems Performance Enhancement

Author: Omar Daoud Qadri Hamarsheh and Ahlam Damati, Published Year: 2015 IEEE SSD'15, 12th International Multi-Conference on Systems, Signals & Devices,, Tunisia

Faculty: Faculty of Engineering

Abstract: In this work a comparison among different proposed algorithms has been done to check the performance improvements for current wireless technologies. Orthogonal Frequency Division Multiplexing (OFDM) technique is one of the main techniques that are uses to enhance the quality of service (QoS) for beyond third generation (B3G) systems. This is in order to meet the rapidly increased of

multimedia users demand. This comparison includes three previous propositions that were made to enhance the OFDM performance; work based on linear coding techniques, work based on wavelet transform and work based on PWM. All these propositions have been made to combat the effect of high Peak-to-Average Power Ratio (PAPR)

Keywords: --

360

Title: PAPR reduction based on entropy wavelet transform for Sniffer Mobile Robot

Author: 10- Omar Daoud, Qadri Hamarsheh and Saleh Saraireh, Published Year: 2014

International Journal of Electronics and Communications- AEÜ, 68

Faculty: Faculty of Engineering

Abstract: In this paper, the performance of wireless systems has been improved based on a proposition of a new peak detection algorithm based on the entropy of the wavelet transforms [1] and to be imposed to the Sniffer Mobile Robot (SNFRbot). This enhancement has been compared with a previously published work that uses a predistortion neural network (PDNN) architecture has been imposed to the SNFRbot. More-over, the proposed method in this work has been applied to combat the Orthogonal Frequency Division Multiplexing (OFDM) system's drawback; namely peak-to-average power ratio (PAPR). Generally, the proposed algorithm consists of three stages; firstly, reconstruction based on wavelet transform, secondly, predetermined thresholding, and thirdly, imposing moving filter. This algorithm is called Multiple-Input Multiple-Output (MIMO)-OFDM system based entropy wavelet transform and to be imposed to SNFRbot work; SNFRbot-EWT. The performance of SNFRbot-EWT has been evaluated using a numerical analysis and a conducted simulation. The results have been compared with our previously published work, SNFRbot-EWT gives an improvement reach to around 30% for the same bandwidth occupancy, which will reduce the cost and the complexity of the transceiver's structure.

Keywords: MIMO-OFDM SNFRbot-EWT Wavelet Entropy PAPR

361

Title: PEAK DETECTION USING WAVELET TRANSFORM

Author: Omar Daoud, Qadri Hamarsheh and Saleh Saraireh, Published Year: 2014

International Journal of Computer Networks and Communications, 6

Faculty: Faculty of Engineering

Abstract: A new work based-wavelet transform is designed to overcome one of the main drawbacks that found in the present new technologies. Orthogonal Frequency Division Multiplexing (OFDM) is proposed in the literature to enhance the multimedia resolution. However, the high peak power (PAPR) values will obstruct such achievements. Therefore, a new proposition is found in this work, making use of the wavelet transforms methods, and it is divided into three main stages; de-noising stage, thresholding stage and then the replacement stage. In order to check the system stages validity; a mathematical model has been built and its checked after using a MATLAB simulation. A simulated bit error rate (BER) achievement will be compared with our previously published work, where an enhancement from 8×10^{-1} to be 5×10^{-1} is achieved. Moreover, these results will be compared to the work found in the literature, where we have accomplished around 27% PAPR extra reduction. As a result, the BER performance has been improved for the same bandwidth occupancy. Moreover and due to the de-noise stage, the verification rate has been improved to reach 81%. This is in addition to the noise immunity

enhancement.

Keywords: MIMO-OFDM, PAPR, wavelet- eigen vector, de-noising

362

Title: Power Peaks Allocation Based on Averaging-Adaptive Wavelet Transform

Author: 2- Qadri Hamarsheh, Omar Daoud, Mohammed Ali, and Ahlam Damati ,

Published Year: 2016

Journal of Circuits, Systems, and Signal Processing, 10

Faculty: Faculty of Engineering

Abstract: One of Orthogonal Frequency Division Multiplexing deficiency has been taken into consideration in this work. A proposition has been made to tackle the Peak to Average Power Ratio (PAPR) problem. The proposed work will be based on a special averaging adaptive wavelet transformation (SAAWT) process. It will be compared with two main works that has been published previously; a neural network (NN)-based and a special averaging technique (SAT)-based. In the NN work, the learning process makes use of a previously published work that is based on three linear coding techniques. The proposed work (SAAWT) consists of three main stages; extracting the needed features, de-noising and the optimization criterion. SAAWT has an enhancement over the SAT that will take the noise clearance enhancement into its consideration. It uses 136880 different combinations of de-noising parameters that are experimentally computed to get the most efficient result with respect to the MSE, SNR and PSNR values. A MATLAB simulation-based of such works has been made in order to check the proposition performance. In this simulation, both of the BER and CCDF curves have been taken into consideration. Furthermore, the bandwidth and channel behaviors have been remain constant. Moreover, two kinds of data have been imposing to this simulation; a random data that is generated randomly by making use of the MATLAB features and a practical data that have been extracted from a funded project entitled by ECEM. From the previously published work the SAT shows promising results in reducing the PAPR effect reached up to 75% over the work in the literature and over the NN-based work. Under the cost of increasing complexity, SAAWT gives further reduction over the SAT reaches up to 6%. This drawback will be examined in the future work.

Keywords: --

363

Title: SPEAKER VERIFICATION OVER MIMO-OFDM SYSTEMS BASED ON AI

Author: Omar Daoud, Qadri Hamarsheh and Wael Al-Sawalmeh, Published Year: 2012

International Journal of Computer and Communications, 6

Faculty: Faculty of Engineering

Abstract: In this work, an enhancement of a previously published work that tackles the use of automatic speaker verification (ASV) techniques in the Beyond Third generation (B3G) cellular systems has been proposed. The new proposition has been studied to overcome the effect of the Peak-to-Average Power Ratio (PAPR), which is a vital problem that found in the Orthogonal Frequency Division Multiplexing (OFDM) techniques, where a powerful combination between two main technologies; Multiple-Input Multiple-Output (MIMO) and OFDM has been developed to meet the rapidly increment in the users demand such as the ubiquitous transmission, imposing new multimedia applications and wireless services. The work space has been divided into three main areas; firstly, reducing the ASV complexity by selecting the weight of the text independent speakers based on Self-Organizing Map (WSOM) Neural Network (NNT), secondly, using the Eigen values/vector extracting features techniques as a pre-processing one to enhance the orthogonality, and finally proposing a new algorithm to combat the effect of the PAPR in the MIMO-OFDM systems. In this

algorithm, wavelets techniques have been used to Denoise the affected OFDM symbol by high PAPR values. After that and based on adaptive threshold method the local maxima and minima will be determined and replaced by the average of them and their surrounding neighbors; Denoise OFDM and Replace PAPR (DORP). A system performance investigation process will be accomplished based on both of numerical method and MATLAB simulation. Moreover, a comparison has been made to check the validity of our proposition with our previously published work. Although, the achieved results show that the proposed work has lower PAPR values; an additional complexity has been added to transceiver's structure. Moreover, and as a result to the comparison with the conventional systems, the bit error rate (BER) performance has been improved for the same bandwidth occupancy. Our simulation results showed that around 28% extra reduction in PAPR over current values in the literature, it can be achieved depending on the system type. Moreover, two different investigation and verifications techniques have been used in this work; Gaussian mixture model based method (GMMWPE) and K-Means clustering based method (KMWPE). A promising verifications result has been showed for verifications rate; around 91% and for noise immunity.

Keywords: ---

364 **Title: Wavelet Entropy algorithm to allocate the extreme power peaks in WiMax systems**

Author: Qadri Hamarsheh, Omar Daoud, and Saleh Saraireh, Published Year: 2014

International Journal of interactive Mobile Technologies, 8

Faculty: Faculty of Engineering

Abstract: This work proposes a solution to overcome the effect for one of the main drawbacks of these days' wireless systems, where Multiple-Input Multiple-Output (MIMO)-Orthogonal Frequency Division Multiplexing (OFDM) combinations has been used. High peak-to-average power ratio (PAPR) arises after the OFDM stage and reduces the performance of the used nonlinear devices. Therefore, a new stage has been imposed between the MIMO and OFDM block. It is based on the entropy meaning of the wavelet transformation to trigger a proposed thresholding criterion and reconstruct the OFDM signal. As a result, the probability of high PAPR appearance will be limited and reduced; a promising result over our recently published work has been conducted; 15-25% extra reduction. This work could be denoted by MIMO-OFDM based on Entropy Wavelet Transform (MO-EWT) systems. The MO-EWT validity has been checked based on either numerical analysis or conducted simulation based on MATLAB; where 80% improvement of reducing the high PAPR has been achieved over the literature. These results have been reached using the same environment conditions and at additional cost and complexity of the transceivers structure

Keywords: --

365 **Title: Wavelet Transform Basis to Detect the Odd Peaks**

Author: Ahlam Damati, Omar Daoud, and Qadri Hamarsheh, Published Year: 2014

”, IEEE SSD'14, 11th International Multi-Conference on Systems, Signals & Devices, Spain

Faculty: Faculty of Engineering

Abstract: The performance of wireless systems has been studied on the basis of tackling the unwanted peak. A wavelet transform method was used for this purpose. Specifically, this proposition has been applied to combat the large peak-to-average

power ratio (PAPR), which is one of the major Orthogonal Frequency Division Multiplexing (OFDM) system's drawbacks. Furthermore, Multiple-Input Multiple-Output (MIMO) technology also imposed to enhance the wireless systems performance. To draw the best performance of this work, a MATLAB simulation has been used and it is divided into three main stages; MIMO-OFDM symbols' reconstruction based on wavelet transform, then a predetermined thresholding formula that is used, and finally, imposing moving filter. This algorithm is called Peaks' detection based Entropy Wavelet Transform; PDEWT. Moreover, a numerical analysis also used to check its validity. Based on our simulation and under some constrains such as the bandwidth occupancy and the complexity structure of the transceivers, a peak detection ratio has been achieved and reaches around 85%. Comparing to our previously published works, the PD-EWT enhances the detection ratio for 25% more peaks.

Keywords: --

366

Title: Wavelet Transformation method to allocate the OFDM signals peaks

Author: Omar Daoud, Qadri Hamarsheh and Ahlam Damati, Published Year: 2016 IEEE SSD'16, 13th International Multi-Conference on Systems, Signals & Devices, Germany

Faculty: Faculty of Engineering

Abstract: This work makes use of the entropy in order to propose a wavelet transformation algorithm to detect the odd peaks. Furthermore, this algorithm has been used to enhance the Orthogonal Frequency Division Multiplexing (OFDM) system performance based on combatting the peak-to-average power ratio (PAPR) problem. Three main stages are used to fulfill the process requirements; OFDM signal transformation based on the wavelet structure, thresholding process based on a predetermined criterion, and the filtration stage based on the moving filter. The proposed algorithm performance has been checked and validated not just numerically but also by a MATLAB conducted simulation. Furthermore, to check the simulation results, a comparison has been made to the literature; and shows promising results under the same bandwidth occupancy and systems limitations

Keywords: --