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وقائع

المؤتمر العلمي الدولي الرابع

للعلوم الهندسية والتقنيات المتقدمة

نقابة الاكاديميين العراقيين

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المؤتمر العلمي الدولي الرابع

للعلوم الهندسية والتقنيات المتقدمة

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3-4 حزيران 2022

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برعاية السيد نقيب الأكاديميين العراقيين الدكتور مهند الهلال المحترم

تقييم اللجنة العلمية والثقافية في نقابة الأكاديميين العراقيين/المقر العام، وبالتعاون مع كلية الرافدين الجامعة الاهلية و الدار الأكاديمية للنشر العلمي المؤتمر العلمي الدولي الرابع للعلوم الهندسية والتقنيات المتقدمة.

المؤتمر سوف يقام الكترونياً في رحاب نقابة الأكاديميين العراقيين للفترة (3 - 4 حزيران 2022)

ايماناً بان نقابة الأكاديميين العراقيين هي احد الركائز والعوامل الرئيسية للارتقاء بواقع التعليم العالي والبحث العلمي، فهي تسعى دائماً من خلال إقامة المحافل العلمية والمؤتمرات لتوفير البيئة العلمية المناسبة للعلماء والباحثين والطلبة في مجالات العلوم الهندسية والتقنيات المتقدمة، لعرض نتاجاتهم العلمية، وتبادل المعلومات والخبرات، واطلاع المشاركين على اخر التطورات في المجالات الهندسية والعلمية المختلفة، وتطبيقاتها لصالح العلم والتنمية التي من شأنها الارتقاء بالواقع العلمي والصناعي في العراق. . علما ان البحوث المقبولة في المؤتمر ستنشر في :

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المؤتمر العلمي الدولي الرابع
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نقابة الاكاديميين العراقيين
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Paper ID:1

Assessment of body mass index for celiac patients and for patients who follow a gluten-free diet and a statistical study of some factors related to celiac disease

Noor M. Abdulrahman, Enaam A. Hamza

Abstract. Celiac disease is a condition in which your immune system attacks the tissues of your small intestine when you eat gluten. The current study aims to assess the body mass index (BMI)of celiac patients, including patients who abstain from eating gluten, and compare them with the healthy (control group). The current study also included the effect of age group and gender on body mass index in these groups. The study also included a statistical study of the factors affecting celiac disease. Body mass index was measured for 183 people of both sexes ranging in age from (2-25) years, and divided into three groups, the group of patients taking gluten includes 62 people and the group of patients who abstained from eating Gluten includes 61 people, and the healthy group (control) includes 60 people. Information related to the disease was also collected for each person through patient answering many questions according to the questionnaire form such as Symptoms experienced by the patient, Does the patient suffer from other diseases ?and dose the patient take nutritional supplements?, and others. The results showed a significant decrease in the in measurement of body mass index in patients who eat gluten as well as patients who abstain from eating gluten compared with healthy controls at a probability level ($p \leq 0.05$). The results showed a significant decrease in BMI measurement among healthy people and patients who abstained from eating gluten whose age group ranged between (2-12) years compared with people whose age group ranged between (13-25) years .The results also showed that there was no significant difference in the measurement of body mass index among patients who took gluten and whose age group ranged between (2-12) years compared with patients who took gluten and whose age group ranged between (13-25) years. The results showed that there was no significant difference in body mass index measurement in males compared to females In the different groups. The study did not include samples from people aged more than 25 years, due to the difficulty of obtaining a number of samples from these ages.

Keyword: (BMI); Celiac disease; (GFD); gluten.

Paper ID:2

U-bent Optical Fiber for Bacterial differentiate

Ola T. Rashid , Fareed F. Rashid, Layla M. Alameri

Abstract. A straightforward method for detecting and discriminating between gram positive (Staphylococcus aureus) and gram negative (Escherichia coli) bacteria was demonstrated using a simple setup. The setup consists of coreless fiber spliced between two multimode parts from both sides, a blue diode laser with a wavelength of 405nm, red diode of 659nm and He-Ne of 632.8nm, spectrometer and a laptop to collect the data. All these are to create an evanescent wave sensor. A blue shift was discovered in gram positive bacteria, while a red shift was discovered in gram negative bacteria, also the wavelength shift increased by increasing the wavelength of the source in the range of the sample absorption peak. This approach is simple, fast and cost effective. It is expected that this method adds a new dimension to the (gram staining) method.

Keyword: U-bent optical fiber; sensor; evanescent wave; visible light source; bacteria differentiation.

Paper ID:3

Convergence Strongly of Projection J-Agarwal via Projection Jungck Generalized Mappings

Noor Nabil Salem, Zena Hussein Maibed

Abstract. This paper deals with the study of some types of iterations using the Projection Jungck ZN-Suzuki generalized mapping. We prove the Projection Jungck-Agarwal converge faster than Projection Jungck-SP and Projection Jungck-S converge faster than Projection Jungck- Agarwal. We also demonstrated the convergence of the following iterations (Projection Jungck-SP , Projection Jungck-Agarwal and Projection Jungck-S) using the above type of maps

Keyword: fixed point, Projection mapping, Jungck-SP, Jungck-Agarwal, Jungck-S, rate of converge.

Paper ID:4

Study of the antibacterial effect of chemically synthesized zinc oxide nanomaterials against Staphylococcus aureus isolates from different infection sites

Maitham Ghali Yousif, Ahmed Sami Salman

Abstract. In this study, about 312 clinical samples were collected from different health institutions in Babylon governorate-Iraq, during the period from 1/10/2021 to 12/1/2022, by taking swabs from Burns (50 samples), wounds (55 samples), nose swabs (50 samples), abscesses (50 samples), diabetic foot (52 samples), and samples from the various inflammatory site such as urine (55 samples), various phenotypic, microscopic, and biochemical tests were conducted on it to detect about the presence of S. aureus among the isolates, these tests proved the return of (105 isolates out of 312 samples) isolated from different sites at clinical samples (Percentage of 33.65%) to the genus S. aureus, Zinc oxide nanoparticles were also chemically synthesized by the sol-gel method from zinc acetate dihydrate as precursor, sodium hydroxide (NaOH), and ethanol for titration when we add slowly drop by drop, the diagnosis of the nano-material was confirmed by conducting four specialized analyzes to reveal the properties of the synthesized material, by (XRD, AFM, FTIR, FESEM), and these analysis proved this material was zinc oxide nanomaterial with size approximately 75 nm, with crystallite composition, homogeneity arrangement, the synthesized nanomaterial was also tested on Staphylococcus aureus bacteria to know its antibacterial activity and its effectiveness in inhibiting the growth of Staphylococcus aureus bacteria, used statistical program SPSS version 26 with biological part by calculating least significant differences with one way ANOVA, novelty of this search was using of zinc oxide nanomaterials chemically prepared against bacteria.

Keyword: zinc oxide nanoparticles, antibacterial, S. aureus, XRD, AFM.

Paper ID:5

Study of Convergence For a New Iterative Rate Method

Zena Hussein Maibed, Alaa M. AL- Hameedwi

Abstract. We shall introduce a novel iteration strategy named in this paper (the resolvent J. Ishikawa iteration, the resolvent J. Petrusel iteration and the resolvent J. Agarwal iteration). Under the solvent ZA-JMappings, the convergence of these iterations for the common fixed point and some affinity results have been demonstrated. It is also shown that the resolvent J. Petrusel is faster than the resolvent J. Ishikawa and the resolvent J. Agarwal.

Keyword: Resolvent Mappings, Jungck Schemes, Rate of Convergence.

Paper ID:8

The Use of Programmable Logic Gate Matrices in the Design of a Physical Unit to Detect the Edges of Digital Images

Haeder Talib Mahde Alahmar

Abstract. One of the most essential methods of image processing is the detection of the edge because the edges represent the most important characteristics of the image through which we can analyze these images and processing after the implementation of edge detection devices in the images is necessary to increase the speed of applications in real-time.The importance of programmable logic gate (FBGA) chipset is that it provides a platform for the processing of algorithms that can work on machines in real-time while delivering much higher performance than digital signal processors (DSPs).Through this research, we present a method we have proposed for detecting these edges using the coefficients Sobel, Robert Prewitt, and Gaussian (log) Laplace.This was done through the use of a graphical consumer interface that combines Matlab, Xilinx System, and Generator (XSG) Simulink to generate a code applied on the chip (FPGA) of the type Spartan-3E.This method differed from the other by giving the edges in the place where digital images are obtained, with a good rate of similarity compared to the software environment, with high speed of implementation with lower consumption of FPGA chip.

Keyword: Programmable logic gate matrices, digital image processing, edge detection..

Paper ID:9

An Efficient Word-Embedding Training Procedure Using Smart Batching For Biomedical Applications

Athar Hussein Mohammed, Ali H. Ali

Abstract. Words embedding means representing words for text analysis; languages models do this. There are many language models such as BERT, Roberta, etc. When applied with biomedical text, these models trained using standard corpus, such as Wikipedia, will not give a good result, so this paper used a more specific corpus from PMC that represents a biomedical text. Language models in Natural Languages Processing take a long time to train the canon may be days or weeks, so this paper used a method that decreases the training time, called innovative padding. The other change is diminishing the computation performed in the Roberta model by using just three layers, leading to reduced time.

Keyword: Roberta, transformer, language model, smart padding, natural language processing (NLP).

Paper ID:10

Coronavirus Detection from Chest X-rays Images Using CNN and GLSM Methods

Faisel G. Mohammed, Yassir Hussein Yassir

Abstract. In global population, the wellbeing and health of individuals are heavily affected by the Corona virus Disease 2019 (COVID19). Efficient screening regarding the infected patients is considered as one of the essential steps for fighting against the pandemic, with radiology examination with the use of chest radiography being one of the key screening method. Early researches discovered that COVID19 patients have abnormalities in the chest radiography images.The modus operandi of the proposed system's components will be clarified in this article. There are two sections to the system. Detecting and recognizing COVID-19. The recognition part of the proposed work used histogram orientation gradient (HOG) algorithm to specify lungs, and convolution neural networks (CNNs) used to classify lung have COVID-19 or not. Convolutional neural networks (CNNs) have been widely used in the applications of deep learning that have rapidly evolved over the last decade, most notably as a method for analyzing medical pictures. Detection part consist gray level co-occurrence matrix (GLCM) to detect the feature of COVID-19 region. The results of proposed method get 100% in training, 99.86 in validation, and 98.5 in testing with dataset contains two classes (each class contains 200 image)

Keyword: Coronavirus Detection,Chest X-rays Images, CNN, Method GLCM Algorithm.

Paper ID:11

Subordination Properties of Analytic Function Defined By New Linear Operator

Ismael I. Hameed, Abdul Rahman S. Juma

Abstract. In this paper, a new operator was defined μ_(m,κ)^(j,υ) f(w)):A⟶A. Associated with Hadamard product of the Komatu Integral operator k_k^υ and the Dziok-Srivastava operator T_m^j. And done use the method of differential subordination to derive certain properties of the differential operator μ_(m,κ)^(j,υ) f(w). And aim of this paper is to use the relation

Keyword: Univalent Function, Analytic Function, Convex Function, Derivative operator, Hadamard product, Differential Subordination, Best Dominant.

Paper ID:12

On Regular ρ –Algebras with Strongly $\bar{\rho}$-Ideals in ρ –Algebras

Arkan Ajil Atshan, Shuker M. Khalil

Abstract. In this study, we introduced and investigated three forms of ρ –algebra ideals, termed strongly $\bar{\rho}$-ideal, ρ – subideal, and primary ρ – ideal. Furthermore, we also offered some theories for explaining some of the connections between these ideal types.

Keyword: ρ – algebras, ρ –ideals, ρ – sublgebras, primary ρ – algebras,020AMS: 03E72, 03G25, 06F35

Paper ID:13

Develop Computational Intelligence Model for Runoff Prediction in Remote Basins

Bashar M. Yahya, Dursun Z. Seker, Basman Y. Hameed

Abstract. The capability of Artificial Intelligent and GIS plays a significant part for the management of ungauged basins by predicting the runoff which represents one of the hydrological variables. This research has been carried out on Al-Murr basin, which resides in Nineveh province, northern of Iraq, where a computational intelligence model based on two artificial neural networks as Non-linear Autoregressive Network with Exogenous inputs (NARX) and Radial Basis Function (RBF) have been developed for the prediction of the annual runoffs. The procedures of the model calibration and validation have been tested according to a number of the error criteria, in which obtained accuracy of performance had reached 84.61%, which resulted in the model giving quite close predicted results with quite small statistic errors for the years of the predicted period from 2018 to 2049 after that, the model starts collapsing and give irrational results. Soil Conservation Service (SCS-CN) approach has been utilized for the determination of the annual depth of the runoff (predicted as well as actual values) that have been utilized for analysis and comparisons. GIS environment has been initiated by primary available and calculated data, in which results of spatial distribution for actual and predicted runoff showed that the basin will be suffering from the shortage of water amounts in predicted period where general average runoff will be reduced.

Keyword: Prediction, Artificial Neural Networks, Runoff, GIS.

Paper ID:14

Design an electronic curtain with an acrylic mirror to enhance the solar collector's efficiency using artificial intelligence techniques

Ali J. Hassoon, Hosham S. Anead, Khalid F. Sultan

Abstract. Evacuated tube solar collectors are an important part of the solar heating system. This solar energy is absorbed by tubes and converted to heat, where this heat is transported to the water. The current research proposes a way to boost the efficiency of the solar collector using evacuated tubes through the design and construction of an electronic acrylic curtain whose movement is controlled using artificial intelligence to enhance the amount of solar radiation falling on the evacuated tubes. The tilt of an electronic curtain is controlled according to the direction of solar radiation. This electronic curtain works to protect the evacuated tubes in addition to acting as a reflector. Through the results obtained, the solar collector's efficiency improved approximately by 15% compared to solar collectors that operate without a curtain, and therefore the proposed design has a higher thermal performance than other systems.

Keyword: Evacuated tube solar collectors, the electronic curtain, acrylic mirror, artificial intelligence.

Paper ID:15

Subordination and Superordination of Analytic Functions Described by New Operator

Mustafa I. Hameed, Nihad Hameed Shehab, Abdul Rahman S. Juma

Abstract. The purpose of this work is to look into some of the characteristics of differential subordination of analytic univalent functions in an open unit disc. It also aims to clarify geometric characteristics like coefficient inequality and the generalized derivative operator. Differential subordination and superordination of analytic univalent functions yielded several interesting results. Differential subordination results employing the generalized derivative operator were presented. Finally, on the open unit disk, numerous results for differential subordination are shown.

Keyword: Univalent Function, Convex function, Differential Subordination, Differential Superordination, Derivative Operator..

Paper ID:16

Land use and Land Cover Study of Al- Kut City, Iraq Using Sentinel-2 Images by Supervised Classification Techniques

Shaimaa H. Shahad, Mutasim I. Malik, Hayder A. Al-Dabbagh

Abstract The purpose of this research was to recognize and map land use and land cover (LULC) in Al-Kut city by utilizing Sentinel-2 image for September/2020, remote sensing (RS) and geographic information system (GIS) was used. To detect LULC classes that predominated in the studied region, a supervised classification method has been utilized, particularly the Maximum Likelihood Method (ML). The result of the classification revealed the existence of five different classes of land use and land cover involving: 3.787 % was for water area, vegetation areas were 6.615%, urban equal to 3.326% soil types 29.352% and, bare area 6.914%.

Keyword: Sentinel-2, Maximum likelihood classification, LULC.

Paper ID:17

Inclusion Properties For Some Subclasses Of Analytic Functions Associated With The Convolution Operators

Bahaa A. Anter, Abdul Rahman S. Juma

Abstract.We define M(D_ρ^(b,m),F,φ_1,ε), B(D_ρ^(b,m),F〖,φ〗_2,η) and H(D_ρ^(b,m),F,φ_1,φ_2,ε,η) the new subclasses of analytic functions that are close- to- convex by utilization the concept of Hadamard product for A fractional operator and subordination. To study different inclusion relationships for these subclasses.

Keyword: Hadamard product , convex functions, univalent functions, subordination. A fractional operator.

Paper ID:18

Review: Deep Learning Methodologies for Vehicle Detection

Dhuha J.Jawad, Raheem Ogla, Abdul Monem Rahma

Abstract. The number of vehicles on the road has grown, producing concerns such as traffic congestion and fatal and injury accidents. To overcome these obstacles, numerous researchers have focused on determining proper vehicle localization, categorization, and tracking using a variety of methodologies. Currently, numerous strategies for detecting vehicles have been proposed. This study gives a detailed overview of deep learning approaches for vehicle detection and classification. The algorithms can be classified into two groups based on the model training approach: among the two-stage detection algorithms are: regional convolutional neural network (R-CNN), fast regional convolutional neural network (Fast R-CNN), faster regional convolutional neural network (Faster R-CNN), mask regional convolutional neural network (Mask R-CNN), and algorithms for single-stage detection include: the single-shot detector (SSD) and you only look once (YOLO). Finally, our paper discusses previous studies for vehicle detection and explains the techniques mentioned above.

Paper ID:19

Soft Penta Continuity in Soft Penta Topological Spaces

Sabih W. Askandar, Ruqayah N. Balo

Abstract. In this study the concept of soft penta topological space is introduced, and the fundamental notions in soft classical topological spaces are investigated. In the context of soft penta topological space, we introduce new forms of soft open and soft closed sets. We also investigate the concept of soft penta continuous, soft penta open and soft penta closed mappings beside that we define the concept of soft penta homeomorphisms

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Paper ID:20

Performance Comparison of Sdn controllers to detected and mitigated DDOS attack using SVM algorithm

Haneen Rafid Mahmood, Dr.Mohammed Younis Thanoun

Abstract. Software Defined Networks is an emerging technology in modern technological manageable, dynamic, low-priced and adaptable environment , however these network are vulnerable to attack specially Distributed Denial of Service attack, the main objective of this research is to detect and mitigated these attack by using machine learning (support vector machine algorithm), two scenarios for topology connected using Vm-ware program-mininet, the most important noteworthy is that in normal traffic operation pox controller connects better than ryu controller for the same data set and topolpogy , whereas ryu makes more progress in throughput when the network is exposed to ddos attack , while if we measure round trip time ryu is better than pox in normal operation but in ddos attack pox is better.

Keyword: software defined networks, machine learning, controllers, svm, detection, ddos, mitigation.

Paper ID:21

Applying SEE Integral Transform on Error and Complementary Error Functions

Sadiq A. Mehdi, Emad A. Kuffi, Eman A. Mansour

Abstract. In the study of errors, the error function is a special function that appears in many scientific theories; it appears in the solutions of many physical and engineering problems, such as vibrating beams, heat and mass transfer, and many other problems that contain an error function (erf.) and a complementary error function (erfc.). As part of solving physical and engineering problems, integral transforms have been used to find the results of errors and complementary errors. In this paper, the efficiency of the novel integral transform, the SEE integral transform, has been demonstrated by providing an exact solution to the improper integrals for some applications that contain error functions without unnecessary calculations.

Keyword: . Complementary error function, Error function, Improper integral, SEE integral transform.

Paper ID:22

Applying SEE Transform on Ordinary Differential Equation with Variable Coefficients

Sadiq A. Mehdi, Emad A. Kuffi, Eman A. Mansour

Abstract. The ability of differential equations to demonstrate and predict the behavioral changes in the problems of many scientific and engineering fields has given them vast importance in the mathematical world. Hence, many integral transforms have been proposed and studied to benefit as much from them in these fields. Integral transforms represent an essential branch of mathematics that possesses an extraordinary capability to handle differential equations. In this paper, the capability of the novel (Sadiq-Emad-Eman) SEE integral transform in solving ordinary differential equations with variable coefficients without resorting to a new frequency domain has been studied and demonstrated.

Keyword: Frequency domain, Ordinary differential equations, SEE integral transform, Variable coefficients.

Paper ID:23

Solving the Second Kind Linear Volterra Integrodifferential Equations Using the Complex SEE integral Transform

Emad A. Kuffi, Sadiq A. Mehdi, Eman A. Mansour

Abstract. As an important type of integral equation, Volterra integral equations snatch the focus of many scientists and mathematicians to provide approximate or exact solutions to such equations. The integral transform capability of providing an algebraic solution to the integral equations led the mathematical community to lean heavily on them to solve those kinds of equations, including the Volterra integrodifferential equations of the second kind. This paper uses the complex SEE integral transform to find the exact solution to the second kind linear Volterra integrodifferential equation. The capability and efficiency of complex SEE integral transform in providing an exact solution with the minimum number of computations possible are demonstrated via practical applications.

Keyword: Complex SEE integral transform, Inverse complex SEE integral transform, Integrodifferential equations, Volterra.

Paper ID:24

Generalization of Complex Al-Tememe Transformation and its Applications

Mustafa Jameel Hussein, Yilmaz Altun, Emad A. Kuffi

Abstract. The increasing need for integral transforms to solve the problems of applications in many scientific fields has led to the relentless pursuit of suggesting new integral transforms. An innovative generalization of the Complex Al-Tememe integral transformation is introduced and discussed thoroughly in this work, where the properties of the proposed transformation and its inverse are exposed by utilizing it in some fundamental functions and the efficiency of the generalized Complex Al-Teme integral transform is demonstrated by using it in solving Euler and multiplication ordinary differential equations with variable coefficients.

Keyword: Complex Al-Tememe Integral Transform, Inverse Complex Al-Tememe Transform, Euler's Equation, Generalization of Complex Al-Tememe Transform. .

Paper ID:25

The Complex EFG Integral Transform and its Applications

Emad A. Kuffi, Faruk Karaaslan, Ghaith Shaeyut Sadkhan

Abstract. In recent years, many integral transforms have been proposed to fulfill the vast number of fields that have benefited from them. The "Complex (Emad-Faruk-Ghaith) EFG" transform is introduced in this paper as a novel general complex integral transformation. The complex EFG transform properties, its application, and the inverse complex FEG transform's application to various fundamental functions are discussed. Using the complex EFG transform to solve high-order ordinary differential equations and other miscellaneous scientific and engineering problems demonstrates the efficacy of the transform in converting the core of some problems into simple, solvable algebraic equations. The EFG transform can be beneficial as a competent new transform in numerous scientific fields..

Keyword: Complex EFG transform, Ordinary differential equations, Inverse complex EFG transform, Beam, Pharmacokinetics.

Paper ID:27

Hepatitis Type B Virus Genotypes in Chronic Hepatitis B Patients (CHBP)

Hiba.TH. Hussain , Arwa Mujahid Abdullah Al-Shuwaikh, Abbas. M. Ahmed

Abstract. Hepatitis B virus (HBV) complications include liver disease, cirrhosis, and cancer. Every year, approximately one million people die as a result of HBV. Virus sequence homogeneity was used to identify at least ten genotypes (A through J) and multiple subgenotypes. Hepatitis B virus varies in terms of virulence, immunological reactivity, pathogenicity, resistance to cure, and global distribution. The study used the nested PCR technique to identify HBV genotypes among (CHB) patients in Baghdad. One hundred CHB patients (68 males and 32 females, ages(4-70) were included in the study. After six months of infection, 100 patients were diagnosed with chronic HBV using an ELISA test for the presence of Anti-HBc IgG and HBsAg. Nested PCR is used to survey the DNA HBV genotypes in positive samples. Our findings show that genotype D was found in roughly (95%)of patients, with (5%) having mixed genotypes (D+B+C), but genotypes A, E, and F were not found in all patients. In terms of biostatistics, the genotype distribution of females and males differed significantly. The presence of 5 HBV genotypes in both males and females with mixed infection suggests that these people were infected at different points in time and from different sources. An epidemiological evaluation of chronic HBV in Iraqi patients is required to identify aberrant acquisition in these mixed genotypes, which necessitates a clinical evaluation and follow-up of each CHB patient's status

Keyword: Genotypes, HBV, CHB , acquisition.

Paper ID:28

Building a Product Recomender Systems with Sales Data of marketing

Lamees Yousif Abed, Murtadha M. Hamad , Ahmed J. Aljaaf

Abstract. The Internet's growth has resulted in a significant dispersion of information resources. As a result, specialized recommendations on various types of information, products, and services are needed to support users in overcoming the problem of information overload. Human nature has a tendency to follow predictable patterns in comparing the available options,the recommendation system is one of the secrets of the success of many companies, and this system is a magical Marketer for services and products who monitors and understands consumers' behavior in order to assist them in making decisions. This paper proposes is used to evaluate performance and create correlation rules in order to improve system efficiency to make accurate predictions and recommend suitable products. A hybrid model was used by integrating technologies such as K-means & KNN, K-means & SVM, K-means & LSTM, as well as the application of the hybrid model between GMM & KNN, GMM & SVM, GMM & LSTM. determine precision recall, f1-score, support, and accuracy. The proposed approach has Modcloth dataset sold Amazon has been applied containing of 998,94 transaction records. The obtained results are compared using assessment measures to determine which model is the best ,observed the best classifier K-means-SVM where achieved the accuracy 0.999 then the K-means-KNN achieved 0.998 rate of accuracy,while obtain result above observed the best classifier GMM-SVM where achieved the accuracy 0.996 , then the GMM-KNN achieved 0.992 rate.

Keyword: Recommender System(RS) , Gaussian Mixture Modelling(GMM) , K-means , Market Basket Analysis(MBA); Support Vector Machine (SVM) ; Data Mining.

Paper ID:30

Spatial Analysis of the Chemical Properties of Karbala Plateau through using Remote Sensing Technology

Hayder H Kareem, Marwah J. Kashkool, Ayad K. Hussein

Abstract. The increase in water consumption associated with population growth and the widening of pollution spots and the multiplicity of its sources makes groundwater more vulnerable to pollution. Therefore, more attention must be paid to studying and monitoring water, understanding the structures and properties of groundwater and the changes that occur, and studying pollutants with their speed and

impact. Humanity needs water in the first place to survive, and this of course applies to other living organisms, as the population needs water for various life purposes such as industry, agriculture, human and animal consumption. The quality of groundwater in the Karbala plateau area is variable, as it is sulfur in most areas west of the Euphrates River, interspersed with water of caloric quality, especially in the areas near Al-Najaf. Groundwater in areas west of the Euphrates is characterized by its salinity ranging from medium to high, which is concentrated in the far western regions of the plateau. The groundwater within the sedimentary plain areas is characterized by its high salinity, except for those areas adjacent to rivers and irrigation channels, which are characterized by low salinity. In general, the salinity of the water in the Karbala plateau is more than 1000 mg/liter (the permissible limit), and therefore the majority of groundwater in the Karbala plateau is not suitable for human drinking, while the majority of it is suitable for agricultural purposes, especially those crops that can use high levels of salinity. The water of the Karbala plateau can be used for industrial and construction purposes, except for some metal industries, where high salinity leads to rusting of metal materials and reducing their conductivity and sometimes to erosion

Keyword: Chemical Analysis, Karbala Plateau, GIS, Remote Sensing Technology.

Paper ID:31

Some Types of Mappings and e-Abacus Diagram

Ammar S. Mahmood, Hiba R. Hashim

Abstract. One of the essential and established aims in every scientific research is to uncover sites of convergence and link between more than two directions at the same time since it takes us out of the usual and gives us a better image of the study we are performing. From this standpoint; and in addition to what Mahmood and Hashim presented in 2022, we present further forms of mappings in a new design based on the e-abacus diagram

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Paper ID:32

Enhancement of Corrosion and Antibacterial Resistances of Zinc Oxide/Silver Nanocomposite Particles on Duplex Stainless Steel Substrate

I.J. alshaibani, Ali Sabea Hammood, Manal Adnan Muheisen

Abstract. This paper reports on electrophoretic deposition (EPD) of zinc oxide/silver nanocomposite coatings on duplex stainless steel (DSS). Scanning electron microscopy were used for the morphology examination of coatings. The corrosion behavior of the uncoated and coated samples was studied by potentiodynamic polarization test. X-ray diffraction (XRD) was used to examine the produced phases of the primary materials. Moreover, the antibacterial activity of zinc oxide/silver nanocomposite was investigated with bacterial strains of E. Coli and S. aureus modes. The results showed that a homogenous coating with less porosity and crack-free structure was obtained at 20 V for 3 min. The corrosion test results revealed that all coated samples had lower corrosion rates and consequently greater corrosion resistance than the uncoated DSS sample. The XRD analysis showed no phase's decomposition occurs during EPD process

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Paper ID:34

Melanoma Diagnosis Using Singular Value Decomposition Based on Empirical Mode Decomposition

Fatimah Shamsulddin Abdulsattar, Walaa Mohammed Khalaf

Abstract. Many Computer-Aided Diagnosis (CAD) systems have been developed to boost melanoma recognition performance in terms of accuracy and decision time. These studies used different lesion properties such as texture, color, structure, and shape to extract features. This study highlights the contribution of using empirical mode decomposition-based singular values features for melanoma detection. Two intrinsic mode functions (IMF) of empirical mode decomposition (EMD) are derived from each color channel. Singular value decomposition (SVD) is then applied to each IMF of the resulting EMD. After that, the largest four singular values are determined and fused from all the IMFs. Finally, binary classification is performed using the support vector machines (SVM) and the extra tree classifiers with a ten-fold cross-validation strategy. The analyses on the PH2 dataset indicate that the blue channel has the highest detection power over the other two channels. The concatenation of the features from the three channels can boost the final detection power as compared to the individual channels. The extra tree outperforms the SVM classifier. The results also highlight that the score-level fusion using the weighted sum rule can improve the accuracy and sensitivity of the overall performance. Finally, the proposed system compares favorably to other recent methods with the best accuracy of 0.987 using a small set of features and without the need to build a complex system.

Keyword: Melanoma detection; Singular Value Decomposition; Empirical Mode Decomposition; binary classification; Cross-validation; Dermoscopic images.

Paper ID:35

Effect of Modified Nanoparticles on the Levels of Some Important Proteins in the Blood

Assel A. Hadi, Nada Y. Fairooz, Hussein K. Al-Hakeim

Abstract. Nanoparticles of manganese dioxides MnO2-NPs are potentially interesting in various groups of applications. The use of nanocomposites for the extraction of precious proteins is an important field of study. This study tends to conjointly find a notable relation between FSH and LH hormones can be adsorbed on the surface chitosan-coated manganese dioxide nanoparticles (MnO2-NPs) and graphene oxide nanocomposites CS/GO-MnO2-NPs spontaneously and used for the extraction of precious proteins from human serum. This work includes the study of adsorption of FSH and LH hormones by using nanocomposite CS/GO-MnO2 NPs was prepare by Co-precipitation method. The synthesized compounds were characterized using a number of techniques, including X-ray diffraction, Fourier Transform Technique (FT-IR), Scanning Electron Microscopy (SEM), Energy Dispersive Spectroscopy (EDS), particle size analysis (PSA). Different concentrations of the hormone solutions were with incubation a fixed the amount of NPs and quantities the amount of hormone absorbed was calculated. To calculate the thermodynamic parameters, the experiments were carried out at various temperatures. The CS/GO-MnO2-NPs have the ability to absorb large amounts of hormones. The adsorption process followed the Freundlich adsorption isotherm, showing that the nanocomposite surface is heterogeneous. Exothermic and spontaneous adsorption processes were discovered by thermodynamic research.. Desorption studies were conducted to identify the forces of interaction between PRL molecules and the surfaces. PRL concentration was measured using ELISA test. From the results and finding of this study, this review focuses on the role of FSH and LH hormones can be adsorbed on the surface of MnO2-NPs spontaneously. This adsorption is associated with protein structure. The findings of the present study should be taken in consideration when NPs used for the extraction of hormones from serum and when NPs used as a supporting media for these hormones in the analytical kit.

Keyword: Manganese dioxide nanoparticles, protein adsorption, FSH, and LH protein structure..

Paper ID:36

Structural, optical, and electrical properties of SrTiO3: La thin films using AACVD technique

Randa Kamel Hussain, Yahya M. Abdul- Hussein, Aqel Mashot Jafar, Mohammed K. Kalaf

Abstract. In this work, SrTiO3: La thin films with different doping (0%, 2%, 4%,6%, and 8%) were deposited on glass substrates by aerosol-assisted chemical vapor deposition (AACVD) technique at a temperature of (500 °C). The deposited thin films are investigated by XRD, SEM, UV-Visible spectroscopy to study the structural properties of (SrTiO3: La) thin film. The XRD results confirmed the cubic structure with crystalline structure of the samples SrTiO3: La. The optical and electrical properties of SrTiO3: La thin films were investigated. The optical properties include the energy band gap, absorption coefficient and transmittances at wave length range (300-800) nm. The electrical properties include the conductivity, Resistivity, mobility, and Hull coefficient of the thin films SrTiO3: La

Keyword: AACVD technique, Electrical conductivity, Hall effect, extinction coefficient.

Paper ID:37

Eyelashes and Eyelids Detection and Removing for Iris Recognition System

Abdul Salam Hassan Abbas , Ahmed Mahmood Khudhur, Ahmed M Shano, Suzan K. Adnan

Abstract. In direction to decrease the eyelashes and eyelids effecting on the iris acknowledgment rate, an eyelashes finding algorithm are projected based on the overlapped eyelashes points appear dark pixels(black), and they may locate at the upper and lower side of the image; while the overlapped eyelid points appear bright (white) pixels. Also, it may appear at the upper, and lower, sides of the iris image. Based on the iris normalization, image enhancement with histogram equalization is used to accurately localize eyelashes and eyelids. The investigational effects show that compared with traditional eyelashes and the eyelids finding algorithm, it isn't essential of algorithm to set up additional parameter, which expresses the simplicity to maximizing the result of the eyelashes and the eyelids segmentation.

Keyword: iris recognition, CASIA, the eyelashes, eyelids, image preprocessing, detection, accuracy.

Paper ID:38

On an Integrodifferential Equation in Three Variables on Time Scales

Khaled M.Shwish, Akram H.Mahmmod

Abstract. In this work, Banach fixed point theorem is used to prove the existence and uniqueness for solving certain integrodifferential equations in three variables on time scales. Moreover, integral inequality with an explicit estimate has been derived and used to study some properties for solving the problem under investigation

Keyword: Integrodifferential equation, time scales, three variables, integral inequality.

Paper ID:39

Some Results For Analytic Univalent Functions on Third-Order Differential Subordination and Superordination

Amal Madhi Rashid, Abdul Rahman S. Juma

Abstract. The purpose of this paper is to discuss the third-order differential subordination and the corresponding differential superordination problems by using derivative operator 〖FT〗_(η,ν,ϱ)^β f(z) . Some classes of admissible functions are obtained and the third-order differential sandwich-type outcomes are presented

Keyword: Analytic function; Univalent function; Differential subordination; Differential superordination; Admissible function.

Paper ID:40

Study Singular and Essential properties Over C-Ring

Shaymaa E. Sarhan, Majid Mohammed Abed

Abstract. In this paper, we introduce some new results about the relationship between two concepts namely singular and essential and c-ring. We prove that if any module W is a direct sum of simple submodules imply that the ring T is C-ring. Also, if W has one maximal submodule, this means T is C-

ring. We investigate that any module W over T is singular and semisimple imply T is C-ring. Finely, we introduced some new examples and definitions about the topic.

Keyword:C-ring, Singular module, Essential submodule, Simple submodule, Semisimple module.

Paper ID:41

Some Results of Representation for Lie Algebras

Hayder Sadeq, Taghreed Majeed

Abstract. Lie algebras appeared in mathematics at the end of the 19th century in connection with the study of Lie groups. A Lie algebra is a vector space over some field together with a bilinear multiplication is called the bracket which satisfies two simple properties: skew symmetric and Jacobi identity. The universal property of tensor product for representations of Lie algebras is a supporting conjugate of tensor product, which guarantees obtaining a linear map from a bilinear map. The main objective of the paper is to obtain results in representations for Lie algebra through the new structure consisting of four and five representations, by action of representation for Lie algebra. As well as obtaining new generalizations using dual action of representation for Lie algebra.

Keyword: Lie algebra, Representation of Lie algebras, Dual representation of Lie algebra, Tensor Product for Representation for Lie algebra.

Paper ID:42

Best Algebraic Monotone And Comonotone Approximations in L_(P,w) ([-1,1]) Space

Alaa Adnan Auad, Sultan Hameed Mehiady

Abstract. The goal of this paper is to use a suitable algebraic polynomial that operators in weighted space to compute the degree best algebraic monotone approximation of unbounded in L_(P,w) ([-1,1]) space. These proofs include the modulus of smoothness of the second order, which is equivalent to the K-Functional are considered.

Keyword: modulus of smoothness, unbounded functions, weighted space, monotone approximations.

Paper ID:43

Recent Result About Loc (P)-hollow fuzzy modules and Related Concepts

Shaheed Jameel Kharbeet, Hatam Yahya Khalf

Abstract. Throughout the work, we demonstrate and study (Loc (p)-hollow f- Modules) as generalization of concepts (LP-hollow modules). We give several fundamental properties about this concept.

Keyword: f- Module, small Ƒ- subm, maximal Ƒ- subm, prime Ƒ- subm, hollow f- Modules, Loc (p)-hollow f- Modules.

Paper ID:44

Synthesizing and Evaluating of (PVA-BaTiO3-TiO2) Nanocomposites for Antibacterial Activities

Zanab I. Zike, Majeed A. Habeeb

Abstract. The (PVA-BaTiO3-TiO2) nanocomposites were made utilizing the solution casting process, with varied weight percentages of BaTiO3 and TiO2 nanoparticales (0,1,1.5,2, and 2.5)wt%.The results were identified by Fourier transform infrared ray (FTIR),scanning electron microscopy (SEM), Optical microscope (OM), and its application for antibacterial. The (FTIR) analysis revealed that the nanocomposites (PVA-BaTiO3-TiO2) contribute to tiny vibrational molecular movement. After introducing BaTiO3 and TiO2 nanoparticles, several polymer chains were also broken. Several more chains were formed instead. The SEM revealed a strong dispersion of BaTiO3 and TiO2 on the polymeric matrix's surface. The (OM) demonstrated that nanoparticles form a continuous system surrounded by polymers. This network is made up of pathways that lead indoors nanocomposites and allows absolving carriers to move over them (PVA-BaTiO3-TiO2) nanocomposites were evaluated for antibacterial activity against gram-positive (S. aureus) and gram-negative (E. coli) bacteria (E. coli). This inhibitory zone grew as the quantities of BaTiO3 and TiO2 nanoparticles rose, according to the findings.

Keyword: Nanocomposites, structural properties ,Antibacterial Activity.

Paper ID:45

The Water Quality Index of Bahr Al-Najaf Aquifer

Athraa k. Abbas ALZamili, Mohammed Jawad Al-Haidarey

Abstract. This study was carried out to evaluate the validity of groundwater in Najaf Governorate / Iraq for the irrigation, poultry, and livestock purposes. Samples were collected from five wells in Bahr Al-Najaf region in September 2021, in a sterilized plastic container with a capacity of 1.5 liters. The first and second wells were used for the purposes of drinking poultry while the third well was used for irrigation purposes, and the fourth and fifth wells were used for the purposes of drinking human, livestock and for irrigating crops. Some physicochemical and biological parameters (i.e. pH, electrical conductivity, total dissolved solids, turbidity, chloride, calcium, magnesium, sulfate, nitrate, phosphate, carbonate, chemical oxygen demands, biological oxygen demand and hardness) were analyzed in all wells. The Canadian Water Quality Index (CWQI) was applied in this study to determine the quality of water in each well. The CWQI results showed groundwater in all wells are excellent for the purposes of livestock and recreation but the values were poor for irrigation with values of 5 to 6 and also poor for drinking with values of 8 to 30. The overall CWQI values were 29 as minimum and 41 as maximum at wells 5 and 3 respectively. Accordingly, groundwater from wells in the research area must be treated before being used for irrigation or drinking purposes.

Keyword: Ground Water, Canadian Water Quality Index, Bahar Al- Najaf. Aquifer.

Paper ID:46

The Bohr-Mottelson model was used to calculate the longitudinal form factor of 31P, 27Al, and 23Na nuclei

Mohammed L. Adnan, Khalid S. Jassim

Abstract. All three nuclei have been studied for their longitudinal electron scattering forms and transition probabilities of 31P, 27Al, and 23Na. Here, sdpfnow is utilized for communicating with windows shell codes. Using the Bohr-Mottelson model. Single-particle radial wave functions were

computed using Skyrme-Hartree Fock, Wood Saxson, and Harmonic oscillator potentials. They are comparing theoretical results to actual data. There was an excellent agreement for the 31P nucleus and a good agreement for the 27Al and 23Na nuclei.

Keyword: Structure of Nuclear, electron scattering (e, e) , Code Nushell.

Paper ID:47

Antibacterial activity and physical properties of some Metal oxide nanoparticles prepared by different methods

Nadia Jasim Ghdeeb, Aseel Mustafa AbdulMajeed, Asma Hadi Mohammed

Abstract. In this research, a mixture of calcium, iron, and magnesium oxides was extracted from the wastes of cement factories using hydrofluoric acid with a concentration of 48%. As a control, Magnesium oxide and Iron oxide were prepared individually by a simple chemical method. Characterizations of the extracted nano-products were done using X-ray diffraction (XRD)which confirmed the crystalline nature of CaO, Fe2O3, MgO, and the mixture of CaO :MgO: Fe2O3 NPs. More, field emission scanning electron microscope (FESEM) has been used to demonstrate the morphology of the nanostructures of CaO and the mixture CaO :MgO: Fe2O3 NPs. The data resulted in the average grain size of CaO , MgO,Fe2O3 and the mixture CaO :MgO: Fe2O3NPs calculated by SEM and crystal size by XRD(64.08,29, 26.02, 84.2)nm and(38.636,6.529,14.569,31.597)nm respectively.Energy-dispersiveX-ray spectroscopy (EDS) spectrum and XRD pattern suggested that prepared CaO, Fe2O3, MgO and the mixed once CaO :MgO: Fe2O3NPs were highly pure. CaO, Fe2O3, MgO, and the mixture of CaO :MgO: Fe2O3 NPs for use as antibacterial agentsfor Gram positive (S. aureus and st. epidermidis)and Gram-negative bacteria(E. coli and Klebsiella sp.) The antifungal activity of the newly synthesized NPs is tested against common unicellular fungi (C. albicans) .It was found that CaO, MgO, Fe2O3 Nps and CaO: MgO: Fe2O3 Nps have higher antibacterial activity against Gram-positive bacteria compared to Gram-negative bacteria.

Keyword: CaO and CaO :MgO: Fe2O3NPs, structure, morphological, antibacterial.

Paper ID:48

Microstructure , Corrosion, and Mechanical Properties of Electrodeposited AlFeCoNiCu High Entropy Alloys-Carbon Nanotubes Composite Coating

A.S. AlGraite, A.K. Abid Ali

Abstract. Microstructure, corrosion, and mechanical properties estimated of AlFeCoNiCu high entropy alloys (HEA) composite coatings with the addition of carbon-Nanotube (CNTs) amounts was studied. HEAs coatings were electro-deposited over low alloy steel (4140 grade) substrate as cathode and the graphite represent the anode electrode at current of 0.16A, time of 15min, and 30Co temperature. After the electro-deposition, the coating samples were mechanically tested by Microhardness, electrochemically tested by Tafel extrapolation, and morphologically tested by field emission scanning electron microscopy and energy dispersive spectroscopy (FESEM and EDS respectively). The results show that corrosion resistance properties of the HEA-CNTs composite coatings conducted in 3.5% NaCl solution increased as compared with HEA coating due to CNTs addition. Detailed microstructural observation by the FESEM test illustrate that CNTs enhanced the smoothness of the coating and leading to granular structure. The microhardness results increased as CNTs added that decreasing the grain size of coatings. Finally, the protective efficiency of coating was enhanced by 37% as CNTs addition.

Keyword: High Entropy Alloy, Electrodeposition, Corrosion, Mechanical Properties, Carbon-Nanotube.

Paper ID:49

Effect of different Co2O3 nanoparticles concentrations on the structural and antibacterial of polymer blends

Ahmed Hashim Mohammed, Majeed Ali Habeeb

Abstract. The (PVA-PVP-Co2O3) nanocomposites were made by dissolution casting with various weight ratios of (Co2O3) nanoparticles (0,1.6,3.2,4.8, and 6.4) wt percent of (Co2O3) nanoparticles, where optical microscope images show the network of the (Co2O3) nanoparticles inside the polymers when this proportion is increased (6.4 wt percent). Comparing pure (PVA-PVP) films, FTIR spectra show shifts in zenith positions as well as changes in form and intensity, which indicates detaching (Co2O3) nanoparticles and tow polymers with the same corresponding vibrational frequencies, and we observed that transmittance decreases with increasing (Co2O3) nanoparticles. Surface morphology of (PVA-PVP-Co2O3) films is revealed by scanning electron microscopy, which reveals many aggregates or chunks on the upper surface that are homogeneous and coherent. Testing of antibacterial properties

of (PVA-PVP-Co2O3) nanocomposites against gram-positive and gram-negative bacteria (E. coli). The results revealed that the inhibition zone increased as the (Co2O3) nanoparticle concentrations increased.

Keyword: Nanocomposites, Antibacterial Activity, Nano Cobalt Oxide.

Paper ID:50

HRRMLQ: CONTAINER SCHEDULING ALGORITHM on EDGE NODES CLUSTER

Dhuha Basheer Abdullah, Balqees Talal Hasan

Abstract. With the evolution of cloud computing, the dominant virtualization technology for data centers has shifted from virtual machine to container. Despite its success, Cloud Computing falls short of several Internet of Things requirements (IoT). Edge Computing appears to be a complement to the Cloud, filling gaps in the IoT scene. By 2025, it is expected that 75 percent of the generated data will be processed in locations other than cloud servers or datacenters. As a result, the number of edge computing nodes is expected to grow rapidly. Among others, Kubernetes was created with the goal of automatically deploying and managing cloud applications created using container runtime techniques such as Docker. Although Kubernetes is designed for cloud computing environments, it does not have adequate system support for edge computing. To use Kubernetes in edge computing environments, edge computing nodes must be managed in a more efficient manner. The Hybrid Round-Robin multi-level queue scheduling algorithm (HRRMLQ) is proposed and implemented in this paper to schedule containers to a single board computer (SBC) cluster based on their priorities. HRRMLQ uses a hybridization of round robin and multilevel queue scheduling algorithms to categorize IoT apps as high or low priority. HRRMLQ classifies IoT apps as either high or low priority. To alleviate the starvation problem that traditional multilevel queues suffer from, HRRMLQ assigned 4 quantum to the high priority queue and 2 quantum to the low priority queue. Experiments show that HRRMLQ can schedule high priority pods first while also reducing the starvation problem that multilevel queues may experience.

Keyword: Container Orchestration, Docker, Edge Computing, Kubernetes, Raspberry Pi, Scheduling Algorithm.

Paper ID:51

Heart Disease Prediction System using (SMOTE Technique) Balanced Dataset and Decision Tree Classifier

Ahmed Sami Jaddoa

Abstract. The deadliest disease and a major cause of the mortality worldwide is heart disease. In medical scope, Machine Learning (ML) is becoming increasingly important. In this work, the SMOTE technique balanced dataset is utilized for the improvement of the performance of the prediction of heart disease, and Cleveland Heart Disease Dataset is predicted using the Decision Tree (DT) algorithm. The dataset contains 14 key attributes that were utilized in the investigation. Yet, classes are not often balanced, and data imbalances develop in the case when one class is a minority and the other is a majority. The usage of the SMOTE resampling technique for balancing the data was examined in this research, and the outcomes of the DT algorithm were compared for unbalanced and balanced data. According to the results of the experiments, classification with resampling/balancing improves accuracy by up to 18.1%. The accuracy of DT without balanced data is 73.3%, whereas the accuracy of DT with balanced data is 91.4%.

Keyword: SOMTE, balanced data, imbalanced data, Decision Tree (DT), Predicting.

Paper ID:53

A Numerica Method for Solving a New Approach of Nonlinear Fuzzy Integral Equation by Using Adomian Decomposition Method

Ahmed Abbas Hassan, Alan Jalal Abdulqader

Abstract. In this work , we compare two approaches of using Adomian Decomposition Method to solve nonlinear nonhomogeneous volterra integral equation with known exact algebraic solutions and proving the existence and uniqueness of such solutions.A procedure for solving nonlinear Fuzzy volterra integral equation Numerically of second kind with some different kernel and also we study and prove the existe and uniqueness for our formulation give some a numerica applications to prove how this method is give a convergence to the exact solution ,in this work we will use maple language.

Keyword: Nonlinear Volterra integral equation ,Fuzzy set Adomain decomposition method.

Paper ID:54

Separation Axioms of Nano-z-Topological Space

Ekram A. Saleh

Abstract. In this paper introduce concept of 〖N〗_Z-generalized closed set ,"some newtypes of spaces are" defined andstudied in " N_Z-topological space namely N_Z D_0 , N_Z D_1 and N_Z D_2 also N_Z T_0,N_Z T_1 and N_Z T_2 .We show the relationship between these concepts with examples.

Paper ID:56

The Use of Hierarchical Clustering and the Markovian Model in Study Tourism in Iraq

Muna T. Ghafil, Wafaa A. Ashour

Abstract. In this research, the hierarchical clustering method has been applied to classify the Iraqi provinces in the tourism aspect, which depends on the multivariate analysis specified depending on the points of similarity and difference between the data, using the statistical program (spss.v.23), in addition to using the Markovian model to estimate the matrix of transitional probabilities in a non-educational way. It was found that the Markovian model is compatible with the cluster analysis and the ease of using the outputs of the cluster analysis in calculating the transitional probabilities matrix.

Keyword: Hierarchical clustering, Markov model, multivariate analysis, transitional probability matrix.

Paper ID:57

Forecasting of Daily Maximum Air Temperature for Winter and Summer Seasons for Meteorological Baghdad Station

Hayder M. Al-Samarrai, Monim H. Al-Jiboori

Abstract. Depending on the Multiple Linear Regression Equation and its improvement, the daily maximum air temperature was predicted based on the historical observations of the Baghdad meteorological station for the period between (2005-2020) and for the winter and summer seasons separately, where the mentioned station is an example for regions with a subtropical climate It has hot dry summers and cool rainy winters. The values recorded in the hour 0300 GMT related to minimum air temperature, wind speed and relative humidity were depended on. The associated observations were analyzed for net days using multiple liner regression technique to predict the maximum daily air temperature for any day during winter and summer, It was characterized by a positive relationship for minimum air temperature (0.69,0.62) and a negative relationship for wind speed (-0.62,-0.55) and also a negative relationship for relative humidity (-0.07,-0.55) for both seasons, winter and summer, respectively. A comparison between the expected maximum air temperature and the recorded maximum air temperature was made to improve the work of the equation by analyzing the residuals of the daily forecast, the bias by analyzing the number of relative occurrences of the occurrence of these errors in order to add value (- 0.1℃) for the separation equation winter and the value (0.05℃) for the summer equation as the error adjustment term.

Paper ID:58

Experimental and Theoretical Investigating of Elastic Modulus of Hybrid Nano-Composite

Luay S. Alansari, Abbas Ali Diwan, Safaa A. Al-Shawi, Husam Jawad Abdulsamad

Abstract. Enhancement in the mechanical behaviors of thermosets polymeric materials has become one interested tasks for the mechanical production especially by using nano fillers due to its easy and wide use in modern applications. Therefore, in this paper, TiO2 and SiO2 nanoparticles were used to enhance the tensile properties of epoxy. The volumetric ratios (0.5%, 1%, 1.5% and 2%) of nanoparticles were mixed by using mechanical mixer and then using ultrasound mixer then injected to the mold. The hybrid nanocomposites with 50% TiO2 and 50% SiO2 of nanoparticles volume fraction were also fabricated. The tensile strength of the hybrid composites were investigated, also the microstructure images were studied by using the scanning electron microscope (SEM) and the X-ray diffraction devices. In this work, analytical models described the elastic modulus variation of nanocomposites were reviewed and discussed. New two models described the elastic modulus variation of hybrid nanocomposites were proposed. One of the proposed models gave a good agreement with the experimental results of elastic modulus.

Keyword: TiO2, SiO2, Epoxy, Hybrid Nanocomposite, Elastic Modulus Models, Tensile Test.

Paper ID:59

d-monotone approximation in L_(p,w) ([-1,1]^d)

Alaa Adnan Auad, Wameeth Mohamed Ali

Abstract. The objective of this work is studied approximation d-monotone unbounded function in weighted space by using some types of algebraic polynomials of degree ≤d-1 which interpolates a d-monotone function f and d knot , sufficiently approximations it , even if the knot of interpolation are close to each other moreover , we are establish the degree of approximation of d-monotone mappings in collection L_(p,w) (x) ,1≤p<∞ in terms modulus of smoothness and the average modulus of smoothness τ_d weighted space

Keyword: d-monotone functions , approximation , modulus of smoothness , average modulus of smoothness .

Paper ID:60

Modified Decomposition Method for Solving Nonlinear Nonhomogeneous Volterra Integral Equations

Salam Adil Majeed, Alan Jalal Abdulqader

Abstract. In this work, we compare two approaches of using the "Modified Decomposition Method" to solve Nonlinear Nonhomogeneous Volterra-Integral Equations with known exact algebraic solutions and proving the existence and uniqueness of such solutions. First, using a numerical approach, a near-exact solution was obtained easily and efficiently. Secondly, knowing that a solution to a multi-term Volterra equation always produces a partial combination of the input terms; a combinatory approach was then used to find the correct combination that represents the exact solution. This method grows exponentially and is only practical for few terms Volterra equations. Both approaches are detailed with examples using Maple software with performance measurements that shows that the numerical approach is the winner if a near-exact solution is sufficient enough which the case for most engineering applications is. For scientific and mathematical applications, the combinatory approach is preferred.

Keyword: Nonlinear Nonhomogeneous Volterra Integral Equations, Modified Decomposition Method.

Paper ID:63

Adding silver oxide on Photoconductive characterizations of (Au-CeO2) thin-film deposited on porous silicon p-type.

Haider J. Hassan, Ahmed k. Abbas, Isam M. Ibrahim

Abstract. In this work, the characterization and properties of photodetectors based on cerium oxide mixed in proportions with gold and the effect of silver in the form of a compound were verified. The materials were prepared using a pulsed laser as a colloidal liquid in deionised and distilled water. Electrochemical etching method (P-type) and spin-coating method were used to deposit metal oxides on porous silicon slides in the form of thin films, which were then used to examine the properties of the photodetector in both the light and the dark with the applied forward voltage ranging from (0.1 to 5) and the intensity of illumination from the source (9.8 mW/cm2). The properties of (I-V) show that the gold and cerium oxide thin film deposited on the (p-type) porous silicon chip has a lower efficiency compared to the sample when adding silver NPs deposited on the p-types has higher efficiency; the manufactured photodetector of (Au-CeO2), (Au-Ag- CeO2) shows improved values of spectral response, quantum efficiency, respectively and a spectral directivity at the wavelength (550 nm) and spectral response in Ultraviolet region for (Au-Ag-CeO2) NPs

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Paper ID:64

Fuzzy Differential Subordinations and Superordinations For Univalent Functions Involving Linear Operator

Duaa Abdullah Salih, Abdul Rahman S. Juma, Ali Al-Fayadh

Abstract. In this work, we establish some results for fuzzy differential subordination with fuzzy differential superordination of univalent functions connected with the Generalization Srivastava-Attiya Operator, which is defined in the unit disk $W=\{w\in C:|w|<1\}$. The purpose of this study is to propose fuzzy differential subordination with fuzzy differential superordination, for which the fuzzy best

dominant with fuzzy best subordinate is provided. These findings are then used to create sandwich results.

Keyword: Univalent functions, Hadamard product, Fuzzy differential subordination.

Paper ID:65

Au Nano Colloid as Colorimetric Sensor for Heavy Metal Ions Detection

Kahtan A. Mohammed, Entidhar Jasim Khamees, Haider H. Kazem, Noor Al-Huda I. Nasser, Baneen A. Hassan

Abstract. This research aims to prepare a nanocolloidal solution of gold by chemical reduction method by tri sodium citrate (TSC) as a reduction agent and using gold chloride as a source of gold ions in aqueous solution at low temperatures (room temperature) and applying the solution as a colorimetric sensor to detect some heavy metal ions. The prepared solution was diagnosed by Transmission electron microscope as well as the XRay Diffraction. The results showed that the shape of the prepared particles is spherical with diameters close to 10 nanometers and with good scattering. The ions of zinc, lead, iron, and copper elements were detected. The nanomaterial gave a very fast color response after adding ions to the solution. And through the results obtained, it is expected that this prepared material can be used in environmental applications

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Paper ID:66

A review of (MgO) Thin Films, Preparation and Applications

Hussein S. Al-Rikabi, Muhammad H. AL-TIMIMI, Intessar K. ABD

Abstract. Magnesium oxide (MgO) thin film is one of the transparent conducting oxide semiconductors. MgO is a promising material for flat panel displays and Solar Cells due to its excellent optical and electrical properties. This paper focuses on the chemical and physical methods that influence the structural properties of MgO thin films, such as chemical spray pyrolysis technology and the solution growth process, Electron beam evaporation technique, Rf magnetron sputtering, and chemical vapor deposition, Many researchers have focused their efforts in recent years on improving the fundamental properties of thin films, particularly thin (MgO) films, which have a wide range of uses, We presented

the most important developments in the field of deposition techniques and some applications of thin(MgO) films and the most important tests conducted by researchers on these films

Keyword: MgO, Thin Film, Preparation Methods, Applications, A review.

Paper ID:67

Solve Multiple Linear Relationship Problem Using LAD Ridge with Application on Covid-19 Data

Tamarah Wathib Mohammad, Dr.Awatif Rezzoky Al-Dubaicy

Abstract. One of the most prevalent regression problems is that of multicollinearity problems because of its negative effects on model estimation. This problem can be solved in a number of ways, in this paper we proposed a ridge parameters, say (kˆ_CN), and estimated it by using least absolute deviation (LAD) method, after comparing it with the original parameter say (kˆ_MED) by simulation, we concluded that the proposed ridge parameter is more efficient than the original parameter, then used this proposed ridge parameters on real data for covid-19, to solve the problem of multicollinearity in this data.

Keyword: Linear regression, Least absolute deviation, Ridge regression, Multicollinearity errors, Efficiency, Application for covid-19.

Paper ID:68

A New Complex SEL Integral Transform and its Applications on Ordinary Differential Equations

Emad A. Kuffi, Luay Salim Ahmed

Abstract. This paper introduces a new complex integral transformation obtained by inserting a complex parameter into the well-known Rangaig integral transform kernel function. The new integral transform is denoted by the acronym SEL and is called the Complex (Serifenur-Emad-Luay) integral transform. The proposed SEL integral transform features are explained and shown to correspond to some fundamental functions. The application of the SEL transform to finding the solution of some differential

equations, including those arising in some real-world practical applications, is discussed as an illustration of the actual fields that could benefit from this novel transform.

Keyword: Complex Kernel, Integral transform, Rangaig transform, SEL integral transform, Differential equations, Uniformly loaded beam, Newton's law of cooling.

Paper ID:69

Using Network Technology Pert and Fuzzy Pert in Scheduling The Stages of The Oil Well Drilling Project

Duaa Basheer Abbas Al-Shamri, Waleed Mayeh Rodeen

Abstract. Most projects suffer from delays in implementation as a result of not planning and scheduling correctly. which leads to the difficulty of estimating the time of completion and thus increasing costs. This study aims to use the classic and fuzzy PERT technique in estimating the expected time to complete a project and comparing them. The results show that the PERT fuzzy technique is better than the classic in handling the execution time and is more suitable for scheduling the drilling project.

Keyword: PERT, Fuzzy Logic, Fuzzy PERT.

Paper ID:70

The Connection Between 500 hPa Geopotential Height and Heavy Rainfall Over Iraq: A Case Study

Mohammed Abdul Raheem Jabbar, Ahmad S. Hassan

Abstract The relationship between weather patterns at 500 hPa geopotential height and surface low pressure is discussed in this paper. Rainfall in the mid-latitudes is heavily tied to the synoptic pattern at the upper levels. Surface low pressure is enhanced by upper-level weather patterns, resulting in heavy rainfall events. We study heavy rainfall events between 2010 and 2020, the weather patterns at the upper level that cause heavy rainfall over Iraq are (cut off low and trough), which can be observed clearly on 500 hPa maps. The decrease of the value of geopotential height compared to the location at the same latitude indicates unsettled weather over the location with a lower value of geopotential height. two case

studies were conducted in 2013 where a heavy rainfall event occurred across Iraq, the weather pattern at the upper boosted low pressure at the surface which advects moist, warm air, resulting in higher instability and heavy rainfall over Iraq.

Paper ID:72

On N_S-Open Sets In Minimal Structure Spaces

Harith M Abdul Razzaq1,a), Haider J Ali2

Abstract. In this work, we will introduce and investigate a new class of sets in minimal structure spaces, namely mX-Ns-open sets, for the first time. In addition, we study and demonstrate some of their characteristics. In order to make use of these sets, we present and investigate a new class of m-compact and m-connected spaces, which we refer to as m-Ns-compact and m-Ns-connected spaces, and we get some of their characterizations and attributes as a result of our research. In furthermore, we discuss the relationships that exist between these concepts. In addition, theorems, facts, and a number of examples have been provided to support our conclusions.

Paper ID:73

Punching Shear Behavior of Steel Fiber Lightweight Reinforced Concrete Slabs

Rana H. Alkerwei, Suhaib S. Abdulhameed, Ashraf A. Alfeehan

Abstract. Slabs are the most structural elements that consume concrete. They represent the largest weight due to their surface area and being the major member that carries live and dead loads. It is important to minimize the slab weight while maintaining the required mechanical properties with wasted energy reduction materials. This paper presented an experimental study on the punching shear behavior of steel fiber lightweight concrete slabs. Eight simply-supported reinforced concrete slabs were tested under concentric static load up to failure to investigate the effect of steel fibers on the punching shear resistance of lightweight concrete. The dimensions of the tested specimens were 780 mm square and 60 mm thickness. The experimental parameters included steel reinforcement ratio (1.65% and 1.78%) and steel fibers volume ratio (0%,0.5%,1% and 1.5%). Test results show that increasing the steel fiber ratio improved the punching shear strength and enhanced the post-cracking behavior of the lightweight

concrete slabs. The maximum effect was reached when the steel fiber ratio was 1.5%, resulting in an 80% increase in the punching strength when the reinforcing ratio was 1.65%.

Keyword: Punching shear, lightweight concrete, fiber reinforced, shear resistance, two way slab.

Paper ID:74

Preparation thin-film from SrTiO3:B for thermopower application

Yahya M. Abdul- Hussein, Randa K. Hussain, Mohammed K. Khalaf

Abstract. . In this work, SrTiO3:B thin films with different ratio doping(0, 0.02,0.0 4,0.06, and 0.08) have been deposited on glass substrate by using aerosol-assisted chemical vapor deposition technique (AACVD) at the temperature of (400 °C). The structural properties and thermoelectric properties of the Sr1-xBxTiO3 thin films were studied after preparation with impurity ratios of SrTiO3:B at($0 \leq x \leq 0.08$). The structural properties of the thin films included the study of surface topography using scanning electron microscopy images (SEM) and atomic force microscopy (AFM) tests. The internal crystal structure was studied by XRD analysis. The thermoelectric properties of the Sr1-xBxTiO3 films included a Seebeck coefficient, electrical conductivity, thermal conductivity, power factor, and efficiency represented by the dimensionless merit character (ZT).

Keyword: Thermo-electric properties, Seebeck coefficient, electrical conductivity, thermal conductivity.

Paper ID:75

Modifications and Improvements to the Twofish Encryption Algorithm: A Review

Ali Hussein Saieed, Assist.Prof.Dr. Anwar Abbas Hattab

Abstract. . In recent years, data (text, voice, image, animation, and video) has been increasingly used to transmit advanced digital content. Academics are concerned about the security of multimedia content as network technology increasingly focuses on the Internet. The transmission of data through a network exposes it to a variety of forms of abuse, including brute force assaults, illegal access, and network

hacking. As a result, the system must be protected by an effective media-aware security framework, such as encryption algorithms based on standard (symmetric-encryption-algorithms), which will be in charge of ensuring data security. The Twofish algorithm is a well-known cryptographic algorithm for encrypting electronic data. It is (symmetric-block-cipher) that was developed by the U.S. National Institute of Standards and Technology (NIST). However, some of the drawbacks of this technique include the processing overhead, the use of an S-Box, and pattern difficulties that arise when dealing with more sophisticated multimedia data types such as text, image, and video. Numerous scholars have conducted research to optimize the algorithm's performance. This article talks about the changes and improvements made to the performance of the modified Twofish algorithms that were proposed in previous research.

Keyword: Twofish algorithm, security, symmetric block cipher, cryptography.

Paper ID:76

Orthogonal Higher k-Derivations on Semiprime Γ-Rings

Salah Mehdi Salih, Hajer Hamed Abd-Ali

Abstract. In this paper , we introduce the concept of orthogonal higher k-derivations and we present some results concerning with these nation on semiprime of □-rings.

Keyword: Semiprime □-Ring , k-derivations , higher k-derivations ,orthogonal.

Paper ID:77

Experimental and Numerical Study Heat Transfer Performance for Printed Circuit Board

Mustafa Emad Kadum, Sattar Aljabair, Ahmed Abdulnabi Imran

Abstract. Electronic circuit cooling has become a critical consideration in the development of electronics. Overheating might result in hardware malfunctions or damage. Air-cooling is an efficient invention to the Printed Circuit Board (PCB) cooling, and the real motherboard ASUS X399-A is inspected by simulation experimentally and numerically. Finite volume method CFD procedure is

employed to pattern the forced convection laminar air-cooling flow in a three-dimensional motherboard. Experiments are performed on the motherboard to simulate the PCB in both horizontal and vertical orientations with a processor full load heat power of 130 W. The results proved that there is an enhancement in heat transfer in the horizontal position from the vertical position in the same working conditions.

Keyword: Thermal management, Printed circuit board, Heat transfer enhancement in electronic system:

Paper ID:78

Single Stage Shrinkage Estimation Methods for Reliability Function of Exponential - Shanker Stress - Strength Models

Isaam k. Ahmed

Abstract. In this paper, the estimation of multi-component system reliability of Exponential- shanker Stress-Strength model with more than two stresses is studied. The estimation of models Rp = p [max (X1, ..., Xr) < max (Z1, …., Zk)] and Rs = P [max (X1 ,… ,Xr) < min (Z1…. Zk)] is studied when (Z1, Z2, …., Zk) are strengths subjected to one of the stresses X1 ,… ,Xr assuming that Z1…. Zk follow independent shanker distribution and X1 ,… ,Xr follow independent exponential distribution. The expression for system reliability of series and parallel systems for an exponential- shanker stress-strength model is derived. MLEs for the parameters and reliability functions with their asymptotic distributions are derived. Shrinkage methods (two types)estimators are derived. Also the performance of MLEs and Shrinkage estimators(two types) of reliability functions are studied by estimating MSEs through simulations.

Paper ID:80

A Comparative Study of Cryptosporidium spp. among Human, Cattle and Sheep in Wasit Province, Iraq

Noor J. Hussein, May N. Khadim

Abstract. The present study aimed to determine the prevalence rate of cryptosporidiosis infection in Wasit province among human and livestock animals (cattle & sheep). A total of 192 stool and fecal

samples were collected from both human and animal [human (n=96), cattle (n=48), sheep (n=48)] in January 2021 to June 2021 using modified Ziehl-Neelsen (M.Z.N) stain and molecular Nested PCR technique. The whole prevalence of Cryptosporidium spp infection in human, cattle, and sheep was 34.38% (33/96), 20% (10/48), 14.5% (7/48) respectively by using M.Z.N stain, while the prevalence of Cryptosporidium spp by nested PCR in human, cattle , and sheep was 36.46% (35/96) 22.92% (11/48) , 14.5% (7/48) respectively. The largest rate in human was found in age group less than 5 years which was 21 (43.7%), while in cattle and sheep was found in age group less than 6 months which was 5 (31.2) , 4(25%) respectively. There was no significant difference between gender and the infection, the highest percentage was observed in females which was 12 (38.7%) rather than males 21 (32.3%). The patients in rural areas have the largest prevalence of infection which was 23 (41.8%) compared with urban areas which was 10 (24.3%) with significant differences at (P<0.05).

Keyword: Cryptosporidium spp, prevalence, human, cattle, sheep, nested PCR

Paper ID:81

On WS-Rationally Extending Modules

Zahraa Abbas Fadel, Mahdi Saleh Nayef

Abstract. The main objective of this work is to present and study a new generalization of the concept of rationally extending module. A module M is called weakly supplement rationally extending module , if every submodule of M is rational in a weakly supplement submodule of M. several basic properties and descriptions of this idea have been discussed. In addition , the relationship between our concept and other related concepts was studied.

Keyword: Rationally extending module , supplement rationally extending module , weakly supplement extending module , weakly supplement rationally extending module, rationally closed $\oplus$-supplemented module.

Paper ID:82

Evaluating The Early Age Performance Of Eco-Friendly Cement Mortar Containing Green Synthesis Nano Alumina From Leaves Mixture

Alaa S. Dawood, Alaa A. Abdul-Hamead, Farhad M. Othman

Abstract Today, the concern for the environment, sustainability, and reducing pollution is one of the most important topics that are discussed around the world, as the high development in the field of construction has a detrimental effect on the environment. Therefore, the need to develop building materials using an environmentally friendly approach has increased. Due to the tremendous development in the field of construction, the need to develop the properties of the cement used in the building mortar has increased, and since Nano-materials, in general, have distinctive properties, their use has increased recently as an additive to the cement to improve its properties. In the current research, Nano-alumina prepared by green synthesis from natural sources available locally was used, where the percentage of Nano-alumina added was (2.5, 5, 7.5, 10) by the weight of cement, the structural properties tests were carried out for prepared Nano-alumina. At the same time, samples of commercial rapid hardening Portland cement (RHPC) were also prepared to compare the results. The compressive strength, viscosity, and density of the samples were examined after 3,7, and 28 days. The results showed an improvement in the compressive strength, density, and viscosity of the samples with an increase in Nano-alumina up to 7.5% and became better than rapid hardening Portland cement therefore it is appropriate to use the waste of mixed leaves to extract alumina and benefit from the leaves in a mixture form.

Keyword: Rapid Hardening Portland Cement (RHPC), green synthesis, Nano-alumina.

Paper ID:83

Design and implementation of an omnidirectional mobile robot for medicine delivery in hospitals during the COVID-19 epidemic

Hiba A Najim , Iman S. Kareem, Wisam E. Abdul-Lateef

Abstract. In the aftermath of the Corona epidemic, mobile robots have played an active part in health services and patient care. The primary purpose of deploying these robots is to eliminate human touch while still ensuring that medications are given to patients in hospitals. This will reduce the hazard for medical personnel who are actively involved in the COVID-19 epidemic. This paper describes the design and building of a mobile robot that can travel in all directions without the use of steering gear, and that uses a particular form of caster called mecanum wheels to work inside hospital hallways to deliver medications to patients while minimizing human touch. The depth camera and LIDAR were utilized as sensors to detect the environment in which the robot operates. This robot is operated by a Robot Operating System that employs the Simultaneous localization and mapping (SLAM) algorithm.

Keyword: COVID-19 pandemic, mecanum wheels, depth camera, LIDAR, the robot's operating system, SLAM.

Paper ID:84

Experimental diagnose for spikes width relation with positive optoelectronic feedback attenuation in a quantum well laser diode

Ayser A. Hemed, Hadeel A. Abbas

Abstract. In this experimental study, the dynamics of a quantum well semiconductor laser (SL) under optoelectronic (OE) feedback are investigated. The feedback is configured by splitting the optical signal emitted by this laser into two identical parts, one of them is detected and then modulated into the laser bias current. Results indicate a variation in laser instability from one state to different states according to the feedback strength. The bias voltage is also individually changed to measure the weight of the pumping level. Width of main lasing peaks, at multi lasing state, are measured. Laser response to these two parameters are measured and analyzed. The multi-pulsation is observed according to this, pulse width is measured versus parameter, resulting relations that has been recorded are transformed as the following; sine, logarithmic, Gauss, finally, exponential. This is due to the self-electro optic effect that forced the laser device to follow the perturba

Keyword: laser diode, chaos, optoelectronic feedback, optical communications, relaxation oscillation came from its feedback via the bias current

Paper ID:86

Deep-Learning Models Based Video Classification: Review

Saif K Jarallah, Sawsen A Mahmood

Abstract. Generally, a set of frames represents a video structure, clips, or scenes. A segmentation process including breaking down a video sequence into its main components should pre-processed video analysis-based classification methods. Recently, Deep Learning Models-based video analysis and classification approaches have been grown-up and developed to be more concise and convenient for modern technologies such as big data, cloud computing, video surveillance, and video summarization systems. This paper focuses on the knowledge related to deep learning-based methods to achieve object detection and tracking along with video sequences. Our revision presents and discusses various studies of video classification tasks. Further, the fundamental purpose of this research is to look at which of these techniques affected mainly the performance of video classification tasks and the main parameters

required to design and implement an efficient video classification system with relative challenges. A comparison study is performed on various types of video classification models to highlight the strong points of each model with a comprehensive analysis of its performance evaluation based on accuracy metrics.

Paper ID:87

Influence of Thermo-Mechanical Treatment on the Surface Roughness of the Machined 2025Al Alloy

Haydar Al-Ethari, Ali Mohammed Altaee

Abstract. The current work investigates the effect of warm squeezing on the microstructure, the hardness, the grain size, and the machinability of 2025Al alloy. Stir casting was used to prepare the alloy samples. The heat treatment included solution treatment at 550°C for 3 hours, quenching in iced water at 0°C, and aging by heating to 150°C for 3 hours. Mechanical treatment included warm squeezing at 1500C by a pressure of 50, 100, and 150MPa. The hardness, the microstructure, the grain size, and the machinability in terms of the surface roughness were tested. Four spindle speeds of 30, 160, 315, and 500rpm for each of which a feed of 0.05mm /rev were considered. It was observed that the surface roughness decreases with the squeezing pressure. It has also been observed that the hardness increases, the grain size decreases with the increase in the squeezing pressure. Maximum increase in Vickers hardness of 62% and a maximum reduction of 56% in the grain size were attained. The percentage reduction in the roughness of the machined surface with the applied cutting conditions were recorded as 56% to 67%.

Keyword: Warm Squeezing, Grain Refinement, Duralumin, Surface Roughness.

Paper ID:88

Assessment The Ants Number And Iteration In Ant Colony Optimization For Edge Detection

Majid R. Jebur , Luma S. Hasan

Abstract. One of the most important purposes of image processing is finding the information about objects in the image file especially detecting the boundary for an edge. Image edge detection is the critical step in image processing. This paper presents the Ant colony optimization (ACO) as a metaheuristic optimization algorithm that depends on the ant's behavior in for searching food by detecting the edge in the image gray file by proposing a new formula for computing the count of ants by decreasing it with 10%, 30% and 50% of the square root of the multiplication between some rows with columns of the image file. it is performed on different images sizes (128x128,256x256) with different values of parameters such as the number of ants, the number of iterations then examine the edge detection in the image file by computing the important parameters for solving any problem, especially the time complexity (elapsed time) and mean square error (MSE) with PSNR.

When analyzing the results of ACO to evaluate the best value of parameters that influenced the success of detecting the edge points, we deduced that when decreasing the number of iterations, the number of ants gives the best result for edge detection.

Paper ID:89

A Secure Proof of Work to Enhance Scalability and Transaction Speed in Blockchain Technology for IoT

Shatha A. Baker, Dr. Ahmed S. Nori

Abstract. The Internet of Things (IoT) has expanded internet connectivity to include not only computers and humans, but also the majority of our everyday things. Although the benefits of IoT are limitless, there are several challenges for implementing IoT in the real world for example centralization, scalability and security concerns that occur owing to the large numbers of networked objects. Therefore, there is an urgent need to provide a decentralized, secure and scalable environment to transform the path of IoT into it. One of the well-known example of the decentralized solutions is blockchain. Blockchain is a sophisticated technology that decentralizes management and computing processes, it can address a many of IoT challenges, including security. This paper proposes a consensus algorithm by distributing the Proof of Work (PoW) process among miners. Each node only discovers a PoW for their little fraction of the searching area, resulting in no two miners putting in the same amount of effort to solve a single block. Furthermore, the paper employs a decentralized Random Beacon (RB) to randomly select nodes to take part in the Block Notarization (BN) process. The algorithm tested by using different scenarios, with different the level of difficulty and number of miners. Results evaluations demonstrate the

algorithm improved the scalability of PoW by up to 77.442%, 91.716% when the number of miners are 10, 20 respectively

Keyword: Internet of Things, Security, Blockchain, Proof of Work, Random Beacon.

Paper ID:90

Human Gait Features Extraction Based on Angles and Curves

R. E. Al-Bayati, Ziad M. Abood

Abstract. Walking could be a motion and it's totally different from one person to another. Walking is one in every of life science that helps to see the identity of an individual while not his data and from an excellent distance during this study we tend to planned to extract the dynamic characteristics looking at the characteristics of the skeleton and therefore the angles of the correct elbow, left elbow, right knee and left knee and changing it to a curve. The video was taken by a digital camera, and the video was inserted into the program, which converts it from second to 3D and exploits the temporal and special changes of the walking cycle.

Keyword: Biometrics, Angle of elbow and knee, human Gait, Extract Features, Curves.

Paper ID:92

Modeling Schottky correction interaction with arc plasma in atmospheric pursuer

Huda Falih Jassam, Rafid Abbas Ali

Abstract. Theoretical calculations and simulation data were presented to study the effect of the mixture (Xe-Dy) of a high-pressure arc discharge plasma. The effect of the change in temperature, voltage and concentration on ionization energy (α), Schottky correction and voltage barrier were studied where different concentrations of Dysprosium (0.005, 0.01, 0.05, 0.1, and 0.5 mol) were added and voltage (U=13V, U=25V) was used. This work using program (NCBL) and the results showed a clear effect to Concentration on the Schottky correction of xe pure where (U=13V) at the temperature)T=3000K) and (Ui=3.45V) the (ΔA=1.25eV) and when add (0.5 mol.) at the temperature (T=3000k) and (Ui=8.08 V)

the (ΔA=1.47eV)And at (U=25V) at the temperature (T=3000K) and (Ui=3.37V) the (ΔA=1.83eV) and when add (0.5 mol.) at the temperature (T=3000k) and (Ui=7.30 V) the (ΔA=2.46eV) and effect concentration on the ionization energy, where at concentration (0.005mol) it is (α=28) and at concentration (0.5mol) it is (α=1). We not observe an effect of the voltage on the value of the ionization energy. The voltage barrier from temperature (1000-3500k) is very high and at temperature (4000k) it begins to decrease. We not observe an effect of the voltage on potential barrier.

Paper ID:93

Experimental Study of Tool Wear Rate and Surface Roughness in Electrical Discharge Machining of Monel alloy Using Cu-Gr Composite Electrode

Mustafa Hassan Hadi, Abbas Fadhil Ibrahim

Abstract. Electrical Discharge Machining (EDM) is an unconventional machining technique widely used for machining of hard to cut metals. Monel is a nickel-copper alloy that is being used in various applications. The present work is aimed to investigate the influence of the process parameters on the Surface Roughness (SR) and Tool Wear Rate (TWR) of Monel alloy using copper, graphite, copper-graphite composite electrode. The effect of discharge current (Ip), pulse on time (Ton), and pulse off time (Toff) were studied. In this study based on the Taguchi method experiments with different electrodes are analyzed using ANOVA through Minitab 20. The results have shown that although copper-graphite electrode attained a relatively high tool wear rate compared to copper and graphite electrodes, copper-graphite electrode achieved lower values of surface roughness

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Paper ID:95

Bismuth oxide aqueous colloidal NPS obtained by a green synthesis inhibit Candida albicans

Marwa A. Faraj, Mushtak A. Jabbar , Ahmed N. Abd

Abstract. Green combination of NPS has drawn in an incredible consideration on account of natural applications. In this work, bismuth oxide NPS (Bi2O3 NP) has been arranged by green amalgamation utilizing cocoa plants watery concentrate, the item was portrayed by X-beam diffraction, (UV-VIS)

spectrophotometer, FTIR, Field Emission-Scanning Electron Microscopy Photoluminescence (PL), The antifungal activity of not set in stone against Candida albicans, the targets of this study were the green blend of bismuth oxide NPS utilizing fluid concentrate and antifungal action

Keyword: Bismuth oxides NPS, Candida albicans, XRD, optical properties, cocoa plants.

Paper ID:96

Preparation of lithium oxide nanoparticles using some salts and plant extracts and their use for biological applications

Bahaa J. Alwan, Ahmed N. Abd, Neihaya H. Zaki

Abstract. In this study, lithium oxide nanoparticles were successfully prepared using a plant extract, which was diagnosed using XRD which was determined to comply with the international standard. It was also proven that the particles have very small dimensions that make them suitable for biological and medical uses. The most important results obtained is the effect of these particles in inhibiting bacteria with different extents and may reach 33 mm.

Keyword: Lithium nitrate, green synthesis, E.coli, Nano-particles.

Paper ID:97

Synthesis Gas Sensor from Compound Sb2O3:In2O3 by Spin Coating Method

Ali J. Khalaf, Abeer S. Alfayhan, Raheem G.K. Hussein

Abstract. Thin films from Sb2O3:In2O3 Prepare membranes of different weights, then prepare membranes using a sipn coating method with the rotation speed are (2000,3000,4000,5000,6000) rpm respectively and the rotation time is 7s.. The films were examined as gas sensor against NH3gas at operating temperatures (130) oC, also sensitivity of films for gases decreases with increases temperature . The variation of the operating temperature of the films have led to a significant changes in sensor sensitivity.The gas sensor at the operating temperature of an to increasing in response time and decreasing in recovery.

Keyword: Thin film , Sb2O3:In2O3 , Operation Temperature, sensitivity, relatively, response, gas sensor:, Spin coating.

Paper ID:99

Antibacterial Activity of Zinc Oxide Nanoparticles Prepared by Green Synthesis

Hassan H. Fryeeh, Majid H. Hassouni

Abstract. The aim of this study is to use the Synthesis of green materials approach to make and characterize ZnO NPs with Cinnamon. UV spectroscopy, (FTIR), X-ray diffraction analysis, and AFM scanning analysis were used to characterize ZnO NPs in detail, revealing that the examination of thin films generated in this work was successful. The nanoparticles' antimicrobial activity is determined by stability, particle size, and concentration of the growth media against Staphylococcus aureus and Escherichia coli and Klepsiella sp.

Keyword: Antibacterial, Cinnamon, Green synthesis, Zinc oxide, Nanoparticles.

Paper ID:100

Inhibitory Effect of Lithium Oxide Nanoparticle Produced by green synthesis method

Bahaa J. Alwan, Ahmed N. Abd, Neihaya H. Zaki

Abstract. Green nanoparticle production has received a lot of attention due to its medical and biological applications. In this study, lithium oxide Nano-particles (Li2O2 NP) were synthesized using aqueous extract from Hibiscus sabdariffa plants, and the results were examined using an ultraviolet-visible Spector-photometer, X-ray diffraction, Fourier transform infrared, and transmission electron microscopy, as well as antibacterial activity against a variety of microorganisms.

Keyword: Lithium oxide, green synthesis, E. coli, antibacterial, Nano-particles.

Paper ID:101

Numerical Analysis of PMMA/HAP/MgO Composite for Dental Applications

Jawaher Abdulelah Sadeq , Randa Kamel Hussain, Aseel M. Abdul Majeed

Abstract. It has been performed a numerical analysis based on the finite element method that used the practical results of the mechanical compression test of the PMMA-HAP-MgO Nano composite, to investigate the possible applicability of this Nano composite in the field of dental materials. HAP and MgO nanoparticles strongly enhanced the elastic modulus up to 1697 MPa and the ultimate stress reach 135 MPa. The stress distribution analysis in PMMA-HAP-MgO Nano composite evidenced the improvement in mechanical properties and durability, the factor of safety has never been less than 1.

Keyword: PMMA, HAP, finite element, Dental Applications, AUTODESK® Inventor, Dental Applications

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Paper ID:102

Stability Of Arens Regularity of (h,g)-Perturbation of Triple Product of Banach Algebras

Marwan A. Jardo, Amir A. Mohammed

Abstract. Assume that A and C are both commutative Banach algebras, and B is Banach algebra. Let h∈Hom(B,A) and g∈Hom(B,C), the coordinate-wise product is perturbed by a multiplication on the triple product space A×B×C, as a result of which a new Banach algebra A×_h B×_g C is created. With regard to h and g, the Arens regularity of A×_h B×_g C has proved to be stable

Keyword: Banach Algebras, Arens Product, Arens Regularity, (h,g)-Perturbation of Triple Product of Banach Algebras.

Paper ID:103

Investigating the Mass Composition of Ultra-High Energy Particles via Studying the Shower longitudinal Profile

Shaimaa Rahem, A. A. Al-Rubaiee

Abstract. The simulation of longitudinal development in extensive air showers (EAS) was performed with AIRES system (version 19.04.00) for vertical and inclined EAS showers at the ultrahigh energies 1019, 3×1019, 1020 and 3×1020 eV. On the basis of this simulation, a new Gaussian function was obtained by approximating the longitudinal development for primary proton and iron nuclei that produced charged and neutral pions as a function of the atmospheric depth of EAS showers. The comparison of the calculated longitudinal development with that simulated with Scuitto has shown an opportunity of primary particle identification and definition of its energy at ultrahigh energies

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Paper ID:104

Preparation of silver oxide nanoparticles using cinnamon plant by Green synthesis method and its biological applications

Hassan H. Fryeeh, Majid H. Hassouni

Abstract. The use of cinnamon as a stabilizing agent in a green chemistry approach for the manufacture of Ag2O nanoparticles reported in this study. The hydrophilic, biocompatible, and non-toxic green biosynthesized nanoparticles have essential applications in a variety of fields of science. The absorbance peak found to be in the range of (240-256) nm in the UV–Visible spectra. The topography of Ag2O, has a semispherical nanoparticles shape (ball shape) and a crystallite size about (36) nm, confirmed using an AFM and XRD pattern. In addition, the produced Ag2O nanoparticles tested for antibacterial efficacy against harmful bacteria.

Keyword: Green synthesized, silver oxide nanoparticles, antibacterial activity.

Paper ID:105

The Experience Of Getting Rid Of Medical Waste While Also Preserving The Environment By Using Agricultural Biomass Waste As Fuel Instead Of Diesel

Sari Kamel JABER, Alaa Aldin ALJAWAD,Tudor PRISECARU, Elena POP1d, Pîsă IONEL

Abstract. Technological development has led to an increase in demand for oil globally, which has led to a rise in environmental pollution and its negative impact on human health. Hospitals and health centres increased with the increase in medical waste. When the COVID-201 virus spread, the medical waste increased. The best solution was to burn in medicinal incinerators to detoxify, complete disinfection, reduce the volume to 95%, weight 70%, restore energy and perform a rapid recovery. At the same time, it produces ash 30% containing heavy metals and metal oxides treated by burial in special landfills for waste that negatively affects the soil, groundwater, the environment, and humans. This paper used wood (Biomass) instead of diesel in the same medical waste. Examine bottom and fly ash in an XRF machine. We found that the concentration was reduced with the increasing mass of ash for heavy metals and metal oxides when using wood with the same waste weight and combustion conditions.

Keyword: Incinerator (furnace), Medical Waste, Wood, Diesel, Ashes.

Paper ID:106

Adsorption of Phenol from Aqueous Solution Using Granular Activated Carbon from Walnut Shell

Arwa M. Othman, Rafie R. Mohammed, Majid Ismail

Abstract. Walnut shell (WS) was examined to prepare granular activated carbon (WSGAC). The characterizations of (WSGAC) were studied using X-ray diffraction and Fourier transform infrared (FTIR). Results suggested that WSGAC possessed a porous structure that is rich in carboxyl and hydroxyl groups on its surface that play a significant role in phenol adsorption. The specific surface area of WSGAC was estimated by methylene blue (MB) adsorption, which is equal to 2313.01 m2/g, iodine number 659.906 (mg/g), and (MB) number 728.5 (mg/g). These numbers revealed that it was highly meso and macro-porous. Various adsorption parameters (dosage of WSGAC, contact time, pH and temperature) were tested. The pH of the solution was shown to have a significant impact on adsorption. At pH 3, the most adsorption occurred. Equilibrium isotherms were analyzed using Freundlich, Langmuir and Temkin models. The data best fitted with the Langmuir isotherm with an adsorption capacity of 2508.86 mg/g and R2=0.9884. Results obtained show that the removal percentage increases as the temperature increases from (81.63%) at 288k to (94.47%) at 343k. The kinetics of phenol adsorption followed a pseudo-second-order kinetic model. Thermodynamic parameters (ΔGo), (ΔH) and (ΔSo) indicated that phenol adsorption was spontaneous and endothermic.

Keyword: granular activated carbon, adsorption, isotherm, walnut shell, phenol, kinetics, Methylene Blue.

Paper ID:107

Reducing erosion rate of Aluminum - Copper alloy by surface processes

Mohammed H. Maseekh, Ali H. Ataiwi, Jamal J. Dawood

Abstract. To reduce the erosion rates of Al–Cu (2024) alloy, a double surface process consisting of committing a Titanium coating followed by plasma nitriding was used. This treatment is carried out by depositing a thin layer of Ti on the annealed alloy surface using a DC sputtering glow discharge method, followed by plasma nitriding for 6 hours at 350 °C in a gas mixture containing 75% of N2 and 25% Ar. Double coatings are made with a greatly enhanced layer depth and are formed of a multiphase layer dominated by TiN and Al3Ti. The micro hardness reaches a maximum of 152 HV, which is almost three times that of the treated alloy. When compared to uncoated AA 2024 Al alloy, the erosion resistance average of coated AA 2024 Al alloy is increased by 18%.

Keyword: Aluminum alloy, slurry erosion, surface treatment, double process, micro hardness.

Paper ID:108

Synthesis and evaluating antimicrobial activity for chalcones thiophen compounds

Maymouna Mazhar Khalaf Hassan, MAHA SALIH HUSSEIN

Abstract. This research included the preparation and characterization of compounds containing chalcones, Schiff bases, and Azo dye: bearing thiophene ring. The compounds (1mk-3mk) had prepared from the reaction acetophenone derivatives with 2-formyl thiophene and, then 2mmk had introduced in two reactions: first, its reaction with some substitutes of benzaldehyde to prepare Schiff bases (4mk-7mk), and the second was the design of a bis azo dye from p-Phenylenediamine with salicylaldehyde to get 8mk, and then reacted with chalcone 2mk to obtain the compound 9mk. The chemical formulas of the prepared compounds were confirmed by spectroscopic methods using UV, infrared, NMR spectroscopy of protons and carbon 13. The antimicrobial activity had tested against Staphylococcus aureus and Candida albicans in compared with neomycin sulfate and nystatin, and some compounds showed good to moderate inhibition at a concentration of 7.5,10 mg/ml.

Keyword: Schiff bases, Azo dye, Staphylococcus aureus, Candida albicans.

Paper ID:109

New Bi Aryl Amide Derivatives of Steroid Analoge Via Suzuki Reaction Synthesis And Characterization

Ali M. Farhan, Nabeel Abid. Abdul-Rida

Abstract. Steroids are natural products of poly cyclic compounds and can be defined as bioactive substances. Thus, this article involves a synthesis of new derivatives from steroid analoge ((5-pregnen-3β,17β-diol-15α-yl)thio) propionate, amide and bi aryl compounds known for its biological activity, amide derivative 1 was prepared by treatment of steroid analoge with primary amine substituted in basic solution. Later, bi aryl compound 2-5 were synthesized via reacting 1 with boric acid derivatives by using Suzuki-Miyaura condition. Finally, all compounds characterization by spectral methods (FT-IR , 1H-NMR) and C.H.N analysis..

Paper ID:110

On Cubic Dihedral Permutation d/BCK-Algebras

Hussein T. Fakher, Shuker M. Khalil

Abstract. In this research, we focused on the concept of cubic dihedral sets in order to look at some new types of algebra, such as cubic dihedral d/BCK-algebra. The algebra of cubic dihedral permutations is investigated using the members in symmetric group that are generated cubic dihedral sets. Furthermore, several findings are presented to study and discuss the types of cubic dihedral even permutation d/BCK-algebra and cubic dihedral odd permutation d/BCK-algebra provided by their permutation structures.

Keyword: cubic dihedral sets, edge d/BCK-algebra, d/BCK-algebras, d/BCK- subalgebras

MSC: 20F29, 06F15, 05C38.

Paper ID:111

Solving Systems of Ordinary Differential Equations Using Particle Swarm Optimization Based on Padé Approximant

Reham H.S. Alazzawi, Azzam S.Y. Aladool

Abstract. An algorithm is used to find approximate solutions of different types of the systems of ordinary differential equations (SODEs) on the given interval. The SODEs is converted to a constrained optimization problem. In this work, the particle swarm optimization (PSO) is combined with Padé expansion to find an approximate solution of the SODEs, by minimizing the value of fitness function. The fitness function is calculated by the sum of discrete lest square weighted function (DLSWF) and a penalty function (PF). The algorithm is applied to solve linear and non-linear SODEs. The results are promising in terms of convergence, stability, accuracy.

Paper ID:115

Spectroscopic Analysis and Calculated Plasma Parameters of Nickle Target by Laser Induced Plasma

Ban F. Rasheed, Firas S. Mohammed, kadhim A. Aadim

Abstract. The optical emission spectroscopy (OES) method was employed to investigate the characteristics of nickel Ni plasma generated by a Nd:YAG laser at atmospheric pressure. Plasma is produced from a solid Ni target irradiated with pulsed laser. The emitted spectra of Ni were detected and captured by the spectrometer in a laboratory, and the emitted spectra were useful in extracting fundamental plasma properties. The emission spectrum, electron temperature T_e, Debye length λ_D, electron density n_e, and Debye sphere N_d are greatly influenced by laser energy. As a result of laser thermal energy conversion to electron kinetic energy, both electron density and plasma temperature dramatically increased. The frequency is proportional to electron density n_(e) while λ_D decreased because the wave length is inversely proportional to frequency in the same operating conditions. The n_(e)varies from 5.5×1018 to 7×1018 cm−3 for laser energy from 600 to 1000 mJ. The values of N_d>>>1 , which is satisfied one of the plasma conditions.

Keyword: Nickle plasma; Laser plasma technique; LIBS; electron density; electron temperature; Debye length.

Paper ID:116

Effect of Two-Dimensional Graphene Addition on the Capacitive Properties of Polymer Composite

Ali J. Saloum, Basma H. Al-Tamimi, Saad B.H. Farid

Abstract. Graphene, as a two-dimensional nano-carbon material with outstanding physical and mechanical properties, attracted scientists to explore and study its structure as a promising material. Herein, a discussion and strategy for the effect of two-dimensional graphene addition on the capacitive properties of epoxy composites for a variety of electrical applications are presented. Then, the accurate characterization of the graphene was studied, and the morphological properties were determined using scanning and a transmission electron microscope. Structural characterizations were investigated using X-ray diffraction measurements. Moreover, mechanical exfoliation for graphene has proven to be effective in achieving the fewest number of layers with a thickness of the layer of (0.348 nm). On the other hand, The results of the LCR scale showed that adding graphene sheets with different weight fractions (1 wt.%, 2 wt.%, 3wt.%, and 4wt.%) to an epoxy matrix progressively enhances the capacitive properties. According to the results and inferences, the design of the graphene/epoxy composite may be better for energy storage capacitors (supercapacitors).

Keyword: 2DGraphene, epoxy, nanocomposite material, capacitors, LCR meter.

Paper ID:117

A Globally Convergent Version Constrained Conjugate Gradient Algorithm for Minimizations

Elaf Sulaiman Khaleel, Eman T Hamed

Abstract. A new conjugate gradient coefficient was derived in the field of constrained optimization based on the objective and constraint function using the interior pointe method and taking advantage of the properties of kkt depending on the new direction of the world (Ibrahim & Mamat) . The new restricted method has proven its efficiency in theory by proof the sufficient descent and global convergence and in practice through the application of the Dolan and more program based on the NOF, NOI,NOC

Keyword: sunt , constrined optimization , c.g , Dolan and more, k.k.t.

Paper ID:118

Another Certain Version of Almost Soft E-Compactness and E-Lindelofness via Soft E-Open Sets

Huda. H. A.Al-Salmani, Alaa. M. F. Al-Jumaili

Abstract. Our article present and investigate another extension for the classical meaning of soft connectedness and soft Lindelöfness, namely almost soft E-compactness and almost soft E-Lindelofness via employing another idea of soft sets namely soft E-open. Various essential properties and some examples to explain the relationships among these spaces have been introduced. As well, the behavior of these spaces under soft E-irresolute mappings has been discussed. Additionally, several finding which connect between some generalized soft connectedness and Lindelöfness which are introduced in our article and some soft topological forms such as soft E-connected spaces and soft E-T_2-spaces have been deduced.

Keyword: soft E-open sets, almost soft E-compactness, almost soft E-Lindelofness, soft E-irresoluteness;soft E-T_2-spaces..

Paper ID:119

Effects Of Collector Electrode Height And Diameter On The Ionic Wind Propulsion For The Needle-to-Ring Configuration

Bakr Al-Bakri, Yasser Al-Jawwady

Abstract. Results of experiments and phenomenological modeling on the effects of collector dimensions parameters in the needle-to-ring configuration in ionic thruster are compared. The study shows that the propulsion is directly proportional to the diameter of the collector and inversely proportional to its height. also, It is seen that although the second-degree discharge voltage dependence of the propulsion derived reproduces the general features of the experimental data, more precise agreement is obtained using a power-law equation fitting. The value of the exponent obtained from the fitting averaged over all geometrical configurations studied is 2.34 ± 0.3.

Paper ID:121

Characterization of superhydrophobic silica aerogel doped with Rhodamine B dye prepared in ambient pressure

Samah S. Ahmed, Israa F. Al-sharuee

Abstract Thermal insulation, drug delivery, adsorption of spilled oil, and self-cleaning windows are the main applications of silica aerogel. In this work, the production and characterization of superhydrophobic silica aerogels doped with Rhodamine B dye are presented. And investigating the effect of doping on some physical properties and chemical structures has been studied. In the preparation, two procedures were used, with the main goal of obtaining a product with the best characteristics in the shortest amount of time. The first method is known as RH1 and RH2. RH1, the modification procedure when the doped sol is converted to gel RH2, begins with the changed solution being added to the sol. The structural, spectral, and morphological properties were investigated using FTIR, BET, and FESEM, as well as EDS analysis. Results show that RH1 samples have the highest contact angle (146º) surface area (899 m2/g), and lowest particle size compared with RH2 samples. Except for the apparent increase in density, the investigation demonstrates that Rhodamine B dye can advance the structural properties of silica aerogel. This study found when n-hexane is mixed with the sol before converting to gel, the aerogel has better specifications and more improvement than the modified surface that's modified after converting to gel.

Paper ID:122

Kinetic Study for Removal of Methyl Orange on Exhausted Catalytic Converter

Hala Allawi Kadhum, Watheq Naser Hussein, Bashar Abid Hamza, Mohammed Al-Shuraifi, Raheem A.H.Al-Uqaily , Subhi A.H. Al-Bayaty

Abstract. Methyl orange, MO is one of the harmful dyes which is used widely in the laboratories, in the textile coloring and other applications, therefore its concentration must be reduced before disposing to sewage, rivers ….et. Adsorption method is one of the cheapest, available, applicable and simple in handling to treat polluted water. Catalytic converter (CC) used in cars exhaust systems to treat emitted gases from combustion processes in engines is a candidate of this study to adsorb MO from aqueous

solution. The reason for using CC as an adsorbent, is due to possessing functional merits such as some transition metals that have unfilled orbitals as well it is cheap and available. It was found that CC can give a good removal of dye, about 70% at 308 0K, pH=7 and adsorption time of 45 min., this is expected because it is considered as an exhausted and not a new one. It was found, that adsorption of MO on CC follows the pseudo second order kinetic.

Keyword: Adsorption, Methyl Orange, Catalytic Converter, Kinetic, Dyes.

Paper ID:123

Other Certain Classes of Generalized Slightly and Almost Slightly Open Mappings

Intisar. M. Mohammed, Alaa. M. F. Al-Jumaili

Abstract. The main objective of present paper, is to introduce and study other new weak forms of both slightly and almost slightly open mappings which are called slightly E-open (resp. slightly δ-ß-open) mappings, almost slightly E- open (resp. almost slightlyδ-ß-open) mappings and almost somewhat E-open (resp. almost somewhat δ-ß-open) maps utilizing E-open and δ-ß-open sets respectively. “Several of the fundamental properties related to these kinds of slight and almost slight open mappings have been investigated. In addition, the interrelationships between these ideas of mappings and other well-known related mappings have been discussed.

Keyword: Slightly E-open maps; Slightly δ-ß- open maps; Almost somewhat E-open maps; Almost somewhat δ-ß-open maps; Almost slightlyδ-ß- open maps.

Paper ID:124

On Fuzzy Normal ROH-Filters and Usual ROH-Filters of ROH-Algebras

Arkan Ajil Atshan, Shuker Mahmood Khalil

Abstract. This work presents and investigates many forms of ρ –algebra filters, termed normal ρ –filter, semi ρ –filter, usual ρ –filter, fuzzy normal ρ –filter, fuzzy semi ρ –filter, and fuzzy usual ρ –filter,

respectively. We also offered some theories to explain some of the connections between these filter types and ideals.

Keyword: Fuzzy sets theory, Fuzzy ρ-algebras, Normal ρ-filter, Regular ρ-algebras, Usual ρ – filter.

2020AMS: 03E72, 03G25, 06F35.

Paper ID:125

Corrosion Reduction of Aluminum Alloy 6061 via Micro Arc Oxidation Coatings

Nawal Mohammed Dawood, Ayad Mohammed Nattah

Abstract. The corrosion features of micro arc oxidation coatings (MAO coatings) precipitated on 6061-Al alloy at current density 1.61 amp/ cm2 was examined in this work. So as to assess the resistant of corrosion of MAO coatings, simple immersion, and potentiodynamic polarization experiments were performed in 3.5 % NaCl. Long-term immersion testing of coated samples (up to 100 hours) revealed no weight change as compared to uncoated alloy. When associated to the bared alloy, the curves of anodic polarization for MAO-coated specimens showed much reduced current of corrosion and greater positive potential of corrosion.

Keyword: Al2O3 coating, hard anodizing, corrosion, potentiodynamic polarization, micro arc oxidation.

Paper ID:126

The Effects of Gamma Radiation on the Structural and Optical Properties of (PVA/ANI) Blend

Hayjaa M. Sadeq, Salma M. Hassan

Abstract. The optical transmission and UV-VIS absorption spectra for PVA/Aniline blends were obtained in the wavelength range (200-1100). Before and after gamma radiation with Co60 were. FTIR spectrophotometer was used to determine the chemical structure. The optical energy gap and optical

constant like refractive index (n) have been assessed. Our result indicates that the materials have allowed direct transition and the value of energy gap changed with the gamma dose exposed to it.

Paper ID:129

On Positive Definiteness of Powell Symmetric Broyden (H-version) Update for Unconstrained Optimization

Mohammed AbdAlamer, Saad Mahmood

Abstract. In this paper, we propose to search for the Powell Symmetric Broyden (PSB) update modification, according to the quasi Newton's (H_(κ+1) y_κ=s_κ) method, regarding the unconstrained optimization problem. Therefore (β-PSB) is the proposed new method of updating. PSB of the second order update classes, which solves the problem of unconstrained optimization, note that the update does not preserve the positive property of the inverse definite of the following Hessian matrix. In this our proposed method, guarantees of the positive property of the following Hessian matrix inverse definite are achieved by performing an update of the s_k vector, (i.e.) Subtraction is made between the next gradient and the current gradient of the target function, which must be differentiable and continuous twice. After that we confirmed the existence of the update. Then the numerical results are presented and then the proposed method is compared with the original update method ƤSB in light of the standard problems

Keyword: Powell symmetric Broyden, Quasi Newton condition, Inverse Hessian matrix, Positive definite property.

Paper ID:132

D-Small Semi-Prime Submodules (Modules)

Adwia Jassim Abdul-Alkalik

Abstract. In this research, we introduces the generalized Semi-prime submodules (modules). Our aim is to study d-Small Semi-prime submodules (modules). Some properties and charactrerizations of d-small semi-prime submodules (modules) are given. In addition, various basic results about these

concepts are considered. We give some relations between, semi-prime submodules (modules), small semi-prime submodules (modules) and d-small semi-prime submodules (modules).

Keyword: d-Small Submodules, d-Small Semi-prime submodules (modules), Semi-prime submodules, Small submodules, and Small semi-prime submodules.

Paper ID:133

A Threshold Approach to Tumor Isolation on Medical Lung Radiographs

Dalael Saad Abdul-Zahra, Hayder Adnan Saleh, Rusul Ahmed Flayyih, Hawraa A.AL-Challabi, Hussein Alaa Al-Tufaili

Abstract. Lung cancer, like other types of malignancies, develops when the usual activities of cell division and proliferation are disrupted by imbalance and disorder, resulting in aberrant and uncontrollable growth of certain of these cells, resulting in a mass or tumor. The current work intends to segment medical lung images to acquire a tumor-specific area of interest, which will aid clinicians in diagnosing images and offer an image appropriate for the next stages of the CAD system, such as feature extraction and classification. The proposed algorithm worked by conducting preset image processing, such as screening medical images and then transforming them to binary form. The image was segmented in the second stage by first determining a description of the elements that make up the image and then determining their properties, with the area and hardness properties being used to determine the tumor area, which represents the most solid area among all the image elements Finally, morphological procedures were used to enhance the region of interest's edges. The proposed method was evaluated on all photos in the database, and it was found to appropriately fragment tumor-containing images with a percentage of more than 98 percent.

Paper ID:134

Relation Between Parameter Solvable Graph and The Solvability Degree of finite Group

AMEER KADHIM ABDULAALI, HAYDER BAQER SHELASH

Abstract. Let G be a finite non-solvable group with solvable radical Sol(G). The solvable graph Γsol(G) of group G is a graph with vertex set V (Γsol) = {σ | σ ∈ G} and two distinct vertices σ1 and σ2 are adjacent if and only if ⟨σ1,σ2⟩ is solvable group, so the solvability degree of G is define by the number of all elements such that {(σ1,σ2) ∈ G × G | ⟨σ1,σ2⟩ ≤_Sol G} on the number 〖(G)〗^2. We show that the relation between Γsol(G) and the solvability degree of G..

Keyword: Solvable group, Solvable graph, Solvability degree.

Paper ID:135

Corrosion Inhibition of Aluminum 6061 alloy by a Micro arc oxidation modified with incorporated Zinc Oxide Nanoparticles

Mohannd Kadhim Alshujery, Khulood Abid Saleh Al-Saadie

Abstract. In this work, Aluminum alloy 6061 (A6061) was modified by Micro arc Oxidation and incorporated with ZnO nanoparticles to improve its corrosion-resistant. The titanium sheet was used as a counter electrode and an electrolyte solution of its components (10 g/L KH2PO4 + 2g/L NaOH), and a high variable AC voltage of 150 volts is applied, to keep the electrolyte temperature as stable as possible, the cell was immersed in an ice bath. While this electrolyte solution was mixed with the Zinc Oxide nanoparticle to incorporate in the A6061 surface. Micro arc Oxidation and incorporation with (ZnO) NPS were confirmed by X-ray diffraction. The surface morphology of the modified and incorporated surface were examined through scanning electron microscopy (SEM). Modified A6061 by Micro arc Oxidation and nanoparticle incorporation revealed a good corrosion protection efficiency even at temperatures ranging (298-328)K in a saline medium. Where the corrosion current density increase with the increase in temperature. Activation energy and pre-exponential factor (kinetic parameters) were calculated and discussed. In addition, thermodynamic values ΔG* and ΔH* were also calculated..

Keyword: Microarc oxidation, incorporation, zinc oxide Nanoparticle, aluminum alloy.

Paper ID:137

Fuzzy Strongly and Fuzzy Primary Ideals in ρ –Algebras

Arkan Ajil Atshan, Shuker Mahmood Khalil

Abstract. We introduced and examined various types of fuzzy ρ – algebra ideals in this research, which we dubbed fuzzy strongly ρ^{-}-ideal,fuzzy ρ – subideal and fuzzy primary ρ – ideal, respectively. We also presented some hypotheses that explained some of the linkages between these fuzzy ideal types.

Keyword: Fuzzy sets theory, ρ–ideals, ρ–subalgebras.

Paper ID:138

Optimization of Properties for Electroless-Plated Steel using Taguchi Approach

Muroog M. Shinyar, Abbas Kh. Hussein, Laith K. Abbas

Abstract. This paper looks at the feasibility of improving the mechanical characteristics and corrosion resistance of electroless coatings on low carbon steel specimens. In this research, it has been utilized to produce (Ni-P/ Nano Al2O3), (Ni-P/ Nano TiO2), and (Ni-P/ Nano SiO2) coating. Taguchi's (L27) orthogonal array has been utilized to optimize the corrosion rate, roughness and microhardness of nanocomposite coatings over low carbon steel specimen by electroless deposition method. Experimental models connecting the response and technique parameters to the findings of these experiments had been developed. The specimen's microhardness and corrosion resistance were greatly enhanced. The optimum parameters level predicted in (S/N) optimization for minimize values of surface roughness, corrosion rate and for maximize value of microhardness are (A1B2C2), (A1B2C1) and (A1B1C2) respectively

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Paper ID:140

Design and Manufacturing of Interference Electromechanical Sensor for Measuring Pressure and Force Between Foot and Orthosis (AFO)

Talib Sabah Hussein, Andrey Izyumov

Abstract. The orthosis AFOs are describe for patients who have lower limbs problems such as minor injuries to the spinal cord, who have fractured ankle joint or to correct the deflection of the foot, it is often used interface pressure sensor to assess the importance and position of corrective force. The electromechanical sensor (EMS), was manufactured in this study are consists of the actuator, Adjustable Slide Potentiometer Sensor (ASPS), and microcontroller unit (LCD display, connecting wires, Arduino UNO, and power bank). The Adjustable Slide Potentiometer Sensor (ASPS) has dimensions (60 x 10 x

10 mm), the system manufactured is described as lightweight, easy to hold, low cost, maintainable, and able to bear the high load, when compared to other sensors, and grants instant pressure on the screen of the LCD, was programmed to measure the interference pressure (IP) and force between the Orthosis and foot in the posterior region and compared with measurement of the F-Socket device. The experimental test was performed on the pathological subject who suffered from an injury in the ankle joint of a right foot. the interface pressure (IP) and force were calculated in two ways, between the foot and the orthosis. The 1st method employs the measurement system of the F-Socket, while the 2nd method employs the pressure and force measurement system (EMS) fabricated in this study. The experimental results showed that the pressure and force readings obtained from the fabrication system was (152 KPa and 1328 N) respectively. while the results obtained from the F-Socket system was (156 KPa and 1335 N) respectively. the results of the manufactured sensor (EMS) are very close to the results obtained by using a system of the F-Socket, despite the fact that it has a simple structure and is less expensive than the F-Socket system.

Keyword: Arduino UNO, Orthosis, Posterior region, F-Socket system, Manufactured system, EMS, ASPS.

Paper ID:141

The Zagreb Indices for Chains and Rings for Cycles

Ammar Raad WaadAllah, Ahmed Mohammed Ali

Abstract. In this paper, we find the first and second Zagreb indices for chains and rings of cycles and then give some examples.

Keyword: First Zagreb, Second Zagreb, Identical, Cycle.

Paper ID:142

A not on Almost Approximaitly NearlyPrime Submodules

Ali Sh. Ajeel, Haibat K. Mohammadali

Abstract. Let R be a commutative ring with identity and D be a left unitary R-module. A proper submodule U of an R-module D is a prime if for any tx∈U, for t∈R, x∈D, implies that either x∈U or tD⊆U. We introduced in this note a concept almost approximaitly nearlyprime submodules as new generalizations of prime submodule, and give characterizations of this concept in class of multiplication modules. Furthermore, we characterized almost approximaitly nearlyprime submodule by it's residual. Moreover, we characterized almost approximaitly nearlyprime ideal I by almost approximaitly nearlyprime of the form ID.

Keyword: Prime submodule, Socle of modules, Jacobson radical of modules. Multiplication modules, Content module

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Paper ID:143

Bond Phase Analysis and Mechanical Properties to Active Brazed Martensitic Stainless Steel.

Salimah A. Muhammed, Fadhil A. Hashim, Ayad K. Hassan

Abstract. In fossil-fuel power plants, martensitic stainless steel (420SS) is widely utilized for intermediate and low-pressure steam turbine blades [1]. The goal of this study is to see if brazing and employing a vacuum brazing furnace can repair small fractures on the surface of 420SS steam turbine blades. As filler metals, silver, copper, and titanium are employed, which are active filler alloys under a protected environment (using a high purity 95 percent Argon gas). To investigate the effect of increasing the proportion of titanium in the joining process on the performance of brazed joints, we used two brazing temperatures (850, 950 C°) based on the solidus temperatures of (martensitic stainless steel) and (Cu-Ti) filler alloys. Brazing actions were carried out over a period of time to ensure that the filler parts were completely saturated (ten min). An optical electron microscope (SEM), a scanner, energy dispersive spectroscopy (EDS), and X-ray diffraction were all used in this study. Since of the high moisture content, an optical scan (SEM) revealed a continuous connection between the filler and base metal, as well as the silver filler metal interfering nearly at the interface because stainless steel interacts strongly with silver. Micro-hardness measurements demonstrated a constant rise in hardness toward the center line of the joint, showing that the bonded layer is made up of a hard intermetallic phase with various compositions at different depths. The samples bonded by (Ag70 percent wt, Cu26 percent wt, and Ti4 percent wt) at 950oC had a higher value (34.34) HV due to intermetallic and centerline eutectic components near the center of the brazing seam.

Paper ID:144

Theoretical calculation including a standard electron energy distribution function and the transport parameter in weakly ionized plasma gases

Maher Sami Saleh, Raad Hameed Majeed

Abstract. The goal of this research is to investigate the electron transport parameters of the pure CO2 as well as CO2-SF6 mixtures. The researchers looked at various ratios of the mixture. Theoretical calculations, including the function of electron energy distribution, are achieved to calculate the transport parameters, such as electron drift velocity, mean energy, diffusion coefficient, etc. To evaluate the standard electron energy distribution function and the accompanying transport parameters, the Boltzmann equation for pure carbon dioxide (CO2) gas and its mixtures with the sulfur hexafluoride gas (SF6) has been solved. The electron transport parameters are examined in the range of E/N between 100 to 1000Td (1Td = 1 Townsend = 10-21 Vm2) At 273 K temperature. In the present work, a modern developed copular simulation program named BOLSIG+ version 07/2015 is used to provide our calculation. Our results give good agreement with the other published data.

Keyword: Boltzmann equation, CO2 gas, transport parameters, swarm parameters, distribution function, gas discharge.

Paper ID:146

Numerical Solution to The Problem of Fluid Flow and Heat Transfer by Conduction and Convection in a Porous Medium

Muna Manaf, Alaa Hammodat

Abstract. In this study, we looked into heat transmission by natural convection for a dilute fluid running in a channel with porous walls. The flow behavior of fluid along a horizontal channel was described using a simulation formulation denoted by this one set of two aspects differential equations with partial coefficients, as well as the cooling effect distribution inside a channel and at the channel level as a result of an externally applied magnetic field. The calculations were figured out. Going to use numerical techniques with the implied interleaved ways approach, and that is one of calculations relatively limited disparities, both in unstable but also standard conditions. We also completed our research on the Prandtl, Schmidt, and Gratshof numbers and their effects.

Keyword: Heat flux, Medium Porous, A Prandtl number, A Schmidt number, A Gratshof number.

Paper ID:149

Relation between Cyclicity degree and cyclic graph of Dihedral group D_2n

OHOOD AYYED HADI, HAYDER BAQER SHELASH

Abstract. In this paper we studied the cyclicity parameter of dihedral group D_2n and we introduced algorithm to compute these parameter.

Keyword: dihedral group ,normal graph, cyclic graph..

Paper ID:150

Upper cooling water technique for enhancing the performance of PV module

A.K.Mohammed, M. Bakirci , A. Th. Mohammad

Abstract. The abundance and sustainability of solar radiation has enabled consumers to take advantage of photovoltaic technology while leaving polluting energy sources. the high temperature stored in the surfaces still to be a barrier to the monocrystalline photovoltaic module's advancement in terms of performance, In addition to its destruction and short life in the long run. The idea of this article is to undertake an experimental investigation into improving the thermal and electrical properties of photovoltaic panels erected in the harsh environment of Iraq. The system was implemented based on hybrid passive cooling technology with the help of spray nozzles overflowing with water on front of the panel. The upper photovoltaic panel surface cooling approach is one of the most promising technologies in heat dissipation, leading to improved electrical properties. The experiment was carried out in a hot, low-wind, highly radioactive climate with a choice of low and high flows, i.e., 1 and 3 L/m, respectively. Analysis of the results of the maximum flow indicated that the panel temperature was reduced by about half-compared to the uncooled panel and in the same context; the infrared images supported these results. After dissipation, the output power was observed to increase by 19.77% and 57.23%, respectively, as did the efficiency, which increased by 18.76% and 47.52% for the 1 and 3 L/m flows, respectively. Finally, the 3 L/m flow was effective in removing a significant amount of heat while also improving the

electrical characteristics. On the other hand, the study found that using drainage water to irrigate crops to get through the dry season was economically feasible.

Keyword: Photovoltaic module, Cooling technique, Spraying, Front cooling, improve efficiency.

Paper ID:151

Design and Fabrication of Broadband Microstrip Antenna on Various Substrates

Prof. Dr. Raad H. Thaher, Ola F. Ahmed, Saadaldeen Rashid Ahmed

Abstract. A new Broadband microstrip antenna is presented and manufactured utilizing an Epoxy-FR-4 substrate with a relative dielectric constant of 4.3 and a loss tangent tan S=0.02 and a relative dielectric constant of 4.3. By etching the slot in the patch, the antenna's performance was increased. The antenna size (25.2 X 28 X 1.6) mm3. The Channing effect was achieved by utilizing a substrate with dielectric constants of 2.2, 6.15. It should be noticed that the return loss (s11), gain, and group delay have all been altered. A vector network analyzer is used to manufacture and test the proposed antenna.

Keyword: microstrip antenna, substrate, group delay, return loss, slots.

Paper ID:153

Design a New Single Band Microstrip Antenna for C Band Applications

Raad H. Thaher, Lina M. Nori

Abstract. This paper presented a new design for ultrawide band (UWB) of the elliptical butterfly shape of microstrip patch antenna having twelve elliptical shape and fed by transmission feedline, with effect of changing the substrate of epoxy FR-4 having dielectric constant (4.3), and the substrate of Roger having dielectric constant ((RT5880)2.2 & (TC600) 6.15). Both ground and patch are Copper Material With Thickness (0.035 mm). the proposed antenna has dimensions (30×30×1.6) 〖mm〗^3. Only single band was achieved when FR-4 operates at (6.2322-6.3824) GHz band at resonance frequency (6.301

) GHz, whereas using Roger(RT5880)operates at (7.7311-7.9303) GHz band at resonance frequency (7.821) GHz, When Roger(TC600)operates at (5.4686-5.6037) GHz band at resonance frequency (5.522) GHz. All of substrate which is suitable for C band applications such as radar, satellite communication applications. The proposed antenna is Simulated by CST-MW Software version 2019.

Paper ID:154

The SEA Integral Transform and its Application on Differential Equations

Ali Hameed Ali, Emad A. Kuffi

Abstract. The subject of integral transformations' suggestions, properties studying and testing their efficiency via their application into real-life scientific applications, is a never-perishing subject. This work proposed a new integral transform called the Sherifa-Emad-Ali) SEA integral transform that manipulates the kernel function of the ZZ transform via the insertion of the complex parameter into the kernel to produce a new integral transform with a different domain than the ZZ transform. The properties and the application of the proposed SEA integral transform are studied and proved. The applicability of the transform to solve some problems represented by differential equations, including Newton's law of cooling problem and the deflecting of a hinged beam under a uniform load, is also discussed.

Keyword: SEA integral transform, ZZ transform, Complex kernel function, Newton's law of cooling, Beam deflection, Differential equations.

Paper ID:155

Simulation Design: The Gold_Bismuth Bi_Layer Surface Plasmon Resonance for A Biosensor

Ali S. H., Kafi S. H., Khalaf M. K., Al-Zuky A. AD., Al-Saleh A. H.

Abstract. The Surface Plasmon Resonance (SPR) mechanism used to design a sensitive optical sensor and biosensor applications. Simulation analysis (in Matlab) has been made for SPR for gold layer with thickness (40 nm) and Bismuth (Bi) layer with different eight thicknesses (from 10 to 80 nm), which deposited on N_LASF9 glass prism, while the final sensing medium is the air. The analysis achieved for different wavelengths in the visible band (500-700 nm) and different refractive index (0, 0.04, 0.08 and

0.12). The properties of SPR angle (θSPR) have been calculated from the incident angle θincid plot. The SPR sensitivity (S) calculated within this study. The results show that the maximum sensitivity is (95.5) for thickness (20 and 30 nm) of Bi, and Δn= 0.04 at wavelength 700nm. The best sensitivity is 90 at wavelength 600 nm for thickness 40 nm for the studied refractive index.

Keyword: Optical Sensors; Surface Plasmon Sensors (SPR), Gold layer surface, bismuth layer surface.

Paper ID:156

Estimation of Reliability Series Stress – strength Model Based On Power Rayleigh Distribution

Abdulrhaman A.J.Ahmed, Feras Sh. M. Batah

Abstract. The estimate of the parameter and reliability Series R_s=p[v<min⁡(t_(1,) t_(2,) t_(3,).…….t_(r,)] system in stress – strength model with (Strength (v)) subject to a(stress(t)) that our motivaction in this paper. They follows the power Rayleigh distribution PR(ʒ,β). We used two data sets with criteria(-2 ln⁡(l),AIC,BIC,AICC,KS,HQIC,p-value) .The paper investgates and proposes some estimation methods. Comparsions between these methods utilized three criteria such as (bisd), (MSE) and (MAPE). Monte Carlo simulation study and real- data set uses to concluded the results of this paper.

Keyword: Series system, Reliability, Stress-Strength model, Estimation mothods.

Paper ID:157

A NEW TWO-PARAMETER BIAS ESTIMATOR IN A LINEAR REGRESSION MODEL UNDER CORRELATED OR HETEROSCEDASTICS ERRORS

Mustafa M.Abdullah.AL.Dulaimi, Mustafa I. Alheety

Abstract. This paper deals with estimators suffers multiple linear regression model that contains heteroscedastics errors and/or correlated and Multicollinearity problem. In this paper we proposed a new biased estimator, called Mustafa unbiased ridge regression estimator, and the properties of this estimator are discussed with other estimators which are generalized least squares estimator generalized ordinary

ridge regression and generalized unbiased ridge regression in the matrix mean square error as a criterion for goodness of fit. lt appears that the new estimator has better properties than other estimators in the sence that it has minimum mean square error compare to others. an example is used to show the results.

Keyword: Generalized least squares estimator, Multicollinearity , Autocorrelated error.

Paper ID:159

Exponential - Pareto for P(X>Y) of (3+1) Cascade Model

Nada Sabah Karam, Marir Ahmed Mezher

Abstract. In this study, the mathematical formula for the reliability of R of the (3+1) Exponential-Pareto Cascade model was concluded. The reliability of the model is expressed by the random variables of the Exponential-Pareto distribution for stress and strength. The reliability model was estimated in seven different ways (ML, Mo, LS, WLS, Rg, Pi and Pr) and simulation was performed using MATLAB 2012 software to compare the results of the reliability model estimates using the MSE criterion, the results indicated that the best estimator among seven estimators is Mo and LS.

Keyword: Cascade, Stress-Strength, Exponential-Pareto distribution.

Paper ID:160

On Extend Nearly Pseudo 2-Absorbing submodules

Omar A. Abdullah, Haibat K. Mohammadali

Abstract. In this research, we introduce concept Extend Nearly Pseud-2-Absorbing submodules over commutative ring with nonzero identity which is generalization of (2-Absorbing, Nearly-2-Absorbing and Pseudo-2-Absorbing) submodules. Furthermore some properties of Extend Nearly Pseudo-2-Absorbing submodules are given. Moreover characterizations in some types of modules of Extend Nearly Pseudo-2-Absorbing submodules are established. Finally, we obtain necessary and sufficient conditions of Extend Nearly Pseudo-2-Absorbing submodules to be 2-Absorbing, Nearly-2-Absorbing and Pseudo-2-Absorbing.

Keyword: 2-Absorbing, socal of submodule and the Jacobson radical of submodule.

Paper ID:161

A New Stochastic Restricted Estimator Using Unbiased Ridge Estimator Under Heteroscedastic and/or Correlated Error

Rawad J.H. Al-Dulaimi, Mustafa I.N. Alheety

AbstractIn this paper, a new stochastic mixed ridge estimator is proposed and its efficiency examined to tackle the multicollinearity problem in a linear regression model with heteroscedastic and/or correlated errors. By combining the philosophy of mixed and the unbiased ridge regression estimator which introduced proposed by crouse et al. (1995), a new unbiased estimator. The performance of the proposed estimator with some against estimator a generalization of the ordinary mixed estimator, generalization of the ordinary ridge regression estimator, generalization of the stochastic restricted Liu estimator and generalization of the stochastic restricted ordinary ridge regression estimator have been given in terms of the matrix mean square error. To illustrate the theoretical results, a numerical example is used.

Keyword: Multicollinearity, Stochastic restriction, Heteroscedastic, autocorrelated, Mean squared error.

Paper ID:162

An Automatic And Customised Question Paper Generator System

Ahmed Ghani Dawood, Emad Essa Abd-Alkareem

Abstract. Preparing a set of test questions is a difficult and time-consuming task for organizations and may lead to a biased question set. This paper proposed a question paper generator system to prepare an automatic and customized question paper. The proposed system applies the integration of two algorithms, the stochastic algorithm and the annealing simulation algorithm, to improve the generation of question sets. Important features related to the question set such as test score, type, difficulty level, test depth of knowledge, relevant chapter and test duration are considered. The proposed algorithm provides an important solution for creating the test question paper. The proposed system was evaluated across three types of assessments, with 100 tests for each type. Each test has three levels of hardness: 30%, 50%, 80%. According to these three types of evaluation, the proposed system's accuracy ratio to

approximate target stiffness was 86.5%, 86.6% and 87.5%. In addition, the evaluation includes the improvement percentage for 100 tests with the same level of hardness. The improvement percentage was 84.3%, 85.5%, and 85.5%, respectively. Finally, the evaluation of the proposed system takes into account the processing time that needs to be taken into account. Thus, according to the same types of hardness level, the time ratio was 3.024 s, 3.159 s and 3.128 s, respectively. The aim of this research work is to reduce the task of preparing a set of questions from teachers so that they can focus on students and improve their teaching techniques

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Paper ID:163

On N-Pure Ring

Raida D. Mahmood, Sura A. Abd

Abstract. A ring K is known as a right N-Pure ring, if for all a∈N(K), aK is a left pure. In this paper, we first introduce and properties a right N-Pure ring, this is a proper generalization of right p-ring. We also look into the relationship between the N-Pure ring and reduced ring, strongly regular ring.

Keyword: P-ring, reduced ring, CER – ring, pure ideal.

Paper ID:165

Sodium silicate-based aerogel in ambient pressure drying: structural and properties

Wasan H. Al-husseny, Israa F. Al-sharuee, Ban R. Ali

Abstract. Experiments using silica aerogel powders have yielded positive results. produced from a glass of water and Tetraethylorthosilicate TEOS and ambient pressure desiccating within short time are presented in this work. a glass of water the acid catalyst was HCl, which was hydrolyzed in water. To put it another way to cut down on the amount of modification and preparation During this time, a new mechanical technical procedure was developed. Crushing and filtering were added, as well as a solvent. The process of exchange/surface modification can be completed quickly. in this manner in addition, we used a water glass. instead of the base catalyst NH3H2O It does, to some extent. contaminants from entering the aerogels were avoided shown to have a significant impact on the physical and chemical

properties of land-based aerogels. As a result, when the water glass dilution ratio is 4, aerogels develop as a base catalyst. has a well-developed mesoporous structure (mean pore size of 20 nm) and a high degree of hydrophobicity (contact angle of 152°).

Paper ID:168

Hopf Galois Structures on Nonnormal Extensions of Degree pqw

Baraa Muthana Jamal, Ali A. Alabdali

Abstract. We study Hopf Galois structures on separable field extensions (nonnormal) L/K such that the degree is square free pqw. The group permutation of degree pqw is G=Gal(E/K) where E/K is the normal closure of L/K. We investigate in details the cyclic case where w, q≥3 and p =2q+1 are all square free primes. We determine the group permutations G, then for each G we determine the Hopf Galois structures. There exists fifty four G such that the field extensions L/K admit the Hopf Galois structures in this case.

Paper ID:169

An Efficient Spectral Search Direction for Solving Several Continuous Unconstrained Optimization Problems

Hamsa Th. Saeed Chilmeran, Huda I. Ahmed, Eman T. Hamed

Abstract. In this paper, a new parameter for the conjugate gradient technique was discovered, as well as a new direction. In principle, utilizing the Dolan-Mor'e performance profile, this path achieves steep gradient and global convergence, and in practice, the new method is more efficient and accurate than previous methods.

Keyword: Unconstrained optimization, Conjugate gradient method, strong Wolfe condition, Globally convergence, Dolan-Mor'e performance.

Paper ID:170

Improvement On Dental Composite Using Supra -Nano Eggshell Particals

Aveen ansaif jassim, Widad hamdi Jassim

Abstract. To improve the microstructure of dental composite resin, the waste chicken eggshell particles with white color were incorporated in it, by the weight ratios 2.5% and 5%. Egg shells, which are a natural source of calcium that mainly involved in the formation of bones and teeth, were used as an additive to strengthen dental composite against external stresses. The main mechanical test represented by hardness, wear resistance and compression strength. The addition of supra nanoparticles eggshell with particles size (300 nm) by weight ratio 2.5% to dental composite resin, significantly improves all of its mechanical properties, in addition to the increase the value of the its glass transition temperature from 58 oC to 75 oC, which rises by the ratio (~ 36%). Electron microscope images were used to observe the degree of homogeneity in dental composite microstructure, which interpretation all the results that are improved mechanically and thermally.

Keyword: dental composite, polyester, hardness, wear loss, compressive strength, eggshells.

Paper ID:172

Experimental Study of Heat Transfer Enhancement Using Hybrid nanofluid and Twisted Tape Insert in Heat Exchangers

Noor Fouad. A. Hamza, Sattar Aljabair1

AbstractThe study presented an experimentally investigating the effect of (Al_2O_3 +CuO /water) hybrid nanofluid on the heat transfer enhancement inside the tube heat exchanger at constant heat flux. hybrid nanofluid with volume concentration (0.6, 1.2, 1.8 %) has been used at different inlet velocities. The experimental setup consisted copper tube heat exchanger with hybrid nanofluid and two types of twisted tape was used in turbulent regime with Reynolds number ranging from 3560 to 8320. The twisted tape, manufactured from polylactic acid (PLA) by 3-dimensional printer device, was inserted inside the tube. The results showed that the maximum increase in Nusselt number 47.17%with plain twisted tape insert when compared to horizontal plain pipe. Also, the enhancement in heat transfer (Nusselt ratio) is about 29%.And the maximum thermal performance of double v- cut twisted tape is about (1.69) was achieved at (Ø=1.8%) with (TR=9.25) for double v-cut tape with hybrid nanofluid

Paper ID:174

Evaluation The Impact and Flexural Properties for Lower Limbs Prosthetic Socket

Hassanein A. Hashim, Jawad K. Oleiwi, Qahtan A. Hamad

Abstract. A prosthetic socket can be described as the artificial device that connects the stump (residual limb) with the prosthesis. The goal of the project is to use both natural and synthetic fibres to fabricate prosthetic sockets from a variety of laminated composite materials in order to increase their comfort, lightness, strength, and durability. This research employs a total of seven laminated composite materials, all of which were manufactured by the vacuum technique to prepare the laminated composite specimens in order to obtain the best results possible for the lamination80:20 resin reinforced with perlon, hemp, Kevlar, glass, and carbon fibres. For laminated specimens, mechanical tests were conducted, which included the following: impact strength, flexural strength, flexural modulus, fracture toughness, and maximum shear stress. The mechanical characteristics of the prosthetic socket were influenced by the number and type of reinforcing layers. As a consequence, the optimal lamination composite consists of four hemps plus two carbon layers. Where the flexural strength, flexural modulus, and maximum shear stress are 149 MPa, 6.5 GPa, and 4.1 MPa, respectively. The impact strength of one layer of hemp fibre was 8 KJ/m2, but was raised to 48.7 KJ/m2 for the hybrid lamination (4hemp+2carbon). Additionally, the fracture toughness of four hemp layers was increased by introducing Kevlar, glass, or carbon fibres up to 17.8 MPa.m1/2 for the hybrid lamination (4hemp+2carbon).

Paper ID:175

On Some Results of Lie Groupoid

Taghreed Hur Majeed

Abstract. The goal of this work is to introduce concepts of groupoid, differential groupoid, locally trivial groupoid and Lie groupoid. We study principal fiber bundle of groupoid and Lie groupoid. We obtain new proposition of them.

Keyword: Groupoid, Lie groupoid, fiber product, principal fiber bundle.

Paper ID:176

Inner Ideals of The Two and Three-Dimensional Lie Algebras

Hasan M. Shlaka, Hassan S. Saeed

Abstract. Inner ideal of the two and three-dimensional Lie algebras were classified in this paper. It is proved that every two-dimensional Lie algebra contains a non-trivial inner ideal. It is also proved that Heisenberg Lie algebras contains non-commutative inner ideals as well as the commutative ones. Inner ideals which are not sub-algebras are also proved to be exist in Heisenberg Lie algebras and we prove that every one-dimensional subspace of the Heisenberg Lie algebra is an inner ideal. Inner ideals of the other three dimensional Lie algebras which are not the Heisenberg ones are also considered in this paper.

Paper ID:177

Design Ankle Joint for Powered Orthosis (AFO)

Talib Sabah Hussein, Andrey Izyumov

Abstract. For a patient suffering from a problem in the Ankle joint to regain healthy movement, a well-designed lower limb Orthosis AFO is required. This research aims to improve the movement of Orthosis through the design of an ankle joint that can perform the desired move for functional use while remaining low-cost. The improvement focuses on creating a new Ankle joint mechanism using a pre-existing Actuator. This entails simulating normal foot function while also enhancing the range of motion of the Ankle joint. Specific requirements must be met in this study, such as the new proposed Ankle joint ability to flex up to 900 with the sagittal plane and be strong enough to support the patient body weight. Every component of the Ankle joint was designed using Solid Works software. After that, each component will be assembled, and the mechanism of the ankle joint mechanism will be simulated to visualize the imagined motion of the new Ankle joint model. The materials utilized (Inconel 718) were chosen after considering each material's cost, safety factor, and quality. The proposed Ankle joint was tested using the ANSYS software (Finite element analysis), and the results were examined to detect if the model could bear specified applied loads. The outcomes were examined, and the novel model proposed by this study was appraised.

Keyword: Inconel 718, Aluminum 2024T351, ankle joint orthosis, contact pressure, AFO.

Paper ID:178

Impact of Ibuprofen on Histological Parameters of Kidney in Male Albino Rats

Wurood Hasan Hadi, Ali Hassan Abood

Abstract. The present study has been conducted in animal house/faculty of sciences/university of kufa between October 2021 and December 2021, fifty albino male Rats are used. Anti-inflammatory and analgesic (NSAID) drugs abuse are on the rise. Ibuprofen (IBU) is a popular pain reliever. The goal of this study was to see how IBU affected several physiological, biochemical, and histological parameters in male rats' kidneys 30 and 60 days following oral treatment of 10, 20, 30, and 40 mg/kg/day. The male rats were randomly divided into two main groups, comprising twenty-five rats for each group. Each main groups are subdivided into five subgroups comprising five rats and including first subgroup is control group was administrated with physiological normal saline, the second subgroup was administrated with 10 mg/kg/day of drug, the third subgroup was administrated with 20 mg/kg/day of drug, the fourth subgroup was administrated with 30 mg/kg/day of drug and the fifth subgroup is administrated with 40 mg/kg/day of drug. The first main group was treated for 30 days and second main group for 60 days and after that rats are sacrificed. The histological sections of kidney after treatment with ibuprofen doses 10, 20, 30 and 40 mg/kg/day for 30 and 60 days shown extensive pathological effects also the severity of virulence gradually increases with increasing concentration and prolonging the time of exposure.

Keyword: Inconel 718, Aluminum 2024T351, ankle joint orthosis, contact pressure, AFO.

Paper ID:179

A Study of Cracked Nano Composite Plates under Mechanical Buckling Load

Zainab K.Younus, Kawther K.Younus, Laith K. Abbas, Abbas K. Hussein

Abstract In this work, buckling behavior of nanocomposite plates with crack has investigated numerically under different types of buckling loads has been investigated numerically. Unsaturated

polyester resin (UPR) matrix reinforced with fiberglass was fabricated incorporating (TiO2) and (SiO2) nanoparticles as fillers. (SiO2) and (TiO2) weight percentage used as 3% for. Finite element (FE) coded utilizing ANSYS 15 is used to work out the numerical model. A lot of design parameters had been varied for studying their influences on the buckling characteristics. The most important part of present work is the part which including the effect of crack parameters on the performance of buckling such as type of load, crack angle, position, and crack face direction.

Keyword: Buckling, crack, Nanoparticles, Polymer nanocomposite, SiO2, TiO2

Paper ID:180

The Influence of Heat Transfer on Peristaltic Transport of MHD Viscoplastic Fluid with Variable Viscosity through Symmetric Porous Channel

Asia Amer, Mohammed Ali Murad

Abstract. This article interprets the peristaltic flow of viscoplastic fluid with variable viscosity across symmetric porous channel. the heat transfer, magneto hydrodynamic (MHD) and porous medium for this problem is also considered. The mathematical equations for Bingham fluid model are developed and then by using suitable transformations and scaling analysis subjected by low Reynolds number and long wavelength, this mathematical problem is transform into its dimensionless form. Analytic solutions for axial velocity, temperature and stream function are obtained by using perturbation method. The results are analyzed graphically for axial velocity, temperature and streamlines. MATHEMATICA software is used computational results and plotted all figures

Keyword: fluid that is viscoplastic , viscosity that varies, way of perturb.

Paper ID:181

Analyzing the Oil Pollution Resulting From the Iraqi Oil Ports in the Northern Arabian Gulf Using the GNOME model

Ahmed A .AL-Behadili, Abdul Haleem Ali Al-Muhyi, Osama T. Al-Taai

Abstract. . The Arabian Gulf is regarded as a worldwide oil industry center. Iraq's oil ports are one of the most major oil transportation hubs in the Arabian Gulf, and any spills might pollute the marine environment. A GNOME model, a physical model that illustrates the motions of oil spills in seawater and probable danger zones, is used to simulate the oil spill trajectory in order to have a better understanding of the spill's destiny. Oil spill trajectory modeling provides a prediction in advance of the direction of movement of the oil slick and the time it will take to reach the coast. The form requires input of data on the time of release of the spill, the duration of the release, the amount of the spill, and the speed and direction of both currents and winds. In this paper, different oil spill trajectory scenarios are simulated From Single point mooring (SPM1) in quantities of 100 and 50 barrels and from Basra oil port in quantities of 100 and 50 barrels of medium crude oil In the north of the Arabian Gulf. The model's findings aid competent authorities in developing their own emergency management strategies for responding to possible danger regions and Rapid treatment of oil spills.

Keyword: Oil Spills. Scenarios. Barrels. Basra. Northwest.

Paper ID:182

Numerical and Analytical models based on Euler and Timoshenko beam theories to analyze the Free Vibration of Functionally Graded Beam

Raghad Azeez Neamah, Ameen Ahmad Nassar, Luay S. Alansari

Abstract. In the present work, a new model of functionally graded beam FGB is derived based on (Euler and each of first and high order shear deformation) theories to analyze the free vibration. The governing equations are derived using the principle of minimum total potential energy. The Navier solution is considered with different solution technique to calculate the natural frequency for simply supporting FGB analytically by using FORTRAN program. As well, this model of FGB is built and analyzed numerically by using ANSYS (17.2) APDL program. According to this program, the FGB is consisted of ten layers in thickness direction; each layer has different material properties that are calculated using power-law form. The analytical and numerical results are compared with some previous researches. Acceptable results are obtained with maximum deviation of 5%. Several parameters are investigated such as" power index value, modulus ratio, aspect ratio, and type of loading "numerically and analytically. The results showed that the shear has a significant effect on the free vibration for the short beam. Also the analytical model of first order shear deformation theory and numerical model are approximately identical. In addition, it can be proved that the present model is reliable and has the ability for analyzing the free vibration for any other required beam with different dimensions.

Keyword: Functionally graded beam (FGB), dimensionless frequency, Classical beam theory, First and high order Timoshenko beam theories, FORTRAN program.

Paper ID:183

Novel Ai- Based Face Recognition Framework Using Deep Neural Networks and Bounding Box Annotation

Rasha Khalid Omar AL-OMARY, Abdullahi Abdu Ibrahim

Abstract. This advanced research focuses on multi-exposure image processing for face identification using image processing and deep learning approaches. The construction of an image deep learning system based on image processing optimization task utilizing a Deep Neural Network (DNN) is a hot topic, with special attention paid to the smoothening of all the picture's edges for face detection. For the project, a DNN-based profound learning custom model was created, and the DNN approach was used with varying degrees of altering half breed image handling procedures. Evaluating for high edge channel to distinguish edges at high exactness has been under banter. In current conversation, the recommended smoothening system is bone thickness based including conceivable prescreening strategies utilizing the picture handling and improvement where 70% of information was utilized for the preparation, 20% for testing and staying 10% for the approval interaction. The custom profound learning model structures were intended to address various profundities. The concentrate likewise endeavors to observe answers for useful profound learning difficulties, for example, low preparation speed and absence of straightforwardness with a precision of 98.19% totally. The imaging and deep learning pipelines are optimized to exploit the available parallelism using the MATLAB programming language with multiple tools under consideration.

Keyword: Face Detection, Filter, Deep Learning, Segmentation, Image Processing, DNN, Recognition, Neural Network, Bounding Box, Optimization

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Paper ID:184

Influence Of DBD Plasma On The Surface Treatment Of The Polythiophene Polymer Prepared By Electrochemical Polymerization Method

Ghufran A. Sabah, Asmaa J. Kadhum

Abstract An effective plasma treatment method is used to improve and cure the surfaces of polythiophene polymer and increase the surface roughness. In this paper, polythiophene polymer was prepared using electrochemical method using two electrodes cell, one of platinum (counter electrode) and the other of ITO (working electrode), with a voltage of 5 volts, a current of 3 mA, and a time of 5 minutes. The films were prepared and optical (UV-Vis) and morphological (AFM) measurements were taken. The properties of the polythiophene polymer were modified by dielectric barrier plasma (DBD) in the presence of air. The membrane surfaces were treated with 15 kV dielectric barrier-vacuum plasma and at different exposure times (0, 10, 30, 70) seconds. When exposed to plasma, the energy gap was decreased, and the surface roughness of the polythiophene polymer increased. Which gives an indication of the improvement and treatment of these films and their use in many applications.

Keyword: DBD, polythiophene polymer, Uv-Vis, AFM.

Paper ID:185

S-Supplement CS Modules

Ikhlas Fadel Abdullah , Mahdi Saleh Nayef

Abstract. In this work, we present a new generalization of the concepts CS module, supplement CS module and semi-CS- module named semi-supplement CS modules, if each submodule of M is semi-essential in supplement submodule of M. Also study the implications and the opposites of them, As well as properties and some characterizations of this concept presented. Furthermore, a relationship between our concept and some well-known modules such as: rad(M), faithful multiplication module ,lifting module.

Keyword: St-closed submodules, semi-essential submodule, supplement submodules , CS-modules, supplement CS modules and semi-extending modules.

Paper ID:186

Bounded on Classes for Integro-Differential Inequalities as Control Gronwall Formulation

Ziad Kh. Zaydan, Sameer Q. Hasan, Raheam A. Al-Saphory

Abstract. The goal of this paper is to prove some proposed integro-differential inequalities equations as control Gronwall formulation. Thus, we have been established and studied their analytic inequalities with properties of differential control equations to give the related estimator of the derivative for the solutions of considered problem. Also, the inequalities classes is presented with distinct input control functions and delay functions in the first time, in which introduce and proved new analytic results for proposed such class. Finally, some applications is presented and illustrated in different situations of this problem.

Keyword: Integro-differential inequalities, estimator, control input, Gronwall formulation, delay functions.

Paper ID:190

Improving Fresh Water Production in Solar Distillation by Adding Magnetic Flux, Solar Collector and Phase Change Materials

Abbas Sahi Shareef, Hayder Jabbar Kurji, Ali Omran

Abstract. The current research was conducted in an experimental environment using new technology that was built and locally manufactured. The solar still, water basin, and associated equipment such as measuring instruments make up the majority of this system. A solar collector, a magnet, and phase-changing material (paraffin) were used individually and in combination to increase the performance of the solar still. Experiments were conducted on the water temperature, the base temperature of the distiller, the temperature of the steam, and the internal and external temperatures of the glass cover of the distillation apparatus. This is in addition to the efficiency and production of the solar distillation device. Experiments showed that the use of the solar collector increased the productivity and efficiency of the distiller by 12% and 15%, respectively. When magnetic flux was added, productivity increased by 15% and efficiency by 18%. The practical results also showed that the addition of phase change materials contributed to increasing the productivity and efficiency of the distiller by 25% and 35%, respectively.

Keyword: Magnetic field, PCM, Solar Desalination, Solar Collector.

Paper ID:191

Reliability of Stress – strength n-cascade system P(X<Y<Z) for the Rayleigh distribution

Haneen A Jasem, Nada S Karam

Abstract. In this paper, is derived the reliability of an n-cascade stress-strength system based on the Rayleigh Distribution (RD) with unknown parameter λ is calculated in this paper for the probability of n-components having strengths Y between two stresses X and Z. There are six methods of parameter estimation in the Rayleigh Distribution, and these system reliability estimators were discussed using the Maximum Likelihood, Moments Method, Least Square Method, Weighted Least Square Method, Regression Method, and Percentile Method, estimators are based on simulation technique, and these estimates were compared by the mean square error using nine different experiments with different sample sizes: small (15), medium (25) and large (100). The maximum likelihood estimator and the percentile estimator were performed and the results all of the other options.

Keyword: n-Cascade system, Stress-strength Reliability, Probability P(X<Y<Z), The Rayleigh Distribution, Estimation Methods.

Paper ID:192

Colitis Detection in the Gastrointestinal Tract Based on Deep Learning and Machine Learning

Ali R. Hamzah Al-zubaidi, Faisel G. Mohammed

Abstract. Approximately two million people worldwide die as a result of gastrointestinal disorders every year. Video endoscopy is one of the most recent medical imaging tools for diagnosing gastrointestinal illnesses such as polyps, colitis, and stomach ulcers. Because medical video endoscopy creates a large number of images, clinicians must devote significant time to reviewing all of them. This makes manual diagnosis difficult, which has led to research into computer-aided methods that can quickly and accurately diagnose all images that are generated.

In this thesis, a system has been proposed to locate and type colon disease. The proposed system consists of two main phases which are (Detection, and Classification). The detection phase consists of preparing

a dataset with two classes (normal, and abnormal), then extracting features using histogram orientation gradient (HOG) for each class then used these features by support vector machine (SVM) classifier for training detection phase. In the classification phase used a convolution neural network (CNN LeNet model) for training with four classes (Dyed-lifted-polyps, Esophagitis, Normal-cecum, and Ulcerative-colitis) depending on the results of SVM detection.

The result archived from the detection phase for (Dyed lifted-polyps class, and Ulcerative-colitis class) was 98.33 %, and the accuracy of (Esophagitis class, and Normal-cecum class) was 96.67%. The average accuracy of detection was 97.5%. The prediction results of the Convolution neural network (CNN) was 100% for training and 95.38 for testing.

Through proposed system it has been concluded that the use of (HOG) with SVM classifier it was very accurate and quick in locating the colitis. Also, using (CNN LeNet model) is better than other models for the dataset used.

Keyword: Inflammatory Bowel Disease (IBD), Colitis, CNN, Deep Learning, Machine Learning, SVM.

Paper ID:193

Traffic Sign Recognition by the Use of Speed Up Robust Features

Shahad J. Shahbaz, Ali A. D. Al-Zuky, Fatin E. M. Al-Obaidi

Abstract. Variations in perspective, illumination, occlusion, motion blur, and weatherworn degeneration of signs could all be crucial in identifying road signs. The goal of this research is to evaluate the image processing technique's performance in detecting and recognizing road signs, as well as determine the optimum threshold value range for doing so. The Speed Up Robust Features (SURF) detector was tested in the current work to detect and recognize road signs through Bagdad's streets under various speeds and threshold values. The importance of the threshold's value was highlighted here to occupy an accurate detection and hence recognize road signs at final. The optimum threshold value for best detection resulted usually in the range (20-25) for all speed signs except for the cross sign. The latter recorded its highest precision value at the five threshold values. On the other side, the highest precision value (i.e. 0.86, 0.76, and 0.059) resulted for speed sign 60 followed by 40 and 80-speed signs respectively

Keyword: Speed Up Robust Features (SURF), labeling stage, true positive, false positive, precision.

Paper ID:194

Comparison of the Methods of Estimating the Parameters and Reliability Function for the Erlang Distribution with Two Parameters with a Practical Application

Zahraa AL- Darraji, Pr. Dr Duraid Badr

Abstract. In recent years, what has been noticed is the increased interest in the issue of reliability due to the development in the era of technology, and the use of modern electronic devices in all fields, and its reflection on the material and economic side, because it is one of the indicators of the ability and efficiency of the machine to work without failure for a longer period of time. this thesis is concerned with estimating the reliability function of the data using the two estimation methods :(Maximum Likelihood method (MLE), Moment method (Mom), he conducted a practical application of the message to an experiment from the real data from the Basra Oil Company, the Rumaila Operations Authority, the submersible pumps division, to know the failure times of the machines to estimate the reliability function in the best ways that were reached in the experimental side. On the basis of this, the simulation program (R program was used), and several experiments were conducted to compare the accuracy of the proposed methods by using the Mean Squares Error (MSE). A random sample of size n=25,50,100 was used. Each experiment was 1000 replicates. On the basis of it, the experimental side of this research was reached and the best method of estimation was known, which is the Maximum Likelihood Estimation Method. It has the least mean squared error (MSE). The researcher also recommended a number of recommendations, including the adoption of modified nonparametric methods to estimate the reliability function of the (Erlang) distribution.

Paper ID:195

Producing Low Cost Adhesives for Concrete Applications

ZainabMajidMohammed, Zoalfokkar Kareem Mezaal Al-obad

Abstract. The purpose of the study is to manufacture a low-cost adhesive for concrete applications and to reduce environmental pollution, where cement (C) is added once and waste concrete (W) again at an added percentage of (0%,3%, 6%, 9%,12%,15% and 20% wt.) to polysulfide Rubber (PSR) taking into account the Considering that the adhesive retains the adhesion and tensile properties as a basic thing parallel to its importance in reducing the cost. Fourier Transform Infrared Spectrometer (FTIR) results

show that there is no chemical reaction between polysulfide samples and cement once or waste concrete .The results of the tensile test show that the ultimate tensile strength increases for polysulfide compound with the increase of the waste concrete content ,and it is higher than ultimate tensile strength of the (non-reinforced) polysulfide samples but when cement is added to polysulfide, the ultimate tensile strength of cement reinforced polysulfide increases slightly .The results of the elongation show that the elongation of the composite materials decreases with the increase in the amount of addition of cement and waste concrete and the decrease is more for samples reinforced with waste concrete than reinforced with cement .The adhesion test results show that the adhesion strength show improvement when adding from 3% to 20% of the cement and waste concrete .The results of Shore (A) hardness test show that the values of reinforced polysulfide are higher than that of unreinforced polysulfide. Scanning Electron Microscopy (SEM) images show agglomeration in waste concrete and a rough and irregular surface which is reflected on the mechanical properties.

Keyword: Polysulfide Rubber,Waste concrete,Cement,Tensile Properties, Pull off Adhesion.

Paper ID:196

LH Labelling of Some Certain Graphs

Safa H. Obaed, Nabeel E. Arif

Abstract. Graph $\hat{G}$ =(V,E), in which p vertex of $\mathcal{V}(\hat{G})$ and q edge of $E(\hat{G})$ are considered an LH Labelling if there exists a one to one and onto function $L: V(\hat{G}) \rightarrow \{1,2,3,\ldots, |\mathcal{V}(\hat{G})|\}$ s.t. produced injection function $L^*: E(\hat{G}) \rightarrow N$ is defined by $L^*(u\ v) = (LCM.(l(u), l(v)))/(HCF.(l(u),l(v)))$, where L.C.M. and H.C.F. Denotes Least(Lower) Common Multiple., the Highest(Uppermost) Common Factor respectively). The Graph $\hat{G}$ is LH. labelling is said LH. graph.

In this paper, we investigated certain graphs such as: cycle cactus graph, coconut tree graph, the comb graph P_n ΘK_2, the triangular snake T_n ΘK_2, Ch(P_2^(k-1) C_4^k) and K_2 ΘC_n then proved LH Labelling of these graph are LH graphs.

Keyword: Graph labelling, The triangular Snake T_n ΘK_2, graph, cycle cactus graph, Coconut tree graph, Corona graph.

Paper ID:197

Modified Stochastich Weighted Mixed Estimator For Linear Regression Model

Mahmoud Mahmoud H.Eiada AL_Hayani, Mustafa I.Alheety

Abstract. A study of a new type of weighted mixed almost unbiased estimator in a linear stochastic restricted regression model for which the sample information and the prior information are not equally important has been proposed. Using the mean square error criterion, we compared the performance of this estimator to exist estimators. Eventually, a numerical example has been studied to know the performance of the new estimator.

Keyword: Weighted mixed regression estimator, multicollinearity, ordinary ridge estimator, prior information.

Paper ID:198

Unconstrained Fuzzy Optimization Problems with Trapezoidal fuzzy numbers

Adnan Waseel Kadhim Shubbar, Saad Shakir Mahmood

Abstract. The aim of this paper is to solve unconstrained fuzzy optimization Problems when the coefficients are trapezoidal fuzzy numbers based on modified Quasi -Newton methods especially modified BFGS method, Numerical examples are solved to show the effective of the method which reported as a tables formula.

Paper ID:200

Optical Recognition System And Evaluation the Transfer of Alex Net

Ahlam M. Kadhim

Abstract. Learning by utilising well-known neural networks is a powerful and efficient way to address classification problems on a specific set of new data. The well-known AlexNet convolution neural network (AlexNet CNN) is used in this research to implement the classification process for the Arabic numeral classes and build an electronic system to recognise coloured text images of Arabic numerals written in various fonts and sizes. Alex CNN is used to build the electronic system recognition to

recognise 10 classes instead of 1000 classes through the well-known Alex CNN algorithm. The last three layers of AlexNet CNN are replaced by new suitable layers that fit the entered training data. A dataset comprising 1000 images for 10 classes of Arabic numerals is also used in this research. A total of 800 and 200 images are respectively utilised for training and verifying the model efficiency and the network accurately. The proposed fine-tuned network performs well, demonstrating 0.98000% for model accuracy evaluation. The results proved that the proposed CNN shows outstanding success to classify Arabic numerals. That result is clarified inaccuracy measures results in the adopted CNN in this research. This study contributes to presenting a model with an excellent architectural design and proves the efficiency of deep learning for a previously trained network.

Paper ID:201

Interleukin 6 and 8 levels correlate with sperm characteristics in Iraqi varicocele patients

Khamaal Hussein Al-Khafaji, Mundher Mudhafar, Ali Hassan Abood,Wurood Hasan Hadi

Abstract. Infertile males were tested for the presence of interleukin 6 and 8, as well as for the presence of lipid peroxidation in their sperm. A total of 75 men with varicoceles and 25 fertile men served as controls, with sperm samples collected via masturbation. Malondialdehyde (MDA) production in the sperm membrane was used to assess the degree of lipid peroxidation in the membrane. Statistics were used to examine the association between the quantities of interleukin-6 (IL-6) and interleukin-8 (IL-8) in plasma of seminal and lipid peroxidation levels of sperm membranes. There existed a statistically significant difference in the concentration of IL-6 in the seminal plasma of unfertile males and fertile men (p 0.05) between the two groups. On the other hand, the concentration of interleukin-8 (IL-8) in the seminal plasma of infertile men was considerably greater than that of fertile men ($p < 0.05$), and the degree of lipid peroxidation in the semen of infertile men was significantly higher than that of fertile men ($p < 0.05$). in seminal plasma the levels of IL-6 and membrane lipid peroxidation process in the spermatozoa were found to be positively related to each other ($p < 0.05$), while IL-8 levels in seminal plasma and lipid peroxidation membrane in sperm were found to be positively correlated with each other ($p < 0.05$). It seems that there is a potential link between plasma interleukin-8 and 6 and ranks of spermatozoa and peroxidation of fat in the sperm membrane based on these findings. It may explain the encouragement species reactive formed by sperm of males and leukocytes, which is stimulated by great ranks of IL-6. Moreover, IL-8 is categorized by chemoattractant action of both T cells and basophils, as well as by the use of a proangiogenic effect on vascular smooth muscle cells. IL-8 is a cytokine that shows a key character in a variety of inflammatory disorders.

Keyword: interleukin-6; interleukin-8 , varicocele.

Paper ID:205

The Effect of Using ZrO2/Distilled Water Nanofluids on the Thermal Efficiency of an Evacuated Tube Solar Collector

Asawer khudhur, Khalid F. Sultan, Hosham S. Anead

Abstract. One of the most widely used solar collectors is a vacuum tube solar collector. Nanofluids were used to improve the heat transfer performance of these collectors because they are characterized by high thermal conductivity. This paper studied the effect of (ZrO2/DW) nanoparticles on the thermal performance of an evacuated solar collector. The ZrO2 nanoparticles used were 60 nm in diameter with three different volume fractions of 1,3 and 5% vol nanoparticles examined at various flow rates of 46, 67, and 93 L/min. Experiments were carried out in Baghdad city of Iraq, at a longitude of 44° 14′ E and latitude of 33° 33 ′ N. The results showed that the volume fraction of nanoparticles 5%vol at a flow rate of 93 L/min attain the maximum useful heat gain. The values denoted that adding more nanoparticles enhanced the thermal efficiency of the evacuated solar tube. The thermal enhancement result of ETSC efficiency at a flow rate of 93 L/min is raised to 5.69% for the nanoparticles volume fraction of 5% vol, while the enhancement rate of distilled water was 4.03% for the same flow rate. Findings dedicated that temperature difference and absorbed energy increased when nanoparticles are used.

Keyword: Renewable energy, heat transfer performance, ZrO2/distilled water, Nanofluid, thermal-efficiency

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Paper ID:206

Initial Coefficient Estimates for a New Subclasses of Bi-Univalent Functions Based on Horadam Polynomials

Ali Mohammed Ramadhan, Najah Ali Jiben Al-Ziadi

Abstract. The main purpose of this paper is to make use of the Hordam polynomials H_n (x), in order to submit and discuss three new subclasses of the class Σ consisting of holomorphic bi-univalent

functions in the open unit disk Δ. For functions belonging to the defined classes, we then derive coefficient bounds and the Fekete-Szegö problems. Also, we obtain new special cases for our results.

Keyword: Holomorphic function, Horadam polynomials, Coefficient bounds, Bi-univalent functions, Fekete-Szegö problem.

Paper ID:207

Measuring the Amount of Environmental Pollution Resulting from Nuclear Radiation in Selected Samples of Rice Consumed in Najaf Governorate

Ameer Ali Hassan, Raghad Sabbar Hadi, Ali J. Khalaf

Abstract. The goal of this work is to introduce concepts of groupoid, differential groupoid, locally trivial groupoid and Lie groupoid. We study principal fiber bundle of groupoid and Lie groupoid. We obtain new proposition of them.

Keyword: Groupoid, Lie groupoid, fiber product, principal fiber bundle.

Paper ID:208

Electrical Power Recovery in Refrigeration Power Plants: A Theoretical Study

Ahmed Saib Naji

Abstract. The global international shortage of electric power guided the researchers to look for low-electrical power consumption devices. Absorption chillers are the lowest energy consumption devices because they have a small centrifugal pump as the unique moving part that consumes the electrical power. The momentum of the fluid (solution or water) will be increased through the pumping process and afterward, it will be lost through the expansion valve(s). This study suggests installing a small pump to work as a turbine (PAT) between the high- and low-pressure sides to exploit some of the fluid momentum losses to produce the power. The present study focuses on multi-effect LiBr-Water absorption chillers type. The results showed that the generated power via using the PAT is more than or

equal to the consumed power through the regular pump(s). Actually, the excess power can be used to drive another chiller pump(s) in the same brand instantaneously or to be stored for further applications.

Keyword: Absorption chillers, Refrigeration, power plants, pumps as turbine, power recovery.

Paper ID:209

Chatbot Research Paper suggestion about Student Admittance Query

Kadhum Ali Sharhan, Emad I Abd-Alkareem

Abstract. Recently, developers and academics have been more attentive to the design and implementation of chatbots. Chatbots are conversational systems based on artificial intelligence (AI), able to use several approaches, such as natural language processing (NLP) and neural network language processing (NN). The major objective of this study is to sum together some of the most effective implementing strategies in recent years. This study does not just critically analyze the past works on chatbots, but also offers a technique for developing a state-of-the-art, customized chatbot application. A few technologies such as Dialog Flow, TensorFlow, Android Studio, and Firebase allow the chatbot. The suggested chatbot will be developed utilizing many technologies, such as Dialog Flow, TensorFlow, Android Studio and Machine Learning (ML), and Deep Learning (DL), including NMT and Deep Reinforcement (RL) models.

Keyword: Machine Learning (ML), Deep Learning (DL), Artificial Intelligence (AI), Natural Language Processing (NLP), Neural Network (NN), Neural machine translation (NMT).

Paper ID:210

Six-Parameters Exponential Pareto-Fréchet (EPF) Distribution: Properties and Applications

Nahla Hadi, Karam Nasser

Abstract. In this paper, A new six-parameter distribution called the Six-Parameters Exponential Pareto-Fréchet (EPF) distribution is derived . The new distribution is mixture of Exponential-Pareto and Fréchet distributions. we have been derived a few statistical properties of the new probability distribution. The

shape of its density function for different values of the parameters has also been established. The first four crude moments, the second and third moments about the mean of the new distribution were derived using the method of moment generating function. Other statistical properties derived include; the distribution of order statistics, coefficient of variation and coefficient of skewness. Six-Parameters Exponential-Pareto and Fréchet (EPF) distribution were estimated by using maximum likelihood method. The flexibility of the Six-parameters Exponential-Pareto and Fréchet (EPF) distribution was shown by fitting the distribution to one real life data set. The goodness of fit shows that the new distribution outperforms the one parameter Exponential (ED) distribution, three parameter Lindely distribution(TPLD), Gamma distribution and invers Gamma distribution (IGD) for the data set used for this study.

Paper ID:212

Study of Topological Submodules

Marrwa Abdallah Salih , Taghreed Hur Majeed, Mahdi Saleh Nayef

Abstract. The main objective of this research is to study some properties of topological submodule .Concentration was of the study tensor product of two topological submodule to get new proposition.Many expression are obtained in this work.

Keyword: Topological module, Topological submodule, Tensorproduct oftopological submodule, maximal of topological module.

Paper ID:214

Rationally Principally Extending Modules

Zinah Naser Sulaiman, Ufuk Ozturk,Mahdi Saleh Nayef

Abstract. In this work, we introduce and study a new generalization of the class of extending modules namely rationally principally extending module (for shortly, RP-extending); and we give many properties with this type of generalizations. On the other hand, we present a new class of modules namely Rc-sub modules and Rc-modules. Several properties and characterizations of these notions are given. Also we study the relation with our notions and some related well known concepts.

Keyword: essential sub module, rational sub module, extending modules, rationally-extending modules and p-extending modules.

Paper ID:215

Study the Possibility of using Hydrated Cement in Cement Mortar

Saadia A. Sahii, Saif Hameed Hlail

Abstract. Recently, the high demand for expanding and building with improve the infrastructure have significant influence on the cement production. This resulting in high demand on cement quality and properties such as workability and other properties. However, the environmental challenges are the main problem facing the cement especially with cement storage. Many researchers work on this point by adding different materials to enhance the storage conditions. This work is very important by using hydrated cement (HC) to obtain a good property. For this purpose, a different replacement proportions of hydrated cement (0, 10, 20, 50, 100%) was used by weight of cement. Two types of cement mortar mixes were used namely 1:2 and 1:3 and also different water-cement ratios. The mechanical properties of cement mortar were assessed in terms of compressive strength, flexural strength, and tensile strength at ages (3, 7, 28, and 90) days. Through the test program, the results offered that the amount of water required for the mix 1:2 and 1:3 increases with the increase in HC. The compressive, flexural, and tensile strength of the cement mortar gradually decreases as the proportion of the HC increases in all mixtures and for all ages. The dosage of 10% HC can be used with cement in infrastructure projects due to its affinity with the engineering properties of cement

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Paper ID:217

ON SOME RESULTS OF WINNING STRATEGY OF TOPOLOGICAL GAMES

Zahraa Mohammed Aziz, Taghreed Hur Majeed

Abstract. Our main goal in this paper is to study the strategy of topological games. We give some results of winning strategy of topological games on the lookout theorems. A topological game is move player on topological space of game between two players be decided thing with properties for topological space,

such as points, open sets and closed sets. we obtain some theorem of topological game and topological space. The topological game is one of application in topological space.

Keyword: Topological Games, strategy of Topological games, class of compact topological games.

Paper ID:218

Millimeter Wave beams coordination and antenna array height effect

Rafal Azzam Abed, Saad Ahmed Ayoob

Abstract. Beamforming technology reduces interference and path loss due to its directional property. The problem Inter User Interference (IUI) is a critical factor that limits the system performance. It is also considered one of the main problems facing communication networks today. This problem exacerbates the narrowness of the spaces near the Tower and the width of the beam coverage area. Accordingly, IUI is considered more dangerous in close areas to the Tower than in far areas from it. The effect of antenna array height on the width of the beam coverage area has been highlighted in this paper. Millimeter waves provide broadband for the 5G networks. They have been used with the COMP system, which represents a solution to improve transmission efficiency and coverage performance. The result shows a coordination process between mmWave beams at different altitudes is used in the COMP array antenna system. It also explained the properties of millimeter waves and mentioned three types of COMP. This research paper reviewed two scenarios implemented using the Matlab (V.2021a); The first scenario represents taking several heights of the antenna set. This scenario is determined the best heights to serve users in the areas near and far from the Tower and within similar Azimuth Angle of Arrival (AOA) angles. The second scenario adopted is the effect of the users' distance from the Tower and at different AOAs. The antenna height is fixed according to the results of the first scenario. The antenna array height for the second scenario is fixed at the peak value obtained for throughput. The simulation results obtained from the two scenarios confirmed the effect of antenna array height on the width of the beam coverage area for users near and far from the Tower. Increasing and decreasing the height can play a positive or negative role in the throughput value. By choosing the highest value for the throughput, this enables coordination between mmWave beams in choosing the best height that can serve the user. The process of coordinating mmWave beams at different heights of the antenna array reduces the value of IUI by 63.64%.

Keyword: 5G, millimeter-wave, CoMP, antenna array, Azimuth Angle of Arrival.

Paper ID:219

ACTION OF TOPOLOGICAL GROUP AND TOPOLOGICAL GROUPOID

Zahraa Mohammed Aziz, Taghreed Hur Majeed

Abstract. Our main goal in this paper is to study the topological group and topological groupoid. We concentrated to research the relation between topological group and topological groupoid. we study some types of topological groupoid and we give some results of action of topological group on the lookout proposition.

Keyword: Topological group, Topological groupoid, action of topological group, principal of topological group.

Paper ID:221

Cells Immobilization of Some Microorganisms As A Tool for Bioremediation: C-Pseudomonas putida

Hala Faez,Ayad Al-Mamoori

Abstract. Pseudomonas putida was selected for immobilization and heavy metals treatment. Final concentration after treatment for lead by immobilized Pseudomonas putida were (9.88, 18.85 and 27.08) ppm respectively. Removal efficiency in current study was: 1.13%, 6% and 10% respectively. The low removal efficiency in current study because the lead (Pb+2) concentration lead to poisoned the bacteria and increase the probability of kill of bacteria and decrease the lead that removed from aqueous solution after treatment by immobilized bacteria according to ASTDR list that explain the lead is lie second position in the ATSDR 2017 Substance Priority List. We are used immobilised Pseudomonas putida in treatment the cadmium, the results that record after treatment were (1.88, 3.88 and 9.12) ppm respectively. Removal efficiency for three concentrations was(81,81,70)%.In Present study we used FTIR and SEM technique to explain how the treatment process was occur ..

Keyword: Immobilisation, Bacteria, Biotechnology.

Paper ID:222

Structural Properties of Zirconia / Alumina composites prepared by Various Techniques

Ahmed M. Shano, Sabah Ali Khadhir, Adnan A. Mohammed, Suzan K. Adnan, Omar A. Ahmed

Abstract. In this study, prepared the zirconia-alumina composites powders with weight ratios using aqueous aluminum nitrate and aqueous zirconia nitrate according to the molar fraction method of (A1) sample and using the molar fraction method in finding the weight ratios for each of the raw materials used in the preparation of the composites according to the following formula (ZrO2 (0.3-AI2O3(0.7)) and the ratio (2 from aluminum and 1 from zirconium) is from the raw materials, and the second sample (A2) according to the traditional ceramic method of direct quantities and is in a ratio (1 to 1) from the raw materials and by the method of common chemical precipitation and using dilute ammonia with a concentration of 30-33 The acidic function = 10 as a strong base for precipitation to obtain the hydroxides of the materials and the sintered primary sintering at Heat of 600 oC for 4 hours and then a final sintering at 1300 oC for four hours. X-ray diffraction pattern spectroscopy (XRD-patterns) of the compound powders prepared at a temperature of (1300 oC) showed that the first sample was at the weight ratio A1 of the primary alumina-button superimposed and formed with two different phases, phase α- AI2O3 and orthogonal phase of zirconia t-zro2. As for the second sample the predominant phase is the orthogonal phase of zirconia t-zro2 with some phases of alumina . Fourier transformations of the infrared spectrum (FTIR) of the powders prepared at a temperature of (1300 oC) showed that they formed the required phases and were pure due to the high sintering temperature and were within the numbers less than (1000cm-1).

Keyword: alumina, chemical precipitation, zirconia, XRD.

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Paper ID:223

W-Projective curvature tensor of nearly Kahler manifold

Ali Khalaf Ali, A. A. Shihab

Abstract. The geometrical properties of one of the AH ("Almost Hermitian")-manifold structures are given by W1, where W1 indicates the almost Kahler manifold, and the w-Projective tensor of a nearly

Kahler manifold has been examined in this research. The following are the important conclusions of the study: - The typical Riemannian curvature symmetry features of this tensor were demonstrated. In the NK- manifold, calculate the Projective tensor (W- tensor) components. Some observations were obtained, and links between the tensor components of this manifold were constructed. For these components w_0 ,w_1,w_2,w_3,w_4,w_(5 ,) w_6,w_7, of virtually kahler is haler manifold, provide a neutral equation.

Keyword: w-Projective Tensor, nearly Kahler manifold.

Paper ID:224

Powell's Method for Solving Fuzzy Technique P2 Optimization Problem

Hasan Abdulraheem Jubair, Saad Shakir Mahmood, Alan Jalal Abdulqader

Abstract. The goal of this work is to look at some of the most prevalent mathematical programming strategies for extremizing nonlinear functions of variables. For tackling unconstrained multi-variable fuzzy optimization problems with fuzzy valued functions, we offer the Powell's Method. To demonstrate the suggested strategy, a numerical example is presented.

Keyword: Powell's Method, Fuzzy optimization Problem, Unconstrained optimization, nonlinear problem, Triangular fuzzy numbers.

Paper ID:225

Improvement in wear resistance of the HSS cutting tool surface by ceramic oxides depositions

Wurood Asaad M, Haydar Al-Ethari, Shaimaa J. Kareem

Abstract. Ceramic coatings layer consisting of titania and alumina were performed on high speed steel tools using the sol-gel route. The tools were dried at 100 -323 ℃ for one hour then calcinated at 600 ℃ for two hours to achieve the appropriate film thickness. The results indicated that the multi-layer coating improves the substrate's adherence. X-ray diffraction phase analysis confirms the presence of phases originating from the coatings and substrate. EDS analysis of the studied coatings indicates the

presence of titanium and aluminum, as well as oxygen. Atomic force microscopy (AFM) was used to examine the morphologies of the coated surfaces. The minimum surface roughness of 15.5nm with a thickness of 5.027µm was recorded by coating with two layers. A multilayer consisting of alumina/titania recorded a maximum adhesive strength of 89MPa, at 30sec immersion time and a layer thickness of 5.027µm. Multilayer coated cutting tool with obvious adhesive strength has minimum wear rate comparing with uncoated and monolayer coated cutting tool.

Keyword: Single point HSS, Ceramic oxides, Adhesive strength, Sol- gel.

Paper ID:226

The impact of substrate type on the characteristics of Tin monosulphide (SnS) thin films deposited via CBD

Saif M. Nasrallah, Manal M. Abdullah, Mohamed S. Mahdi

Abstract. Substrate type plays an important role in the growth of semiconductor films using the chemical bath deposition (CBD) method, which is a simple and cost-effective technique. The effect of the nature of the substrate on the structural, optical, morphological, and electrical properties of tin monosulfide (SnS) films on both substrates (glass and flexible) was studied for 4 h at a constant temperature of 80 °C, with a strong peak at 31.75, which corresponds to the (111) level of the prepared SnS films. The scanning electron microscope revealed that the surface of the film on the glass substrate is covered with irregular spherical granules, some of which are nanoflakes, while the surface of the film on the flexible substrate is observed to contain flower-like spherical granules that are well distributed, more compact, and of a homogeneous structure. The grain size of SnS films was found to be 2.7 µm and 3.6 µm on glass and flexible substrates, respectively. The energy bandgap varied between 2.06 eV on the glass substrate and 1.52 eV on the flexible substrate. Hall Effect measurements show the films created have p-type conductivity for both substrates.

Keyword: different substrates, Tin monosulphide, Flexible polyester substrate, chemical bath deposition.

Paper ID:229

Results on Stability for Iterative Procedure in a Convex Metric Space

Maha Jawad Mousa, Salwa Salman Abed

Abstract. Through this paper, the stability of modified Ishikawa iteration for a convex subset of convex metric. Two main theorems are established for two independent maps of quasi-contraction type which are.$\forall x, y \in \mathfrak{B}$, d (H^i x,H^i y) ≤ h max{d(x,y),d(x,H^i x), d(y,H^i y), d(x,H^i y), d(y,H^i x)}, 0 ≤ h <1 and d(H^i x,H^i y)≤ c M(x, y) + L d(x,H^i x), where M(x, y) = max { d(x,y), d(x,H^i x), d(y,H^i y), d(x,H^i y),d(y,H^i x) }, 0 ≤ c < 1 and L ≥ 0 where, in both cases the stability of iteration was achieved.

Keyword: Metric space, convex metric space, stability, iterative processes.

Paper ID:230

Indoor Air Quality Monitoring Based on Non-dispersive Infrared Gas Detection

Ibtehal F. Mahdi, Mohanad M.Azzawi, Firas S. Mohammed

Abstract. In this paper, Indoor Air Quality monitoring based on the non-dispersive infrared (NDIR) used as an optical method of detecting gases. The Co2 concentrations measured in indoor environments surrounding the human beings by a Portable CO2 Detector (CH016Q- BriSunshine). Four tests achieved on several locations such as: places of worship (the mosque), meeting room, transport car, the primary schools. For the first indoor environment (Mosque), the highest gas concentrations around (1400 ppm) with closed air vacuums. This result controlled to reach (750 ppm) concentrations for a period of time 33 minutes in the presence of two air vacuums. The second environment (meeting room) requires only one vacuum to reduce the highest gas concentration from (1800 ppm) to (750 ppm) within 40 minutes. As for the third and most important environment (the school), the fluctuating rise in CO2 emission between (800-1500 ppm). After 23 minute from opening the first window, the highest gas concentrations decreased to (950 ppm). Also, the gas ratios rise rapidly resulting from the increase in students' movement during break time. As for the last environment (the car), Co2 emission rise to (4500 ppm) with an average FWHM time of 18 minutes which is bad the air quality, it can be treated through small air vents or opening one of the car windows. It is noticed a decrease in Co2 gas concentrations and a remarkable speed. The importance of the obtained results used to solve the problem of the Co2 direct impact on human health through monitoring air quality small systems..

Keyword: Gases detection; Non-dispersive infrared technology; Carbon dioxide.

Paper ID:231

Enhancements the structural and electrical properties of TiO2 films by adding graphene nanoparticles prepared by PLD technique

Amer. M. Salih, Zuheer.N. Majeed, Sabri .J. Mohammed

Abstract. The goal of this work is to introduce concepts of groupoid, differential groupoid, locally trivial groupoid and Lie groupoid. We study principal fiber bundle of groupoid and Lie groupoid. We obtain new proposition of them.

Keyword: Groupoid, Lie groupoid, fiber product, principal fiber bundle.

Paper ID:236

ON NIL – CLEAN IDEAL

Prof. Dr. Nazar H. Shuker, Muayad Mohammed Noor

Abstract. An element a in a ring R is called a nil – clean element if a=e+n, where e is idempotent element and n is a nilpotent element. If further en=ne, a is said to be a strongly nil – clean element. An ideal I is said to be a nil – clean (strongly nil – clean) if every element of I is a nil – clean (strongly nil – clean) element. In this paper further properties of nil – clean and strongly nil – clean ideal are given, and its connection with clean ideal and strongly 2 – nil – clean ideals are obtained. .

Keyword: Nilpotent element, Jacobson radical, Nil – clean ideal, Idempotent element.

Paper ID:237

Microstructure, Hardness, and Wear rate of Hot Squeezed Cu-10 Sn-Graphite Composite Prepared by Stir Casting

Rasha Hussein Ali, Haydar Al-Ethari, Talib A. Jasim

Abstract. The current paper focused on improvement of Cu10Sn alloy by reinforcing with graphite along with hot squeezing. The composite was prepared by stir casting method. The added graphite was coated by copper. The hot squeezing was performed at 6000c by using several squeezing pressures. The effect of reinforcing and squeezing was studied on the microstructure, the grain size, the porosity, the hardness, the coefficient of friction, and the wear rate of the alloy. Analysis and observations of each investigation were prepared by incorporating the morphological results obtained through Optical Microscope, Scanning Electron Microscope, Electron Dispersive Spectroscopy, X-ray Diffraction Technique, Brinell hardness test and wear test. The results showed that 9Tons hot squeezing pressure applied on Cu-10Sn alloy with 5wt.% coated graphite reduced the grain size by 48%, decreased the porosity by 20%, increased the hardness by 94%, reduced the wear rate by (54%), and reduced the friction coefficient by 39%..

Keyword: Microstructure, Hardness, Wear rate, Hot Squeezed, Cu10Sn, Graphite, Stir Casting.

Paper ID:238

Optimization and Experimental Power Generation Assessment of Counter Rotation Twin Turbine Configuration

Mohammed Abood Habib, Ahmed Abdulqader Hussein, Abdullateef A. Jadallah

Abstract. Wind energy is recognized as one of the main sources of renewable energy and a promising source in providing power and promoting the required transition towards low carbon emission systems. In this work, the proposed system design, analysis and the performance of the counter-rotor twin-turbine (horizontal type) has been conducted. A system of such equipment with different series of airfoils the rotor blade has been installed with a single permanent Magnet Synchronous Generator (PMSG). The proposed system design based on twin-rotor turbine has been tested in the low wind speed regime. Hence, it has been started up at a cut-in speed of (4.5 m/s) and the optimum value of the wind speed has been obtained. As a result, the proposed system design proves that the counter rotation dual wind turbine can be implemented domestically and efficiently under low wind speed conditions.

Keyword: Wind-Energy, PMSG, Conversion-System, Counter Dual- Rotors, MPPT.

Paper ID:239

Projective Continuity on Uniform Frechet Algebras

Mohammed Jabbar Hussein, Al-Nafie Z. D.

Abstract. In this work, we try to study a new class of the continuity of the linear maps in uniform Frechet algebras provided with a method of projective limits of uniform Banach algebras. To do this, we introduce and generalize on a uniform Frechet algebra the method of [4] which is based on the fact that any Frechet space can be considered as projective limits of Banach spaces..

Paper ID:240

Some types Horadam polynomials for solving mathematical model describe fungal diseases

Dilbreen Ibrahim Saleh, Ahmed Farooq Qasim

Abstract. In this paper, types of Horadam polynomials are used to solve a Mathematical modelling of causing fungal diseases, the main advantage of these polynomials are use it in solving nonlinear ordinary and partial differential equations. The obtained results are compared with the Laplace Adomian decomposition method for epidemiological model to show the efficiency and reliability of the proposed method which can be extended to solve a large variety of ordinary differential equations. Tables are also given to show the variation of the absolute errors for large approximation.

Keyword: Horadam polynomials, causing fungal diseases, partial differential equations.

Paper ID:241

Spectrophotometric Determination of Clonazepam in Pure Form and in its Pharmaceutical Preparation via its Reaction with Sodium 1,2-Naphthoquinone-4- Sulfonate

Rabee Mohammed Ali Yassin, Nabeel Sabeeh Othman

Abstract. An easy, sensitive, and rapid spectrophotometric method has been proposed for the estimation of clonazepam (CZM) in its pure form and its pharmaceutical preparation (tablets). The method included the reaction of CZM with sodium 1,2-naphthoquinone-4- sulfonate (NQSS) as a chromogenic reagent in presence of alkaline media.to form a yellowish-orange coloured product gave the maximum absorbance at 452 nm. The nucleophilic substitution reaction is responsible for appears coloured product. The factors that influence the completion of the reaction have been optimized. The range of linearity according to Beer's law was within the range 1.25-20 µg/ml and with a molar absorption coefficient of 8.934 x 103 l.mol-1.cm-1. While the values of Sandell's sensitivity, detection limit, and estimation limit were 0.0353 µg/cm2, 0.219 µg/ml, and 0.730 µg/ml respectively.

Paper ID:242

Mechanical and Self-Sensing Properties of Cementitious Composites with Hybrid Carbon Particles/Fibers as Functional Fillers

Raid Dahham Abdullah, Ali Majeed Al-Dahawi, Hussein H Zghair

Abstract. Recently, cementitious composites have been significantly developed to make them more functional and not limited to their structural function only, through a series of researches and studies that deal with the utilization of self-sensing property in most concrete structures, especially in highway structures, in order to monitor the structural health and early notice of damage before it gets worse. In this paper, the piezoresistive characteristics under compressive loads of cementitious composites with embedded hybrid carbon-based functional fillers were investigated. Mixtures containing different amounts of carbon black particles and carbon fibers were fabricated. In order to enhance the mechanical properties, in addition to the carbon-based materials, polypropylene, polyolefin, and steel fibers are used as reinforcing fibers with a constant amount. Four pairs of carbon black (% by weight of cementitious materials) and carbon fibers (% by volume of mixtures) were introduced. These are (0.5, 1.0), (1.0, 0.75), (1.5, 0.50) and (2.0, 0.25) respectively. A reference mixture without the functional fillers was, also, manufactured. The amount of reinforcing fibers was kept as 2.0% by the volume of mixtures. The ratios of water to cementitious materials (W/CM) and fly ash to Portland cement (FA/PC) were constants with 0.27 and 1.2 respectively. The fabricated specimens were demolded after 24 hours of pouring and cured in water for 27 days age at room temperature and moved to the oven for 24 hours at 60 o C to remove the unwanted moisture that potentially affects the changes of electrical resistivity. The results revealed that the mixtures with low carbon black and high carbon fiber dosages have lower electrical resistivity and they do not negatively affect the compressive strength. On the other hand, self-sensing behavior was

better for the mixtures containing high dosages of carbon black in terms of fractional change in electrical resistivity (FCER).

Paper ID:243

Design and Simulation of coaxial cavity filter with high Q-factor for 5G networks

Zaid A. Ismail, Saad W. O. Luhaib

Abstract. In this article we present a low loss of a Chebyshev coaxial cavity bandpass filter with post-manufacturing tuning capabilities. The third-order BPF has been designed and simulated at a center frequency of 4.8 GHz with an insertion bandwidth of 100 MHz and a length of λ/4. The size of the cavity has been chosen to give the optimum value for the unloaded Q-factor and spurious window. The simulation results show that the insertion loss is 0.1 dB, while the return loss is 18 dB. The unloaded Q factor was 4800 which is meet the specifications of a 5G applications network, this form of microwave filter would be beneficial in any microwave system that requires minimal insertion loss and good Q-factor, such as a base station, radar, or satellite transceivers. Finally, we constructed this model by the use high-frequency structure simulator (HFSS).

Paper ID:245

Soft Bornological Structures

Ashwaq F. Abdal, Anwar N. Imran,Lieth A. Majed

Abstract. In this paper, we combine the soft set theory with bornology to constructe a new structure that is called a soft bornology to solve the problems of boundedness for the a soft set. Also, we construct soft base and soft subbase for this structure. It is a natural to study fundamental construction for this new structure such as soft subspace, product soft bornology and soft bornological isomorphism. The main important results, we prove that a family of soft bornological sets can be a partial ordered set by partial ordered relation and we prove that the intersection of soft bornological sets is soft bornological set but the union of soft bornological sets is not necessary to be soft bornological set

Keyword: Soft set, Bounded set, Bornological set, Bounded map.

Paper ID:246

Soft Bornological Group Acts on Soft Bornological Set

Ashwaq F. Abdal, Anwar N. Imran

Abstract. In this paper, we introduce the notation of soft bornological group to solve the problem of boundedness for the soft group. Where we combine the soft set theory with bornology to produce a new structure that is called a soft bornological group such as the product and inverse maps are soft bounded. As well as, we study the actions for a soft bornological group on a soft bornological set, the aim of soft bornological set is partition into soft orbital classes by acting soft bornological group on soft bornological set. In addition, we explain centralizer, normalizer, stabilizer in details. The main important results, we prove that the product of soft bornological groups is soft bornological group, we prove that centralizer, normalizer, stabilizer are soft bornological subgroup of a soft bornological group and action for different elements are same action.

Keyword: Soft set, Bounded map, Soft bornological set, Soft bounded map.

Paper ID:247

Possibility of Using Azolla Meal as an Alternative Fish Feed

Mustafa Hassan Naji, Sadiq Kadhum Lafta Alzurfi

Abstract. Current study aimed to possibility use Azolla filiculoides Lam. As a source of protein it is a partial substitute for plant meal to reduce the cost of feeding the Cyprinus carpio L fish . Azolla meal was included in fish feed at different levels (0%, 25%, 50%,75% and 100%) and was fed to farmed Cyprinus carpio L. and the use of plastic ponds in a 45-day carp growth experiment. The obtained results demonstrated that the final body weight, weight gain, and specific growth rate decreased significantly in fish fed 50% Azolla ($P<0.05$), while increase rate of carp fish fed 25% was higher of other treatments significantly but lower of the control ($P<0.05$). The fish length ratio increased significantly in fish fed 25 % Azolla ($P<0.05$) compare other treatment except control. Feeding carp with Azolla resulted in normal hematological and biochemical functions with insignificant differences for the measured parameters , Albumin, blood urea ,GOT and Triglyceride were not affected by the inclusion of Azolla especially 25% treatment in carp diets and remained similar to those of the control group ($P>0.05$). The

creatinine ,GPT ,total protein and cholesterol was significantly affected by Azolla inclusion in carp diets especially 25% treatment with control (P<0.05). It is conclude that the Azolla can be substituted as a partial substitute for plant meal (25%) as the growth criterion. We recommend experiments on Azolla plant at other concentrations to reached to best growth criterion.

Keyword: Azolla, meal, Cyprinus carpio,GOT,Fish.

Paper ID:250

Preparation of gold nanoparticles by chemical reduction method

Murtadha Ali Abdul Mahdi, Ali Hatif Hadi1, Ameer Ali Hassan

Abstract. In this paper, Gold nanoparticles were prepared by chemical reduction method using materials Gold chloride (HAuCl4/H2O) and deionized water, This method has proven its effectiveness by obtaining gold nanoparticles with sizes (9-11) nanometers.

Keyword: Nano gold particuls , Chimical reduction , Gold chloride , Trisodium citrate.

Paper ID:251

The Operating Voltage of Rf-Powered Sensor Of (PMMA)-Nano Silver Doped

Asmaa I. Abed, Najat A. Dahham, Anwar M.E.Alfaidhi

Abstract. A multi-layer low-energy sensor, manufactured using (PMMA) deposit by spinner technology with a thickness of (3OO ± 10) µm. The membrane doping was prepared with Nano-silver (Ag) of the granular size of (50 nm) and volumes of (25%, 50% & 75%). The manufactured models have undergone different tests through a range of radio frequencies. The results showed that the best response to the sensor current occurs at a base effort located within the area specified by the space charge, while when the base is at the (Ohmic) region, the current is concave. While convex appears near the (B.D.) region

Keyword: low energy sensors, Operating voltage, PMCS, multilayers.

Paper ID:253

Using Magnesium Oxide MgO Nanoparticles to Enhance Heat Transfer in a Double Pipe Heat Exchanger: A CFD study

Mustafa M. Gabir, Dhirgham Alkhafaji

Abstract. Recently heat transfer enhancement utilizing double pipe heat exchangers had been a key of engineering research topic in different field. The present work illustrates how magnesium oxide nanofluid (MgO) affects the enhancement of heat energy exchange in a double pipe heat exchanger at different concentrations of nanoparticles. The governing equations of heat and fluid flow had been solved using ANSYS FLUENT based upon finite volume scheme. The temperatures for hot and cold streams at the inlet are 50 oC & 25 oC respectively. The volumetric flowrates for hot fluid (8-20) LPM and for cold fluid 8 LPM. The magnesium oxide nanoparticles MgO have concentrations range (0.125 % - 2%) by volume were implemented. According to the findings of the study implemented in sustainable applications and different industries fields, heat energy exchange rises when the volume concentration of nanoparticles increases also. Currently, there are several studies have been conducted to assess the consequence of nanofluid that enhancement heat energy exchange in the double pipe heat exchanger. The type and concentration of nanoparticles in the base fluid play important role in the enhancement of heat energy exchange. This paper illustrated the effect of increased magnesium oxide nanofluid MgO nanoparticles concentration on the heat energy exchange of a double pipe heat exchanger.

Paper ID:254

Characterization Of Iron Oxide Nano Particles Prepared By Sonochemical Method

Ahmed B. Taha, Mohammed Sh. Essa, Bahaa T. Chiad

Abstract. Nanoparticles have achieved large attention in the last decade due to their large applications in many fields, Iron oxide nanopowder is one of the promising material due to their unique properties, many methods have been used to synthesize iron oxide nanopowder. in this research, Iron Oxide nanopowder is synthesized by Sonochemical method by using precursors of ferric chloride and ferrous sulfate. Many studies of iron oxide nanopowder has been studies, including Surface morphology, Structural morphology and optical studies. The synthesis of iron oxide's surface morphology was

investigated using SEM and AFM. The SEM analyses indicates the formation of the nanoparticles with a mean size below 100 nm, image processing is used to calculate particle size of some iron oxide nanopowder and its showed that all measured particles are in the Nano range. The 2 Dimension and 3 Dimension of Atomic Force Microscopy (AFM) images of iron oxide particles show a uniformly average size ranging from 51-100 nm, with a spherical shape, which confirmed the SEM results. Structural characteristics of the XRD pattern show very thin peaks indicating small crystalline size and the fine nature of the particles with a cubic spinal structure, the peaks of the XRD visible at $2\theta \approx 30.640$, 36.030, 43.310, 58.040 and 63.150. The crystallite size has been calculated using Scherer equation and its found between 40 to 78 nm and the cell parameters of IONPs has been calculated using Bragg's equation, The EDS spectra shows only the peaks of Oxygen and Iron, the Fe percent was (80.75 %) by weight. In contrast, the percent of O is (19.25%) by weight; the optical properties of the iron oxide sample show a broad absorption band around 520 nm. This broadening may be attributed to adsorbed molecules. So, all studies showed the formation of Iron oxide nanopowder with high purity and small particle size..

Paper ID:255

Principally Strongly Generalized ⊕-radical Supplemented Modules

Narjis Mujtabah Kamil, Thaar Younis Ghawi

Abstract. The goal of this study is to introduce and investigate a class of modules which is analogous to that of sgrs^⊕-modules and principally g-lifting modules. The module M is called principally sgrs^⊕-modules if, for any cyclic submodule N of M with 〖Rad〗_g (M)⊆N has a g-supplement that is a direct summand of M. Several of features, examples and relations of sgrs^⊕-modules are investigated. Also, we discuss the factors and direct summands of this type of modules by several consequences that are given.

Keyword: g-small submodules; g-supplement submodule; generalized radical submodules; principally semisimple modules; principally sgrs^⊕-modules.

Paper ID:256

Performance Comparison of MDORA, MDORA-OD and MDORA-WD Routing Protocols in VANET

Dania Mohammed, Muhamad Bin Mansor, Goh Chin Hock

Abstract. Vehicular Ad hoc Network (VANET) is one of the new technologies and differs from other ad hoc networks because it has unique characteristics. In the VANET, it is challenging to establish routing protocols due to the frequent disconnection of the connection, the topology changes in the network structure, and the high speed of vehicles. Routing is used in the VANET to direct vehicle-to-infrastructure (V2I) or vehicle-to-vehicle (V2V) data. VANET contributes to improving intelligent transportation systems (ITS) because it can provide traffic information and increase road safety to reduce daily road accidents. This paper will focus on the position-based routing protocol, and a performance comparison will be made between the MDORA, MDORA-OD, and MDORA-WD protocols in terms of end-to-end (E2E) delay, packet delivery ratio (PDR), and communication overhead. The network was simulated in an urban environment by MATLAB. The comparison results showed that the MDORA-WD had better results than MDORA and MDORA-OD.

Keyword: VANET, MDORA, MDORA-OD, MDORA-WD, E2E delay, PDR, overhead.

Paper ID:257

Divisible Gamma Acts

Mehdi. S. Abbas, Saad. A. Al – Saadi, Amer. I. Al – Saeed

Abstract. In this paper we introduce and investigate the concept of divisible gamma act and study some of its properties. Through other results we show that an S_Γ-act S is divisible if and only if for all α∈Γ, all right α-cancellable elements of S are right α-invertible. Any Γ-homomorphic image of an α-divisible S_Γ-act is α-divisible. The factor Γ-act S/ρ is divisible if and only if [s]_ρ∩cαS≠∅ for any s,c∈S and c is right α-cancellable element where ρ is a left Γ-congruence on Γ-semigroup S. Then the Ree's factor S/K is divisible if and only if K∩cαS≠∅ for any right α-cancellable element c∈S and for any s∉K there exists t∈S such that s=cαt where K is a proper left ideal of Γ-semigroup S. A left ideal SΓz,z∈S of S is divisible if and only if for any s,c∈S,c is right α-cancellable element, α∈Γ and for every β∈Γ, there exists u∈S and γ∈Γ such that sβz=cα(uγz).

Keyword: Γ-semigroup, Γ-act, Γ-congruence, 〖(T-S)〗_Γ-compatible closure relation, α-cancellable element, α-invertible element, gamma biact and divisible gamma act.

Paper ID:258

Optical Analytic Study of the Focus Point in Solar Ball Lens Concentrator Using ZEMAX

Sabah M. Hadi, Manal Midhat Abdella, Mohamed S. Mahdi

Abstract. The shell thickness of the solar ball lens (SBL) is a lens constructive parameter that is important in minimizing spherical and paraxial color aberrations. Furthermore, the optical properties of the symmetry concentric system eliminate off-axis and on-axis aberrations. In this study, an iterative mathematical relation was developed using the MATLAB program to calculate the optimum shell thickness of SBL. The geometric optical analysis of the symmetry concentric system (SBL) was carried out using the MATLAB program and the trigonometric ray tracing method. The iterative mathematical relationship revealed that the optimal shell thickness to outer radius ratio for SBL composed of abundant and cost-effective materials (Polymethyl methacrylate (PMMA) shell – pure water core) is 0.435468. In order to assess the validity of the iterative relationship, the optical design program (ZEMAX) was utilized. The relationship of geometric concentration (GC) ratio with aberration was also investigated in the case of Abbe wavelengths and infinite conjugate conditions for geometric concentrations of maximum and 1000. The geometrical design of SBL allows for the production of scalable-sized solar collector lenses by avoiding any order of asphericity surfaces (zero conic for common spherical concentric surfaces). This optical arrangement can produce a point focus concentrator as a low-cost solar static concentration collector for thermal applications..

Paper ID:261

Generalized Conharmonic Curvature Tensor of W2-Manifold

Wissam Abbas Hussien, Ali. A. Shihab

Abstract. This Research studied the(GC) Conharmonic curvature tensor of almost kahler-manifold, where this research focuses on the geometrical feature or properties of the one of the almost kahler-manifold. We arrived at the following results:

- Demonstrated that this tensor in this manifold has the conventional Riemannian curvature symmetry features.
- The eight non-zero components' values are determined.

- Some results have been obtained, as well as, the correlation between the eight non-zero components of W2 manifold's tensor has been established

- Get a neutral equation for these components (GC)0, (GC)1, (GC)2, (GC)3, (GC)4, (GC)5, (GC)6, (GC)7, of almost kahler is haler manifold.

Paper ID:262

Concircular Curvature Tensor of AK-Manifold

Yaseen. K. Abass, A. A. Shihab2)

Abstract. In this research, we look at the Concircular curvature tensor of an almost kahler manifold, which means that the geometrical qualities of one of the nearly hermitian manifold structures are provided by W2, where W2 denotes the almost kahler manifold. The key findings of this investigation are summarized. Demonstrated that this tensor has the classical symmetry features of Riemannian curvature. Computing the Projective tensor (C- tensor) components in the AK- manifold. Obtained some findings and established linkages between the tensor components in this manifold. Get a neutral equation for these components C0 , C1 ,C2 ,C3 ,C4 ,C5 ,C6 ,C7 of almost Kahler manifold.

Keyword: Concircular curvature tensor, almost kahler manifold.

Paper ID:263

Preparation of (Epoxy/ Carrot Fibers) Composites as Natural Gel Coat with High Wear Resistance

Afya Q. Fadhel, Widad H. Jassim

Abstract. The improvement of (Epoxy/ sub microns carrot fibers)to prepare natural gelcoat has been done , using two different particle sizes of carrot fibers in different weight ratios of addition (1 ,2 ,3 ,4 ,5 ,6,7 and 8%) as reinforcement to epoxy. The wear loss and density were carried out; where the density decreases with increase the weight ratios of addition at weight fractions less than (8%). (Epoxy/ 0.25 microns carrot fibers) Composites have high Wear resistance with employed small percentages of carrot fibers (1and 2 %) while (Epoxy/ 0.5 microns carrot fibers) Composites have high wear resistance with

employed higher percentage carrot fibers (3 and 5 %). the addition (1 % of 0.25 Micro carrot fibers)to epoxy will improve its wear resistance by (~40%.) , While to get the improvement (55 %) in wear resistance of epoxy, it must added (3 % of 0.5Micro carrot fibers) . The techniques SEM and EDS were employed to fix the microstructure and the elements composition of (Epoxy/ 0.5 microns carrot fibers) and (Epoxy/ 0.25 microns carrot fibers) Composites respectively.

Paper ID:264

Successive Technique for Solving Nonlinear Fuzzy Integral Equation of Second Kind

Ahmed Abbas Hassan, Alan Jalal Abdulqader

Abstract. In this paper, a mathematical strategy to address nonlinear volterra indispensable conditions in view of a progressive estimation procedure is thought of. An arrangement of capacity is delivered which merges to the solution.Some models are introduced to show techniques. To observe a complete bound of the mistake, we examine blunder. At long last, a few models are introduced to results create the impression that this technique is exceptionally successful and helpful to settle these conditions.

Keyword: Nonlinear Volterra Integral Equation of the Second Kind, Fuzzy Set, Successive Approximation Method.

Paper ID:265

Modification of structure, surface morphology and optical band gap by variation of Co3O4 film thickness

Sarah Abbas Shakir, Adel H. Omran Alkhayatt

Abstract. Co3O4 Cobalt oxide thin films of various thickness about (250,450 and 600) nm were synthesized on glass heated up to 400°C temperature using spraying pyrolysis method. Influence of the cobalt oxide layer thickness on the crystal structure, surface morphology, and optical parameters were investigated. The crystal structure results of the prepared samples showed that the crystallization was improved as the thickness increased with polycrystalline structure of cubic phase. The surface

morphology of the prepared samples of various thickness showed a homogeneous surface without any cracks and uniform densely distribution of well-defined grains, whereas the lower film thickness has smaller grain size without pores, cracks, and pinholes. Optical characteristics revealed that the prepared films include two energy gaps for allowed direct transitions. The direct forbidden energy gap was reduced from 2.15 eV to 1.99 eV with increase film thickness. From the variation of Co3O4 properties by varying its thickness, one can be conclude that the properties of the cobalt oxide films can be controlled by film thickness, which can be used in different and suitable applications for optoelectronics, and photodetector devices.

Keyword: Co3O4, thin films, Chemical spray pyrolysis, Thickness effect, Optical band gap.

Paper ID:175

The Essential Conditions for Soliton Solution of the Non-local Manakov System

Haitham Hamid, Junaid Mustafa

Abstract. This paper aims to study and determine the necessary condition of obtaining soliton solutions in multi-component generalizations of the non-local reduction for nonlinear Schrödinger equation with PT-symmetry. We consider particularly square barrier initial conditions. This work includes: evaluating the spectral problem, introducing the Jost solutions and scattering matrix of the Zakharov-Shabat system, and determining discrete eigenvalues. As the main example, we use the Zakharov-Shabat system which corresponds to the Manakov system of nonlinear Schrödinger equation. In addition, three cases of square barrier potential corresponding to symmetric and asymmetric potentials are shown and studied. A multi-soliton configuration is shown to be allowed for multi-component non-local nonlinear Schrödinger equations of the Manakov type. Numerical simulations are used to obtain and illustrate the results that depend on solving a system of equations.

Paper ID:268

Natural Convection from a Horizontal Cylinder Placed in a Square Enclosure: CFD Simulations

Raid Ahmed Mahmood, Ahmed Khalid Ibrahim, Ali Ghazi Mohammed Kamil, Ramiz Ibraheem Saeed

Abstract. Natural convection from a horizontal cylinder placed in a square enclosure is numerically investigated using two different fluids as a heat transfer medium. Water and air are used as two different heat transfer mediums. The diameter and length of the cylinder are 50 mm and 500 mm respectively. The cylinder is placed in a close square enclosure of 300 mm x 300 mm. The range of operating conditions covered different surface temperature from 303 K to 414 K. Two-dimensional Computational Fluid Dynamic (CFD) approach is used to predict the natural convection when water and air are the heat transfer mediums. The Nusselt number is estimated and compared with the experimental result which is obtained from previous study with maximum absolute percentage error of 13%. The results show that the surface temperature has a direct and significant effect on the Nusselt number when the cylinder is surrounded by air as a medium for the heat transfer with maximum velocity varied from 0.007 m/s to 0.11 m/s. Conduction heat transfer mode is the dominant mod when the cylinder is surrounded by water with maximum velocity of 0.3 m/s. at surface temperature of 350 K.

Keyword: CFD, Natural convection, Horizontal cylinder, Water and air heat transfer medium.

Paper ID:269

Analytic Method for Solving Nonlinear Nonhomogeneous Volterra Integral Equation of Second Kind by Using Adomian Decomposition Method

Salam Adel Majeed, Alan Jalal Abdulqader

Abstract. We contemplate the two procedures of using the "Adomian Decomposition Method" to address Nonhomogeneous Nonlinear Volterra Integral Equations of Second Kind with the particular numerical course of action known and we gave the speculation of the exist plan and its unprecedented game plan, by using a numerical approach a shut unmistakable game plan was found without breaking a sweat and beneficially, we show under the portrayal of this strategy with tables and graphs, we used the maple 2019.

Keyword: Nonlinear Nonhomogeneous Volterra Integral Equation of second kind, Adomian Decomposition Method.

Paper ID:270

Evaluation Of Soil Classification Methods Based on CPT Data for Soil in Nasiriyah, Iraq

Duaa Muhsin, Ressol R. Shakir

Abstract. Soils classification based on CPT data is depending on soil behavior in site which is very important for geotechnical engineers. Soil behavior is complicated since it related to the variation of the geological processes, therefore uncertainty in identifying soil stratigraphy is expected. In this paper, seven soil classification methods based on CPT data have been used for classifying the soil of the study site located in Nasiriyah city, south of Iraq. These methods have been presented with a description for each method. Four CPT soundings were tested and six boreholes were drilled at different locations next to CPT sounding locations at a depth (15-20) m. The results have been evaluated by comparing it with the results of (USCS) classification system after converting the results of SBT charts to USCS soil types groups. It has been found that Robertson chart 2010 and Eslami and Fellenius chart 1997 gave the best agreement with the results of the laboratory test with prediction ratios equal to (56, 88, 86 and 78) % for Robertson chart 2010 and (67, 75, 85 and 67) % for Eslami and Fellenius chart 1997 for CPT1, CPT2, CPT3, CPT4 respectively.

Keyword: Cone penetration test, Soil classification, SBT charts, USCS.

Paper ID:271

Compactness via Grill Topological Spaces

Saad.s.suliman, R.B.Esmaeel

Abstract. The notion of grill was employed in this work to generalize a new form of compact space and investigate its features, as well as its link to previously established concepts, as well as the definition of new categories of functions such as lindeloff space and determining the relationship between them, This set will be a beginning point for investigating the numerous futures of this set by offering many instances and attributes that pertain to it.

Keyword: Grill, Ԍ^* α"-compact" , 〖 Ԍ〗 ^* α"-lindelof" , "Ԍ" ^"*" "α-irresolute function" , "Ԍ" ^"*" "α-" strongly "functio" n, "Ԍ" ^"*" "α-continuou" s "function".

Paper ID:273

Effect of Laser Energy and Substrate Temperature on the Optical and Structural Characteristics of ZnO: Cu Thin Film

Ali A. Rajeh, Abbas K. Hussein, Laith K. Abbas

Abstract.

Abstract. Using the pulsed laser deposition method, thin films of (ZnO 3%Cu) were prepared, and the effects of laser energy at (600, 700, 800 MJ) and substrate temperature at (200, 300, 400 °C) on the structural and optical Characteristics were investigated. The nature of the deposited films and crystal size were measured by X-ray diffraction analysis (XRD). In this study, the surface morphology and roughness of the thin films were determined using atomic force microscopy (AFM). The thickness of the films was determined using an (Ellipsometer). The value of the optical energy gap was determined by using the UV-VIS spectroscopy technique. The crystallographic findings are supported by FESEM measurements. Using an energy-dispersive X-ray spectroscopic technique, it was shown that Cu ions were effectively incorporated into the lattice of the (ZnO) nanostructure without affecting its wurtzite structure.

Paper ID:274

Investigating of the Size–Strain Relationship of NiO Nanoparticles by Using Williamson -Hall Analysis

Karrar H. Musa, Tagreed M. Al- Saadi

Abstract. It can show that when using the Scherrer equation to compute nanoparticle sizes utilizing X-ray powder diffraction, the results need to be scrutinized more closely. Microstrain adds to the line broadening of diffraction peaks when nanoparticles are not ideal crystals. The extra breadth of the diffraction peak might lead to a miscalculation of the nanoparticle size. In this paper, we explain how to use Williamson–Hall plotting to directly compute the size and microstrain of NiO nanoparticles and compare the findings to those obtained using the Scherrer equation. Furthermore, to these findings, the straight line derived by Williamson–Hall plotting demonstrates the nanoparticles' uniformity.

Keyword: NiO, Williamson-Hall, Size –Strain Plot, X-ray diffraction, Nanoparticles.

Paper ID:275

New Design of Efficient Non-Linear Stream Key Generator

Saif Ahmed Shaker, Ayad Ghazi Nasir, Faez Hassan Ali

Abstract. In this paper we will design a new key generator (KG) depends on the LFSR unit and chaotic map. The designed KG can be used for many purposes, like cryptography and steganography. The suggested KG is called Efficient Stream KG which proves its efficiency when passes all the tests of the basic efficiency criteria (periodicity, linear complexity, correlation immunity, and randomness). In this work we suggest three different samples of output binary keys with different lengths, the tests results are arranged in many tables to describe the pass decisions for the designed KG.

Paper ID:276

Some Covering Properties via Generalizations of Semi-Open Sets

Ali j.Mahmood, A.I.Naser

Abstract. This study used the concept of grill to generalize a new type of compact space and study its properties, as well as the connection it has to previously specified concepts, This set will be a beginning point for investigating the numerous futures of this collection, as well as developing new sorts of functions like Lindeloff space and finding the relationship between them, as well as presenting many instances and features that belong to it.

Keyword: Grill, Ǥ^"*" "s-" ċ"ompact" , Ǥ^"*" "s-lindelòff" , Ǥ^* s- continuous function, . Strongly Ǥ^* s-continuous function, Ǥ^* s-irresolute function.

Paper ID:278

Application of Haar-Wavelet Method to Solve a System of Volterra Integrodifferential Equations

Harith Alhafody, Kais Ibraheem

Abstract. In this article, based on the Haar-wavelet method, a method for obtaining numerical solutions for solving a system of linear Volterra integrodifferential equations is developed. The proposed method proved to be completely acceptable and accurate in many tests.

Keyword: Haar-wavelet, integrodifferential equations, liner Volterra system.

Paper ID:279

Efficient Harris's Hawk Optimization Algorithm by Used the Quadratic Interpolation Search Method for Global Optimization Problems

Omar I. Khaleel, Nazar K. Hussein

Abstract. Harris's Hawk Optimization (HHO) algorithm, is a population-based optimization algorithm, which has good efficiency in solving optimization problems. However, HHO suffers from getting caught up in local optimizations and is almost slow convergence. To avoid these problems and because the Quadratic Interpolation (QI) method is considered one of the efficient local search algorithms, the Quadratic Interpolation Harris's Hawk Optimization (QIHHO) algorithm was proposed, in which (QI) is used in order to overcome the problem of falling into the local solution. On the other side, the exploit is modified by introducing a parameter that speeds up the effective convergence process. Which helps to improve the exploitation and accuracy of solutions. Furthermore, the algorithm attempts to achieve a balance between exploitation and exploration. QIHHO is compared to many standard algorithms on 23 classical standards mission. Experimental results show that QIHHO has good exploitation and efficient exploration compared with HHO and other population algorithms.

Keyword: Nature-inspired computing, Harris hawk's optimization algorithm, Quadratic Interpolation, optimization.

Paper ID:283

Positive definite property of Powell Symmetric Broyden update

Mohammed AbdAlamer, Saad Mahmood

Abstract. Within this paper, we propose to search for a Powel Symmetric Broyden (PSB) update modification in the newly modified Quasi Newton (H_(κ+1) y_κ=s_κ). With respect to the unconstrained optimization problem, note that the update in the original method does not preserve the positive definite property for the inverse of the Hessian matrix. If the initial matrix (H_k) has the property of a positive definite, then it is not necessary that the matrix (H_(k+1)) in the following iterations also possesses the property of the definite. In this proposed new method, guarantees of the positive property of the definite of the inverse Hessian matrix are achieved by performing a vector update y_κ, (i.e.). The difference between next minimizer and current minimizer, which must be differentiable and continuous twice. After that we confirmed the existence of the update. The numerical results are presented and then the proposed new method is compared with the original method in light of the standard problems.

Keyword: Powell symmetric Broyden, Quasi-Newton condition, Inverse Hessian matrix, Positive definite property.

Paper ID:285

Influences of Carbon Nanotubes on the Wear Behavior of Electroplating Cr–MWCNTs Composite Coating

Nawal Mohammed Dawood, Talib Abdulameer Jasim

Abstract. Hard chromium electroplating has been a popular practice for several decades. Carbon Nanotubes are the most prominent materials used during the past few decades. The use of carbon Nanotube has found a rapid spread due to its many characteristics. In this work, the hard chrome plating and multi-walled carbon nanotube (MWCNTs) were mated. Four percentages of MWCNTs were added to the chromium electroplating bath. These percentages are 0.5%, 1%, 1.5% and 2%. The coating bath consisted of 300 g/l of chromic oxide (CrO3), and 3 ml of concentrated sulfuric acid (H2SO4) was added as a catalyst. Also, use an electric current of 30 amps/dm² and a voltage of 6 volts. Several tests were performed for the purpose of characterizing the co-deposit layer. Microstructure test using a scanning

electron microscope (SEM), the composition of the coating layer evaluated using energy spectrometers, microhardness, and wear resistance testing carried out using Vickers microhardness and universal wear tester respectively. The results of the microscopic examination showed that the addition of MWCNTs to the coating path refined the microstructure of the co-deposit layer. The refining increased with the increase of MWCNTs percentage, and the best percentage was 2%. The results of the EDS show the presence of chromium and carbon in the coating layer. The hardness results indicated that the best hardness was when adding 2% carbon nanotube, where it was 1592 HV0.025. The wear rate improved by increasing the percentage of MWCNTs, and the best was in the sample containing 2%, where it was 2.4 x 10 -11 g/cm.

Keyword: Low carbon steel, hard chromium electroplating, Hard chromium- Carbon Nanotube composite electroplating, carbon Nanotube, wear resistance.

Paper ID:286

Employment Survival Analysis to Study The Factors Affecting Heart Attack Patients in Marjan Hospital/ Hilla

Zainab Abood Ahmed AL-Bairmani, Aasha Abdulkhleq Ismael

Abstract. The idea of this research is to use survival analysis methods to study the factors affecting the survival of heart attack patients, this type of data deals with time, as the data were taken from Marjan Hospital in the city of Hilla with a sample size of (98) patients. (10) Explanatory variables depending on the factors that have the main role in determining the severity of the disease. As for the response variable: it consists of two parts (survival time and statue). When comparing two methods of survival analysis, we obtained (3) significant variables when using the Cox regression model (Cox1), When using Kaplan and Meier (K-M) method, it was found that there are (7) significant variables. After that, we took only the significant variables that we obtained from using the (K-M) method to obtain another Cox regression (Cox2) model and we got the same significant variables that we obtained in the (Cox1) model in addition to a fourth variable (x1: Age), finally the coefficient of determination was calculated (R2) To find out which of the two models is better between them, the result was that the model (Cox1). Where (R2=72.8%) of the (Cox1) model was better than the (Cox2) model that was (R2=72.5%). Thus, we concluded that each of the variables (x8: Blood pressure, x9: Body mass, x10: Diabetic) has an effect on the survival of heart attack patients.

Paper ID:289

Design, Fabrication, and Performance Analysis of Microstrip Patch Antenna for Wi-Fi / WiMax

ApplicationsIlham H. Qaddoori, Dr.Raad H. Thaher, Israa Hazem Ali

Abstract. In this paper, a new design of Micro strip patch antenna is proposed, simulated and fabricated for Wi-Fi & Wi-Max applications. The antenna operates at (2.4 & 5.6) GHz, which is modified by inserting eight rectangular slots & one elliptical slot in the ground layer. Copper is used for the patch and ground layers, while FR-4 epoxy is used for the substrate layer, which has a Ɛr =4.3 and a loss tangent (tanδ) of 0.025. The antenna is (43.5x46x1.6) mm3 in size. The suggested antenna has a -58 dB reflection coefficient at 2.4 GHz and a -44 dB reflection coefficient at 5.6 GHz. Using a CST Studio Suite 2019 and Vector Network Analyzer (VNA), the suggested antenna is analyzed, simulated and tested. There is a decent level of agreement between simulation and practical results.

Paper ID:290

Preparation, The Spectroscopic and Biological Study of Some Derivatives of (β-lactam, Oxazepine, and Imidazole) linked to a Heterocyclic Nucleus

Mohamed Fadel Hassan, Muqdad Iraheem Kadhim

Abstract. This study was the preparation ion heterocyclic compounds of seven ring know Oxazepine compounds through the reaction of Schiff base compounds with cyclic anhydride (maleic anhydride). In addition, β –lactam, and imidazolidine were prepared in this study, Schiff bases compound synthesis by reaction between amino and different aldehyde compounds, and the prepared compounds were identified by infrared FT-IR, 1H-NMR, and 13C-NMR technique. The biological activity of the prepared compounds was studied and its effect on two bacteria (Escherichia coli) positive bacteria and (Staphylococcus aureus) negative bacteria, Penicillium mushrooms have also been studied for efficacy.

Keyword: β-lactam, Oxazepine, Schiff base, heterocyclic compounds, biological activity.

Paper ID:291

On Nano ıc-Open Set and Some of Its Application

Jamil Mahmoud Jamil, Wadhah Abdulelah Hussein

Abstract. The major scope of this study is to establish and research a specific type of open sets with nanostructures titled by Nano ıc-open set and determine the fundamental features of this set. and we specify the critical factors for the etiology of anemia.

Keyword: Nano ıc-open set, Nano ıc-closed set, Nano ı-open set, Nano topology, and Nano hyper connected space..

Paper ID:292

Multi-Objective Optimization in Electrical Discharge Machining of SiC and/ or B4C Reinforced Al7075 Using Grey Relational Analysis

Mohammed Shakir Nahi, Saad Hameed Al-Shafaie, Sundus Abbas Jasim

Abstract. A composite material is a material system that consists of a combination of two or more materials or phases of the same materials that are insoluble in each other. Their properties are often midway between those of the matrix material and those of the reinforcements. The current work study the machining behaviour of Al-7075 metal matrix composites (AMMCs) reinforced with (4.5 percent B4C and 4.5 percent SiC) produced by the stir casting process. The literature on the machining behavior of AMMCs was reviewed, and the influence of electrical discharge machine (EDM) process parameters such as voltage (V), current (I), pulse-on time, and pulse-off time on performance characteristics; Material Removal rate (MRR), Tool Wear Rate (TWR) and Surface Roughness (Ra) was investigated. The L18 orthogonal array design of experiments has been experimentally investigated, Grey relational analysis (GRA) based on the Taguchi technique will be used to determine the best machining conditions for (Al7075-4.5% B4C +4.5% SiC) samples. The GRA results confirm that the best combination of process parameter is obtained as V 140 volt, Ip 10 A, Ton 50 µs and Toff 25 µs. It has been found that the voltage is the more significantly affected than the rest of the input parameters to obtain a greater material removal rate (MRR) and lower electrode wear rate (EWR) and surface roughness (Ra) through

response table. The study revealed the multi-performance characteristic can be enhanced by selecting the proper process parameters.

Keyword: Hybrid Composites; Electrical Discharge Machining, Material Removal Rate, Electrode Wear Rate, surface roughness, Taguchi, Grey Relational Analysis.

Paper ID:293

ML-Based Methods for Detection of AD and MCI Using Blood Biomarkers

Hussam Daleel Shnawa Al-Kabi, Jamal Mustafa Al-Tuwaijari, Ali H. Husseen Al-nuaimi

Abstract. Alzheimer's disease (AD) is the most prevalent kind of neurodegenerative, and early detection remains a significant challenge in biomarker identification. Neuroimaging technologies are costly and may not be generally available, while cerebrospinal fluid testing is invasive. Blood-based biomarkers have the potential to be developed into a low-cost, time-efficient tool for detecting AD early and facilitating access to suitable care pathways. The goal of this study is to identify the number optimal of biomarkers in the blood in terms of the number of biomarkers, sensitivity, and specificity, which can be utilized to diagnose AD, and MCI. On the ADNI database, we used machine learning-based approaches to find a limited number of biomarkers in the blood for AD, and MCI. We determined a panel of 5 biomarkers (BTC, Calcitonin, EOT3, HBEGF, and PAPP A), which when combined with MMSE and age as two covariates, was able to distinguish between AD, MCI, and normal subjects at a sensitivity, specificity, AUC, and accuracy of 94%, 98%, 99%, and 94% respectively.

Paper ID:296

Characterizations of Several Soft Covering Properties

Mohammed Shanan Imran

Abstract. The motivation of this paper is to define new soft topological space namely soft star compact space and monotonically soft star compact space which lead us, firstly, to generalize existing comparable properties via soft compact topology and types of soft topologies such as soft locally compact, soft Lindelof and soft paracompact. Secondly, to obtain a relationship between them. In redefined soft topological spaces discussed some of their properties, we extent the soft compact topological spaces to

soft star compact topological spaces under certain conditions, and discuss their basic properties as well as examples.

Keyword: soft set, soft topological spaces, soft compact, soft locally compact, soft paracompact compact and soft star compact..

Paper ID:298

Flexible Broadband Photodetector Based on Tin Sulfide (SnS) Nanostructured Thin Film

Baha'a A.M. Al-Hilli, Mohamed S. Mahdi, Husam S. Al-Arab, Naser M. Ahmed, K. Ibrahim

Abstract. Significant interest has been gained during the last decade in the market for flexible optoelectronic technologies for wearable applications. Moreover, broad spectral response photodetectors are also needed for industrial applications such as chemical / biological sensing, image, large spectral switches and environmental monitoring. In this research, a novel high-performance and low-cost SnS film-based photodetector was constructed onto a flexible substrate polyethylene terephthalate (PET). The SnS nanostructured thin film was deposited using a chemical bath deposition (CBD) method. The photodetector exhibited a high sensitivity to a wide range of spectral response (UV-Vis-NIR); the sensitivity values of the device for wavelengths of 380, 530, 750 and 850 nm were found to be 107, 88, 174 and 216, respectively. Furthermore, the photoresponse properties were studied by illumination (850 nm) at various bias voltages and power densities of light. Under 850 nm illumination, the photodetector demonstrated a fast response time; the rise time and decay time were 0.17 and 0.052 sec, respectively. The present SnS photodetector is a promising device that is competitive in the UV-Vis-NIR regions, as well as its non-toxic character and low cost.

Paper ID:175

On Some Results of Lie Groupoid

Taghreed Hur Majeed

Abstract. The goal of this work is to introduce concepts of groupoid, differential groupoid, locally trivial groupoid and Lie groupoid. We study principal fiber bundle of groupoid and Lie groupoid. We obtain new proposition of them.

Keyword: Groupoid, Lie groupoid, fiber product, principal fiber bundle.

Paper ID:299

Spectroscopic diagnosis of calcium plasma generated by Nd: YAG laser.

Husham T. Lateef, Ahmed k. Abbas, Kadhim A. Aadim

Abstract. The specification of the Nd-YAG laser with a fundamental frequency is presented (Q key of length) in this study. For the ablation of calcium samples in the air and the creation of calcium plasma at atmospheric pressure, several laser energies ranging from 300 to 600 mJ were utilised (at 1064 nm wavelength, 100 Hz repetition rate, and 9 nm pulse duration). The calcium plasma emission lines were detected experimentally, and the data was utilised to determine plasma variables such as for example, the temperature of the plasma (electron temperature, electron density, Debye length and plasma frequency). The temperature of a laser-induced plasma, which is one of its most essential characteristics, was measured using the Boltzmann plots technique, whilst the electron density was obtained using the Stark broadening method, which is another key feature.

Keyword: Optical Fiber Cable (OFC), Laser Induced Breakdown Spectroscopy (LIBS),Optica Emission Spectroscopic(OES),Calcium(Ca).

Paper ID:301

Review of using ceramic coatings to increase the performance of solar collectors with air brush spray method on aluminium substrate

Ahmed Z. Hasheem, Elham A. majeed, Hayder K. Rashid

Abstract. The goal of this study determine the materials that can be used as conductive and insulator coating materials and coating process to increase performance solar flat plate collector. The solar flat plate collector consists of a transparent cover, absorber plate, heat exchanger tube, and frame. The

absorber plate, the part absorbs solar radiation that be used for heating the water flowing in the heat exchanger and water tank. To increase performance, the solar collector must increase the absorptivity and thermal conductivity of the plate absorber from the side that receives the sun's radiation and increase the insulation on the other side of the plate. The use of ceramic materials in coatings improves thermal conductivity and insulation. The materials that are used to increase thermal conductivity are: graphene, graphite, carbon nanotube, diamond, aluminum nitride, boron nitride. The carbon family have thermal conductivity higher from other coating materials. The graphene consider higher thermal conductivity coating material can be used. The ceramic materials have thermal insulation higher from other insulation coating materials. The yttria stabilized zirconia (YSZ) and Lanthanum Zerconate consider higher thermal insulation. The materials used to develop collector performance can be mixed with polymer material to increase the homogeneity and adhesion of the coating mixture without affecting coating specifications. The tests that work on coating materials are: X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM), Atomic force microscopy (AFM), Fourier transmittance infrared spectrophotometer (FTIR), Thermal conductivity, Adhesion strength, Coating thickness, Ultraviolent (U.V), Porosity, Density, Thermal analysis.

Keyword: Thermal insulating, thermal conductivity, flat plate collector, Aluminum, spray air brush.

Paper ID:304

Detection of P53 Suppressor Gene Mutation in Women With Breast Cancer In Mosul City

Mohamed A. Hameed, Owayes M. Hamed

Abstract. The p53 protein engages in numerous biological processes, including Cell development and DNA repairing. Genetic variants of TP53 gene have associated to the development of tumors worldwide. There are more than 200 genetic polymorphisms (SNPs) have been identified, however a well instance at codon 72, Pro72Arg (rs1042522), produced conflicting outcomes in terms of tumor hazard. The goal of this research should be to determine whether the nucleotide sequence variant (SNP) Pro72Arg (rs1042522) in the TP53 gene is linked to an increased hazard of breast carcinoma in women.Method This research contained (95) samples taken from women with an age average (35-45) which separated into (74) samples from women with breast cancer and (21) samples from women in the same age group who did not have breast cancer. The researchers use a method to extract DNA from the blood of all the samples included in the study, the genotyping test include Detection of (rs1042522) Polymorphism by ARMS-PCR and Detection of Exon 7 (codon 249) Polymorphism by RFLP-PCR. Result, The result of this study showed there is a correlation between Breast cancer in women and mutation of P53 gene in

location rs1042522, On the other hand the result showed for observation of allele, the wild allele C existence 80% in healthy women and 58% in patients, and mutant allele G existence 20% in healthy women and 42% in patients, and the odd ratio for allele is 3.0640 like that considered a risk factor for disease. Also, the result of the study showed there is a relationship between Breast cancer in woman and mutation of P53 gene in location codon 249, On the other hand the result showed for observation of allele, the wild allele G existence 78% in healthy women and 39% in patients, and mutant allele C existence 22 % in healthy women and 61% in patients, and the odd ration for allele be 14.422 like that considered a risk factor for disease..

Keyword: P53 gene, ARMS-PCR, RFLP-PCR, Polymorphism and Breast carcinoma.

Paper ID:305

Pb-free metal Halide Double perovskite, Cs2SbAgX6, X = I or Cl, with TiO2 Nano-Particles in solar cell applications

Aqel Mashot Jafar, Kawther A. Khalaph, Amar Moula Hmood, Nisreen Kh. Abdalameera

Abstract. The instability and toxicity of Pb-perovskite composites in the applications of solar cells are still the demands that are required to be resolved in competition to find alternatives without the composites of lead. This report presents the empirical synthesis of a new family of double perovskite inorganic halide free of lead as Cesium Antimony Silver Chloride, (Cs2SbAgCl6) and Cesium Antimony Silver Iodide (Cs2SbAgI6) as an essential sensor or absorption layer for the perovskite solar cells (PSCs). The structural and optical properties of these materials were studied, and their performance was verified in a photovoltaic (PV) device. These materials were successfully prepared and deposited as thin films to prepare PSCs. The structural investigations of the prepared materials were performed by X-ray diffraction, (XRD), tests, and the optical properties were studied via UV-Vis spectroscopy of the prepared materials. The indirect energy gap of (Cs2SbAgCl6) and (Cs2SbAgI6) were estimated (1.65 and 1.15 eV), respectively. The optimize performance of PV device is found by using Cs2SbAgI6 as the absorption layer, the power conversion efficiency was (PCE=16.17%), the fill factor was (FF = 40.2%), the short circuit current was (Ish = 6.701 m A), and the open circuit voltage was (Voc= 600.7 m V). The measurements were performed under the simulator sunlight with an illumination intensity of (100 W/m2).

Keyword: Pb-free perovskite, Double perovskite, Cs2SbAgX6, Optical properties, Structural properties, Solar Cell.

Paper ID:307

Differential Transform with Finite Difference Method to Solve the Coupled Burger's Equation

Nazik J. Ahmed, Abdulghafor M. Al-Rozbayani

Abstract. In this study, Burger's equation performs as a key role clarifying briefly to anticipate the behavior of nonlinear systems utilizing a mixed procedure two extremely effective strategies, Specifically, the finite difference and differential transform approaches. Our goal with this approach is to try to combine the possibilities of the differential transform method (DTM) with the reliability of finite difference method (FDM).The results were compared to the system's exact solution. We noticed that the outcomes are extremely precise, and the method's efficacy has been shown.

Keyword: Differential Transform Method, Finite Differences Method, Coupled Burger's Equation.

Paper ID:309

New supra open sets with ideal in supra topological space

Ghufran H. Auda, Hula M. Salih

Abstract We introduce some weak types of open sets with ideals in supra.topological space and give the relationship between them. Also, some examples are included to illustrate the main results.

Paper ID:311

Assessment of Turbulence Models by Using a Mixing Ventilation System with Partitioned Office Room to Predict Temp Distribution and Thermal Comfort

Sherin S Jasim, Alaa A Mahdi

Abstract. Many types of turbulence models were examined in this article in an office room separated into two zones, as well as the influence of the partition on selecting the closest turbulence model for a good prediction of air movement and temp distribution around the occupied zone. A numerical study of four turbulence models with a mixing ventilation system utilized to ventilate a room divided into two parts by a partition; the dimensions of the room are (3× 2.5× 2.5) m, where the influence of choosing the type of turbulence model on the temperatures distribution and contaminants as well as the air movement inside the room was studied, where the AIRPAK3.0.16 was utilized with turbulence model (Zero equation, Indoor zero equation, Two equation, RNG, and Spalart-Allmaras). The study concluded thatthe (RNG) turbulence model gives a minimum average error (4.57% at air temp distribution), The (RNG) turbulence model is more accurate than other turbulence models for isothermal tested rooms under mixing ventilation systems with internal partition..

Keyword: Thermal comfort, Airpak3.0.16), Computational fluid-dynamics, Mixing ventilation, Indoor air quality, internal partition. .

Paper ID:313

Solving second-order Systems of Ordinary Differential Equations Using Genetic Algorithm Based on Padé Approximant

Rehem H.S. Alazzawi, Azzam S.Y. Aladool

Abstract. A numerical algorithm of combination of genetic algorithm with Padé Approximant is applied to solve a class of linear and nonlinear second-order systems of ordinary differential equations. In this method, the system is converted into an optimization problem by minimization of the overall value of fitness function. The fitness function is computed by the sum of the value of discrete lest square weighted function and the value of a penalty function. In this paper, the applicability, and accuracy of the use of genetic algorithm based on Padé Approximant for solving linear and non-linear second order systems of differential equations are investigated. additionally, the convergence analysis is also discussed. The outcomes show the ability of Genetic algorithm based on Padé approximant of solving linear and nonlinear second-order Systems of Ordinary Differential Equations.

Paper ID:314

MicroRNA-122 as a Biomarker Associated with Inflammation in Patients Suffering from Metabolic Diseases

Ruqaya S. Reda, Nawal Khinteel Jabbar

Abstract. The study's purpose was to investigate the effect of the expression pattern of microRNA-122 (miRNA-122) in patients with diabetes, hypertension, and patients who have diabetes and hypertension together compared to healthy control subjects, compared each other, and study its effect on stimulating inflammatory factors related to a metabolic disorder of these diseases. Blood samples were obtained from thirty patients with type 2 diabetes mellitus (T2DM), thirty patients with hypertension (HTN), thirty patients with T2DM+HTN, and thirty healthy people as control groups. Lipid profiles were determined by using an ARCHITECT c4000 clinical chemistry analyzer. Whole blood hemoglobinA1c and serum C-reactive protein (C-RP) levels were measured by the sandwich immunodetection method. Serum tumor necrosis factor-alpha (TNF-α) level was measured by enzyme-linked immunosorbent assay (ELISA). The expression of serum miRNA-122 was screened using the quantitative polymerase chain reaction (qPCR). The results revealed a substantial rise in TNF-α levels in each patient group when compared to the control group ($p<0.05$), indicating that there is no meaningful difference between the two groups. CRP levels are significantly higher in the T2DM and T2DM+HTN groups than in the control and HTN groups ($p<0.05$). When comparing patient groups to control groups, miRNA-122 gene expression was substantially higher in the patients ($p<0.05$). According to the data, miRNA-122 expression is implicated in the etiology of metabolic illnesses such as T2DM and HTN, or in people who have both. Increased expression of miRNA-122 stimulates inflammation in individuals with metabolic disorders, especially those with T2DM.

Keyword: Metabolic Syndrome, Inflammation, miRNA, Diabetes Mellitus, Hypertension.

Paper ID:315

Study of microstructure evolution and hardness properties of stainless steel/medium carbon steel dissimilar spot-welded joint

Muhaed Alali, Maysaa G. Alnaffakh

Abstract. In this research, 316L austenitic stainless steel (ASS) and medium carbon steel (MCS) were joined together by resistance spot welding. ERNiCr-3 filler wire in a form of foil was utilized as an interlayer. The microstructure evolution in the heat affected zone (HAZ) and fusion zone (FZ) was

investigated. The impact of the welding process on the microhardness was examined. The results showed that the HAZ underwent a martensitic transformation near the fusion boundary. The FZ consisted of austenitic solidified microstructure with columnar dendritic solidification mode in as-welded joint, and cellular mode with the application of foil. The average microhardness values recorded in the base metal were 200 HV in the MCS and 220 HV in ASS. In the HAZ, the hardness increased to 400 HV due to the effect of martensite formation. While on the ASS side, the hardness remained at the same level. The big impact of the dissimilar welding on the microhardness was recorded in the FZ. The hardness raised to 680 HV in the as-welded joints and reduced to 530 HV when the foil was applied.

Keyword: Resistance Spot welding, Austenitic Stainless Steel, Medium carbon steel, Microhardness, Dissimilar welding.

Paper ID:317

Impact of Work in Gas Station on Some Hematological and Immunological Parameters

Zaid M. A. Al-Khanaji, Afyaa S. Al-hamdany

Abstract. Gas stations workers are more exposed to several pollutants factors, like vehicle exhaust, particulate matter (PM2.5), and violate organic carbon (VOCs) products containing benzene and toluene with a lot of saturated and unsaturated hydrocarbon have toxic effects on various body systems during occupational and environmental exposure. the impact of the immune and hematopoietic and respiratory systems, this study seeks to determine the effects of these pollutants exposure on blood parameters of workers at Gas stations in AL-Furat al-awsat consisting of 120 people participated in this study. included 60 workers have been exposed to pollutants of the Gas station and 60 healthy people as a comparison with those exposed. The purpose of this research was to investigate the effect of vapor emitted directly from filling stations mainly containing BTEX (Benzene, toluene ethylbenzene, and xylene) with a lot of saturated and unsaturated hydrocarbon on Immune and inflammatory markers, along with its effect on hematological parameters and peak flow rate of workers compared with controls. Conclusion. workers in Gas stations with more than 3 years of service are more vulnerable to changes in hematology and inflammatory as a result of inhalation of volatile organic carbon (VOCs), vehicle exhaust, and Particles matter (PM2.5), which affect the hematopoietic system and also increase level of IL-1α , IL-1β,and IL-6 among workers.

Keyword: Gas Station Workers, Cytokines, Hematological Parameters, Pulmonary Functions.

Paper ID:320

A comparative Study for Improving Indoor Air Quality Between Two Types of Supply Air Diffusers at Different Occupants Density

Atheer Hamza Saber, Alaa Abbas Mahdi, Mohammed Wahhab Aljibory

Abstract. The need of a clean indoor environment has received a lot of attention in recent years as a result of the rise of diseases and viruses around the world, and acceptable indoor air quality and maximum thermal comfort are particularly essential markers of passenger comfort. This research focuses on resolving indoor air quality (IAQ) issues in office environments, as well as analysing the principle of the influence of occupant density under mixing ventilation on office room thermal comfort. Two office rooms were simulated under a mixing ventilation system using the program ANSYS 15.0 (ICEPAK). The relative humidity, air temperature distribution, carbon dioxide concentration (CO2) and thermal efficiency were numerically estimated for each room and a comparison was made between the two rooms to show the effect of the diffuser type on the comfort of the occupants. Three tests were conducted for each room, depending on the number of persons in the room (3,4,6 persons). The air supply temperature and flow rate of the two rooms differ according to the heat acquired from the external environment, where the air temperature and flow rate (19.8 oC)and (0.45 m3/s), respectively, were recorded in the office room (under- linear slot diffuser), while in the office room (under- round ceiling diffuser) were the air supply temperature and flow rate (16 oC) and (0.1766 m3/s) ,respectively. The results of the tests found that the indicators of thermal comfort (ADPI), (PPD), (PMV) improves with reducing the number of person in the room. When comparing the two rooms, the results show that the office room (under- round ceiling diffuser) gives better indicators of thermal comfort than the office room (under- linear slot diffuser). In the present office area, the air distribution efficiency of the (MV) system using round ceiling diffuser was an average of (10%) greater than a similar system utilizing linear slot diffuser; this disparity reduces by around (2%) with each increase in the number of persons.

Keyword: Thermal comfort, ANSYS 15.0 ICEPAK, Computational fluid dynamics (CFD), Indoor air quality(IAQ), Mixing ventilation (MV), occupied density.

Paper ID:322

Studying the Possibility of Using 2D Electrical Resistivity Imaging (ERI) to Detect the Concrete Cracks

Mervat Ayad Al-Obaidi, Alaa Ezet Hassen

Abstract. Cracks in concrete or cement-based materials represent a significant danger to building structures; they are extremely dangerous and have resulted in a considerable deal of damage and loss. Even seemingly minor cracks can expand and finally lead to major structural failure. In this study, Non-Destructive Testing (NDT), 2D electrical imaging techniques allow for the assessment of concrete structural conditions. The testing methodologies proposed in this research are based on a study of the electrical resistivity measurement's ability to detect and locate cracks and spalling in damaged concrete using measurements. An experimental research was carried out on a concrete sample with two artificial defects and cracks of varying lengths and widths. The first crack with length (30 cm) and width (0.5 cm), while the second crack with a length of (1) m and width of (3.5) cm, Direct Current (DC) is injected into the ground. The data is Analysis using the RES2DINV powerful software packages for inversion of 2D based on the inverse theory and the distribution of the real resistivity values in the Wenner and Dipole-Dipole arrangement. The results show that the 2D electrical resistivity imaging survey using the Wenner arrangement based on the 2D inversion technique is a more effective tool than the Dipole arrangement for assessment, detection, and delineation of the existing concrete cracks structures.

Keyword: 2D Resistivity Imaging, concrete Cracks, Non-destructive methods, Wenner array.

Paper ID:324

Developed OTP (One-time pad) Key Generation Method Based Multi- Self Generation

Sahar Adill Kadum, Shaimaa Mehdi kadum

Abstract. His work aims to develop a method for generating OTP encryption keys using a series of multiple self-key generation to overcome OTP, This method is based on randomly generating a secret parameter (r) as a step to generate a series of multiple images of encrypted keys fixed with values of 2r for each character. The encrypted message is generated from a binary representation of each character in the message and one of the string keys chosen randomly according to the function intended for that purpose. This set is framed by XOR ed process and 2r value added. This method is facilitated by: the production of a chain of 2r sticky keys of varying lengths (l * r), the management of keys from the point

of view (generation and distribution) depends on r and the length of the key chain and the production of 2r cipher messages for the same message. The results prove that the proposed method has good management keys and that each key is used only once of length => message length, original, and more secure compared to traditional OTP key. The program used in this study is in Visul Basic..

Paper ID:331

Design of Einzel Electrostatic lenses using Schiske's model

Ahmad K. Ahmad, Firas A. Abdularhman

Abstract The present work is concerned with computer design within the field the optics of charged particles. This investigation is involved designing an electrostatic Einzel lens using Schinke's model under certain magnification conditions (zero magnification). An analytical function named by Schiske's model has been used to represent the potential field distribution for the electrostatic lens (Einzel lens). By solving the paraxial ray equation using the 4th order Runge-Kutta method the charged particle beam trajectory and its derivatives traversing the lens has been found. The einzel lens axial potential distributions and its 1st and 2nd derivatives and the beam trajectory and it's 1st and 2nd derivatives are calculated from solving the paraxial ray equation and all used to determine the optical properties of the proposed electrostatic lens like magnification, focal properties and aberrations (spherical and chromatic).

Paper ID:333

A Variable Cant Angle and Winglet Span Analysis to Optimize Winglet Performance

Ali J. Al-Khafaji, G. S. Panatov, A. S. Boldyrev

Abstract. Winglet considers one of the most effective ways to reduce wingtip vortices, and since winglet is discovered, much research has been made to improve its work. Different parameters can be enhanced to optimize the winglet work. So, in this paper, we analyze the aerodynamics characteristics of the wing with winglets at different Cant angles and winglet span values to improve the winglet performance. Four different cant angles were studies, and three different winglet spans of a semi-span wing were considered. All the models were tested for four Angle of attack values. Then, we calculated the values

of L/D to decide which model has the highest value of the lift and the lowest value of drag. All wing models (fifty-two models) are modeled in 3D using SOLIDWORKS software based on Boeing 737 wing dimensions, and then all the models are analyzed utilizing ANSYS FLUENT. The results show that the Cant angle and winglet span of the winglet by changing their selection can improve the aerodynamic performance for different AOA. The best L/D ratio value was determined with a Cant angle 60o, winglet span 20%, and AOA 5o.

Keyword: lift, drag, lift and drag coefficient, aircraft wing, winglet, Angle of attack, Cant Angle, SOLIDWORKS, CFD, ANSYS FLUENT.

Paper ID:334

Investigation of Mechanical Properties of Similar Welding Process of T91 Using Different Filler Materials

Sarah Mohammed Kamil, Jamal Jalal Dawood, Layth Al-Gebory

Abstract. This research investigates the mechanical characteristics and fracture location associated with a similar welding process of T91 using Gas Tungsten Arc Welding (GTAW). Two different filler materials configurations are used, including (ER90S-B9) and (ERNiCr-3). Experimental work was carried out to validate the mechanical properties at a higher temperature (550 °C), and mechanical tensile strength was evaluated. Microstructures of welding joint and heat affected zone are identified via scanning electron microscope (SEM) images. A set of thermal treatment processes were applied, such as pre-welding heat treatment at 200 °C, the inter-pass temperature of 300 °C, and post-welding thermal treatment at 740 °C for 15 minutes. The major work findings revealed that the ultimate strength corresponding to the welding using the filler material ER90S-B9 was 547 MPa, related to an elongation of 17%. While the ultimate strength of the welding was 521 MPa, corresponding to an elongation of 13% and cross-section of 58.86 mm2. Furthermore, findings indicated that the hardness values associated with ER90S-B9 welding range between 252 and 298 HV. While the hardness of welding using the filler material ERNiCr-3 ranges between 204 and 321 HV. Additionally, it was found that although (ERNiCr-3) is more expensive than (ER90S-B9), the latter filler material provided better welding performance, including higher hardness, ductility, and toughness than (ERNiCr-3). Also, the welding process resulted in the precipitation of Cr, Mo, and Fe, which formulated M23C6. Besides, using (ERNiCr-3) helped austenite form at the welded joint resulting in a reduction of welding joint hardness. Besides, results affirmed that the fracture location took place at the base metal when the ER90S-B9 was used. While the fracture location using the filler material ERNiCr-3 occurred at the weld metal.

Keyword: boiler steam pipes; similar welding; filler material; mechanical properties.

Paper ID:337

Fabrication of GLAD Metallic Nanorods on Patterned Substrates

Wisam J. Khudhayer

Abstract. In this study, the glancing angle deposition (GLAD) and modified nanosphere lithography (m-NSL) techniques are utilized to fabricate well-organized and –separated nanorods by depositing the GLAD nanorods on patterned substrates that pre-prepared by m-NSL technique. The source materials (targets) are chosen to be Chromium (Cr), Copper (Cu), Molybdenum (Mo) since they are low in cost and available in the laboratory. Compared to the nanorods grown by GLAD technique on flat substrates, the nanorods fabricated by GLAD and m-NSL techniques show amazing periodicity and better separation, however, they are shorter in length and larger in diameter. Finally, the replication of the underlying patterned substrates results in a flower-like or honeycomb-like structure of the well-ordered and –separated nanorods.

Paper ID:339

Properties of Truncated Inverse Weibull Exponential Distribution with Application to lifetime data

Amany F. Khubbaz, Mundher A. Khaleel

Abstract. With three parameters a new distribution has been introduced this paper named [0, 1] Truncated Inverse Weibull exponential distribution ([0, 1] TIWE). The properties of [0, 1] TIWE were established like pdf expansion, quantile function, moments, MGF, and entropy. The distribution parameters were estimated by using (MLE) maximum likelihood method. We analyze one real data set, and it represents 59-day COVID-19 mortality rates in Italy from 27 /2/2020 to 27 /4/ 2020 to show the versatility of the proposed distribution for modelling lifetime data

Keyword: Exponential, [0, 1] Truncated, MLE, Moments, Inverse Weibull.

Paper ID:340

The properties and Application of a new extension Exponentiated exponential distribution

Mahdi A. Abdul Latif, Mundher A. Khaleel

Abstract. The modeling of lifetime data has been an important study issue in the last years. Several papers have been published on this topic, with the goal of introducing new statistical approaches for dealing with lifespan phenomena. We use the family [0,1] Truncated Inverse Weibull-G to extend the Exponentaited Exponential distribution in this paper. The result is a [0,1] Truncated Invers Weibull Exponentaited Exponential distribution. TIWEE. We give precise formulations for properties such as the hazard function, quantile function, moments, MGF, reliability function, and order statistics. This is the section for you. The failure times of 50 components (per 1000 hours) are represented in the data set, demonstrating the flexibility in modeling real-life data.

Keyword: Exponentiated exponential distribution, Inverse Weibull, Order Statistics, MLE, [0, 1] Truncated.

Paper ID:341

Transformed Semicircular Generalized Gompertz Distribution

N A Oleiwi, S H Abid, N H Al-Noor

Abstract. In this paper, through applying the transformation of the inverse stereographic projection, a new four parameters transformed Semicircular Generalized Gompertz (SGGo) distribution is constructed. The cumulative distribution function, unexpanded and expanded formulas of the probability density function, reliability measures, moments, trigonometric moments, characteristic function, simulated data, quantile function, reliability stress strength model, Shannon and relative entropies are obtained. Furthermore, the maximum likelihood estimation method is implemented to estimate the unknown four parameters. A simulation study is conducted to detect empirically the performances of the maximum likelihood estimates of the SGGo parameters within different default values of the parameters and different samples size. The results provide grounds for optimism about the distribution's stability and flexibility in practical applications.

Keyword: Circular distributions, Semicircular distributions, Generalized Gompertz distribution, Statistical properties, Stress strength, Entropies.

Paper ID:342

Enhancement the self-cleaning and hardness property of brick surfaces by bauxite modified nano-TiO2 composite coatings using spin coating technique

Samir H Awad, Fatima Shaker

Abstract. Many studies on the self-cleaning property have recently been conducted since it is considered among the most motivating issues in bio mimicry because to its possible uses in energy conversion, biomedical, and environmental protection. The spin coating technique was used to coat brick surfaces with TiO2 nano-particles based polymer composite coatings modified with Iraqi natural bauxite particles to self-cleaning, tribological, anti-wear and environmental reasons in this study. Polystyrene was used to make the matrix solutions. The particles were characterized using the x-ray diffraction XRD and particle size analysis PSA . AFM and SEM techniques ,hardness, roughness, as well as contact angle measuring CA, were used to characterize the coatings. Results show that CA enhanced with raising PS amount and additions of nano-TiO2 and bauxite. The composite coatings exhibit a dense topography with increased roughness as the amount of bauxite added increases, as well as a porous morphology with clear dispersion of TiO2 nano-particles and bigger bauxite modification particles. It was also determined that the[(20wt%)PS- (6wt%)TiO2-(9wt%)Bauxite] coatings may have a promising effect in converting superhydrophilic surfaces to hydrophobic surfaces with a larger contact angle of 106.766o and improved hardness (484.4 Hv). Future study in surface engineering of brick surface utilizing bauxite powder to self-cleaning ,anti-wear ,weather erosion and structural applications will be encouraged by these findings.

Keyword: TiO2 nano-particles, Bauxite, Spin coating, Bricks, Hydrophobic, hardness ,self-cleaning, anti-erosion.

Paper ID:347

A New Conjugacy Coefficient of Nonlinear Conjugate Gradient Method for Minimization

Saja O. Mohammad T., Eman T. Hamed

Abstract. In this study, Burger's equation performs as a key role clarifying briefly to anticipate the behavior of nonlinear systems utilizing a mixed procedure two extremely effective strategies, Specifically, the finite difference and differential transform approaches. Our goal with this approach is to try to combine the possibilities of the differential transform method (DTM) with the reliability of finite difference method (FDM).The results were compared to the system's exact solution. We noticed that the outcomes are extremely precise, and the method's efficacy has been shown.

Keyword: Differential Transform Method, Finite Differences Method, Coupled Burger's Equation.

Paper ID:352

Investigates The Effect of MgO, h-BN, and Hybrid Nano Fillers on The Thermal, Electrical Properties And Hardness of an Epoxy Polymer

Anwar Qasim Saeed, Zoalfokkar Kareem Mezaal Al-obad

Abstract. The major purpose of this study is to enhance the thermal conductivityof a pure epoxy polymer by adding magnisium oxide, boron nitride and (1:1MgO/BN) hybrid without negatively affecting the electrical insulation and mechanical properties. The nanoparticle-filled epoxy nanocomposites were prepared using the solution mixing method with (1%,3%,5%,7%) wt%. The characteristics of the polymer nanocomposites were investigated using (DSC, SEM, ShorD hardness, thermal and electrical measurements). DSC results show that glass transition temperature (Tg) increases with increasing nanoparticale content. A significant improvement in thermal conductivity and hardness are obtained without reducing electrical properties when nanofillers were added into the epoxy polymer. The addition of 7wt% nanopartical NP improves the thermal conductivity and electrical resistivity. This can be concluded that the incorporation of hybrid NP increased the properties, as well as the hardness. It is also demonstrated that hybrid NP is capable to provide effective toughening mechanisms in epoxy resin as indicated by the SEM micrographs where the MgO NP with corse shape but BN with finner shap. Nanofillers can greatly increase the thermal characteristics of epoxy composites as well as their insulating ability at high temperatures, according to the findings.

Keyword: Epoxy resin, (h-BN, MgO, 1:1 MgO/BN hybrid nanocomposites), electrical resistivety, thermal conductivity (TC).

Paper ID:355

Synthesis And Characterization Of Some New Derivatives BasedOn4,4'-(1,3,4-oxadiazole-2,5-diyl)DiAniline

Shetha F. Al- Zubiady,SaharT.Adday, Enaam Fadil Mousa, Iftikhar Ahmed Hussein, Maryam M.Sahib

Abstract. This paper includes preparation of [M1]compound from the reaction of the starting material(4,4'-(1,3,4-oxadiazole-2,5-diyl)di anilinewith4-amino benzoic acid andhydrazine hydrate.the reaction of [M1] compound with Chloroacetyl chloride gives [M2]compound then a variety of new of phenolic schiff bases derivatives have been synthesized starting from [M3,M4] , then prepared on methylolic and etheric schiff base [M5-M10] which fused epoxy ring obtained [M11,M12] , then reacted with morpholine due to [M13, M14] . Finally, all prepared compounds were investigated by FT-IR, 1HNMR spectra and Elemental analysis.Also, the biological activity for these compounds were studied.

Paper ID:356

Performance of Liu-type estimator in gamma regression model

Dler Abduljabber Abdulqader, Zakariya Yahya Algamal

Abstract. The ridge regression model has been shown to be an effective shrinking strategy for reducing the impacts of multicollinearity on a number of occasions. When the response variable is positively skewed, the gamma regression model (GR) is a popular model to use. Multicollinearity, on the other hand, is known to reduce the variance of the maximum likelihood estimator of gamma regression coefficients. A novel estimator is proposed in this paper by presenting a generalization of the Liu-type estimator using gamma regression (NGLTE). The performance of NGLTE is fully depending on the shrinkage parameter, k. In this paper, three selection methods of the shrinkage parameter are explored and investigated. In addition, their predictive performances are considered. Our Monte Carlo simulation and real application results suggest that some estimators can bring significant improvement relative to others, in terms of mean squared error.

Keyword: Multicollinearity; ridge estimator; gamma regression model; Liu-type estimator; Monte Carlo simulation.

Paper ID:359

The Effect of Welding Fume Exposure Period on Certain Blood Parameters in White Albino Rats

Mohammed J. Al-Haidarey, Suhad Aziz Al-Gurabi

Abstract. The aim of this study was to test whether exposure to welding fume by inhalation of the electrical welding fume processes would affects some hematological parameters. To investigate the goals of this study, hematology coulter counter to analyze whole blood sample of rats after exposure to welding fumes was used. Twenty females of Albino rats were subdivided to five groups (5 rats were control, 5 rats exposure for 10 days, 5 rats exposure for 20 days, and 5 rats exposure for 30 days). Welding fume inhalation box was created for this purpose. During this study, the results showed significant decrease in hemoglobin (Hb) concentration, and RBCs count; while the WBCs, and platelets counts (PlT) were increased significantly. This study conclude that inhalation of welding fume for a long time influence the progression of anemia and inflammation suggesting that welding fume profoundly affects whole blood profiles.

Keyword: welding fume, RBCs, WBCs, Platelets, Hb.

Paper ID:360

SENTIMENT ANALYSIS SYSTEM USING CONVENTIONAL NEURAL NETWORK IN SOCIAL MEDIA

Hayder Mahmood Waseen, Narjis Mezaal Shati

Abstract. Sentiment analysis systems on social media platforms such as Twitter has become an extremely significant and difficult topic. In the proposed system, the convolution neural network CNN has been employed to classify operations, CNN is one of the fast, accurate, reliable, and efficient networks among other classification networks. This paper used one dataset which are: the Stanford Twitter Sentiment Test "STSTd". The proposed SACNN model consists of main steps such as: "preprocessing, feature extraction, and classification" steps. There are four steps in preprocessing operation which is: Tokenization, Stopword Removal, Stemming, and Transformation. Following

preprocessing, characteristics from a text document are extracted through the use of frequency and "inverse document frequency (TF-IDF)" to feed forward to the proposed SACNN classifier. The proposed SACNN was created to classify the text as “positive” or “negative”, the structure of the proposed CNN consists of 18 layers which are divided into one input layer, eight convolution layers, seven pooling layers, one Flatten layer and finally Dense Layer. CNN layers have been created with multi parameters; this structure made CNN more efficient in the classification process. The proposed CNN classifier has been achieving a higher accuracy metric rate of 96.53 in the classification process by testing STSTd. while the metrics have been scored as precision is 92.88%, recall is 97.45%, and F1-score is 98.88%.

Keyword: Sentiment Analysis, Machine Learning, Social Media, CNN.

Paper ID:366

Fabrication and Characterization of Cadmium Sulfide Nanoparticles Using Chemical Precipitation Method

Zainab T. Turki, Aula M. Al Hindawi, Nagham M. Shiltagh

Abstract. CdS nanoparticles were prepared successfully using chemical precipitation technique. CdCl2 and Na2S were utilized as precursors for Cd ions and sulfide ions in aqueous media, respectively. The effect of reaction temperature, reaction time and PH values on the growth process of CdS particles were investigated realizing that 30 oC. 6 hours and PH of 11 are the best conditions for producing CdS nanoparticles. Structural features showed that CdS particles have a nearly spherical shape and the XDR measurement confirmed the presence of both cadmium and sulfur atoms in as-prepared particles. The bandgap energy was calculated from the Uv-Visible spectrum ~2.66 eV, which is high compared to 2.42 eV (Eg of bulk CdS). XRD pattern showed that the zinc blend phase is dominated and the particle size was estimated at around 3.2 nm using the Scherrer formula.

Keyword: CdS nanoparticles, Optical properties, XRD and TEM.

Paper ID:368

On Tensor Product of Representation for Lie Algebra

Hayder Sadeq, Taghreed Majeed

Abstract. In this paper, we will define the basics mentioned with some examples to clarify them, and then present what is new in our paper, which is the relationship between (QCoA) for Lie algebra and Tensor product. This new relationship will be studied on a structure consisting of five representations. We will study dual of representation for Lie algebra on this relationship. In order to complete this paper, we will review the (QCoA) for Lie algebra and Lie group in tables and how to apply them.

Keyword: Lie algebra, Tensor Product, Tensor Product for Lie algebra and Representation of Lie algebra.

Paper ID:373

Optimal Placement of Cluster Head in Wireless Sensors Networks for Semi-stochastic Environments

Reham Hatash, Ahmed Al Hilli

Abstract. In order to minimize the maximum energy consumption in wireless sensor network for semi-stochastic environments. This paper presents a model to extend the lifetime of the whole network by extending the lifetime of the farthest transmit-only (TO) nodes, and selecting the optimal location for the single cluster head (CH). A detailed comparison is made between the proposed approach and the previous approach in the lifetime far TO sensor nodes for two distribution of sensor nodes uniform distribution and non-uniform distribution. Our mathematical results, supported by simulations, show that the proposed max approach achieves a better performance under the uniform sensors distribution, while the performance degrades in the non-uniform distribution as the number of dead sensors increases.

Keyword: WSNs, network lifetime, energy consumption, non-uniform distribution, cluster head.

Paper ID:374

A New Conjugacy Coefficient of Nonlinear Conjugate Gradient Method for Minimization

Saja O. Mohammad T., Eman T. Hamed

Abstract. In this paper, a new parameter for the modified Hestenes-Stiefel (HS) conjugate gradient technique was discovered, as well as a new direction. In principle, utilizing the Dolan-Mor'e performance profile, this new search direction achieves the sufficient descent direction and global convergence when using the strong Wolfe condition, and in practice, the new method is more efficient and accurate than previous methods.

Keyword: Unconstrained optimization, CG method, Wolfe Conditions, Globally convergence, Dolan-Mor'e performance.

Paper ID:375

Improving Iraqi Carpet Company Earnings using Decision tree and Naive Bayes Algorithms

Hala S. Radhi, Mousa K. Wali

Abstract. The improving of a company's earnings is considered as one of the important Challenges that facing these companies in terms of the amounts of their manufactured products. Therefore, it is very essential to determine which units of production that gives the reasonable profit. In this paper, data Mining (DM) and decision tree were used to define the products quantities of the Iraqi carpet company in the year 2016 that led to the acceptable profit using decision tree algorithm. This said algorithm is determined the product amounts that can gave the required profit namely; low permeable carpet, high embroidered blanket and high woven blanket with their quantities138, 1172, and 5025 respectively. In order to check the validity of the acceptable profit, these products were tested by the Naive Bayes algorithm which check their probabilities as probability of P (yes) and P (no) got 0.0208 and 0 respectively.

Keyword: Decision Tree, Navy Bias, Product Profit, Entropy, Information Gain.

Paper ID:376

Mechanical Properties of Hybrid Nano Additives for Geopolymer Bricks

Sarah. ayad, Layth Al-Gebory, Aseel.B. ALzubaidi

Abstract. Geopolymer brick is regarded to be a more environmentally friendly alternative to Portland cement in the building sector. This study uses a natural nanomaterial as an aluminosilicate source metahalloysite- based geopolymer with two types of alkaline activator solution, sodium hydroxide (NaOH) and potassium hydroxide (KOH) mixed with sodium silicate. Adding nanoparticles to reinforce the geopolymer composite by weight of metahalloysite (1%, 2%, and 3%) (nano clay, MWCNT, Hybrid) hybrid that mixes nano clay with MWCNT. The mechanical properties were tested by compressive strength and hardness, to Characterization properties of metahalloysite- based geopolymer using Fourier transformed infrared, differential scanning calorimetry (DSC), and scanning electron microscopy (SEM). The results show the optimum addition of nanoparticlescles is 2% hybrid that obtained the highest compressive strength was 30MPa and hardness test was 90, the morphology was more homogeneous and without pores due to additives of nanomaterials also that fact function as fillers in the matrix. From FTIR and DSC results the highest percentage of geopolymerization due to the tubular nano halloysite has vast surface areas and can serve as excellent nucleating sites. The production of new bricks that provide thermal insulation with high mechanical properties made it unique in constructions building.

Keyword: geopolymer bricks; hybrid nano additives; mechanical properties.

Paper ID:377

Mechanical properties of Polypropylene/Sawdust powder composites under different conditions

Alradha Rusul M., Al-dabbagh Balqees, Jawad Hanaa K

Abstract The composite samples were prepared by extrusion using atactic polypropylene and sawdust powder. Immersion solutions were made with potassium hydroxide (KOH) at 0.1 M in water (0.1 N). To make the composite samples as well as the pure polypropylene, different weight ratios of sawdust (10, 16, and 22 percent wt.) were added to polypropylene and the specimens extruded at 260 oC. The structural properties of pure and composite samples were studied using infrared spectroscopy (FTIR). (Shore D hardness, flexural strength, and impact strength) of composite samples were investigated. The FTIR results revealed that sawdust and polypropylene did not react chemically. The results of varying weights showed that the basic solution causes surface cracking and composite samples. Mechanical properties such as hardness and bending strength increase as the weight ratio of sawdust powder increases, as bending strength increases from 25 MPa to 73 MPa before immersion in KOH solution, but drops after immersion in base solution from (25 to 23) MPa, and it also increases with increasing the

weight ratios of sawdust for the same previous ratios, whereas impact strength decreases as the weight ratio of filler increases after and before immersion in KOH solution, as it does with increasing the weight ratio before immersion in KOH solution, hardness increased from 15.3 to 26.5, and after immersion in KOH solution, it increased to 23.4.

Keyword: powder sawdust , polypropylene composites, bending strength , impact strength.

Paper ID:378

Experimental investigation of ceramic coatings on solar collectors for improvement of their performance and thermal conductivity.

Elham A.A. majeed, Hayder K. Rashid, Ahmed Z. Hasheem

Abstract. Conventional energy sources are typically expensive and insufficient to provide a wide range of energy demands, owing to rising manufacturing and household usage. The ceramic materials employed in this study to improve thermal conductivity performance include graphite and copper powder because the carbon covering has a larger absorptivity; it traps a wider range of light wavelengths and reduces reflectivity. The results showing from thermal conductivity test for samples coated with graphite coating increased about 60% while the sample that be coated with ratios of copper powder and graphite material the thermal conductivity increase about 80% from bare aluminum plate. Spray air brush coating was employed in this project, and the absorber plate was made of aluminum alloy. X-ray diffraction X-R-D, scanning electron microscope SEM, atomic force microscope AFM, thermal conductivity TC, adhesion strength, density, coating thickness and ultraviolet UV are the tests used to investigate and guarantee the findings. The goal of this project is to demonstrate how to improve the efficiency of a solar flat plate collector by coating the absorber plate with ceramic coating materials to increase thermal conductivity on the side that faces to the sun.

Keyword: graphite, thermal conductivity, flat plate collector, aluminum, spray air brush.

Paper ID:379

Step Shaft Analysis and Observation of The Effect of Adding Magnetic Bearings on The Dynamic Behavior

Karrar Baher Tuaib, Imad Abdulhussain Abdulsahib, Qasim Abass Atiyah

Abstract. Vibrations in vibrant mechanical systems are a common problem that can cause significant damage to the system, as well as the loosening of the structure and equipment collapse, so studying vibrations in shafts of rotating bearings is critical for determining the cause of system failure and lowering system efficiency. The Dunkerley method is used to measure vibration in rotating bearing shafts. In this study, non-uniform (step shafts) with free ends or simply supported ends are investigated. Magnetic bearings are widely utilized for a variety of reasons, including the capacity to achieve exceptionally high rotation velocity without lubrication, high power density without rotor and bearing body contact, and no mechanical wear. As a result, using the COMSOL program, a typical model of active magnetic bearings was created, and the impact of adding these bearings on intensity, vibration reduction, and frequency response was explored. The intensity of vibration was considerably reduced to roughly 60% when active magnetic bearings were introduced to the revolving bearing shaft, giving them a more sturdy and robust nature. A shift in frequency values was detected when AMB was added to the rotating bearing shaft. The change in the control current generated as a result of adding active magnetic bearings, and the forces acting on AMB were studied in this paper. The addition of active magnetic bearings to the rotary bearing shaft system resulted in a high level of stability, a large reduction in vibration amplitude, and a significant performance improvement, indicating the value of using this technology in rotating machines.

Keyword: Vibrations; Rotating-Bearing System; Dunkerley method; Magnetic bearing; Active magnetic bearing (AMB)

Paper ID:380

On NDa- Closed Set and Continuity

Rdab T. Abdalla, Luma S. Abdalbaqi

Abstract. The major goals of this research are to investigate the concept of D∝-closed set are introduced and studied in a topological space. Furthermore, the relationship between N open set in a topology, the collection of all N D∝-open sets are strictly between the collection of all N -open set and N g-open set, Characterization and examples of the proposed idea are presented, as well as several different properties of in the study of topological space, is studied as well. Many properties of N D∝-interior, and N D∝ -closure

Keyword: N ∝-open set, N g-open, N D∝-open sets, N D∝ -closed set,N g-closed.

Paper ID:381

Some Types of Fuzzy function in Fuzzy Topological Group

Hiba Mahdi Musa, Prof. Dr. Munir Abdul khalik AL-Khafaj, Assist. prof. Dr. Taghreed Hurr Majeed

Abstract. In this paper we give further results about some types of fuzzy continuous functions and fuzzy function defined from fuzzy topological group and show the relationships between them , , and giving some countere examples , which show the converse need not to be true .We are going to introduse the following functions introduse , F.r.Cont, F. Cont , F. β. Cont, F.ii. Cont, F.i. Cont, F.int. Cont, F.semi. Cont, F. γ. Cont. Also F. β^*. Cont, F. β^(**). Cont and F. β^(***). Cont, almost F. β.Cont, F.o. function, F.c.function ,F.ii.o.function , F.ii^*.o.function, F.ii^(**).o.function ,almost F.ii.o.function.

Keyword: fuzzy topological space, fuzzy group, fuzzy topological group, fuzzy continuous, fuzzy function.

Paper ID:383

Improving the Mechanical Properties of Al7075 Alloy by Adding B4C and/or SiC Particles Using Gray Relational Analysis.

Mohammed Shakir Nahi, Saad Hameed Al-Shafaie, Sundus Abbas Jasim

Abstract. Metal matrix composites (MMCs) are widely used in different industrial applications because of their superior properties, like high specific strength, high impact strength, and high fracture toughness when compared to traditional materials. Among all aluminum alloys, the Al 7075 series was widely used in transportation applications, particularly aerospace, aviation, Marin, and vehicle, because of its high strength to low weight ratio. Even though the Al 7075 series alloys have better mechanical and thermal characteristics as well as high wear resistance, they still need to be improved to be used in engineering applications. The mechanical properties of Al-7075 metal matrix composite (AMMCs) reinforced with (3,6 and 9) of B4C and/or SiC incorporated in the stir casting method are investigated in this study. The mechanical properties of AMMCs, such as Vickers hardness(VHN), ultimate tensile strength(UTS), ultimate compression strength(UCS), flexural strength(FS), and elongation e%; were explored after reviewing the literature on the mechanical behavior of AMMCs. The materials were characterized using

the XRD, particle size analyzer, SEM, and optical microscope. Mechanical properties results revealed that all reinforcing materials have an influential impact on these parameters. The reinforcing material (4.5 % B4C + 4.5 % SiC) provided better mechanical properties. Mechanical properties have improved by 54.95 percent in VHN, 32.46 percent in UTS, 31.1 percent in YS, 39.4% in FS, and 34.42 percent in UCS when compared to the base alloy. Optimization by gray relational analysis based on the Taguchi method used to determine the best combination of AMMC.

Keyword: Al-7075, SiC, B4C, mechanical properties.

Paper ID:385

correlation of the TNF-α SNP with infection severity of covid-19 patients

Ahmed Shiker Dewin, Suaad Abid Fazaa Al-Miyah

Abstract. The aim of this study is to find out the relationship between TNF-α (rs1800629) Single Nucleotide Polymorphisms and infection severity for covid-19 patients.Blood samples were collected and divided into two groups: the first group was 120 samples from infected patients (covid-19), and the second group was 80 samples from healthy people for non-infected individuals, and the last group was represented by group control.Serum levels of tumor necrosis factor alpha were measured using ELISA technology. TNF-α promoter polymorphism has also been detected. The indicated results that a Significant there was ($P < 0.05$) increase in the concentrations of TNF-α levels in the patients group compared with control group. By these indicators, the severity of infection was divided into three groups of patients (moderate, severe, critical) which are very important groups. To assess the patient's condition and thus it is possible to reduce the risks, critical cases and deaths of patients infected with COVID-19.

Keyword: SNP, TNF-α, Severity ,covid-19,infection,promoter,polymorphism.

Paper ID:386

Solar Parabola Mirror with Power Generation

Zaid Ali Hussein, Mohammed H Alobaidi, Kadim Hamza Ghlaim

Abstract. . This study tried to test the construction of a parabolic solar power generator by using of concentrating mirror collector with a line focus collection. Heat from the sun is concentrated on the absorber pipe that resides at the focus line of the mirror reflector in which the water absorbed heat. The amount of heat adsorbed depends upon the length of pipe used which located in the focus of the reflector as well as the reflection surface type and the ambient conditions. This parabolic solar energy generator is very useful because it is environmentally safe, not expansive even if it is compared with point focus, technically less difficult, and no fuel required. This work described as well the unit of the sun tracking system through the manual lever tilting at the parabolic dish for the capturing of the sun energy. The entire arrangement has been fixed on a hinged frame that is supported by a slotted lever to tilt the parabolic dish reflector to a variety of angles so that the sun stays always directed to a collector at various day periods. This research tried to construct a heat generator with a specific required output water temperature by adjusting the working fluid flow rates. The efficiency of parabolic heat generation with pipe for heat transfer at different water flow rates was calculated.

Paper ID:388

Solve Fuzzy Nonlinear Equations By Using New Conjugate Gradient Algorithm

Zeyad M. Abdullah, Hisham M. Khudhur, Amera Kh. Ahmed

Abstract. In this paper, a new method of conjugate gradient methods is proposed that is used in minimizing functions to solve nonlinear fuzzy equations. This method is called hybrid conjugate gradient method, where it is hybridized using convex structures, The properties of global convergence and descent have been proven using some mathematical hypotheses, The numerical results and the figures showed a clear superiority of the proposed algorithm compared to the FR and KH algorithms for solving nonlinear fuzzy equations.

Keyword: Algorithm; Conjugate Gradient; Fuzzy Nonlinear Equations; Numerical; Optimization.

Paper ID:390

Investigations of Hardened and Thermal Conductivity of Eco-efficient Mortar by Recycling Waste Foil Aluminum of Water Glass Cover as Fine Aggregate

Noor A. Rajab, Nadhim Hamah Sor, Ayad S Aadi, Ahmed Abdullah Mohammed

Abstract. Waste foil aluminium from water glass covers is one of the most common non-biodegradable solid wastes generated by human consumption of water. An important issue that has a negative impact on ecosystems is solid waste generation. This is because of difficulties like the difficulty in recycling waste and the limitations on reusing. It's important to note that aluminium foil trash has a negative environmental impact. The goal of this study is to assess the effects of partially substituting waste foil aluminium from water glass covers as fine aggregate in mortar. The influence of this substance on concrete's fresh, mechanical, and thermal conductivity qualities was examined. A total of six mortar mixtures were prepared utilizing waste foil aluminium as a partial replacement of river sand at various percentages of 0%, 1.50%, 2.50%, 3.50%, 4.50%, and 5%. The parameters of fresh and hardened concrete's slump, dry and fresh unit weight, thermal conductivity and compressive strength were measured. A drop in unit weight and compressive strength was observed as replacement amount increased in the studies. The mix's thermal conductivity was reduced by 28.45 % due to the inclusion of 4.5% waste foil aluminium, which met the structural lower strength requirement.

Keyword: Waste foil aluminum, Workability, Dry unit weight, Compressive strength, Thermal conductivity.

Paper ID:392

Molecular Identification Of Some Virulence Genes of Enterococcus Faecalis Isolated From Various Clinical Samples

Bashir H. Hassoun, Ghaidaa J. Mohammed

Abstract. Gram-positive bacteria, Enterococcus faecalis, cause serious nosocomial infections such as UTI , bloodstream infections, and endocarditis. The study's amid was to isolate and identify Enterococcus faecalis from various clinical specimens in Al-Diwanyiah province hospitals, as well as to identify some virulence factor genes in these isolates. The study extended from October 2021 to January 2022 . Biochemical tests, Vitek 2 and 16S rRNA analysis identified 37 bacteria as Enterococcus faecalis. Five virulence factors genes was detected by PCR for 20 isolates of Enterococcus faecalis ,The more commonness virulence factors genes were asa1 (100 %) , ace (100%) , cyl A (70.0 %) , gel E (95.0 %), hyl (0.0 %). The results demonstrate that Enterococcus facalis isolated from clinical samples appears different virulence factors genes and the effectiveness of molecular assay ,PCR in detecting these genes.

Keyword: Clinical specimens, Enterococcus faecalis , Virulence factors, PCR.

Paper ID:396

Investigate the Interfacial Reaction of Copper/304 and Copper/201 Stainless Steel Joints

Alaa salih kadhim, Fatima Loai Aziz, Prof. Dr. Ahmed Ouda Jasim

Abstract. In the present work, the copper with 304 and 201stainless steel was successfully joined by a torch brazing. A copper-to-stainless steel cylindrical lap joint was studied: a stainless steel rod of 10 mm in diameter, brazed inside a copper tube using BAg-7 brazing alloy. The overlap length for lap joints was setting of 5mm. Different joint clearance between the dissimilar metals (100µm, 150µm, 200µm) has been set to obtain the optimum strength of the joints. . Torch brazing was used with flux for brazing 304 and 201stainless steels with copper.

The results indicate that maximum shear strength obtains at the narrow gap (100µm) between the faying surfaces SS/Cu and higher than others clearance of the gaps (150µm, 200µm) for two type of stainless steel. shear strength of 304SS/Cu is(29.849) with 100µm gap thickness has a higher joining than 201SS/Cu, more Copper nodules migrate from the copper base to the brazing alloy, reinforcing the eutectic matrix. The eutectic brazing alloy has a coarse lamellar spacing.

Keyword: steel joining, study the interfacial, brazing by torch.

Paper ID:399

Synthesis of some new thioimidazolidine compound derivatives from benzil

Khalid Jamal Hatem, Moayd N. Mohammed

Abstract. Synthesis routes to diphenyl thiohydantoin derivatives in the presence of the benzil ; 4,4-dimethylbenzil , 4-methylbenzil , 4,4-dibromobenzil , 4-dimethylaminbenzil , 4-dimethylamin-4-nitrobenzil and 4,4-dichlorobenzil and thiourea – give condensation of benzil and thiourea allowed by benzylic rearrangement

Keyword: Thioimidazolidine , thiourea , benzil , benzylic rearrangement.

Paper ID:400

Classification of The Critical Points for Smooth Function of Codimensions 121

Hadeel G. Abd Ali, Mudhir A. Abdul Hussain

Abstract. In this paper, Modify Lyapunov-Schmidt method (MLSM) is applied to find the key function conforming to the Fredholm functional. Critical points for key function of codimensions 121 has been classified by calculating the geometric description of caustic. The level curves for this function are derived and sketched in the space of parameters.

Keyword: Modify Lyapunov-Schmidt method; caustic; Bifurcation theorem.

Paper ID:401

The Effect of Slip Condition and Heat and Mass Flux on Peristaltic Transport of MHD Viscoplastic Fluid With Variable Viscosity Across Asymmetric porous Channel

Asia Amer, Mohammed Ali Murad

Abstract. In this paper, the effect of slip condition and heat and mass flux on peristaltic transport of MHD viscoplastic fluid with variable viscosity across asymmetric porous channel are studied. The mathematical equations for Bingham fluid model are developed and using perturbation method ,the analytic solutions of the expression for axial velocity, temperature, concentration distribution and stream function are obtained under the assumption of long wavelength and low Reynolds number. The effects of all parameters that appear in the problem are analyzed through graphs. The results showed that axial velocity increasing with by increasing Q, and the opposite for rising m. Also, the temperature profile increasing by increasing k and ϕ_1 with the opposite behavior for M. The concentration go down by increasing in β and m, however it's decreases for rising M and k. By rising M, β,m and φ, the size of the trapped bolus decreases, whereas it growing with rises k, ϕ_1, 〖ϕ〗_2, and Q. MATHEMATICA software is used for computational results and plotted all figures.

Keyword: Peristaltic transport, Slip condition, Magnetic Field, Plastic Fluid.

Paper ID:402

Periodic weak Solutions For The Quasi-linear Parabolic Chafee-Infante Equation By Fixed Point Theorem

Raad Awad Hameed, Israa Munir Tawfik, Shaimaa Rasheed Talab2

Abstract. The authors of this manuscript have worked to investigate the existence of the time periodic weak solution Quasi-linear Chafee-Infante Equation with periodic initial conditions and Neumann boundary conditions. This paper is based mainly on the fixed point theorem of infinite spaces, where we used the Leray–Schauder theory to investigate the existence of a non-trivial non-negative time periodic weak solution.

Keyword: periodic initial condition, Neumann condition, Topological degree Theorem, Quasi-linear parabolic equation, Allen-Cahn equation

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Paper ID:403

Study The Effect of Graphene on The Hydroxyapatite Coating of Ti-13Nb-13Zr Alloy for Biomedical Application

Nabeel Mohammed Abd Alkadim, Jassim Mohammed Salman

Abstract. Titanium-13Niobium-13Zirconium alloy has widespread potential in biomedical applications due to its high degree of biocompatibility, favorable mechanical properties, high corrosion resistance, and high possibility of osseointegration. The surface was improved by electrophoretic deposition method using hydroxyapatite and graphene (5g nanoHAp) (5g nanoHAp+0.06 nanoGr) and suspended in ethanol solution at different conditions of time and voltage (1,3,5 and 7 minutes) (50, 70, 90, and 100 volts). The effect of the two suspended materials on the surface of the Ti-13Nb-13Zr alloy was studied by using the tests of (visual observation, the weight, and thickness of the coating layer) to know the homogeneity of the coating layer, adhesion testing, contact angle, and electrochemical tests in addition to XRD. The results showed that the addition of graphene led to the stability of the thickness of the coating layer with deposition time in contrast to the voltage and an improvement in the adhesion, which

increased from (0.91) to (3.03) compared to adding hydroxyapatite only. the Corrosion rate where improve by adding graphene from (57.4%) to (74%) compared to adding hydroxyapatite only from (50.8%) to (60%).

Paper ID:404

Events Detecting in Social Data Streams with DL(CNN,LSTM) and ML (NB,LR)

Mohammed Ali Mohammed, Narjis Mezaal Shati

Abstract. Social network has actually come to be a component of our lives. This system is utilized by billions of clients as an interaction gizmo as well as likewise as a real-time information resource and also has actually become favored among people. On the internet social media networks (OSN) such as Twitter, Facebook in addition to Instagram are among one of the most effective sites definitely cost-free expression for individuals of every age current research has actually shown that a massive part of social media streams revolve around 'events'. Collectively, events supply a (short recap of your social networks streams), so event detection is important and also helpful for recognizing as well as understanding large amounts of social media sites websites information, the work is typically developed on a controlled ranking concern where algorithms are educated on posts observed pertaining to upsetting or offending web material, in the recommended job, the major focus has been to examine the outcomes of private policy on hate speech on social networks making use of a choice of formulas to achieve this goal, consisting of Naive Bayesian (NB), logistic regression (LR), convolutional semantic network (CNN) and also memory Long Range (LSTM). Four various formulas are used in the Twitter dataset to find hate speech and contrast its accuracy, acquired with the training phase of the CNN algorithm was = 99.99 while the test phase was the data = 96.67, and for the LSTM classifier the accuracy results drawn out throughout the training phase of the algorithm were = 99.90, while the test phase was the data = 96.09, and the accuracy worth of the Naive Bayes classifier, was 95.72, Finally, the accuracy value of the logistic regression classifier was 96.18 and via experiments, the very best results and the highest possible accuracy of the CNN classifier were found. As part of the assessment, we contrast our technique to the current pertinent remedies. In general, our experiences and user-based evaluation reveal that the current event detection method delivers advanced performance.

Keyword: Event Detection, Social Media, Visualization, CNN, LSTM, OSN, NB, LR.

Paper ID:406

The new extension of Chen distribution using Gompertz family Properties and Application

Khansaa A. Yusur, Mundher A. Khaleel

Abstract. In this paper, a new four parameter model for life time datasets is introduced. The proposed distribution is termed "Gompertz Chen distribution". Some mathematical properties of the new distribution are derived such as the expansion of the probability density, quantile function, Renyi entropy, moment generating function and order statistics. The flexibility of the proposed distribution was assessed using engineering data. For real-life dataset, the proposed Gompertz Chen distribution can be used as an alternative to the well-known competitive distributions available in the literature.

Keyword: Gompertz family, Chen distribution, moments, MLE.

Paper ID:410

Synthesis some of mannish base compounds derivative from acetylene compound and biological activity

Zahraa Hamza najem, Moayd N. Mohammed

Abstract. In this present a new series of mannish base from (3-prop-ynyl oxy)-4,4`dichloro benzoin ,(3-prop-2-ynyl oxy)- 4,4`dibromo benzoin ,(3-prop-ynyl oxy)-4,4`dimethyl benzoin, ( 3-prop-2ynyl oxy)4-dimethyl amino benzoin ,(3-prop-2-ynyl-oxy-4- benzoin with dimethyl amine and pipyridine yielded series of new mannish base the prepared compounds were characterized by FTIR,`HNMR and analysis elemental analysis and were tested for their antibacterial activity.

Keyword: Benzoin , propyne bromide ,dimethyl amine ,pipyridine.

Paper ID:411

Electro spun Fibers of Polystyrene and Poly vinylidene fluoride Blend for high self-cleaning surfaces

Ammar Karim, Hanaa Jawad

Abstract. The goal of this study is to investigate the hydrophobicity of electro spun polystyrene (PS) fibers and blends with various volume ratios of poly vinyldene fluoride (PVDF) using the solvent N-N-dimethyl formamide (DMF). A concentration of 0.13 g/ml polystyrene (PS) dissolved in di methyl formamide (DMF) and a concentration of 0.1 g/ml polyvinylidene fluoride (PVDF) dissolved in DMF were generated using a magnetic mixer at 50 ° C. The solution was mixed for two hours for each solution to generate homogeneous polymer solutions. After that, different quantities of PS solution dissolved in DMF and PVDF solution dissolved in DMF were blended in the (0.74 PS: 0.26 PVDF) and (0.68 PS: 0.32 PVDF) using a hot plate magnetic stirrer at 50 degrees. The prepared solution's viscosity, surface tension, and electrical conductivity were all tested. PS fibers and blends were made using an electrospinning technique under the following conditions: (15 kV alternative high voltage (AC), electrospinning distance 5 cm, flat plate collector with dimensions (10 * 10 cm2), 0.38 mm needle diameter, and 1 ml/hr flow rate) The structural bonding of PS fibers and mixes were studied using a furious transmittance test (FTIR). The microstructure of electrospun PS fibers and their blends was studied using scanning electron microscopy (SEM). The roughness parameters of the resulting fibers were studied using atomic force microscopy. A contact angle analyzer was utilized to determine the hydrophobicity of the resultant fibers by measuring contact angles. The results showed that PS fibers and blends have a larger contact angle than 90o, and FTIR measurements showed that PS and PVDF blends work well together, with current PVDF bonds involving (C-F) bending and stretching. The SEM results show that the AC high voltage power source has a limited ability to pump PS fibers from solution, but that adding PVDF to the solution improves the spin ability of the solution by increasing the electrical conductivity. The best sample with a greater bearing index and smaller roughness, according to AFM data, was (PS 0.76 : PVDF 0.24). .

Keyword: electro spun , fibers , PS , PS/PVDF blend , hydrophobicity, AFM , SEM.

Paper ID:412

Polyacrylamide reinforced with Alumina nanocomposites for coating application

Adnan Nardeen B. , Alradha Rusul M., Jawad Hanaa K., Al-dabbagh Balqees M

Abstract. This search aims to study the effect of alumina nanoparticles with a diameter (100 nm) on the properties of Poly Acryl amide (PAM) with different weight percentage of alumina nanoparticles including (0.1, 0.6, and 0.8)% wt. PAM with 0.1 wt. was made by using a hot plate magnetic stirrer to dissolve 10 g of poly acrylamide powder in 90 g of di-ionized distil water for 4 hours. The resultant solution was divided into four portions, each with a volume of 25 mL. Alumina nanoparticles in various ratios (0.0, 0.1, 0.6, and 0.8) were combined separately with each solution to produce four nano fluid solutions with varying alumina nanoparticle contents based on each weight %. The nano composited membranes were made using the hand casting method for nanocomposites samples, which involved pouring the prepared solution into a suitable plastic mold, leaving it to cure for 24 hours, and then cutting the resulting thin film according to each test. Tensile strength, Young's modulus, elongation, and toughness were studied by tensile test. As well as, Fourier transition infrared radiation (FTIR) test for studying the physical and chemical bonds between the poly Acryl amide and alumina nanoparticles was performed. Scan electron microscopy was used to study the morphology of the samples. The contact angles of samples were tested to limit the hydrophilicity behavior of these samples. Concluded from this paper the adding alumina nanoparticles to PAM matrix leads to enhance the mechanical properties of resultant nanocomposites, tensile strength increases from 2.25 MPa to 8 MPa with increasing alumina nanoparticles from 0 to 0.8% wt. respectively, Young's modulus also increased from 13 t0 20 MPa for the same previous ratios. Toughness increases to 3 kJ/cm2 for the higher weight ratio of alumina nanoparticles (0.8 %) wt. On the other hand the adding alumina nanoparticles lead to enhance the contact angle of PAM surface from 55 o to 60 o and it has hydrophilic behavior. This results refers to use the resultant nanocomposites as a coating for hydrophilic with high mechaninical properties requirement's.

Keyword: Nanocomposite , Alumina nanoparticles, Polyacrylamide.

Paper ID:416

Effect of Cadmium Partial Substitution on the Structural and Electrical Properties of YBa2Cu2.8Zn0.2O6+δ superconducting

Balqees Abdul-Jaleel Al-Asady, Haider MJ. Haider

Abstract. The purpose of the current work is to investigate the influence of a partial replacement of Cadmium (Cd) for yttrium (Y) on the electrical characteristics of yttrium-based alloys of the Y1-xcdxBa2Cu2.8Zn0.2O6+δ Superconducting compound, where x = 0, 0.05, 0.1, 0.15,0.2 and 0.25. Using the solid-state reaction approach, the samples were produced (SSR). The samples were sintered in normal air at temperatures of 850 degrees Celsius for 24 hours at a rate of 10 degrees Celsius per minute. The Four-Probe Technique was used to obtain All samples exhibited superconducting behavior at

temperatures below their critical temperatures. The samples showed superconducting behaviour, with the highest critical temperature (Tc (offset)) equal to 108.5 K and the highest energy gap value (Eg) = 0.033034eV at the Cadmium concentration x = 0.05.

Keyword: Superconductors, Sintered temperature, Four-Probe Technique, Critical temperature.

Paper ID:418

Effect of Magnisium Oxide, Boron Nitride, and Hybrid Nanoparticles on The Mechanical Properties of Epoxy Nanocomposites.

Anwar Qasim Saeed, Zoalfokkar Kareem Mezaal Al-obad

Abstract. In this study, Burger's equation performs as a key role clarifying briefly to anticipate the behavior of nonlinear systems utilizing a mixed procedure two extremely effective strategies, Specifically, the finite difference and differential transform approaches. Our goal with this approach is to try to combine the possibilities of the differential transform method (DTM) with the reliability of finite difference method (FDM).The results were compared to the system's exact solution. We noticed that the outcomes are extremely precise, and the method's efficacy has been shown.

Keyword: Differential Transform Method, Finite Differences Method, Coupled Burger's Equation.

Paper ID:420

Synthesis and Characterization of Zinc Sulfide Nanomaterials for Removal Methylene Blue Dye from Aqueous Solution

Ameer Q. Abed, Aula M. Al Hindawi, Hasan F. Alesary

Abstract. This work focused mainly on the synthesis and characterization of zinc sulfide nanocrystals using chemical co-precipitation approach. Zinc sulfide nanoparticles with quasi-spherical shape have been fabricated by controlling the concentration of the starting materials, reaction time and PH of the solution. The formation of zinc sulfide nanocrystals was confirmed through TEM, FE-SEM, XRD and EDS techniques. The band gap energy was measured from the UV-Visible spectrum and was found to

be 3.8 eV, the observation of red shift with respect to the bulk ZnS is attributed to the effect of quantum confinement. The influences of ZnS nanoparticles concentration and the contact time on cationic dye adsorption, were investigated. The adsorption behavior of ZnS nanoparticles was demonstrated and it was found that ZnS particles have the ability to adsorb methylene blue dye (MB) from aqueous solution. It was found that with increasing amount of ZnS in the dye solution, the removing for MB increased. Moreover, enhancing in the time of shaking causing growing in the absorption of MB on the ZnS.

Keyword: Zinc sulfide nanomaterials, Adsorption, color removal, methylene blue.

Paper ID:421

Characterization of The Wettability of Bio-Composite Coating on Titanium Alloy Using Electrostatic Spray Deposition

Samara Bashar, Hanaa A. Al-Kaisy, Mohanad N. Al-Shroofy

Abstract. It is possible to increase the corrosion resistance of a commercially pure titanium substrate while maintaining its excellent mechanical properties using the electrostatic spray method. To construct the bio composite-polymer base coating, several percentages (6 and 10) weight percent (wt%) of Nickel Oxide (NiO) were combined with (94 and 90) wt% of PMMA powder in comparison to the coated 100 wt% PMMA layers. The surface morphology of the coated layers was determined using FESEM/EDS and XRD techniques. The contact angle test was used to investigate the biological behavior of the coated samples, which revealed that they had good wetting characteristics. A high surface wettability as well as homogeneous, uniform, and crack-free coating layers were achieved.

Keyword: electrostatic spray method, bio-composite coating, implants

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Paper ID:422

Study the Effect of Partial Substitution of Silver on the Structural and Electrical Properties of HgBa2ca2cu2.8Cd0.2O8+□ Superconducting Compound

Mayada Mardan Abad, Haider MJ. Haider

Abstract. This research prepared the compound Hg-base superconductors Hg1-xAgxBa2 Ca2Cu2.8Cd0.2 O8+□ with substitution of (x=AgO) with concentration x=(0.0, 0.05, 0.1, 0.15, 0.2,and 0.25) by Hg through method of powder metallurgy(solid-state reaction) together temperature of sintering 750OC for 24h. The Studied improvement of structural and electrical properties for composition substations. After the x-ray scattering tests were completed, the results were analyzed to determine all cell units' configuration and lattice constants (a,b,c). The diffraction of the x-ray revealed that all samples have crystals and a tetragonal structure. The analysis of the electrical characteristics to obtain critical temperature was carried out using four-probe point devices, with the highest heating value being found when x=0.15 equals 122.9K for Hg0.85AgO0.15Ba2Ca2Cu3O8+□ compound, all other samples have the highest 1223 main phases compared to the other phases. .

Keyword: Superconductors, sintered temperature, Four-Probe Technique, Critic temperature.

Paper ID:423

The LC50 Of Diazinon And Sub-Lethal Concentration Effect Of It On Hematological Properties In Cyprinus Carpio Fish

Jaafar B. Algburi, Moayed J.Y. AL-Amari

Abstract. Diazinon, a harmful organic insecticide, was discharged into the aquatic environment and had an impact on creatures including fish. As a result, this study was designed to calculate the Lethal and Sub-lethal Concentration (LC50, sub-LC50) of Diazinon, and then to test the effect of different concentrations of Diazinon on some blood parameters of Cyprinus carpio fish, using 100-liter plastic containers filled with 70-liter de-chlorinated tap water. To calculate the LC50, the fish were exposed to four concentrations of Diazinon (0, 6, 10, and 15 mg/l) in triplicate, with each container containing six individuals of Cyprinus carpio fish. The mortality rate was reported in the first, twenty-fourth, forty-eighth, seventy-two, and ninety-sixth hours, respectively. Using Probet's equation, the LC50 dos was computed. According to Probet's investigation, the LC50 value of Diazinon was 9.5 mg/l. For 28 days, fish were exposed to one sub-lethal dosage of Diazinon 2.37 mg/L (25 percent of LC50). The hematological tests were performed after four, fourteen, and twenty-eight days of exposure. The study results revealed a substantial drop in erythrocytes after 4 days of exposure ($P<0.05$), as well as a little influence on blood parameters such as platelets, hemoglobin, and leukocytes.

Keyword: LC50, Bioaccumulation, Cyprinus carpio, Diazinon, Pesticide, Xenobiotics.

Paper ID:426

Study the Interfacial Reaction between Ductile Cast Irons Joining with different filler metals

Yasser Loai Aziz, Prof. Dr. Ahmed Ouda Jasim

Abstract. . In the present work, a ductile cast iron was successfully joined to a ductile cast iron by furnace brazing. By using Ag20 and BAg-8 filler metal with bonding time of 15 minutes was investigated. The overlap length for lap joints was set at 5mm. Joint clearance between the similar metals is 0.1 mm and has been set to obtain the optimum strength of the joints. An electrical furnace was used to braze this similar metal. The brazing temperature for Ag20 is 820˚C and 780˚C for the BAg-8 alloy. Optical microscopy (OM) was used to examine the brazing joints. The shear strength of brazed joints was measured by loading the samples in compression and the hardness was examined in order to measure the mechanical properties. The results indicate that maximum shear strength obtains between the faying surfaces of ductile cast irons is 276.878Mpa by using Ag20 filler higher than BAg-8 filler (185.223Mpa) and the hardness is (116,124HB) for Ag20 and Bag-8 respectively, the joining of ductile cast iron by using Ag20 and Bag-8 filler metal alloy shows an Eutectic structure at the middle of filler zone.

Keyword: cast iron joining, study the interfacial, brazing in furnace.

Paper ID:428

Examining The Seasonal Correlation between SSN, T-index, and F10.7 Parameters During Solar Cycles 23 and 24

Huda S. Garee, Khalid A. Hadi1

Abstract. In this paper, the seasonal correlation between three different solar - ionospheric indices, namely the T-ionosphere (T-index), sunspot number (SSN) and solar radio flux (F10.7) for the 23 and 24 solar cycles, was examined. as well, the behavior of the selected indices and their seasonal variations were investigated for the periods (Aug. 1996 – Nov. 2008) (Des. 2008 – Nov. 2019) of solar cycles 23 and 24, respectively. The results of the seasonal cross-correlation between the SSN, F10.7, and T-index indices showed that the seasonal cross-correlation between the studied indices can be represented by polynomial equations of the first-order "linear regression equation". The proposed mathematical equations gave good and close results to the observed values for all seasons of the studied periods. The

statistical calculation results of the tested indices indicate that the results were good for all statistical parameters. The examination of the seasonal cross correlation between the tested solar ionosphere indices during solar cycles 23 and 24 showed that the three indices are reciprocally and linearly correlated and mutually predictable depending on the proposed correlated mathematical equations

Keyword: Solar Indices, Solar Radio Flux, Ionospheric Index, Sun Spots.

Paper ID:429

Influence of zirconia addition on corrosion behavior of biomedical COCrMo alloys(F75).

Haydar H.J. Jamal Al-Deen, Zain A.K. Alhusseini

Abstract. The aim of this study is to investigate the influence of zirconia addition as a particles reinforcement with various percentages (0.5,1,1.5,2,2.5,3,3.5,4,4.5,5 wt. %) on corrosion behaver of biomedical CoCrMo alloy ASTM(F75) prepared using powder metallurgy technique (P/M). Samples were sintered and prepared for microstructure observation and electrochemical tests (open circuit potential and polarization) at a temperature simulating corrosive conditions (37±1) and with two various solutions (Hank's solution and prostheses saliva). Adding zirconia to COCrMo ASTM(F75) made the OCP move in the positive direction, made the alloy more noble, also addition of zirconia improve resistance of corrosion by decreasing density of corrosion current where the improvement percentage range (96.7 to 90 %) and (87.8 to 66.8%) in artificial saliva and Hank's solution respectively.

Keyword: powder metallurgy, corrosion resistance, ASTM (F75) alloy, Zirconia.

Paper ID:430

Synthesis Mixed Dielectric Materials for Optical Coating Applications

Shahed Zeyed Tariq, Alaa Nazar Abd Algaffar, Kadhim A Aadim

Abstract. . This work is the attempt to produce a novel beam splitter with single layer using a technique depends on mixture made up of dielectric substance SiO2 and TiO2 by a pulsed laser (PLD) method. As-grown film optical features such as optical transmittance spectrum have been studied. .Also the x-

ray diffraction were studied. The results refers that mix (TiO2: SiO2) layer coating gave to optimal optical performance of beam splitter at different number of shots. This beam splitter application in Visible –NIR region (400-1100μm.

Keyword: SiO2, TiO2, PLD, Beam splitter.

Paper ID:432

Preparation and Characterization of Bioactive Glasses-Ceramic with Add Low Melting Oxides

Ahmed Kareem Khadim, Shaker J. Edrees

Abstract. The continuous demand for the use of bioactive glass for the purpose of remedying hard tissues requires improving the properties and adding new oxides with curative properties beneficial to the human body. Preparing bioactive glass by relying on Hench glass compositions with the addition of an eutectic component (K5V3O10+KVO3), which was obtained by heating the binary system (39% V2O5: 61%) mole at 501 °C for 2 hours. After blending the regent, it was melted for two hours at 1100 °C and quenched in water to produce an amorphous glass phase. The resultant glass was compressed and sintered at 1000°C for three hours. In the pure bioactive, glass-ceramic structure, X-ray, diffraction revealed the presence of the following phases: Na4Ca4(Si6O18) and a small quantity of (K.5V3O5) and Na4Ca4(Si6O18) in others. The main goals of this study are to assess the impact of inserting a eutectic component (K5V3O10+KVO3) as an additive to the physicochemical characteristics of bioactive glass-ceramics.

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Improvement of the Corrosion Performance of 316L Stainless Steel using Anodization Process

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Abstract. Corrosion prevention in biomaterials has become crucial particularly to overcome inflammation and allergic reactions caused by the biomaterials' implants towards the human body. When

these metal implants contacted with fluidic environments such as bloodstream and tissue of the body, most of them became mutually highly antagonistic and subsequently promotes corrosion. An electrochemical anodizing approach was used to modify the surface of 316L stainless steel in this investigation. Stainless steel was subjected to voltages of 6 and 8 V for 5 and 10 minutes in these trials., and the distance between anode and cathode are 2 and 4 cm to form an oxide film. Analytical results demonstrated that after various anodization modifications, a dichromium trioxide (Cr2O3) oxide layer formed on the modified 316L BSS specimens. The effects of anodizing conditions (voltage, time and distance) on the roughness, thickness, and microhardness were studied. Finally, potentiodynamic polarization (PDP) tests were used to examine the corrosion behavior of a specimen. In a Ringer's solution, the amended 316L alloy demonstrated enhanced corrosion resistance.

Keyword: 316L biomedical stainless steel; anodization; hardness; coating thickness; roughness and corrosion rate.

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Review of using ceramic coatings to increase the performance of solar collectors with air brush spray method on aluminium substrate

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Abstract. The goal of this study determine the materials that can be used as conductive and insulator coating materials and coating process to increase performance solar flat plate collector. The solar flat plate collector consists of a transparent cover, absorber plate, heat exchanger tube, and frame. The absorber plate, the part absorbs solar radiation that be used for heating the water flowing in the heat exchanger and water tank. To increase performance, the solar collector must increase the absorptivity and thermal conductivity of the plate absorber from the side that receives the sun's radiation and increase the insulation on the other side of the plate. The use of ceramic materials in coatings improves thermal conductivity and insulation. The materials that are used to increase thermal conductivity are: graphene, graphite, carbon nanotube, diamond, aluminum nitride, boron nitride. The carbon family have thermal conductivity higher from other coating materials. The graphene consider higher thermal conductivity coating material can be used. The ceramic materials have thermal insulation higher from other insulation coating materials. The yttria stabilized zirconia (YSZ) and Lanthanum Zerconate consider higher thermal insulation. The materials used to develop collector performance can be mixed with polymer material to increase the homogeneity and adhesion of the coating mixture without affecting coating specifications. The tests that work on coating materials are: X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM), Atomic force microscopy (AFM), Fourier transmittance infrared

spectrophotometer (FTIR), Thermal conductivity, Adhesion strength, Coating thickness, Ultraviolent (U.V), Porosity, Density, Thermal analysis."

Keyword: Thermal insulating, thermal conductivity, flat plate collector, Aluminum, spray air brush.
