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An Efficient DenseNet-Based Deep Learning Model for Malware Detection

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Abstract: Recently, there has been a huge rise in malware growth, which creates a significant security threat to organizations and individuals. Despite the incessant efforts of cybersecurity research to defend against malware threats, malware developers discover new ways to evade these defense techniques. Traditional static and dynamic analysis methods are ineffective in identifying new malware and pose high overhead in terms of memory and time. Typical machine learning approaches that train a classifier based on handcrafted features are also not sufficiently potent against these evasive techniques and require more efforts due to feature-engineering. Recent malware detectors indicate performance degradation due to class imbalance in malware datasets. To resolve these challenges, this work adopts a visualization-based method, where malware binaries are depicted as two-dimensional images and classified by a deep learning model. We propose an efficient malware detection system based on deep learning. The system uses a reweighted class-balanced loss function in the final classification layer of the DenseNet model to achieve significant performance improvements in classifying malware by handling imbalanced data issues. Comprehensive experiments performed on four benchmark malware datasets show that the proposed approach can detect new malware samples with higher accuracy (98.23% for the Maling dataset, 98.46% for the BIG 2015 dataset, 98.21% for the MaleVis dataset, and 89.48% for the unseen Malicia dataset) and reduced false-positive rates when compared with conventional malware mitigation techniques while maintaining low computational time. The proposed malware detection solution is also reliable and effective against obfuscation attacks.

Keywords: malware detection; malware visualization; cybersecurity; densely connected convolutional network; deep learning

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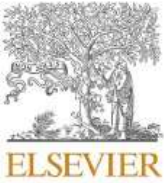
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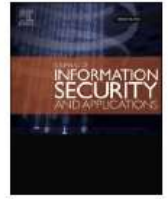
1. Introduction

The increasing number and complexity of malware have become one of the most serious cybersecurity threats [1,2]. Although the cybersecurity industry is constantly working to monitor and thrive in several ways with malware, cyber attackers show no indications of stopping or slowing down their attacks. Malicious hacker groups develop sophisticated evasive malware techniques such as polymorphism [3], metamorphism [4], code obfuscations [5], etc., that outperform many traditional malware mitigation systems. The most widely used malware by attackers targeting businesses are backdoors, miners, spyware, and information stealers. Emotet [6] and TrickBot [7] are information stealers that commonly use malicious spam (malspam) to infect systems. Malspam



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Multi-directional block based PVD and modulus function image steganography to avoid FOBP and IEP

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ABSTRACT

Since the inception of pixel value differencing (PVD) image steganography, it has drawn considerable interest among the researchers of this field. However, most of the PVD based techniques suffer from either falling-off boundary problem (FOBP) or incorrect extraction problem (IEP). Therefore, to address these two issues, this paper proposes a multi-directional pixel value differencing and modulus function (MDPVDMF) based technique. During the embedding process, the original image (OI) is partitioned into 2×2 size pixel blocks. Then, data embedding is performed by exploiting the horizontal, vertical, and diagonal directions for each block. For a 2×2 pixel block, two difference values can be obtained in any of the three directions. Next, using the difference values and the remainders of the pixel pairs, the secret bits are embedded. The experiment has been conducted to compute the performance of the proposed technique with regards to the image quality metrics like peak signal-to-noise ratio (PSNR), embedding capacity (EC), and FOBP. Results show that PSNR is optimal for vertical pairs with 39.17 dB whereas the EC is optimal for the diagonal pairs with 3.10 bits per pixel (BPP). Further, the proposed technique has shown exceptional attack resistance ability to regular & singular (RS) attack, salt & pepper (S&P) noise, pixel difference histogram (PDH) analysis, and subtractive pixel adjacency matrix (SPAM) steganalysis.

1. Introduction

Over the years, steganography has emerged as one of the prominent data hiding technique [1]. It conceals the secret data into various digital objects such as video, image, audio, or text. Image steganographic techniques like least significant bit (LSB) substitution, pixel value differencing (PVD), modulus function (MF), and exploiting modification direction (EMD) have drawn considerable attention due to their simplicity and lucidity [2]. In image steganography, an innocent-looking image carries the secret information without the knowledge of the intruder [3]. The indispensable requirements like imperceptibility, embedding capacity (EC), and security are to be considered while developing an image steganographic technique. Imperceptibility refers to the quality of the stego-image (SI). Among various imperceptibility parameters, peak signal to noise ratio (PSNR) is considered as an ideal metric to measure the imperceptibility. Similarly, the EC refers to the capacity of an image to hide the secret bits [4].

Finally, the security of the image steganographic techniques can be validated by applying various steganalysis techniques like regular and singular (RS) analysis, salt & pepper (S&P) noise, pixel difference histogram (PDH) analysis, and subtractive pixel adjacency matrix (SPAM) analysis [5].

The simplest data hiding technique that embeds the secret data in the LSB position of an original image (OI) pixel is known as the LSB substitution technique. Authors in [6] suggested an improved LSB based technique to reduce the modifications in each pixel. The technique improves the PSNR, but the EC remains low as it conceals only 1 bit per pixel. Recently, authors in [7-10] have proposed various improved techniques using LSB steganography. The LSB substitution based techniques are exposed to RS analysis [11]. Another variation of the LSB substitution technique is the LSB matching [12]. The LSB matching techniques successfully withstand the RS attack. This technique modifies the OI pixels by ± 1 to produce the SI [12]. Mielikainen [13] suggested an improved LSB matching technique that increases the PSNR without

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ARTICLE



Artificial Neural Network based Solar Energy Integrated Unified Power Quality Conditioner

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ABSTRACT

The utility grid is prone to power quality issues due to the advent of power electronic devices and integration of Distributed Energy Resources. The power quality has to be maintained despite variation in load under steady and fault conditions. Unified Power Quality Conditioner is a FACTS device that improves the power quality at the Distribution side of the utility grid. In Unified Power Quality Conditioner, reactive and real power compensation is carried out simultaneously improving the power quality. The proposed control algorithm for Unified Power Quality Conditioner is a hybrid combination of Reactive Power Control and Unit Vector Template. The Unified Power Quality Conditioner is integrated with Distributed Energy Resources like solar energy to minimize the power rating of converters and meet the power demand. The reinforced learning algorithms have been effectively increasing the performance of the power electronic devices; among them, the most commonly used is the Neural-Network algorithm. The Artificial Neural Network controller for the solar integrated Unified Power Quality Conditioner system improves the power quality when compared to the conventional controllers by self adapting themselves to the environmental needs. The system is tested under both balanced and unbalanced load conditions with MATLAB-SIMULINK. The per-unit system has been used for the analysis purpose to minimize the complexity. The hybrid control of the series and shunt converters supported by solar integration at the DC link proves to eliminate distortion caused by the non-linear load. The system is subjected to a momentary voltage sag/swell as per IEEE 1159 standards. The momentary sag/swell that varies between 0.5 seconds to 3 seconds has been made to ride through less than 50 milliseconds as per the Computer and Business Equipment Manufacture Association curve. The load side current harmonics have been minimized inevitably by the proposed control methodology to ensure reliability and good power factor at the Distribution side.

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RESEARCH ARTICLE

Automated brain tumor detection and classification using weighted fuzzy clustering algorithm, deep auto encoder with barnacle mating algorithm and random forest classifier techniques

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Abstract

Magnetic resonance imaging (MRI) scan analysis is an effective tool that accurately detects abnormal brain tissue. This manuscript proposes the strategy of segmentation of brain tumors in MRI images and uses the technique of weighted fuzzy factor based on kernel metrics. Here, a deep auto encoder (DAE) with barnacle mating algorithm (BMOA) and random forest (RF) classifier are used to tumor stage classification to enhance the accuracy of prediction. This manuscript presents a deep-neural network structure, integrating DAE and RF, with a classification unit, which is used for the classification of brain MRI. Finally, the segmented features are graded by the DAE with BMOA and RF. The proposed method is executed in MATLAB site and the performance is analyzed with existing methods. The experimental outcomes of the proposed method are assessed and validated in MR brain images depending on accuracy, sensitivity, and specificity for performance with quality analysis.

KEYWORDS

barnacle mating algorithm, deep auto-encoder, magnetic resonance imaging, random forest classifier, weighted fuzzy clustering algorithm

1 | INTRODUCTION

A brain tumor represents an unidentified functional brain mass or development. The brain tumor brain can differ significantly. The capability of generating as well as the brain tumor position determines how it affects the functions of the nervous system. The treatment of brain tumor can vary according to the category of brain tumor that exist, size and location of the brain tumor. The physician uses magnetic resonance imaging (MRI), computed tomography (CT), or other diagnostic imaging to know about the brain tumor as much as possible.¹ MRI has a major role to play in clinical research in the study

of the human being brain. Beneficial details on soft tissue anatomy are shown in MRI images.

A study of detecting is the most pervasive way to assess the brain tumor type when MRI is used to detect a tumor in the brain.^{2,3} MRIs, rather than x-rays, create accurate pictures of the body with magnetic fields. Tumor size can be measured with MRI.^{4,5} Before the scan, individuals are given a special pigment, called a contrast medium, to make the picture clearer.^{6,7} MRIs produce more high-resolution images than CT scans and also this is the optimal method to detect the brain tumor.⁸⁻¹⁰ The MRI is taken to treat soft tissues, like tendons, ligaments, and brain tissues in an image as the required medical imaging method.

Experimental Investigation on Tribological Characteristics of NaOH Treated Chopped Abaca Fiber Reinforced Epoxy Composites

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Keywords: Natural Fiber, Abaca Fiber, Dry Sliding, Tribology, Epoxy

Abstract. For material engineers, greater consumption of fuel by the aviation and automobile sector is a greater challenge. Based on this scenario, exploration towards the generation of new engineering materials which are lighter with superior mechanical properties in the field of aviation and automobile sector is found to be important. Reduce the fuel utilization up to 70% in the above mentioned sectors is the 2025 universe vision. According to substantial reports, eco-friendly products can be refined from natural fiber composites. Tribological characteristics of NaOH treated chopped abaca fiber reinforced epoxy composites were discussed in this paper. Using compression moulding technique, NaOH treated chopped abaca fiber reinforced epoxy composites were fabricated by varying the abaca fiber volume fraction to 10 wt%, 15 wt%, 20 wt%, and 25 wt%. Pin-on-disk wear testing machine is used in this study for the dry sliding wear test at different loads of 10N, 15N and 20N. The wear test sample results were compared with neat epoxy composites. The composites containing abaca fiber shows better tribological characteristics than the neat epoxy composites. The investigation results shows that wear results of the composites can be very much influenced by the speed, sliding distance and applied load. 25wt% of abaca fibre volume fraction composites was found to be the optimum value.

1. Introduction

Spreading natural mindfulness has centered extensive enthusiasm towards the products from the areas of eco-friendly, renewable and sustainable. Composites have been employed in numerous structural and technical applications since they are an independent class of materials which have exclusive mechanical and physical properties [1, 2]. Vijaya Kumar et al. [3] studied that, at increasing loads, the coefficient of friction decreases at varied sliding velocities and different loads. It has also noticed that, the introduction of filler boosts the coefficient of friction up to 12.5% and decreases 15% on further addition. K Vignesh et al. [4] commented over the wear performance of coir fiber and coconut shell powder reinforced with polyester resin at different loads of 5N, 10N, 15N, 20N and 25N. With the inclusion of coconut shell powder and coir fiber, the wear rate is decreased. In present- day, countless polymeric composites have been progressively used for such tribological application [5, 6]. However, at this point, a significant part of the information on their tribological conduct is frequently observational and extremely restricted prescient capacity exists [7, 8]. Polymers have been extensively used for the mass production of mechanical parts like gears, oil sealing etc. as their coefficient of friction is less due to their self-lubrication property [9, 10]. Wang et al. [11] researched the friction and wear behavior of graphite and carbon fiber. The investigation reveals that the combination of carbon fiber with graphite produces some best

Mechanical Characterization and Evaluation of NaOH Treated Chopped Abaca Fiber Reinforced Epoxy Composites

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Keywords: Sustainability, Natural Fibers, Abaca Fiber, Epoxy

Abstract. Researchers have been busy developing new environmental friendly products and materials based on sustainability principles to reduce pollution and prevention of our resourceful non-biodegradable and non-renewable sources. Over synthetic materials there are many unquestionable focal points for natural fibers and some of them are low thickness, least waste transfer issues and also equivalent quality. In this research the mechanical properties of abaca fiber reinforced epoxy composite were evaluated. Then with the help of compression moulding process, different composite samples of varying fiber volume fractions were prepared. Different mechanical tests such as tensile, flexural, impact and hardness were conducted on the prepared samples. 25 wt% of abaca fibre volume fraction composites shows better mechanical properties.

1. Introduction

The oil reserves are depleting day by day, every associate around in the globe is showing urgency and interests towards the biomass materials. The natural fibers are renewable, low cost, biodegradable and light weight. Sisal, abaca, jute, coconut, flax, hemp and bamboo were the commonly used natural fibers in composite materials as reinforcement [1]. It is widely discussed in some of the literature about the alkali treatment of jute, coconut, flax, hemp and bamboo. For particle reinforced composite, these particles upgrade the composite material properties. The general shapes for particles are spherical, cubic or tetragonal [2]. Fiber based composites are characterized mainly into continuous fibers and discontinuous fibers. These are again subdivided into bidirectional and unidirectional reinforcements [3]. On the other hand, composites that are obtained from hybrid composition enhance the basic properties of these composites and diminish the overall expenses [4]. Hybrid composite exhibits better properties than single fibre composites, because they contain the combination of different fibers [5]. Fiber length and fiber volume fraction plays a major role in the composite properties [6]. Maurya et al. [7] observed that short randomly oriented sisal fiber of 15mm length reinforced with epoxy, improved its mechanical properties. Ramesh et al. [8] studied that mechanical properties are maximum in composites containing 50% of both epoxy resin and banana fiber. Vaghasia et al. [9] studied that after a certain extent, addition of bamboo fiber to epoxy resin results in deficiency of resin and it prompts decline in mechanical properties. But in the field of abaca fibres there are much more to be explored. Musa Textiles is the botanical name given to abaca fiber and it comes from the banana family. It is commonly known as Manila hemp. Abaca fiber is extracted from the stalk of the abaca plant. It contains hemicellulose, cellulose, wax, pectin and lignin. Alkali chemical treatment helps to modify the surface properties of abaca fiber [10]. Ramnath et al. [11] observed that abaca fiber composites showed better mechanical properties than jute fiber composite. Poly propylene banana fiber composites are used



Magnetic field induced donor binding energy of a GaN/AlGaN quantum dot

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ABSTRACT

The donor binding energy of a parabolic quantum dot is investigated in the presence of a intense magnetic field. We also consider that the donor is placed at the center of the parabolic quantum dot. Using the effective-mass approximation within a variational scheme, binding energy of donor are obtained as a function of the dot size with and without the magnetic field strength. The result shows that binding energy decreases as the radius of the quantum dot increases or the magnetic field decreases. The magnetic field is appreciable especially for large QD while for small QD the geometrical confinement is predominant.

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1. Introduction

Studies on low-dimensional semiconductor structures such as quantum wells (QW), quantum well wires (QWW) and quantum dots(QD) have been extensively investigated due to the play of quantum size effects both theoretically[1–6] and experimentally [7–9] An understanding of the nature of impurity states in semiconductor structures is one of the crucial problems in semiconductor physics because impurities can dramatically alter the properties and performance of a quantum device. An understanding of the nature of impurity states in low dimensional semiconductor structures is one of the crucial problems in semiconductor physics because impurities can dramatically alter the properties and performance of a quantum device. For a semiconductor crystal, electronic excitation consists of a loosely bounded electron–hole pair (the Mott–Wannier exciton), usually delocalized over a length much longer than the lattice constant. As the size of the semiconductor crystallite approaches this exciton Bohr radius, its electronic properties begin to change. This is the so-called quantum size effect, which can be observed as a blue shift in the optical band gap of exciton energy. In recent times, owing to the advance in

materials synthesis, that semiconductor in this size regime can be systematically studied by Wang and Herron [10].

In particular, the study of semiconductor quantum dots(QDs) is of great interest both for their fundamental physical properties and their potential applications in micro and now, in nano-optoelectronic devices. The wide-band gap GaN material systems have attracted much attention for their applications in optoelectronic devices [11]. Built-in electric field is absent in zinc-blend (ZB) GaN structures because the spontaneous polarization does not exist in the ZB GaN due to the higher crystal symmetry. There has been a lot of work devoted to understanding of hydrogenic impurity states in ZB GaN quantum dots and quantum wire. In these systems, wave function would penetrate more to the adjacent quantum dots if the barrier height or the barrier thickness is reduced.

In this work, we make a variational study about the effect of a magnetic field on the groundstate energy and binding energy of a hydrogenic impurity within a ZB GaN Parabolic QD. In Sec. 2, the model Hamiltonians and the trial wave functions proposed for these calculations are presented, while the results are shown and discussed in Sec. 3. Finally, a summary is given in Sec. 4.

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Multiple input and multiple output ofdm for visible light communication

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Abstract. VLC is an important strategy that gives wireless communication by utilizing an optical source. It is the corresponding method to Radio Frequency communication since it has more extensive data transmission. In this paper, VLC utilizes MIMOOFDM. In MIMOOFDM, countless subcarriers are utilized to convey the information, at that point the required precoding strategy is utilized to wipe out the impedance. Data communication can be accomplished by utilizing LEDs that send information to the receiver side.

Keywords— Visible Light Communication(VLC), Multiple Input Multiple Output Orthogonal Frequency Division Multiplexing(MIMOOFDM), Microcontroller.

1. Introduction

VLC may be a data communication variety that uses obvious light between 400 – 800 THz. This innovation utilizes LEDs for moving information. LEDs are utilized at the transmitter section and the Li-Fi sensor is utilized at the beneficiary side. Li-Fi, as well as Wi-Fi, is very like both communicate information as electromagnetic signals. In any case, Wi-Fi can use the radio waves and Li-Fi runs on obvious light. Thusly the VLC gets the light signals and a component to change over the information into a streamable substance. A LED is a semiconductor diode that is used to convert the electrical energy into the light energy and it is used to move the information. Information is taken care of into a LED light, it at that point sends information at quick speeds to the photograph identifier (photodiode). LEDs are used as an eco-friendly light resource that is used in many types of instruments, electronic circuits, and consumer products. LEDs can be used in the process of signaling and illumination. These can be used because of their small size, long life, low cost, and high energy savings over other light resources. Beside it is an initiative and Energy-Effective System.

2. Related work

Numerous papers that use the MIMOOFDM for VLC. B. Li et al, 2015 [1], explained that LEDs are used for illumination and are invoked to support wireless services which produce multiuser interference. Hence, transceiver design is proposed to eliminate multiuser interference. T. Fath and H. Haas, 2013 [2], provides significant spectrum relief for the crowded radio frequency spectrum used by the older wireless communication systems in indoor areas. The strategy utilized in Z. Yu et al, 2013 [3], is the precoding procedure were utilized in Multiuser MISO in transmitter plan in indoor obvious light correspondence to wipe out obstruction. S. D. Dissanayake and J. Armstrong, 2013 [4], differentiate the ACO-OFDM and DCO-OFDM. In ACO-OFDM, the sent sign can be made as a positive, and cutting the first bipolar OFDM signal to zero and sending just the positive sign of signals. In DCO-OFDM, a DC bias can be added to the signal to get it as positive. Azhar et al, 2013





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Experimental determination of the effect of change in relative roughness pitch on the thermo-hydraulic performance of air heater working with solar energy

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ABSTRACT

Solar Air Heater has recently developed the effective utilization of renewable, natural and non-conventional energy for environmental sustainability. It is the most appreciating natural resource available for sustainable development. The current work deals with the analysis of thermo-hydraulic properties of solar air heater with specific parameter variation i.e. Relative Roughness Pitch (RRP). As already diagnosed the effect of relative roughness height, width, etc. using MATLAB. Here the authors have specifically focused on the effect of RRP on the solar air heater's performance. The system utilized some fixed parameters such as, 0.88 emittance of the glass, 0.9 emittance of plate and transmittance-absorptance as 0.8. Also the 0.004 m single glass cover thickness is considered with thermal conductivity of insulation as 0.037 W/m-K. For the analysis purpose, the range of RRP is kept between 6 and 12. Related to operating parameters, Ambient temperature is kept 300 K (fixed) and Wind velocity 1 m/s (assumed fixed) whereas Insulation is kept in the variable range of 500–1000 W/m². Finally, the results are recorded and the interpretations are made based on the validated data and the outcome results.

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1. Introduction

One of the most important requirement for energy conservation and energy utilization in the current synerio is the hunt for eco-friendly, sustainable, cost effective and natural source [1]. The use of solar energy has brought about the revolution in the hours of scarcity of non-renewable energy resources and turned out to be the most effective and best energy source. The application of solar is been observed in all the fields of science. The use of solar energy in development of air heater, effectively named as solar air heater is also one of the effective applications of sun energy [2]. Now the current researchers are dealing with the optimization of developed technologies. The major applications of the SAH are for the sustainable development of the society [3].

In the current research, the efforts are made to computationally analyze the effect of RRP on the thermohydraulic characteristics of

SAH. The idea was generated by reviewing the work by Verma & Varshneyin 2015 [4] where the thermohydraulic analysis is performed with several varying parameters and Kumar, A in 2014 [5] who performed an analysis of fluid flow in various roughness elements and solar air heater ducts. Several parameters are being discussed and the results were obtained for different manipulations within the same setup.

2. Methodology for performance

The relationships of Nusselt number and friction factor of multiple v ribs developed by Hans et al., 2010 [6] are used for prediction of thermal and thermohydraulic performance. Various different characterizations are analysed with the same experimental setup shown in Fig. 1. In the current research, the effect of change in Relative Roughness Pitch is analysed on the performance of Air pre heater. Optimum values of roughness parameters are determined as a function of temperature rise parameter and solar insolation. Bansal et al. (2020) used the similar setup to determine

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ZrC-Impregnated Titanium-Based Coating as an Effective Lubricating Barrier for Artificial Hip Prosthesis

Reference

R. Malkiya Rasalin Prince, N. Selvakumar, D. Arulkirubakaran, S. Christopher Ezhil Singh, M. Chrispin Das, P. K. Bannaravuri, R. Mercy Russelin Prabha, J. Aldrin Raj, and R. B. Jeen Robert, "ZrC-Impregnated Titanium-Based Coating as an Effective Lubricating Barrier for Artificial Hip Prosthesis," *Materials Performance and Characterization* 10, no. 1 (2021): 189–205. <https://doi.org/10.1520/MPC20200075>

ABSTRACT

The important properties of implant materials are extended component life, wear resistance, and biocompatibility. The wear characteristics depend, for implant materials, on the nature of the implant, movement of joints, and usage of the part. Hard ceramic Ti-6Al-4V-2ZrC (Titanium (Ti), Aluminium (Al), Vanadium (V), Zirconium Carbide (ZrC)) was coated over stainless steel (SS) 316L for analyzing the wear and mechanical properties against E-52100 steel balls sliding for artificial hip joints. The coating crystallography was examined by X-ray diffraction analysis and the topography was inspected by an Atomic Force Microscope (AFM). The coating thickness has been measured as 5–6 μm using a scanning electron microscope (SEM), and the smooth surface roughness of 0.03 μm was measured using AFM. The Ti-6Al-4V-2ZrC coated surface nanohardness has been enhanced three times higher than uncoated. The ball-on-disk wear was investigated with a load of 2–3 N, sliding distance 110 m, and sliding velocity 0.25–0.95 m/s. The investigated wear rates are mostly higher than 10^{-5} mm^3/Nm , and the frictional coefficient reduces from 0.8 to 0.35. The morphology of worn surfaces was analyzed using SEM. Based on the improvement in nanohardness, it is concluded that the Ti-6Al-4V-2ZrC coated SS 316L is a good replacement for an artificial hip joint because of its better wear resistance and coefficient of friction.

Keywords

Ti-6Al-4V-2ZrC films, artificial hip joint, wear and coefficient of friction (CoF), adhesion, nanoindentation

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DETECTION AND CLASSIFICATION OF MRI BRAIN
TUMOUR USING GLCM AND ENHANCED K-NN

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(Submitted by Academician V. Sgurev on March 13, 2020)

Abstract

Magnetic Resonance Imaging (MRI) modality is an advanced and efficient tool in radiology to obtain the pictures of the anatomy of human brain. In this proposed work, an automated classification of brain tumour as tumour or non-tumour is presented using enhanced K-Nearest Neighbour (enhanced K-NN) classifier. Here, Median Filtering is used in the pre-processing stage; Fuzzy C-means clustering (FCM) to separate the tumour region from MRI; Grey level co-occurrence matrix (GLCM) is adopted for feature selection followed by Principle component analysis (PCA) for feature reduction. These reduced features are trained and classified using enhanced K-NN classifier. The proposed work is compared with various existing classifiers such as Naïve Bayes, Probabilistic Neural Network (PNN), Support Vector Machine (SVM) and Artificial Neural Network (ANN). The experimental result of the proposed work shows better performance in terms of Recall 97.68%, Precision 97.43% and accuracy 98.42%.

Key words: Magnetic Resonance Imaging, Enhanced K-NN classifier, Gray Level Co-occurrence Matrix, Principal Component Analysis

1. Introduction. In recent years, tumour has become the most serious disease across the world. Around 14.1 million people suffered by tumour in 2012 as reported by American Cancer Society and furthermore, it is predicted to increase up to 21.7 million in 2030. Brain tumour is the growth of abnormal cells in human brain. These are considered to be either cancerous (malignant) or noncancerous

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Wiener filter based deep convolutional network approach for classification of satellite images

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Abstract

Semantic segmentation is a fundamental task in computer vision and image scenery detection. Many applications, such as urban planning, change detection, and environmental monitoring require accurate segmentation. Hence, most segmentation tasks are performed by humans. Currently, with the growth of deep convolutional neural network (DCNN), there are many works aimed to find the best network architecture fitting for this task. In this work, the GoogLeNet classifier is used to perform better segmentation as well as a classification for satellite images. The Wiener filter is used here for image denoising. Data Augmentation is performed to extract high information about the input picture. The output of the above steps helps in classification i.e. it identifies the scenery of the input image with four labels. The result shows that the GoogLeNet based image classification has reduced error rate and it also increases the accuracy of output. Additionally, the efficiency of the Wiener filters also described clearly in the result.

Keywords Deep convolution neural network · Satellite images · Object based classification · Wiener filter · GoogleNet

1 Introduction

Along with the successful launch of new generation satellites like “Worldview” and “Pleiades” in recent years, a large amount of very high resolution (VHR) remotely sensed images is available to be used for the extraction of man-made objects to update urban information systems database and support urban planning activities. Also, detection and segmentation of man-made objects from remotely sensed imagery have been applied to cartography, mapping, change

detection, forestry, urban growth detection, and target detection. Although manual digitization of VHR satellite images to detect and extract man-made objects has been widely used by different communities, this approach is exhausting, time-consuming and expensive, especially for large areas. In this work, we present an approach for training and employing a deep convolutional neural network for object classification in satellite imagery.

Feature extraction is the basis of all state-of-the-art methods to solve problems at hand. Wavelet transforms, morphological profiles, texture statistics, oriented gradients, and segment-based features are the methods popularly selected. The free parameters are set based on the experience of the user or by error and trail which are the basis for the above methods. While considering large spatial neighborhoods, the computational cost is very high for those parameters due to the extensive optimization. This issue has overcome using deep learning methods known as convolutional neural network (CNN) because the spatial features are automatically learned from input images in those methods. Three main operations are performed by the sequence of processing layers in CNNs, which are 2-D convolutions, spatial pooling with subsampling and unit-wise nonlinear activations.

The Wiener filter is a filter used to produce an estimate of a desired or target random process by linear

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Deep learning algorithm for breast masses classification in mammograms

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Abstract: A mammogram is an image of a breast used to detect and diagnose breast cancer. This paper emphasises a Computer-Aided Detection system based on convolutional neural network (CNN) that uses the concept of deep learning to classify the mammogram images into benign, malignant and normal. The proposed CNN model consists of eight convolutional, four max-pooling and two fully connected layers and achieved better results compared to the pre-trained nets, AlexNet and VGG16. The proposed model demonstrates the feasibility of using CNNs on medical image processing techniques for the classification of breast masses. The results are also compared with the state-of-the-art machine learning algorithm like kNN classifier. Experimentation is done with three datasets. Among them, two are publicly available, Mammographic Image Analysis Society (MIAS), digital database for screening mammography (DDSM) and an internally collected dataset. The proposed model achieved accuracies of 92.54, 96.47 and 95 and the Area under the ROC curve (AUC) score of 0.85, 0.96 and 0.94 for MIAS, DDSM and the internally collected dataset respectively. Furthermore, the images of the three datasets are merged to build one large set and used to fine tune the proposed CNN model and produced accuracy of 98.32 and AUC of 0.98.

1 Introduction

Breast cancer is the major cause of cancer deaths among women all over the world. The number of deaths can be reduced by detecting it at its early stages. There are effective techniques available to find out the presence of cancer. The chance of getting cured is high if the disease is identified at its early stages. There are several modalities available for taking the images of breasts such as Mammography, Tomosynthesis, Molecular Breast Imaging, and Magnetic Resonance Imaging. Among them, the most widely used imaging technique is mammography because of its low cost and availability [1].

Mammography is the traditional method used by many people. It uses low-dose X-rays to inspect the human breast. It is a very simple approach and can be easily affordable by people. Cancerous masses and calcium deposits look brighter on the mammogram. Currently, mammography is the gold standard method to detect early stage breast cancer before the lesions become clinically palpable. It has helped to decrease the mortality rate by 25 to 30%. Radiologists take two views of each breast hence two images are produced. They are MLO (Medio Lateral Oblique) view and CC (Cranio Caudal) view.

Since the 1980s, numerous research works with mammography images have been conducted. As there has been a tremendous increase in the number of image processing algorithms, this research field is ever-evolving. Artificial Intelligence and Machine Learning techniques have begun to prove their importance in image processing, i.e. classification of breast masses, micro-calcifications, architectural distortions, and bilateral asymmetry [2].

Research work these days focus mainly on deep learning algorithms. Deep learning techniques refer to a range of Artificial Neural Networks comprising of multiple layers. The techniques mimic the human brain's structure and cognitive behaviour. Deep learning relies not on the hand-crafted features, instead acquire knowledge directly from the data. Deep learning gets raw data as inputs, learns features by itself and classifies the inputs into class labels.

CNN is a special type of multi-layer feed forward neural network that is best suited for classification. Each neuron takes inputs from a local receptive field in the previous layer, and forces it to extract local features. Each convolution layer is composed of multiple feature maps and each one is in the form of a plane within which the individual neurons are constrained. A convolutional neural network (CNN) is a deep artificial neural network which is used mainly to classify images. The usefulness of convolutional nets (CNNs) in image processing has increased the effectiveness of deep learning. Especially, in the field of Medical Image Processing, deep learning plays a vital role [3].

The aim of this paper is to develop a Computer-Aided Detection system methodology to help the radiologists to classify mass lesions, based on CNN with a limited number of layers without losing features for getting a good prediction and also is scalable to massive datasets.

The paper is organised as follows: after reviewing a fraction of the existing literature in Section 2, the proposed model is discussed in Section 3. Section 4 details the results and discussion on various parameters used for the comparison. Section 5 concludes the proposed work.

2 Related works

Methods for classifying breast masses in mammograms have been a continuous topic in the literature for many years, due to its role in image processing. In recent years, machine learning and deep learning algorithms play a vital role in the research.

Litjens *et al.* [4] reviewed the most important deep learning concepts related to medical image analysis and summarised more than 300 research papers in the field. Their survey focused on the application of deep learning algorithms for various image processing tasks. They considered various studies per application area, which were neuro, retinal, pulmonary, digital pathology, breast, cardiac, abdominal etc. Neural networks are a type of learning algorithm which forms the basis of most deep learning methods.



Aerva lanata flowers extract as green corrosion inhibitor of low-carbon steel in HCl solution: an in vitro study

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Abstract

In this study, we present the performance as an inhibitor of plant extract of *Aerva lanata* flowers (ALF) used as an environmentally benign compound for protection of corrosion of low-carbon steel in 1.0 mol L⁻¹ HCl solution. The investigation was accomplished using conventional mass loss, electrochemical measurements and scanning electron microscopy (SEM). The investigation of weight loss demonstrated that the inhibition performance had been improved via raising the concentration of the inhibitor. The efficiency of inhibition has been found to exceed 88% at 600 ppm of the ALF formulation. Using anodic polarization curves, it was demonstrated that flower extract of *Aerva lanata* acted as a mixed-type inhibitor. The green inhibitor compounds covered the steel surface following Langmuir adsorption isotherm. The surface morphology analysis was conducted to validate the results.

Keywords Inhibition performance · Environmentally benign · Corrosion protection · Electrochemical technique · SEM

Introduction

Iron and steels are utilized in a wide range of industries because of their natural availability, toughness, and economic viability. The main disadvantage of these materials

is the high level of susceptibility to corrosion in acid environments. In fact, strong mineral acids like hydrochloric acid are frequently used as efficient pickling agents in chemical and steel industry in particular for the removal of scale, rust, cleaning, etc. Due to their low corrosion resistance, steels are subject to serious corrosion within these aggressive solutions (Derfouf et al. 2019).

In many instances, during acid cleaning of steel surfaces by hydrochloric acid (HCl) before painting or storage, the reaction between acid solutions and iron or its oxides is fierce after several working cycles. The aggressive Cl⁻ and H⁺ ions usually attack the steel base triggering severe corrosion damages because of pitting and uniform corrosion. To prolong the life span of low-carbon steel structures, it is essential that the acid is sufficiently inhibited by a suitable low cost and high-efficiency inhibitor in required quantities to avoid the direct contact and ion–steel interaction (Haruna et al. 2018).

Unfortunately, industrial synthesis of some organic and inorganic chemical inhibitors may cause a harmful effect on nature. As a result, the Directive 76/464/EEC (Environment European Commission) bans on some of those compounds used as inhibitors due to strict environmental rules (Council of the European Communities (CEC) 1997). To address this challenge, during the past 3 decades, big efforts have been made by researchers in the direction toward searching for safe and less

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Trusted Sensing Model for Mobile Ad HoC Network Using Differential Evolution Algorithm

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Mobile Ad Hoc Network (MANET) has a set of mobile nodes that are allowed to communicate with each other through wireless links. The nodes are deployed spontaneously without any infrastructure in a geographical area. Due to the lack of centralized administration and prior organization, MANETs are vulnerable to different attacks of malicious nodes. To overcome the problem of black hole attack in MANETs, a trust model using Differential Evolution (DE) algorithm has been proposed. It identifies the malicious node and inhibits them to become the member of data transmission path. The proposed work consists of two phases; one is to obtain the optimized path and the other deals with the penalty factor for malicious nodes. Moreover, the Differential Evolution is one of the most promising optimization to enhance security with increased network density. The proposed algorithm is compared with Ad Hoc on Demand Multipath Distance Vector (AOMDV), Dynamic Source Routing (DSR), Genetic algorithm and Ant Colony Optimization (ACO).

KEYWORDS: Trust Model, Differential Evolution, Penalty factor, Fitness function, Black hole attack.



Exploring the Properties of Pineapple Leaf Fiber and *Prosopis Juliflora* Powder Reinforced Epoxy Composite

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ABSTRACT

Natural fibers derived from plants are gaining attraction for its low-cost production, excellent mechanical properties, eco-friendly nature and availability. They act as an effective replacement of synthetic materials, makes them suitable for industrial applications. In this work, natural fiber derived from the Pineapple leaf fiber (PLF) and powder derived from *Prosopis Juliflora* (PJP) plant as the filler was utilized as an effective reinforcement for polymer matrix composites. PLF has high cellulose content, makes it suitable for the achievement of high tensile strength, whereas the porous nature of the fiber surface enhances bonding with the polymer matrix. The low cost and wide availability of the fibers make it a suitable alternative for the harmful synthetic fibers. Semi-crystallinity of the fiber allows reduction in water absorption. The PJP belonged to gelatinous or mucilaginous type. PLF was chemically treated with NaOH to remove the wax content on the surface and to improve its mechanical properties. Composites were fabricated by using compression molding machine with 30 weight percentage (wt.%) of untreated PLF and PJP, 30 wt.% of treated PLF and PJP, 40 wt.% of treated PLF and PJP, 50 wt.% of treated PLF and PJP. The remaining wt.% attributes to the epoxy matrix addition. In the fiber wt.%, equal weights of PLF & PJP were taken. The untreated and treated fiber composite samples are tested for their tensile, impact and flexural strength. SEM images of the PLF, PJP and mechanical tested samples were analyzed. Water absorptivity test was carried out to identify the absorption level of fibers in the composite. The test results suggest that the Pineapple leaf fiber and *Prosopis Juliflora* powder reinforced epoxy reinforced composites would be a low-weight, low cost and higher strength material appropriate for industrial applications.

摘要

在本研究中，生物脱胶的秋葵皮和玉米壳纤维进行碱化处理。碱化处理导致生物脱胶纤维线密度降低。碱浓度的增加导致所有拉伸指标的初始增加，然后连续降低：初始模量、断裂韧度和断裂伸长率。3g/L NaOH处理纤维对秋葵皮和玉米壳纤维的拉伸性能最好。红外光谱分析表明，碱处理可消除细胞外物质。所制备的黄秋葵皮和玉米壳纤维的性能范围可归纳为线性密度为9.7-12.3和20.0-24.3 tex初始模量在1257-1897和156.4-354.6 cN/tex之间断裂韧性范围为28.0-46.8和6.37-15.2 cN/tex伸长率范围为2.0-2.5%和8.7-19.9%。所得黄秋葵韧皮纤维的性能优于玉米壳纤维，与常规韧皮纤维相当。

KEYWORDS

Pineapple leaf fiber; prosopis *Juliflora* powder; compression molding machine; mechanical properties; sem analysis; water absorptivity

关键词

农残; 碱化; 生物复合; 生物脱胶; 玉米壳纤维; 天然纤维; 秋葵韧皮纤维



ANFIS-based Power Quality Improvement by Photovoltaic Integrated UPQC at Distribution System

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ABSTRACT

The advent of power electronic devices for the control of non-linear loads has made an impact on the power quality at the Distribution side of the utility grid. The Distribution side must be compensated for both reactive and real power compensation while simultaneously improving the power quality. Unified Power Quality Conditioner is a FACTS device with back-to-back converters coupled together with a DC link element that improves the power quality at the Distribution side. The DC link element sizing and the converter ratings are the challenges faced during the design of UPQC. The Distributed Energy Resource (DER) integrated at the DC link element, supports for power exchange and minimization of the converter ratings. UPQC integrated with a DER simultaneously improves the fault-ride-through capabilities at the Point of Common Coupling. The PV integrated UPQC with bidirectional series and shunt converters are controlled by a hybrid combination of Unit Vector Template and p-q theory respectively. The control unit of the proposed system has to be more precise in a closed-loop structure. The conventional mathematical based PI controllers fail to perform well during the transient oscillations for the UPQC system. The proposed PV-UPQC system has been analysed with an Adaptive Neuro-Fuzzy controller that embeds a reinforced learning algorithm. The Fuzzy-Model-Based (FMB) controller improves the performance of the system by inferencing the system parameters through linguistic rules and helps in reference current generation. The PV-UPQC performed significantly well even during various load conditions. The implementation of an Adaptive Neuro-Fuzzy Inference System leads to minimization in the percentage of Total Harmonic Distortion level.

KEYWORDS

Active filter; Artificial neural networks; Distributed energy resources; Harmonics; Photovoltaics; UPQC

NOMENCLATURE

$V_{grid}(t)$	system source voltage	V_{PLL_abc}	Phase Lock Loop Voltage in <i>abc</i> Cartesian coordinates
$V_{grid+}(t)$	positive sequence component of the system voltage	V_{Load_abc}	load Voltage in <i>abc</i> Cartesian coordinates
$V_{grid-}(t)$	negative sequence component of the system voltage	$v_{\alpha\beta load}$	load voltage in $\alpha\beta$ coordinate
$V_{grid0}(t)$	zero sequence component of the system voltage	$i_{\alpha\beta load}$	load current in $\alpha\beta$ coordinate
V_{sh}	voltage of the shunt compensator	v_{abc_load}	load voltage in <i>abc</i> -coordinate
C_{DC_link}	DC link capacitor	i_{abc_load}	load current in <i>abc</i> -coordinate
$V_{Load}(t)$	load voltage	p_{load}	real power at the load side
$V_{se_comp}(t)$	series compensation voltage	q_{load}	reactive power at the load side
$I_{grid}(t)$	current flowing through the grid	$\overline{p_{dc_load}}$	real power oscillating component at load side
$I_{Load}(t)$	load current	$\overline{q_{ac_load}}$	reactive power average component at load side
$I_{sh_comp}(t)$	shunt compensating current	$\overline{q_{dc_load}}$	reactive power average component at load side
$I_{Load+}(t)$	positive sequence of the load current	$i_{abc_load}^*$	reference current generated in <i>abc</i> Cartesian coordinates at load side
$I_{Load-}(t)$	negative sequence of the load current	$i_{\alpha\beta_load}^*$	reference current in $\alpha\beta$ coordinates at load side
$I_{Load0}(t)$	zero-sequence component of the load current	$r(t)$	input signal
V_{peak}	peak value of the input voltage		

REVIEW ARTICLE

A Survey on Machine Learning Algorithms for the Diagnosis of Breast Masses with Mammograms

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Abstract: Breast cancer is leading cancer among women for the past 60 years. There are no effective mechanisms for completely preventing breast cancer. Rather it can be detected at its earlier stages so that unnecessary biopsy can be reduced. Although there are several imaging modalities available for capturing the abnormalities in breasts, mammography is the most commonly used technique, because of its low cost. Computer-Aided Detection (CAD) system plays a key role in analyzing the mammogram images to diagnose the abnormalities. CAD assists the radiologists for diagnosis. This paper intends to provide an outline of the state-of-the-art machine learning algorithms used in the detection of breast cancer developed in recent years. We begin the review with a concise introduction about the fundamental concepts related to mammograms and CAD systems. We then focus on the techniques used in the diagnosis of breast cancer with mammograms.

Keywords: Breast cancer, mammograms, computer-aided detection, genetic algorithm, deep learning, neural networks.

1. INTRODUCTION

Cancer is a term for a broad range of more than 100 deadly diseases which are characterized mostly by unwanted and uncontrolled cell divisions. These extra cells control and invade the nearby tissues causing those to fail. Most cancers are named after the place in which the unwanted cell /tumor growth begins, in some cases, even after those cells travel to other places and attack the vicinity [1].

The principal indicators of breast cancer are breast masses and breast calcifications. Breast calcifications are small calcium deposits developed in a woman's breast tissue. They are usually benign (noncancerous). In some cases, certain types of breast calcifications may recommend early breast cancer. These are of two types: macrocalcifications and microcalcifications. Macrocalcifications look like large white dots on a mammogram. They are often dispersed randomly within the breast. Microcalcifications are small calcium deposits that look like white specks on a mammogram. They are usually not a result of cancer. But if they seem in certain patterns and are clustered together, they may be a sign of precancerous cells [2].

The modern methods for screening for breast cancer include digital mammography. Other techniques support digital mammography, some are under development and others are already in clinical use. Those techniques include Tomosynthesis (3D mammography) is an advanced form of breast imaging. It uses a low-dose X-ray system and

computer reconstructions to create three-dimensional images of the breasts. The X-ray tube moves in an arc over the compressed breast capturing multiple images of each breast from different angles. These digital images are then synthesized into a set of three-dimensional images by a computer. These 3D image sets are used to distinguish normal overlapping breast tissue from tumors [3].

A breast lump is a mass that develops in the breast. Breast lumps may appear in various sizes and texture. They may cause pain. A breast lump with a smooth, well-defined border is often benign. If the mass contains fluid, it is called a cyst. The breast lump with irregular shape is defined as breast mass and it is also called malignant [3].

Microcalcifications are divided into Type I composed of calcium oxalate and are related to benign cases of the breast and Type II composed of hydroxyapatite or calcium carbonate and are related to malignant breast cases including carcinomas [4].

Breast cancer, like all other cancers, is defined by abnormal uncontained growth of cells which is local to the breast region. It should also be noted that not all cancers which develop in the breast region are considered as breast cancer, for example, the tumors developed in some breast tissues, often called, sarcomas and lymphomas. These uncontrollable cell divisions result in tumors which can be identified through X-rays or other scanning techniques. Tumor cells are considered to be malignant if they spread or travel to other areas of the body, metastasis. Most developed tumors can be felt as a lump in the breast, but this is not the case for the tumors which are just beginning. These young tumors can still be found in mammogram screening. It is also

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TG/DTA studies on the oxidation and thermal behaviour of Ti-6Al-4V-B₄C coatings obtained by magnetron sputtering

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Abstract: Thermogravimetric analysis (TG) is a rapid method for the determination of protecting the ability of thin film coatings in addition to oxidation kinetics. Boron carbide (B₄C) reinforced Ti-6Al-4V thin films were deposited through the magnetron sputtering coating technique. The effect of 0, 2, 4, 6 and 8 Wt. % of B₄C adding on microstructure, thermal behaviour and hardness of Ti-6Al-4V-B₄C coatings were investigated. Thermal analysis of Ti-6Al-4V-B₄C coatings with varying percentage of B₄C resulted in the establishment of an exothermic peak, for the reason that reduction in the oxidation of coating. The thermal behaviour of coating was improved by B₄C addition; those coatings are recommended for practical application. It was proven that the addition of B₄C not only alters the thermal stability but also transforms the mechanism of oxidation. It was absolutely unconcealed that the Ti-6Al-4V-B₄C film oxidization may be a multi-staged procedure subject on the heating rate. An occurrence of formal treatment for obtaining Kissinger's assessment mechanics for various oxidization levels is additionally valid. The addition of B₄C was supported to enhance the nanohardness of the coating. The morphology, composition and structure of the thin film coatings were examined by way of SEM, AFM and XRD.

Keywords: Thermogravimetric analysis, differential thermal analysis, oxidation kinetics, activation energy, nanohardness

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Pectoral Muscle Segmentation in Mammograms

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Pectoral Muscle Segmentation is an essential pre-processing technique used for subsequent processing of finding abnormalities in mammograms. The aim of this paper is to segment pectoral muscle region from the Mediolateral Oblique view of mammograms. The proposed algorithm uses the active contour and intensity based thresholding approach to identify the boundary existing between the pectoral muscle region and the rest of the breast area. The algorithm works in two stage; Contrast enhancement and contour identification in the pre-processing stage and thresholding approach in the second stage. The algorithm is experimented with the 322 mammogram images available in the Mammographic Image Analysis Society (MIAS) database. The proposed algorithm successfully segmented 298 images and thus produced an accuracy of 92.55%. The algorithm is compared with the existing methodologies and shown promising results.

Keywords: Mammograms, Pectoral Muscle, Thresholding, Pre-processing, Intensity, Contour.

Breast cancer is a type of disease mainly affects most of the women all over the world. The disease remains a major health issue.¹ Although there are many techniques available for the detection of breast cancer, mammography is the most important modality chosen by many people. It is the standard and simple modality preferred by many radiologists. Mammography uses low dose X-rays to produce images of both the breasts.² These images are known as mammograms. For each breast two views of pictures are taken from different angles: Cranio-Caudal (CC) view and Mediolateral oblique (MLO) view. Radiologists analyse both the views for the interpretation of the presence of breast tumor. Breast cancer mostly has no symptoms at its earliest stages. Thus, an early

detection should be done through screening from experts which can give greater success.³

About thirty years many researchers paid their attention over the screening mammograms, since medical image processing is the everlasting field. This field attracted many young scientists.⁴ There exist several challenges with mammogram screening. They are, breast masses classification, micro-calcifications, architectural distortions and bilateral asymmetry. Computer Aided Detection (CAD) system provides algorithms which are used for diagnosing the presence of breast cancer. CAD helps the radiologists as a diagnosis tool.⁵

Generally, the Radiologists prefer the MLO view for diagnosis. This is because the MLO view allows imaging of more of the breast in the

Green composite materials for green technology in the automotive industry

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Abstract: The utilization of inexhaustible assets is a significant achievement towards viable individual versatility. Using natural fibers is a worthwhile input towards the ecological mindful of individual transportation. There were numerous advantages related with green initiative which includes better acoustic properties, weight and cost saving potential along with better working conditions. This research contributes a review in the expansive field of green composites searching out for materials with possibilities to be applied on vehicle body parts. The usefulness of the regular fiber composites for car industry was outlined. In addition, this work distinguishes a different method for assessing natural fiber composites compared with general desired criteria. This leads to a situation that natural fiber is no longer an environmental waste by its large scale industrial application which is being discussed here. Here different criteria levels were given to the categorize natural fibers. This criteria serves as a basic tool for the engineers while selecting the natural fiber composites based on its practical application. The automobile business is in the driving seat of green composites since it is here that the need is most prominent. Today we're not offering materials that will change the landscape in the way that metal replacement did, but we are beginning to offer natural fiber composites that will present improvements, particularly in areas such as impact resistance, chemical resistance and, in some cases, process cost.

1. INTRODUCTION

The quest for higher quality at the same price point or retained quality at a lower cost has driven the automotive industry forward for a century. Yet in recent times, the game has dramatically changed. Through a combination of legislation, changing market demands and, to a lesser extent, integrity, environmental responsibility has become critical to vehicle manufacturers and suppliers. Many other industrial sectors have followed suit, but the guidelines outlining the requirements for product improvement in the automotive industry are unique. Aerodynamics and tribology might nibble at the periphery, but the main agent of change has been materials science. Light weighting and a greater use of recycled material have become massive drivers in production, though each has to co-exist within the 'cheaper or better' mantra and fit the established development framework. All things considered, it makes for one of the most interesting upheavals in automotive history. This research aims to provide a thorough knowledge on different types of natural fiber polymers that were used in the manufacturing of various automobile components.





Tribological and Mechanical Performance Characteristics of Epoxy-Resin Composites Reinforced with Multi-Walled Carbon Nanotubes for Sustainable Applications

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Abstract

The increased awareness on devastating effect of synthetically developed materials towards the nature has resulted in the development of eco-friendly and sustainable materials. Natural fibers are weak on its own so, they are used as reinforcement in polymers. The objectives of the current work are focused on fabricating and testing epoxy-nanocomposites reinforced with different concentrations of multi-walled carbon nanotubes (MWCNTs). MWCNT-epoxy resin nanocomposites are prepared with the help of ultrasonic cell crusher and compression moulding process. Samples are subjected to different mechanical testing such as tensile strength, tensile modulus, flexural strength, flexural modulus, impact strength and hardness test in accordance with ASTM standards. It is found that the mechanical performance of MWCNT-epoxy nanocomposites are improved significantly with the addition of MWCNTs. Pin-on-disc (POD) was used to analyse the tribological characteristics of nanocomposites at varying loading conditions. Worn surfaces of POD samples are analysed using Scanning electron microscope (SEM) to elucidate the wear mechanisms. In addition, it is

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Effects of substrate temperature on structural and optoelectronic properties of SnSe thin films by nebulized spray deposition for solar cell applications

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ABSTRACT

SnSe thin films were prepared by nebulized spray deposition method at different substrate temperature of 250–325 °C. The effects of deposition temperature on the structural, morphological, electrical and optical properties of the films were evaluated using XRD, SEM, Hall Effect, UV and PL. The X-ray diffraction study reveals that the all films present an orthorhombic structure of preferred orientation along the (111) direction. From the recorded optical data indicates the existence of direct allowed band gap in the range of 1.14–1.24 eV was obtained. The electrical resistivity shows that the prepared films are semi-conducting nature and resistivity is found to be low at the temperature of 300 °C.

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1. Introduction

In recent past, more importance has been committed in the field of IV–VI class of semiconducting compounds on account of their optoelectronic properties and applications [1–5]. Tin Selenide (SnSe) is a narrow band gap, binary IV–VI semiconductor, suitable for various optoelectronic applications like memory switching devices, photovoltaic, light emitting devices (LED), and holographic recording systems [6–8]. Because of their anisotropic character, the tin chalcogenides are attractive layered compounds, and can be used as cathode materials in lithium intercalation batteries [9] and decreasing the photo corrosion reaction [10]. Considerable attention has been devoted by various authors to the preparation of SnSe thin films by different methods like vacuum evaporation [11–21], flash evaporation [22], hot wall epitaxy [23,24], reactive evaporation [25], electrodeposition [26–29], laser ablation [30,31], brush plating [32], chemical bath deposition (CBD) [33], electrochemical atomic layer epitaxy (ECALE) [34] and spray pyrolysis [35,36] to study various physical properties. Among these

methods, although high quality and uniform films are prepared by physical technique, they are comparably costly and highly energy consuming. Nebulized spray pyrolysis is a simple, versatile, inexpensive, time saving and efficient way of growing thin films at room atmosphere. This technique can be scalable to larger area deposition. The nebulized spray pyrolysis technique (NSP) has been widely used to deposit binary and ternary oxide thin films such as MgO [37], tin doped zinc oxide [38], Cd-doped SnO₂ [39], Gd_xZn_{1-x}O [40], and Na-doped ZnO [41]. Xiaorong et al [37] reported that this technique has advantages like the simplicity of the apparatus and low price of raw materials. E.E.Ebsenso et al [42] had reported deposition of a quaternary oxide, Ln_{1-x}Sr_xCoO₃ (Ln = La, Nd, and Gd) and ternary oxide, SrRuO₃ thin films by nebulized spray pyrolysis technique. It was observed that the film prepared by this technique exhibits low resistivity than other techniques which can be exploited for use as electrodes in several situations. SnSe Thin films were not deposited previously by NSP technique.

In this work, an attempt was made to deposit SnSe thin films by simple nebulized spray pyrolysis technique. The observations of this study reveal that SnSe thin films have good semiconducting nature and seem to be a promising candidate for solar cell applica-

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Performance improvement of Standalone PV system by Full-Bridge LLC Resonant Converter

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ABSTRACT

The depletion in fossil fuels has turned to increase the rapid exploitation of energy from the Renewable Energy resource. The Renewable Energy resources are intermittent and the reliability can be increased by proper conditioning with power electronic devices. The power electronic devices make use of controllers to change the nature of electrical quantity either AC to DC or vice versa. The DC-DC converters conditions the output energy from sun or wind. Resonant converter works on Zero-Voltage-Switching (ZVS) and Zero-Current-Switching (ZCS). The Full-Bridge LLC resonant converter is a three-element resonant converter that has two inductors coupled together by a capacitor and operates at a high frequency with synchronous self-driven rectifiers. The proposed LLC converter topology minimizes the diode rating enabling the converter to be used for high voltage application. LLC converter ensures switching loss minimization compared to the PWM converters. Photovoltaic panels that harness solar energy make use of MPPT controller and maximum power is extracted. The DC electrical energy fed from the PV panels is conditioned by the Full-Bridge LLC resonant converter that can operate in boost and buck modes. The effectiveness of the converter is calculated through simulation with MATLAB and validation through Hardware-In-Loop.

Keywords

Photo-Voltaic, Resonant converters, MPPT, ZVS, ZCS, Perturb and Observe

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Introduction

Renewable energy development has led to many DC-DC converter configurations, that can be more efficient in both stand-alone operations and grid-connected operations. The DC-DC converters are used to perform buck, boost operations, load impedance matching, and improve efficiency. The AC load can be connected after conditioning the DC quantity by the DC-DC converter via an inverter [1]. Renewable energy can either be stored in the batteries for future use or the excess of energy can be fed to the grid. In standalone operation the sizing of the batteries is the primary aspect and, in the grid, connected operation synchronizing with the utility grid must of primary concern [2]-[4]. One of the common techniques used to harness maximum energy from the photovoltaic panels is by controlling DC-DC converter switches with the MPPT Controller [5]-[7]. An algorithm is embedded in MPPT controller that tracks the maximum power when there is varying irradiation.

PWM signals are used for generating the control signals for the converter. The converters that are based on PWM signals contribute to switching losses at operation in high voltage. The handling of high voltage with less switching losses in the high frequency domain is possible by the resonant converters. Resonant works on the principle of resonance by coupling two inductors with a capacitor. The resonant converters are easy for magnetic integration, higher efficiency, and soft switching capabilities [8]. The resonant converter can operate at high switching frequencies. The design of the proposed converter, integration with PV, and MPPT controller under load and no-load conditions have been discussed. The Full-Bridge-LLC resonant converter

has been compared with boost converter through MATLAB-Simulink and validated through the Hardware-In-Loop process.

Methodology

DC-DC converter has different topologies. Resonant converters are reliable and highly efficient. The Zero Voltage Switching in the resonant converter is responsible for minimization of the switching losses which leads to an increase in operating frequency. The resonant converter is responsible for minimization in switching losses, high power density, and higher operating. The resonant converter is of two types based upon the configuration, Parallel, and Series. In Parallel, the regulation of output voltage is simple as the load is in parallel with the main resonant capacitor. The drawback of Parallel Resonant Converter is that there is an increase in loss of energy as the high circulating current increases. A hybrid combination of Series-Parallel Resonant Converter came into existence which removed the drawbacks of both Series and Parallel.

The proposed LLC resonant converter is made up of a combination of an inductor, capacitor, and inductor [8]-[12]. The proposed LLC resonant converter makes use of the leakage inductance of transformer rather than a resonant inductor. A tank circuit is formed along with a capacitor and the core loss in the transformer is reduced by a reduction in flux ripple. The magnetic component is reduced that minimized the flux ripple. The LLC resonant converter can be classified based on the transformer topology as Center tapped LLC and Full Bridge LLC. Full Bridge LLC reduces the oscillations in voltage at the secondary rectifier due to the secondary leakage inductance [13],[14]. The LLC-

Sl.No.	Journal No	Title	Publisher	ISSN	E-ISSN
6801	19693	Entomologica Americana	New York Entomological Soc Inc	19475136	19475144
6802	19694	Entomologica Fennica	Entomologica Fennica	7858760	
6803	19696	Entomological News	Amer Entomol Soc	0013872X	21623236
6804	19697	Entomological Research	Wiley-Blackwell	17382297	17485967
6805	19698	Entomological Review	Scripta Technica	138738	
6806	19699	Entomological Science	Wiley-Blackwell	13438786	14798298
6807	19702	Entomologist's Gazette	Gem Publishing Co.	138894	
6808	19705	Entomotropica	Sociedad Venezolana De Entomologia	13175262	
6809	19708	Entrepreneurship and Regional Development	Routledge Journals, Taylor & Francis Ltd	8985626	14645114
6810	19709	Entrepreneurship Research Journal	Walter De Gruyter Gmbh	21946175	21575665
6811	19711	Entrepreneurship: Theory and Practice	Baylor University	10422587	
6812	19712	Entreprises et Histoire	Editions Eska	11612770	
6813	19713	Entropy	Mdpi Ag	10994300	10994300
6814	19714	Environment	Routledge Journals, Taylor & Francis Ltd	139157	19399154
6815	62805	Environment & We: An International Journal of Science and Technology	Magazine, Delhi	9757112	9757120
6816	19717	Environment and Behaviour	Sage Publications	139165	
6817	19718	Environment and Development Economics	Cambridge Univ Press	1355770X	14694395
6818	19719	Environment and Ecology	MKK Publications	9700420	
6819	19720	Environment and History	White Horse Press	9673407	17527023
6820	19722	Environment and Planning A	Sage Publications Inc	0308518X	14723409
6821	19723	Environment and Planning B: Planning and Design	Pion Ltd	2658135	
6822	19725	Environment and Planning C: Government and Policy	Pion Ltd	0263774X	
6823	19727	Environment and Planning D: Society and Space	Pion Ltd	2637758	
6824	19729	Environment and Society: Advances in Research	Berghahn Books Inc.	21506779	21506787
6825	19730	Environment and Urbanization	Sage Publications Ltd	9562478	17460301
6826	19731	Environment and Urbanization ASIA	Sage Publications Inc.	9754253	9763546
6827	19735	Environment International	Pergamon-Elsevier Science Ltd	1604120	18736750
6828	19738	Environment Systems & Decisions	Springer Science + Business Media	21945403	21945411
6829	19740	Environment, Development and Sustainability	Springer Netherlands	1387585X	15732975

Sl.No.	Journal No	Title	Publisher	ISSN	E-ISSN
14124	30174	Journal of Information and Knowledge Management	World Scientific Publishing Co.	2196492	17936926
14125	30176	Journal of Information and Organizational Sciences	University of Zagreb	18463312	18469418
14126	30177	Journal of Information Display	Korean Information Display Society	15980316	21581606
14127	30178	Journal of Information Ethics	Mcfarland & Co.	10619321	
14128	30179	Journal of Information Hiding and Multimedia Signal Processing	National Kaohsiung University of Applied Sciences	20734212	20734239
14129	30180	Journal of Information Literacy	Cilip Information Literacy Group	17505968	
14130	42802	Journal of Information Policy	Pennsylvania State University, Institute for Information Policy	21583897	
14131	30181	Journal of Information Processing	Information Processing Society of Japan	3876101	18826652
14132	30182	Journal of Information Processing Systems	Korea Information Processing Society (Kips)	1976913X	
14133	30184	Journal of Information Science	Sage Publications Ltd	1655515	17416485
14134	30185	Journal of Information Science and Engineering	Inst Information Science	10162364	
14135	30186	Journal of Information Security and Applications	Elsevier Limited	22142126	22142134
14136	30188	Journal of Information Systems	American Accounting Association	8887985	
14137	30191	Journal of Information Technology	Palgrave Macmillan Ltd	2683962	14664437
14138	30192	Journal of Information Technology and Politics	Routledge	19331681	1933169X
14139	64150	Journal of Information Technology Cases and Applications	Taylor & Fransis	23336897	
14140	30193	Journal of Information Technology Education: Innovations in Practice	Informing Science Institute	21653151	2165316X
14141	30194	Journal of Information Technology Education: Research	Informing Science Institute	15479714	15393585
14142	30195	Journal of Information Technology Research	The Information Resources Management Association (Irma)	19387857	
14143	30196	Journal of Information Technology Teaching Cases	Springer International Publishing Ag		20438869
14144	30197	Journal of Information, Communication and Ethics in Society	Emerald Group Publishing Ltd	1477996X	
14145	30199	Journal of Informetrics	Elsevier Science Bv	17511577	18755879

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6719	19577	Energy Science & Engineering	Wiley-Blackwell	20500505	20500505
6720	19581	Energy Sources, Part A: Recovery, Utilization and Environmental Effects	Taylor & Francis	15567036	15567230
6721	19582	Energy Sources, Part B: Economics, Planning and Policy	Taylor & Francis	15567249	
6722	19583	Energy Storage Materials	Elsevier Bv		24058297
6723	19584	Energy Strategy Reviews	Elsevier Science Bv	2211467X	22114688
6724	19585	Energy Studies Review	Mcmaster University, Institute for Energy Studies	8434379	
6725	19586	Energy Systems	Springer Verlag	18683967	18683975
6726	19588	Energy Technology	Wiley-V C H Verlag Gmbh	21944288	21944296
6727	19590	Energy, Sustainability and Society	Springer Science + Business Media		21920567
6728	19591	eNeurologicalSci	Elsevier Bv		24056502
6729	19592	Enfance	Presses Universitaires De France	137545	
6730	19593	Enfances et Psy	Eres Publishers	12865559	17762820
6731	19594	Enfances, Familles, Generations	Erudit Publishers	17086310	
6732	19596	Enfermedades Infecciosas y Microbiologia	Obsidiana Editores	14050994	
6733	19597	Enfermedades Infecciosas y Microbiologia Clinica	Ediciones Doyma S A	0213005X	15781852
6734	19598	Enfermedades Infecciosas y Microbiologia Clinica Monografias	Ediciones Doyma S.A.	16963539	
6735	19599	Enfermeria Clinica	Ediciones Doyma S.A.	11308621	15792013
6736	19600	Enfermeria Global	Universidad De Murcia Servicio De Publicaciones	16956141	
6737	19601	Enfermeria intensiva / Sociedad Espanola de Enfermeria Intensiva y Unidades Coronarias	Ediciones Doyma S.A.	11302399	15781291
6738	19602	Enfermeria Nefrologica	Sociedad Espanola De Enfermeria Nefrologica	22542884	22553517
6739	62335	Engaging Science, Technology, and Society	Society for Social Studies of Science		
6740	19603	Engenharia Agricola	Soc Brasil Engenharia Agricola	1006916	
6741	19604	Engenharia Sanitaria e Ambiental	Assoc Brasileira Engenharia Sanitaria Ambiental	14134152	18094457
6742	19605	Engineer	Centaur Communications Ltd	137758	
6743	19608	Engineering	Gilard Welch Ltd	137782	
6744	19610	Engineering Analysis with Boundary Elements	Elsevier Sci Ltd	9557997	1873197X

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10878	22914	International Journal of Hyperthermia	Taylor & Francis	2656736	14645157
10879	22915	International Journal of Iberian Studies	Intellect Books	1364971X	
10880	22916	International Journal of Image and Data Fusion	Taylor and Francis Inc.	19479832	19479824
10881	46333	International Journal of Image and Graphics	World Scientific Publishing Co. Pte. Ltd	2194678	
10882	22917	International Journal of Imaging and Robotics	Ceser Publications	2231525X	
10883	45261	International Journal of Imaging Science and Engineering	ITFR Signal Processing Society	19349955	
10884	22918	International Journal of Imaging Systems and Technology	Wiley-Blackwell	8999457	10981098
10885	22919	International Journal of Immunogenetics	Wiley-Blackwell	17443121	1744313X
10886	22920	International Journal of Immunopathology and Pharmacology	Sage Publications Inc	3946320	
10887	22923	International Journal of Impact Engineering	Pergamon-Elsevier Science Ltd	0734743X	18793509
10888	22924	International Journal of Impotence Research	Nature Publishing Group	9559930	14765489
10889	22925	International Journal of Inclusive Education	Routledge Journals, Taylor & Francis Ltd	13603116	14645173
10890	47404	International journal of Indian culture and business management (IJICBM)	Inderscience	17530806	17530814
10891	22926	International Journal of Industrial and Systems Engineering	Inderscience Publishers	17485037	17485045
10892	22927	International Journal of Industrial Chemistry	Springer Science + Business Media	22285970	22285547
10893	22928	International Journal of Industrial Engineering : Theory Applications and Practice	University of Texas At El Paso	10724761	
10894	22933	International Journal of Industrial Engineering and Management	University of Novi Sad, Faculty of Technical Sciences	22172661	
10895	22929	International Journal of Industrial Engineering Computations	Growing Science	19232926	19232934
10896	22930	International Journal of Industrial Engineering-Theory Applications and Practice	Univ Cincinnati Industrial Engineering	1943670X	1943670X

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17215	49021	Materials Today: Proceedings	Elsevier BV	22147853	
17216	4009	Materials Transactions	Japan Inst Metals	13459678	13475320
17217	4010	Materials World	Maney Publishing	9678638	
17218	4011	Materialwissenschaft und Werkstofftechnik	Wiley-V C H Verlag Gmbh	9335137	15214052
17219	4012	Materia-Rio De Janeiro	Univ Fed Rio De Janeiro, Lab Hidrogenio	15177076	15177076
17220	4014	Materiaux et Techniques	S.I.R.P.E.	326895	
17221	4015	Maternal and Child Health Journal	Springer/Plenum Publishers	10927875	15736628
17222	4016	Maternal and Child Nutrition	Wiley-Blackwell	17408695	17408709
17223	4018	Mathematica	Editions De L'Academie Roumaine	12229016	
17224	4019	Mathematica Bohemica	Akademie Ved Ceske Republiky	8627959	
17225	4020	Mathematica Scandinavica	Matematisk Inst	255521	19031807
17226	4021	Mathematica Slovaca	Walter De Gruyter Gmbh	1399918	13372211
17227	63420	Mathematical and Computational Applications	MDPI	22978747	
17228	4023	Mathematical and Computational Forestry and Natural-Resource Sciences	Contemporary Journal Concept Press	19467664	
17229	46971	Mathematical and Computer Modeling	Elsevier		8957177
17230	4025	Mathematical and Computer Modelling of Dynamical Systems	Taylor & Francis Inc	13873954	17445051
17231	4026	Mathematical Biology and Bioinformatics	Institute of Mathematical Problems of Biology	19946538	
17232	4027	Mathematical Biosciences	Elsevier Science Inc	255564	18793134
17233	4028	Mathematical Biosciences and Engineering	Amer Inst Mathematical Sciences-Aims	15471063	15510018
17234	4029	Mathematical Communications	Univ Osijek, Dept Mathematics	13310623	13310623
17235	4030	Mathematical Control and Related Fields	Amer Inst Mathematical Sciences-Aims	21568472	21568499
17236	4031	Mathematical Engineering	Springer Science + Business Media	21924732	21924740
17237	4033	Mathematical Finance	Wiley-Blackwell	9601627	14679965
17238	63463	Mathematical Finance Letters	Science & Knowledge Publishing Corporation Limited,UK	20512929	
17239	4035	Mathematical Geosciences	Springer Heidelberg	18748961	18748953
17240	4037	Mathematical Inequalities and Applications	Element D.O.O.	13314343	
17241	4038	Mathematical Intelligencer	Springer	3436993	18667414

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15108	48424	Journal of Physical Education, Recreation and Dance	Society of Health and Physical Educators, America	7303084	21683186
15109	19198	Journal of Physical Oceanography	Amer Meteorological Soc	223670	15200485
15110	19199	Journal of Physical Organic Chemistry	Wiley-Blackwell	8943230	10991395
15111	19200	Journal of Physical Science	Penerbit Universiti Sains Malaysia	16753402	21804230
15112	63941	Journal of Physical Sciences	Vidyasagar University		23500352
15113	19201	Journal of Physical Studies	West Ukrainian Physical Society	10274642	
15114	19202	Journal of Physical Therapy	Journal of Physical Therapy	20790015	20799209
15115	19203	Journal of Physical Therapy Science	Society of Physical Therapy Science	9155287	
15116	19204	Journal of Physician Assistant Education	Physician Assistant Education Association	19419430	19419449
15117	19206	Journal of Physics A: Mathematical and Theoretical	IOP Publishing Ltd	17518113	17518121
15118	19209	Journal of Physics and Chemistry of Solids	Pergamon-Elsevier Science Ltd	223697	18792553
15119	19210	Journal of Physics B: Atomic, Molecular and Optical Physics	IOP Publishing Ltd	9534075	
15120	62357	Journal of Physics Communications	IOP Publishing Ltd		23996528
15121	19212	Journal of Physics Condensed Matter	IOP Publishing Ltd	9538984	
15122	19213	Journal of Physics D: Applied Physics	IOP Publishing Ltd	223727	
15123	19217	Journal of Physics G: Nuclear and Particle Physics	IOP Publishing Ltd	9543899	
15124	19222	Journal of Physics: Conference Series	IOP Publishing Ltd	17426588	
15125	19224	Journal of Physiological Anthropology	Biomed Central Ltd	18806805	18806805
15126	19226	Journal of Physiological Sciences	Springer Japan Kk	18806546	18806562
15127	19227	Journal of Physiology	Blackwell Publishing Inc.	223751	14697793
15128	19228	Journal of Physiology and Biochemistry	Springer	11387548	18778755
15129	19229	Journal of Physiology and Pharmacology	Polish Physiological Soc	8675910	
15130	19230	Journal of Physiology Paris	Elsevier Bv	9284257	
15131	19233	Journal of Physiotherapy	Australian Physiotherapy Assoc	18369553	18369561
15132	19236	Journal of Phytopathology	Wiley-Blackwell	9311785	14390434

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17215	49021	Materials Today: Proceedings	Elsevier BV	22147853	
17216	4009	Materials Transactions	Japan Inst Metals	13459678	13475320
17217	4010	Materials World	Maney Publishing	9678638	
17218	4011	Materialwissenschaft und Werkstofftechnik	Wiley-V C H Verlag Gmbh	9335137	15214052
17219	4012	Materia-Rio De Janeiro	Univ Fed Rio De Janeiro, Lab Hidrogenio	15177076	15177076
17220	4014	Materiaux et Techniques	S.I.R.P.E.	326895	
17221	4015	Maternal and Child Health Journal	Springer/Plenum Publishers	10927875	15736628
17222	4016	Maternal and Child Nutrition	Wiley-Blackwell	17408695	17408709
17223	4018	Mathematica	Editions De L'Academie Roumaine	12229016	
17224	4019	Mathematica Bohemica	Akademie Ved Ceske Republiky	8627959	
17225	4020	Mathematica Scandinavica	Matematisk Inst	255521	19031807
17226	4021	Mathematica Slovaca	Walter De Gruyter Gmbh	1399918	13372211
17227	63420	Mathematical and Computational Applications	MDPI	22978747	
17228	4023	Mathematical and Computational Forestry and Natural-Resource Sciences	Contemporary Journal Concept Press	19467664	
17229	46971	Mathematical and Computer Modeling	Elsevier		8957177
17230	4025	Mathematical and Computer Modelling of Dynamical Systems	Taylor & Francis Inc	13873954	17445051
17231	4026	Mathematical Biology and Bioinformatics	Institute of Mathematical Problems of Biology	19946538	
17232	4027	Mathematical Biosciences	Elsevier Science Inc	255564	18793134
17233	4028	Mathematical Biosciences and Engineering	Amer Inst Mathematical Sciences-Aims	15471063	15510018
17234	4029	Mathematical Communications	Univ Osijek, Dept Mathematics	13310623	13310623
17235	4030	Mathematical Control and Related Fields	Amer Inst Mathematical Sciences-Aims	21568472	21568499
17236	4031	Mathematical Engineering	Springer Science + Business Media	21924732	21924740
17237	4033	Mathematical Finance	Wiley-Blackwell	9601627	14679965
17238	63463	Mathematical Finance Letters	Science & Knowledge Publishing Corporation Limited,UK	20512929	
17239	4035	Mathematical Geosciences	Springer Heidelberg	18748961	18748953
17240	4037	Mathematical Inequalities and Applications	Element D.O.O.	13314343	
17241	4038	Mathematical Intelligencer	Springer	3436993	18667414

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17187	3968	Materials at High Temperatures	Taylor & Francis	9603409	18786413
17188	3969	Materials Characterization	Elsevier Science Inc	10445803	18734189
17189	3971	Materials Chemistry and Physics	Elsevier Science Sa	2540584	18793312
17190	47732	Materials Chemistry Frontiers	Royal Society of Chemistry		20521537
17191	3972	Materials China	Chemical Industry Press	16743962	
17192	3974	Materials Express	Amer Scientific Publishers	21585849	21585857
17193	3975	Materials for Renewable and Sustainable Energy	Springer International Publishing Ag	21941459	21941467
17194	3977	Materials Horizons	Royal Soc Chemistry	20516347	20516355
17195	3978	Materials Letters	Elsevier Science Bv	0167577X	18734979
17196	3981	Materials Performance and Characterization	Astm International		21653992
17197	3982	Materials Physics and Mechanics	Advanced Study Center Co.	16052730	16058119
17198	3983	Materials Research	Universidade Federal De Sao Carlos	15161439	
17199	3984	Materials Research Bulletin	Pergamon-Elsevier Science Ltd	255408	18734227
17200	3985	Materials Research Express	IOP Publishing Ltd	20531591	20531591
17201	3986	Materials Research Innovations	Maney Publishing	14328917	1433075X
17202	3987	Materials Research Letters	Taylor & Francis Inc	21663831	21663831
17203	3989	Materials Science	Springer	1068820X	1573885X
17204	3990	Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing	Elsevier Bv	9215093	
17205	3991	Materials Science & Engineering B: Solid-State Materials for Advanced Technology	Elsevier Bv	9215107	
17206	3997	Materials Science and Engineering C	Elsevier Bv	9284931	
17207	3998	Materials Science and Engineering: R: Reports	Elsevier Bv	0927796X	
17208	3999	Materials Science and Technology	Taylor & Francis	2670836	17432847
17209	4000	Materials Science in Semiconductor Processing	Elsevier Sci Ltd	13698001	18734081
17210	4004	Materials Science-Poland	De Gruyter Open Ltd	2083134X	2083134X
17211	4005	Materials Technology	Taylor & Francis	10667857	17535557
17212	4007	Materials Today	Elsevier Sci Ltd	13697021	18734103
17213	4008	Materials Today Communications	Elsevier Bv	23524928	
17214	63824	Materials Today Energy	Elsevier		24686069

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4930	16381	Complex Systems and Complexity Science	Fu Za Xi Tong Yu Fu Za Xing Ke Xue Bian Ji Bu	16723813	
4931	16382	Complex Variables and Elliptic Equations	Taylor & Francis	17476933	17476941
4932	16383	Complexity	Hindawi Publishing Corporation	10762787	10990526
4933	16389	Complutum	Universidad Complutense De Madrid	11316993	19882327
4934	16391	Composite Interfaces	Taylor & Francis	9276440	15685543
4935	16394	Composite Structures	Elsevier Sci Ltd	2638223	18791085
4936	63825	Composites Communications	Elsevier		24522139
4937	16399	Composites Part A: Applied Science and Manufacturing	Pergamon Press Ltd	1359835X	
4938	16401	Composites Part B: Engineering	Pergamon Press Ltd	13598368	
4939	16403	Composites Science and Technology	Elsevier Sci Ltd	2663538	18791050
4940	16406	Composites: Mechanics, Computations, Applications	Begell House	21522057	21522073
4941	16407	Compositio Mathematica	Cambridge Univ Press	0010437X	15705846
4942	16410	Compost Science and Utilization	J G Press, Inc.	1065657X	
4943	16413	Comprehensive Analytical Chemistry	Elsevier Bv	0166526X	
4944	16417	Comprehensive Physiology	John Wiley & Sons Inc	20404603	20404603
4945	16418	Comprehensive Psychiatry	Elsevier	0010440X	15328384
4946	16419	Comprehensive Reviews in Food Science and Food Safety	Wiley-Blackwell	15414337	15414337
4947	16422	Comptabilite Controle Audit	Assoc Francophone Comptabilite-Afc	12622788	
4948	16425	Comptes Rendus - Biologies	Elsevier Masson	16310691	
4949	16426	Comptes Rendus - Geoscience	Elsevier Masson	16310713	
4950	16427	Comptes Rendus - Mecanique	Elsevier Masson	16310721	
4951	16428	Comptes Rendus - Palevol	Elsevier Masson	16310683	
4952	16430	Comptes Rendus Chimie	Elsevier France-Editions Scientifiques Medicales Elsevier	16310748	18781543
4953	16433	Comptes Rendus de l'Academie Bulgare des Sciences	Gauthier Villars Editeur	13101331	
4954	16449	Comptes Rendus Mathematique	Elsevier France-Editions Scientifiques Medicales Elsevier	1631073X	17783569

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12519	26392	Journal of Allergy and Clinical Immunology: In Practice	Elsevier	22132198	
12520	26394	Journal of Allied Health	Charles B Slack	907421	
12521	26395	Journal of Alloys and Compounds	Elsevier Science Sa	9258388	18734669
12522	26396	Journal of Alternative and Complementary Medicine	Mary Ann Liebert, Inc	10755535	15577708
12523	26397	Journal of Alternative Investments	Institutional Investor Systems	15203255	
12524	26399	Journal of Alzheimer's Disease	IOS Press	13872877	
12525	26400	Journal of Ambient Intelligence and Humanized Computing	Springer Heidelberg	18685137	18685145
12526	26401	Journal of Ambient Intelligence and Smart Environments	IOS Press	18761364	18761372
12527	26402	Journal of Ambulatory Care Management	Lippincott Williams & Wilkins Ltd	1489917	
12528	26404	Journal of American College Health	Routledge Journals, Taylor & Francis Ltd	7448481	19403208
12529	26406	Journal of American Ethnic History	Univ Illinois Press	2785927	19364695
12530	26407	Journal of American Folklore	Amer Folklore Soc	218715	15351882
12531	26408	Journal of American History	Oxford University Press	218723	19452314
12532	26409	Journal of American Studies	Cambridge Univ Press	218758	14695154
12533	26410	Journal of Anaesthesiology Clinical Pharmacology	Research Society of Anaesthesiology - Clinical Pharmacology	9709185	
12534	26412	Journal of Analysis and Computation	Serials Publications	9732861	
12535	26413	Journal of Analytical and Applied Pyrolysis	Elsevier Science Bv	1652370	1873250X
12536	26414	Journal of Analytical Atomic Spectrometry	Royal Soc Chemistry	2679477	13645544
12537	26415	Journal of Analytical Chemistry	Maik Nauka/Interperiodica/Springer	10619348	16083199
12538	26417	Journal of Analytical Methods in Chemistry	Hindawi Publishing Corporation	20908865	20908873
12539	26419	Journal of Analytical Psychology	Blackwell Publishing Inc.	218774	
12540	26420	Journal of Analytical Toxicology	Oxford University Press	1464760	19452403
12541	26422	Journal of Anatomy	Wiley-Blackwell	218782	14697580

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9473	30075	IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences	Oxford University Press	9168508	
9474	30076	IEICE Transactions on Information and Systems	Ieice-Inst Electronics Information Communications Eng	17451361	17451361
9475	30077	IES Journal Part A: Civil and Structural Engineering	Taylor and Francis Inc.	19373260	19373279
9476	30078	IET Biometrics	Inst Engineering Technology-let	20474938	20474946
9477	30080	IET Circuits, Devices and Systems	Institution of Engineering and Technology	1751858X	17518598
9478	30081	IET Communications	Inst Engineering Technology-let	17518628	17518636
9479	30082	IET Computer Vision	Inst Engineering Technology-let	17519632	17519640
9480	30083	IET Computers and Digital Techniques	Inst Engineering Technology-let	17518601	1751861X
9481	30084	IET Control Theory and Applications	Inst Engineering Technology-let	17518644	17518652
9482	62348	IET Cyber-Physical Systems: Theory & Applications	The Institution of Engineering and Technology		23983396
9483	30085	IET Electric Power Applications	Inst Engineering Technology-let	17518660	17518679
9484	30086	IET Electrical Systems in Transportation	The Institution of Engineering and Technology	20429738	20429746
9485	30088	IET Generation, Transmission and Distribution	Institution of Engineering and Technology	17518687	17518695
9486	30089	IET Image Processing	Inst Engineering Technology-let	17519659	17519667
9487	30090	IET Information Security	Inst Engineering Technology-let	17518709	17518717
9488	30091	IET Intelligent Transport Systems	Inst Engineering Technology-let	1751956X	17519578
9489	30093	IET Microwaves, Antennas and Propagation	Institution of Engineering and Technology	17518725	
9490	30094	IET Nanobiotechnology	Inst Engineering Technology-let	17518741	1751875X
9491	30095	IET Networks	Institution of Engineering and Technology		20474962
9492	30096	IET Optoelectronics	Inst Engineering Technology-let	17518768	17518776
9493	30097	IET Power Electronics	Inst Engineering Technology-let	17554535	17554543

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4146	5457	Chemical Engineering Sciences	Pergamon Press Ltd	92509	
4147	5458	Chemical Engineering Transactions	Italian Association of Chemical Engineering - Aidic	19749791	
4148	5461	Chemical Geology	Elsevier Science Bv	92541	18785999
4149	5465	Chemical Immunology and Allergy	Karger Ag	16602242	
4150	5467	Chemical Industry and Chemical Engineering Quarterly	Association of The Chemical Engineers	14519372	
4151	5472	Chemical Modelling	Royal Society of Chemistry	5848555	
4152	5473	Chemical Papers	Springer International Publishing Ag	3666352	13369075
4153	5474	Chemical Physics	Elsevier Science Bv	3010104	18734421
4154	5475	Chemical Physics Letters	Elsevier Science Bv	92614	18734448
4155	5479	Chemical Product and Process Modeling	Walter De Gruyter Gmbh	19342659	
4156	5480	Chemical Record	Wiley-V C H Verlag Gmbh	15278999	15280691
4157	5481	Chemical Research in Chinese Universities	Higher Education Press	10059040	22103171
4158	5482	Chemical Research in Toxicology	American Chemical Society	0893228X	15205010
4159	5483	Chemical Reviews	American Chemical Society	92665	15206890
4160	5484	Chemical Science	Royal Soc Chemistry	20416520	20416539
4161	5485	Chemical Senses	Oxford University Press	0379864X	14643553
4162	5487	Chemical Society Reviews	Royal Soc Chemistry	3060012	14604744
4163	5488	Chemical Speciation and Bioavailability	Taylor & Francis	9542299	20476523
4164	5489	Chemical Vapor Deposition	Wiley-V C H Verlag Gmbh	9481907	15213862
4165	5492	Chemicke Listy	Chemicke Listy	92770	12137103
4166	5494	Chemico-Biological Interactions	Elsevier Ireland Ltd	92797	18727786
4167	5495	Chemie der Erde	Gustav Fischer Verlag	92819	
4168	5497	Chemie in Unserer Zeit	Wiley-V C H Verlag Gmbh	92851	15213781
4169	5502	Chemija	Lietuvos Mokslu Akad Leidykla	2357216	2357216
4170	5503	Chemik	Association of Engineers and Technicians of Chemical Industry	92886	
4171	5508	Chemistry	Ministry of Education and Sciences of The Republic of Bugaria	8619255	
4172	5509	Chemistry - A European Journal	John Wiley & Sons Ltd	9476539	15213765
4173	5510	Chemistry - An Asian Journal	Wiley - V C H Verlag Gmbbh & Co.	18614728	1861471X
4174	48474	Chemistry & Biology Interface	NA	22494820	

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9923	21112	Information Grammaticale	Peeters Publishers	2229838	
9924	21114	Information Management	Idea Group Publishing	1080286X	
9925	21116	Information Polity	IOS Press	15701255	18758754
9926	21118	Information Processing and Management	Pergamon Press Ltd	3064573	
9927	21119	Information processing in medical imaging : proceedings of the ... conference	Springer Verlag	10112499	
9928	21120	Information Processing Letters	Elsevier Science Bv	200190	18726119
9929	21122	Information Psychiatrique	John Libbey Eurotext	200204	
9930	21123	Information Research	University of Sheffield	13681613	
9931	21125	Information Resources Management Journal	Idea Group Publishing	10401628	15337979
9932	21126	Information Retrieval	Kluwer Academic Publishers	13864564	15737659
9933	21128	Information Sciences	Elsevier Science Inc	200255	18726291
9934	21131	Information Security Journal	Taylor & Francis	19393555	
9935	21133	Information Services and Use	IOS Press	1675265	
9936	21134	Information Society	Taylor & Francis Inc	1972243	10876537
9937	21137	Information Systems	Pergamon-Elsevier Science Ltd	3064379	18736076
9938	21138	Information Systems and e-Business Management	Springer Heidelberg	16179846	16179854
9939	21139	Information Systems Frontiers	Springer	13873326	15729419
9940	21140	Information Systems Journal	Wiley-Blackwell	13501917	13652575
9941	21141	Information Systems Management	Auerbach Publications	10580530	19348703
9942	21142	Information Systems Research	Informa	10477047	15265536
9943	44864	Information Technologies and International Development	U S C Annenberg School for Communication	15447529	
9944	21145	Information Technology and Control	Kaunas Univ Technology	1392124X	
9945	21146	Information Technology and Disabilities	Easi: Equal Access To Software and Information	10735127	
9946	21147	Information Technology and Libraries	Amer Library Assoc	7309295	21635226
9947	21148	Information Technology and Management	Baltzer Science Publishers B.V.	1385951X	15737667
9948	21149	Information Technology and People	Northwind Publications, Ltd	9593845	
9949	21150	Information Technology and Tourism	Springer Science + Business Media	10983058	19434294

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14751	24764	Journal of National Black Nurses' Association : JNBNA	The National Black Nurses' Association, Inc.	8856028	
14752	41807	Journal of National Development (Bi-annual)	Centre for Studies of National Development, Meerut	9728309	
14753	41098	Journal of National Law University, Delhi	National Law University, Delhi	22774017	
14754	24765	Journal of Natural Disasters	Science & Technology Periodical Press	10044574	
14755	24766	Journal of Natural Fibers	Taylor & Francis Inc	15440478	1544046X
14756	24768	Journal of Natural Gas Science and Engineering	Elsevier Sci Ltd	18755100	22123865
14757	24769	Journal of Natural History	Taylor & Francis	222933	14645262
14758	24770	Journal of Natural Medicines	Springer Japan Kk	13403443	18610293
14759	24771	Journal of Natural Products	American Chemical Society	1633864	15206025
14760	44931	Journal of Natural Products	Americal Chemical Society	9639969	
14761	64432	Journal of Natural Products.	AMERICAN CHEMICAL SOCIETY	9745211	
14762	24772	Journal of Natural Remedies	Natural Remedies Private Ltd	9725547	
14763	24773	Journal of Natural Resources Policy Research	Routledge	19390459	19390467
14764	24774	Journal of Natural Science, Biology and Medicine	Medknow Publications and Media Pvt. Ltd	9769668	22297707
14765	24776	Journal of Nature Conservation	Nature conservators, India	9705945	
14766	24777	Journal of Naval Architecture and Marine Engineering	Bangladesh University of Engineering and Technology	18138535	20708998
14767	24778	Journal of Navigation	Cambridge Univ Press	3734633	14697785
14768	24779	Journal of Near Eastern studies	Univ Chicago Press	222968	15456978
14769	24780	Journal of Near Infrared Spectroscopy	Sage Publications Ltd	9670335	17516552
14770	24781	Journal of Negative Results in BioMedicine	Biomed Central	14775751	
14771	24782	Journal of Nematology	Soc Nematologists	0022300X	
14772	24783	Journal of Neonatal Nursing	Stansted News Ltd	13551841	
14773	24784	Journal of Neonatal-Perinatal Medicine	IOS Press	19345798	18784429
14774	24786	Journal of Nepal Health Research Council	Nepal Health Research Council	19996217	
14775	24788	Journal of Nepal Paediatric Society	Nepal Paediatric Society	19907974	19907982
14776	24789	Journal of Nephrology	Wichtig Publishing	11218428	17246059
14777	24791	Journal of Nephropathology	Society of Diabetic Nephropathy Prevention	22518363	22518819

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9494	30099	IET Radar, Sonar and Navigation	Institution of Engineering and Technology	17518784	17518792
9495	30100	IET Renewable Power Generation	Inst Engineering Technology-let	17521416	17521424
9496	30102	IET Science, Measurement and Technology	Institution of Engineering and Technology	17518822	17518830
9497	30103	IET Signal Processing	Inst Engineering Technology-let	17519675	17519683
9498	30104	IET Software	Inst Engineering Technology-let	17518806	17518814
9499	30106	IET Systems Biology	Inst Engineering Technology-let	17518849	17518857
9500	30107	IET Wireless Sensor Systems	Institution of Engineering and Technology	20436386	20436394
9501	30108	IETE Journal of Education	Taylor and Francis Group	24554383	9747338
9502	30109	IETE Journal of Research	Taylor and Francis Group	3772063	0974780X
9503	30110	IETE Technical Review	Taylor and Francis Group	2564602	9745971
9504	30112	IFAC-PapersOnLine	Ifac Secretariat	24058963	
9505	30114	IFIP Advances in Information and Communication Technology	Springer Verlag	18684238	1868422X
9506	30116	IFLA Journal	Sage Publications	3400352	
9507	30117	IForest	The Italian Society of Silviculture and Forest Ecology (Sisef)	19717458	
9508	30119	IFRF Combustion Journal	International Flame Research Foundation	1562479X	
9509	30120	Igaku butsuri : Nihon Igaku Butsuri Gakkai kikanshi = Japanese journal of medical physics : an official journal of Japan Society of Medical Physics	Nihon Igaku Butsuri Gakkai	13455354	
9510	41183	Igaku Toshokan (Journal of the Japan Medical Library Association)	Nihon Igaku Toshokan Kyokai, Japan Medical Library Association	4452429	18845622
9511	30121	Igiene e Sanita Pubblica	Nebo Sas Editore	191639	
9512	30123	Iheringia - Serie Botanica	Fundacao Zoobotanica Do Rio Grande	734705	
9513	30124	Iheringia - Serie Zoologia	Fundacao Zoobotanica Do Rio Grande	734721	
9514	30129	IIC International Review of Intellectual Property and Competition Law	Verlag C.H. Beck Ohg	189855	
9515	30132	IIE Transactions (Institute of Industrial Engineers)	Taylor & Francis	0740817X	
9516	30135	IIMB Management Review	Indian Institute of Management	9703896	
9517	44408	IISE Transactions	Taylor & Francis	24725854	24725862

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5499	48044	Current Green Chemistry	Bentham Science Publishers Ltd	22133461	2213347X
5500	14224	Current Gynecologic Oncology	Medical Communications	20811632	
5501	14225	Current Heart Failure Reports	Current Science Inc.	15469530	15469549
5502	14226	Current Hematologic Malignancy Reports	Current Medicine Group	15588211	1558822X
5503	14228	Current Hepatitis Reports	Current Science Inc.	15403416	15410706
5504	14229	Current Herpetology	Herpetological Society of Japan	13455834	
5505	14230	Current History	Current Hist Inc	113530	1944785X
5506	14231	Current HIV Research	Bentham Science Publ Ltd	1570162X	18734251
5507	14232	Current HIV/AIDS Reports	Springer	15483568	15483576
5508	14233	Current Hypertension Reports	Springer	15226417	15343111
5509	14236	Current Immunology Reviews	Bentham Science Publishers	15733955	
5510	14237	Current Infectious Disease Reports	Springer	15233847	15343146
5511	14238	Current Issues in Auditing	American Accounting Association	19361270	
5512	14239	Current Issues in Education	Arizona State University	1099839X	
5513	14241	Current Issues in Language Planning	Multilingual Matters Ltd	14664208	
5514	14242	Current Issues in Molecular Biology	Horizon Scientific Press	14673037	14673045
5515	14243	Current Issues in Pharmacy and Medical Sciences	Uniwersytet Medyczny W Lublinie	2084980X	
5516	14244	Current Issues in Tourism	Routledge Journals, Taylor & Francis Ltd	13683500	17477603
5517	14245	Current Legal Problems	Oxford University Press	701998	20448422
5518	14246	Current Medical Imaging Reviews	Bentham Science Publ Ltd	15734056	18756603
5519	14247	Current Medical Research and Opinion	Taylor & Francis	3007995	14734877
5520	14249	Current Medical Trends	All India Medicos Society	9723390	
5521	14250	Current Medicinal Chemistry	Bentham Science Publ Ltd	9298673	1875533X
5522	14254	Current Medicine Research and Practice	Sir Ganga Ram Hospital	23520817	
5523	63937	Current Metabolomics	Bentham Science	2213235X	22132368
5524	14256	Current Microbiology	Springer	3438651	14320991
5525	63637	Current Microwave Chemistry	Bentham Science, United Arab Emirates	22133356	22133364
5526	14260	Current Molecular Medicine	Bentham Science Publ Ltd	15665240	18755666
5527	14261	Current molecular pharmacology	Bentham Science Publishers	18744702	
5528	14262	Current Nanoscience	Bentham Science Publ Ltd	15734137	18756786

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12631	21434	Journal of Applied Research and Technology	Centro De Ciencias Aplicadas Y Desarrollo Tecnológico, Universidad Nacional Autónoma De Mexico	16656423	
12632	21435	Journal of Applied Research in Higher Education	Emerald Group Publishing Ltd	17581184	20507003
12633	21436	Journal of Applied Research in Intellectual Disabilities	Wiley-Blackwell	13602322	14683148
12634	21437	Journal of Applied Research in Memory and Cognition	Elsevier Science Inc	22113681	2211369X
12635	21438	Journal of Applied Research on Children	Children At Risk		
12636	21439	Journal of Applied Research on Medicinal and Aromatic Plants	Elsevier Gmbh	22147861	
12637	21440	Journal of Applied School Psychology	Haworth Press Inc.	15377903	15377911
12638	41238	Journal of Applied Science and Computations	Institute of Applied Science & Computations	10765131	
12639	21444	Journal of Applied Security Research	Taylor & Francis	19361610	19361629
12640	21445	Journal of Applied Social Psychology	Wiley-Blackwell	219029	15591816
12641	21446	Journal of Applied Social Science	Society for Applied Sociology	19367244	
12642	21449	Journal of Applied Spectroscopy (English Translation of Zhurnal Prikladnoi Spektroskopii)	Kluwer Academic Publishers	219037	15738647
12643	21450	Journal of Applied Sport Psychology	Taylor & Francis	10413200	15331571
12644	21452	Journal of Applied Statistics	Taylor & Francis	2664763	13600532
12645	21456	Journal of Applied Toxicology	Wiley-Blackwell	0260437X	10991263
12646	21457	Journal of Applied Volcanology	Springer International Publishing Ag		21915040
12647	21458	Journal of Applied Zoological Researches	Applied Zoologist Research Association	9709304	
12648	21459	Journal of Approximation Theory	Academic Press Inc Elsevier Science	219045	10960430
12649	21461	Journal of Aquaculture in the Tropics	MD Publications Private Limited	9700846	
12650	21463	Journal of Aquatic Animal Health	Taylor & Francis Inc	8997659	15488667

Sl.No.	Journal No	Title	Publisher	ISSN	E-ISSN
2976	14723	Biology	Multidisciplinary Digital Publishing Institute (MDPI)		20797737
2977	14725	Biology and Environment	Royal Irish Academy	7917945	
2978	14727	Biology and Fertility of Soils	Springer	1782762	14320789
2979	14729	Biology and Philosophy	Kluwer Academic Publishers	1693867	15728404
2980	14731	Biology Bulletin	Maik Nauka/Interperiodica/Springer	10623590	10263470
2981	47303	biology bulletin reviews	springer	20790864	20790872
2982	14733	Biology Direct	Biomed Central Ltd	17456150	
2983	14734	Biology Letters	Royal Soc	17449561	1744957X
2984	14735	Biology of Blood and Marrow Transplantation	Elsevier Science Inc	10838791	15236536
2985	14738	Biology of Mood and Anxiety Disorders	Biomed Central		20455380
2986	14739	Biology of Reproduction	Soc Study Reproduction	63363	15297268
2987	14740	Biology of Sex Differences	Biomed Central Ltd	20426410	
2988	14741	Biology of Sport	Inst Sport	0860021X	20831862
2989	14742	Biology of the Cell	Wiley-Blackwell	2484900	1768322X
2990	14744	Biology Open	Company of Biologists Ltd	20466390	20466390
2991	14745	Biomacromolecules	American Chemical Society	15257797	15264602
2992	14747	Biomarker Insights	Libertas Academica	11772719	
2993	14748	Biomarkers	Taylor & Francis	1354750X	13665804
2994	14749	Biomarkers and Genomic Medicine	Elsevier Bv	22140247	
2995	14750	Biomarkers in Medicine	Future Medicine Ltd	17520363	17520371
2996	14753	Biomass and Bioenergy	Pergamon Press Ltd	9619534	
2997	14754	Biomass Conversion and Biorefinery	Springer Verlag	21906815	21906823
2998	14755	Biomaterials	Elsevier Sci Ltd	1429612	18785905
2999	14757	Biomaterials Science	Royal Soc Chemistry	20474830	20474849
3000	14760	Biomatter	Landes Bioscience	21592527	21592535
3001	14761	Biomechanics and Modeling in Mechanobiology	Springer Heidelberg	16177959	16177940
3002	46493	BioMed Central Obesity	BioMed Central Ltd		20529538
3003	14762	BioMed Research International	Hindawi Publishing Corporation	23146133	23146141
3004	14764	Biomedica : revista del Instituto Nacional de Salud	Instituto Nacional De Salud	1204157	
3005	14767	Biomedical and Environmental Sciences	Chinese Center Disease Control & Prevention	8953988	
3006	14769	Biomedical and Pharmacology Journal	Oriental Scientific Pub. Co.	9746242	
3007	14770	Biomedical Chromatography	Wiley-Blackwell	2693879	10990801
3008	14773	Bio-Medical Engineering	Kluwer Academic Publishers	63398	15738256

Sl.No.	Journal No	Title	Publisher	ISSN	E-ISSN
13908	28358	Journal of Graph Theory	Wiley-Blackwell	3649024	10970118
13909	28359	Journal of Graphic Novels and Comics	Routledge	21504857	21504865
13910	28361	Journal of Great Lakes Research	Elsevier Sci Ltd	3801330	
13911	28362	Journal of Greek Linguistics	Brill	15665844	
13912	28363	Journal of Green Building	College Publishing	15526100	19434618
13913	28364	Journal of Green Engineering	River Publishers	19044720	22454586
13914	28365	Journal of Grey System	Research Information Ltd	9573720	
13915	28366	Journal of Grid Computing	Springer	15707873	15729184
13916	28367	Journal of Group Theory	Walter De Gruyter GmbH	14335883	14354446
13917	28368	Journal of Groups in Addiction and Recovery	Haworth Press Inc.	1556035X	15560368
13918	28371	Journal of Guidance, Control, and Dynamics	American Institute of Aeronautics and Astronautics	7315090	15333884
13919	28372	Journal of Gynecologic Oncology	Korean Soc Gynecology Oncology & Colposcopy	20050380	20050399
13920	28374	Journal of Gynecologic Surgery	Mary Ann Liebert Inc.	10424067	
13921	28378	Journal of Hand Surgery	Elsevier	3635023	15316564
13922	28379	Journal of Hand Surgery: European Volume	Sage Publications	17531934	15322211
13923	28382	Journal of Hand Therapy	Hanley & Belfus-Elsevier Inc	8941130	1545004X
13924	28383	Journal of Happiness Studies	Springer	13894978	15737780
13925	28384	Journal of Harbin Institute of Technology (New Series)	Harbin Gongye Daxue/Harbin Institute of Technology	10059113	
13926	28385	Journal of Hard Tissue Biology	Journal Hard Tissue Biology	13417649	13417649
13927	64113	Journal Of Harmonized Research In Applied Science	Society of Harmonized Research		23217456
13928	42497	Journal of Haryana Studies		4549201	
13929	28386	Journal of Hazardous Materials	Elsevier Science Bv	3043894	18733336
13930	28387	Journal of Hazardous, Toxic, and Radioactive Waste	American Society of Civil Engineers	21535493	21535515
13931	28388	Journal of Head Trauma Rehabilitation	Lippincott Williams & Wilkins	8859701	1550509X
13932	28389	Journal of Headache and Pain	Springer-Verlag Italia Srl	11292369	11292377
13933	28394	Journal of Health and Human Services Administration	Southern Public Administration Education Foundation, Inc.	10793739	

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17215	49021	Materials Today: Proceedings	Elsevier BV	22147853	
17216	4009	Materials Transactions	Japan Inst Metals	13459678	13475320
17217	4010	Materials World	Maney Publishing	9678638	
17218	4011	Materialwissenschaft und Werkstofftechnik	Wiley-V C H Verlag Gmbh	9335137	15214052
17219	4012	Materia-Rio De Janeiro	Univ Fed Rio De Janeiro, Lab Hidrogenio	15177076	15177076
17220	4014	Materiaux et Techniques	S.I.R.P.E.	326895	
17221	4015	Maternal and Child Health Journal	Springer/Plenum Publishers	10927875	15736628
17222	4016	Maternal and Child Nutrition	Wiley-Blackwell	17408695	17408709
17223	4018	Mathematica	Editions De L'Academie Roumaine	12229016	
17224	4019	Mathematica Bohemica	Akademie Ved Ceske Republiky	8627959	
17225	4020	Mathematica Scandinavica	Matematisk Inst	255521	19031807
17226	4021	Mathematica Slovaca	Walter De Gruyter Gmbh	1399918	13372211
17227	63420	Mathematical and Computational Aplications	MDPI	22978747	
17228	4023	Mathematical and Computational Forestry and Natural-Resource Sciences	Contemporary Journal Concept Press	19467664	
17229	46971	Mathematical and Computer Modeling	Elsevier		8957177
17230	4025	Mathematical and Computer Modelling of Dynamical Systems	Taylor & Francis Inc	13873954	17445051
17231	4026	Mathematical Biology and Bioinformatics	Institute of Mathematical Problems of Biology	19946538	
17232	4027	Mathematical Biosciences	Elsevier Science Inc	255564	18793134
17233	4028	Mathematical Biosciences and Engineering	Amer Inst Mathematical Sciences-Aims	15471063	15510018
17234	4029	Mathematical Communications	Univ Osijek, Dept Mathematics	13310623	13310623
17235	4030	Mathematical Control and Related Fields	Amer Inst Mathematical Sciences-Aims	21568472	21568499
17236	4031	Mathematical Engineering	Springer Science + Business Media	21924732	21924740
17237	4033	Mathematical Finance	Wiley-Blackwell	9601627	14679965
17238	63463	Mathematical Finance Letters	Science & Knowledge Publishing Corporation Limited,UK	20512929	
17239	4035	Mathematical Geosciences	Springer Heidelberg	18748961	18748953
17240	4037	Mathematical Inequalities and Applications	Element D.O.O.	13314343	
17241	4038	Mathematical Intelligencer	Springer	3436993	18667414

Sl.No.	Journal No	Title	Publisher	ISSN	E-ISSN
20617	32137	Psychological Injury and Law	Springer Verlag	1938971X	19389728
20618	32138	Psychological Inquiry	Routledge Journals, Taylor & Francis Ltd	1047840X	15327965
20619	32140	Psychological Medicine	Cambridge Univ Press	332917	14698978
20620	32141	Psychological Methods	Amer Psychological Assoc	1082989X	19391463
20621	32142	Psychological Perspectives	Taylor and Francis Inc.	332925	15563030
20622	32143	Psychological Record	Springer	332933	21633452
20623	32144	Psychological Reports	Sage Publications Inc	332941	1558691X
20624	32145	Psychological Research	Springer Verlag	3400727	14302772
20625	32147	Psychological Review	Amer Psychological Assoc	0033295X	19391471
20626	32148	Psychological Science	Sage Publications Inc	9567976	14679280
20627	32150	Psychological science in the public interest : a journal of the American Psychological Society	Sage Publications Inc.		21600031
20628	53	Psychological Science in the Public Interest, Supplement	Sage Publications, Inc.	15291006	
20629	32151	Psychological Services	Amer Psychological Assoc	15411559	1939148X
20630	32152	Psychological Studies	Mysore University	332968	
20631	32153	Psychological Trauma: Theory, Research, Practice, and Policy	American Psychological Association	19429681	
20632	32158	Psychologie Francaise	Elsevier France-Editions Scientifiques Medicales Elsevier	332984	
20633	32159	Psychologie in Erziehung und Unterricht	Ernst Reinhardt Gmbh Co Verlag	0342183X	
20634	32161	Psychologische Rundschau	Hogrefe & Huber Publishers	333042	21906238
20635	32162	Psychologist	British Psychological Soc	9528229	9528229
20636	32163	Psychologist-Manager Journal	Taylor and Francis	10887156	
20637	42153	Psychology		21527180	21527199
20638	32166	Psychology and Aging	Amer Psychological Assoc	8827974	19391498
20639	32167	Psychology and Developing Societies	Sage Publications India Pvt Ltd	9713336	
20640	32168	Psychology and Education	Psychology and Education	333077	
20641	32169	Psychology and Health	Brunner - Routledge (Us)	8870446	
20642	32170	Psychology and Marketing	John Wiley & Sons Inc.	7426046	15206793
20643	32171	Psychology and Neuroscience	Casa Do Psicologo	19843054	19833288
20644	32172	Psychology and Psychotherapy: Theory, Research and Practice	Wiley-Blackwell	14760835	20448341
20645	32174	Psychology and Sexuality	Routledge	19419899	19419902
20646	32177	Psychology in Russia: State of the Art	Faculty of Psychology, Lomonosov Moscow State University	20746857	

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Scopus coverage years: from 1984 to 1986, from 1994 to Present

Publisher: Trans Tech Publications Ltd

ISSN: 0255-5476 E-ISSN: 1662-9752

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SJR 2020
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0.426

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IOP Conference Series: Materials Science and Engineering

Scopus coverage years: from 2009 to 2021

ISSN: 1757-8981 E-ISSN: 1757-899X

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