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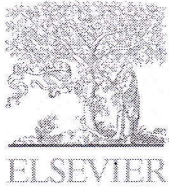
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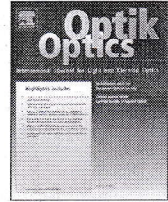
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Original research article

# Analysis of lifting scheme based Double Density Dual-Tree Complex Wavelet Transform for de-noising medical images

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## ARTICLE INFO

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## ABSTRACT

Medical images play a vital role in diagnosis of various diseases. This has paved a path to the extensive use of CT, mammogram, MRI and ultrasound images in the recent days which has caused a rising concern about the radiation dosage that is involved in medical screening process. Owing to this concern low dose screening is widely being performed and has resulted in the introduction of noise, artifacts thus producing low image quality which can adversely affect the judgment of the radiologists. This in turn has led to the demand of enhanced image de-noising techniques. This work is an approach to remove multiple types of noises from low dose medical images using lifting based Double Density Dual-Tree Complex Wavelet Transform (DDDCWT) and a modified Bernoulli based thresholding technique enhanced by fuzzy optimization technique. The parameters observed from the simulation results of the proposed method were compared with the existing de-noising techniques and results of the proposed method have shown significant improvement over the conventional techniques. The proposed work not only efficiently de-noises the image but also enhances its visual appearance. The Lifting scheme used provides augmented memory for decomposition, thus speeding up the entire de-noising process.

## 1. Introduction

The presence of noise, artifacts and distortion in the medical images might make the diagnosis highly unstable and unreliable [1]. Noise might decrease the visibility of entities in the image which might result in faulty diagnosis. Noise does not just occur due to low dosage but also due to various other factors like machine specifications, detector specifications, image acquisition, compression and transmission of medical data. Also, low lighting conditions and limited exposure might lead to degradation of the medical data. De-noising is the most essential pre-processing task required for medical investigation and diagnosis [2]. The sole objective of de-noising lies in suppressing noise from the medical image whilst protecting their edge features and textural features. Edge, texture and noise are known as high frequency components thus making it difficult to distinguish them in the process of de-noising and resulting in loss of information. Therefore, often image enhancement techniques are essential post de-noising of medical images. Low Dose CT and mammogram images which are said to be the principal application of CT image technology mainly suffer from additive Gaussian noise. Speckle noise is said to be common in ultra-sound images and MRI images are prone to thermal noise, Rican noise or Poisson noise. Certain cases often result in a mixture of noises which make it even more intractable to remove using a unified de-noising filter as different filters are effective for different type of noise [3].

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## Mechanically toughened EMI shielding natural rubber composite in microwave frequency bands

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### ABSTRACT

Mechanically toughened high electromagnetic interference (EMI) shielding natural rubber composite material was prepared and characterised. The aim of this investigation was to reveal the role of adding cobalt nanowire and conductive graphene nanoplatelet in toughening and EMI shielding effectiveness of rubber composite in microwave bands (E, F, I and J). The composites were prepared using two roll-mill and cured at 150°C. The mechanical and EMI shielding behaviour was measured following ASTM standards. The addition of graphene nanoplatelet improved the toughness and skin effect of rubber, whereas cobalt nanowire improved the magnetic permeability. A highest EMI shielding of -17.6 dB in absorption and -20 dB in reflection at 18 GHz was observed for the composite made of graphene nanoplatelet and cobalt nanowire of 3 and 8phr. These mechanically toughened promising EMI shielding composite materials could be used as EMI filters and electromagnetic wave absorbers in antennae application with good toughness.

### ARTICLE HISTORY

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### KEYWORDS

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### Introduction

High toughness EMI shielding improved polymer composites are having wider applications in electronics applications particularly in Telecommunication sectors [1]. Usually, the electromagnetic interference (EMI) between gadgets creates a malfunction in signal transmission, data recurring and clarity of data processing [2]. To reduce the EMI between gadgets high-performance flexible shielding materials are getting high attention among rigid thermoset plastic-based materials [3]. In general, elastomers are more flexible and versatile than polymer and metallic materials, thus they are highly suitable in high-performance EMI shielding application. Since elastomers are flexible nature their degree of application and workability is very high in several engineering domains [4]. A lot of researchers studied rigid thermoset plastic-based EMI shielding materials; whereas rubber-based flexible EMI shielding research is marginally less. Moreover, for the past decade, many researchers used conducting materials as filler for improving the shielding effectiveness by absorption ( $S_{21}$ ) scattering phenomenon but still the shielding efficiency is not so high. But some researchers have been identified that the ferromagnetic selective additions could improve EM shielding. John et al. [5] investigated the role of  $Fe_3O_4$  particle addition along with conducting particle. They concluded that

the addition of magnetic particle improved the shielding effect than composite made of  $TiO_2$  particle alone. Tahir et al. [6] studied the EMI effect of adding  $Fe_3O_4$  magnetic fillers along with conducting fillers. The authors concluded that the addition of magnetic filler of significant volume percentage increased the EMI shielding at a higher rate than composite made of only conducting particles. Jin et al. [7] investigated the effect of iron-deposited graphene oxides on the electromagnetic wave absorbing property of polymer composite films with Fe-based hollow magnetic fibres for near-field applications. They concluded that the power losses of the composite films showed that the incorporation of a small amount of Fe-deposited GO into the film alongside the hollow fibres could lead to a dramatic increase in the power loss compared to the other secondary fillers. Similarly, Avanish et al. [8] investigated the phenolic resin-based composite sheets filled with mixtures of reduced graphene oxide,  $\gamma-Fe_2O_3$  and carbon fibres for excellent EMI shielding in the X-band. The authors concluded that additions of  $\gamma-Fe_2O_3$  in RGO matrix improved the thermal stability and dielectric loss thereby increasing the shielding effectiveness. Yanhu et al. [9] have done a fabrication of a flexible EMI shielding  $Fe_3O_4$ /reduced graphene oxide/natural rubber (NRMG) composite with a segregated network. The author concluded that the presence of  $Fe_3O_4$  enhances the EMI shielding effectiveness (EMI SE) of NRMG composites. The

## An Efficient Frequency Reconfigurable Antenna with Dual Feed for Wireless Applications

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**Abstract:** In this paper, an efficient frequency reconfigurable antenna design with dual feed is presented. The proposed frequency reconfigurable antenna uses stub placements in the place of switches reducing the need of complex circuitry. To implement the design, a stub loaded Complementary Split Ring Resonator (CSRR) is employed beneath the signal plane. The proposed method exploits signal integration in the signal plane through a coupling gap. The antenna is designed with  $0.05\lambda \times 0.05\lambda$  dimension resonating at 5.16 GHz and 6.5 GHz respectively. An impedance of  $50\Omega$  is maintained in designing the prototype. When complementary split ring is deployed in ground plane, dual band (5.16 GHz and 6.5 GHz) frequency response is noted. When stub loading is introduced in the gap region of split ring, circular ring characteristics is noted over a single band (6.5 GHz). The reconfiguration has been achieved by switching the antenna with single and dual band operations. The antenna is empirically developed, simulated and measured to yield the Ultra Wide Band (UWB) frequency for wireless applications. The frequency reconfigurable antenna provides narrow band of operations and achieved 98% of efficiency.

**Keywords:** Complimentary Split Ring Resonator, dual band, frequency reconfiguration, stub loading.

### I. INTRODUCTION

Novelties in present-day communication systems need antennas to be capable of with intellectual competence. Thus, such systems have need of intelligent antennas that adapt their basic operating parameters for instance operating frequency, polarization and radiation pattern with the varying requests. This stimulates the investigation of novel field in antenna engineering over reconfigurable antenna. Those antennas have the capability of altering its elementary operational characteristics. Most of the reconfigurable antennas are dominated by employing Radio Frequency-Micro Electro Mechanical Systems (RF-MEMS), PIN diodes, Varactor diodes and Field-Effect Transistors (FET) [1] – [5].



RESEARCH ARTICLE



Polymer  
COMPOSITES

WILEY

# Role of cobalt nanowire and graphene nanoplatelet on microwave shielding behavior of natural rubber composite in high frequency bands

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#### Abstract

Highly flexible microwave shielding E (2-3 GHz), F (3-4 GHz), I (8-12 GHz) and J (12-16 GHz) natural rubber composites for antenna application were prepared and characterized. The main objective of this current research is to develop a flexible microwave shielding material to reduce electromagnetic interference (EMI) effect. Graphene nanoplatelet and cobalt nanowire was selected for improving electric and magnetic losses. The flexible rubber composite was prepared using two-roll mill process and cured at an temperature of 150°C. The mechanical, dielectric, magnetic, and microwave shielding properties were tested in accordance to ASTM standards. Highest tensile strength of 30 MPa was obtained for composite made of 6phr (parts per hundred rubber) of graphene nanoplatelet and cobalt nanowire (NR<sub>4</sub>). Dielectric results show that the composite consists of graphene nanoplatelet and cobalt nanowire of 6phr gives highest dielectric constant of 7.2. The hysteresis analysis shows a highest magnetization of 940 emu, remanence of 610 emu and coercivity of 2750G for NR<sub>4</sub> composite. Similarly, the maximum microwave attenuation of 38.1 dB at 18 GHz (J band) was achieved in NR<sub>4</sub> composite. This high microwave shielding flexible composite material could be used as EMI filter and electromagnetic absorber in antennae applications where EMI need to be lesser.

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## Survey on Big Data Acquisition tools and techniques

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**Arockia Jaya J<sup>1</sup>, Dr. Mahalakshmi K<sup>2</sup>, Survey on Big Data Acquisition tools and techniques  
- Palarch's Journal of Archaeology of Egypt/Egyptology 17(9). ISSN 1567-214x,**

### 1. Introduction

In the past years, word big data have been used for labelling attributes by various players. Also, various methods to process architectures for big data were given to meet the various features big data. Altogether, data acquisition is known as the method to gather, filter, as well as clean data prior to storing the data in a data warehouse or any other solutions for storing.

The location of big data acquisition among the overall big data value chain are depicted in Fig. 1. Obtaining big data is very often decided by 4 Vs: volume, velocity, variety, and value. Many data obtaining scenarios provide high-volume, high-velocity, high-variety, yet low-value data, that made it of utmost importance to get adapted as well as time-efficient gathering, filtering, and cleaning algorithm which makes sure that specifically high-value parts of the data usually underwent processing by the data-warehouse analysis. Still few organizations, many data are of more value so that it could be of utmost importance to get new consumers. For such organization, data analyzing, classifying, and packing on a increased data capacities that provide the maximum central role post data obtaining.

The aim of this paper can be divided into 3 parts: Initially, its objective is to find out the current common needs for obtaining data by demonstrating open benchmark framework as well as protocol for obtaining huge data for companies. The second aim of this is unveiling the present methods utilized to obtain data in various sectors. At the end, we discuss the needs for obtaining data are got by present methods and feasible methods could happen in the same area.

### 2. Key Insights for Big Data Acquisition

For obtaining a better insight about the data acquisition, the part will initially show various big data architectures of Oracle, Vivisimo, as well as IBM. This will combine the method for acquiring among the big data processing pipeline.

The historical data show various methods by which the abstraction of big data pipeline. Oracle (2012) depends on the 3-step strategy to process data. Initially, the components of various source of data are obtained and stored in a confined scalable solution for storing like the NoSQL database or the Hadoop Distributed File System (HDFS). Details that have undergone storage follows by reorganizing and is stored in a big data analytics software that is capable of SQL. At last, it undergoes analysis with a big data analytics algorithm.

Velocity[1] depends on various views on a big data. In this the technique is often based

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## An Extensive Survey On Resource Allocation Mechanisms In Cloud Computing

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Jansi Sophia Mary C<sup>1</sup>, Dr. Mahalakshmi K<sup>2</sup>, An Extensive Survey On Resource Allocation Mechanisms In Cloud Computing - PalArch's Journal of Archaeology of Egypt/Egyptology 17(9). ISSN 1567-214x, *Keywords:* Cloud Computing, Resource Allocation, Consumer Context, Virtualization, Infrastructure as a Service Cloud, Optimization

### Abstract-

At present scenario, Cloud Computing is the emerging trend technology in order to store, process, visualize and analyze data in an efficient way. It deals with on demand dynamic resource allocation for giving assured services to the consumers. Pay-As-You-Use model is used here to the public. Resource Allocation is carried out beside with intention of reducing the price associated with it. In recent days, the major functions of Resource Allocation are meeting the needs of customers and application requirements. Different resource allocation techniques had been inspected in this paper.

### 1. Introduction:

In an internet, Cloud Computing (CC) is explicated as New- Fashioned technique of assessing, storing the Flexible and Virtual assets dynamically. CC is an empowering framework on demand to get entry for distributed group of sources such as servers, storage units which yields the responsibilities that may additionally be saved and discarded with tons much less control work [1]. CC suggests cutting edge fashion in Information generation that shifts the computing facts into the massive statistics facilities from the desktop. It is elucidated as app delivered as services throughout the web. The computing effort through all cloud environments is furnished by the way of gaggle of knowledge centers, in diverse location are interrelated through excessive velocity network. Cloud may be bunch of distributed systems in cloud computing. It supplies required statically asset to digital clients at some stage in the internet. The method of controlling the useful resource aids to synchronize data assets in retort to control works finished via each the Consumer and givers of cloud. It is called as Resource Allocation (RA) to resource's customers from the resource's providers. User can use the reachable ability greater effectively due to the fact the aid administration lets in to reallocating the assets dynamically. In CC, Resource Allocation is the approach of allotting obtainable resources to the required cloud apps throughout the web. Because of predefined aid allocation process, the Infrastructure as a Service (IaaS) assigns assets to contesting the demands. When the assigning is now not managed accurately, RA craves utilities. The issue is deduced by way

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