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## Significant Groundwater Level Decline for Handri River Basin, Andhra Pradesh, India

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*Abstract: Analysis of significant groundwater level decline is essential for efficient groundwater resources management for domestic uses, industrial uses and irrigation purposes in the study area. The present research entails the significant groundwater level decline analysed for Handri river basin, a tributary of Tungabhadra river in Andhra Pradesh, India. The component helps in assessment of groundwater sources. Groundwater Estimation Committee (India) guidelines are followed in this assessment of significant groundwater level decline. Various data is collected from various agencies. The groundwater levels for both pre-monsoon and post-monsoon seasons are collected for time period 1997 to 2015. Present methodology is based on recommendations of Groundwater Estimation Committee which is formed by government of India. Significant groundwater level decline is estimated for various watersheds which are fall under Handri river basin for both commanded and non-commanded areas for both pre-monsoon and post-monsoon seasons. The component significant groundwater level decline is assessed for four command areas and eleven non command areas in the study area*

*Key Words: Groundwater, Assessment, Handri, Decline, River*

### 1. INTRODUCTION

Groundwater resources are important to meet the rapidly expanding urban, industrial and agricultural water requirements, particularly in arid and semi-arid zones. Groundwater is one of the most valuable natural resources supporting human health and economic development. Because of its continuous availability and excellent natural quality, it becomes an important source of water supply in & both urban and rural areas of any country. It also helps in poverty alleviation and reduction, i.e., can be delivered directly to the poor community far more cheaply and quickly than the canal water. Groundwater management is under pressure on increased water demand, climate change and pollution problems (Kumar and Seethapathi, 2007). The main scientific concern is the correct understanding of the changes in quality and quantity of groundwater caused by human activities and climate change.

In India rainfall is get from monsoons. Present methodology is based on recommendations of Groundwater Estimation Committee which is formed by government of India. For computation of significant groundwater level decline various data is required. Data of groundwater levels for both pre-monsoon and post-monsoon seasons are collected for time period 1997 to 2015. Significant groundwater level decline is estimated for various watersheds which are fall

under Handri river basin for both commanded and non-commanded areas for both pre-monsoon and post-monsoon seasons. The component significant groundwater level decline is assessed for four command areas and eleven non-command areas in the study area.

### 2. STUDY AREA

The study area considered for assessment of groundwater resources is Handri river basin, a tributary of Tungabhadra river in Kurmool district, which is in Andhra Pradesh state (India) lies between a latitude of  $14^{\circ} 35' 35'' - 16^{\circ} 09' 36''$  N and longitude of  $75^{\circ} 58' 42'' - 78^{\circ} 56' 06''$  of E. Figure 1 shows the details of study area. The origin of sub basin between Patikonda and Aspari and mingle in river Tungabhadra which is one of the major tributary of river Krishna. The study area receives an average rainfall of 665 mm per annum. The geological formation consists of shales, lime stones, granite gneisses and quartzites (Kuranth K. R, 1994).

### 3. METHODOLOGY

Present work methodology is based on guidelines of Groundwater Estimation Committee (Gouse Peera and Bhavani, 2019; MoWR, 2009). The component significant groundwater level decline is estimated for various water



## An empirical implementation model of total quality management in construction: Southern India

N. R. Gowthami , C. N. V. Sridhar & N. Venkata Ramana

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## Groundwater Investigation by Electrical Resistivity Method in Cheyyeru River Basin, District-Kadapa, Andhra Pradesh

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*Abstract: The area chosen for the present study is Cheyyeru River Basin, Kadapa District, which belongs to the drought prone area of Andhra Pradesh state, India. Kadapa district suffers from water problem, and therefore, there is no extra water available to supply for the agricultural and industrial growth. To understand the lithological characters in terms of its hydro-geological conditions, it is necessary to understand the geology of the area. It is now established fact that the geophysical method gives a better information of subsurface geology. Geophysical electrical surveys with four electrodes configuration, i.e., Wenner and Schlumberger method, were carried out at the same selected sites to observe the similarity and compared both the applications in terms of its use and handling in the field. A total 4 VES soundings were carried out spread over the Kadapa district and representing different lithological units.*

*Key Words: Geophysics, Groundwater, Exploration, Vertical electrical sounding, Wenner and Schlumberger*

## 1. INTRODUCTION

Recurring droughts and the continuous occurrence of low rain fall caused enormous depletion of the ground water reserves. Added to the problem exclusive enterprising commercial agricultural activity has severe impact on the fast depletion of groundwater reserves. Hence the conservation and steps to be taken up for artificial recharge has become inevitable and several types of constructing recharge structure are designed. Taking micro watershed as a unit of the basin the runoff is made to recharge groundwater by constructing various types of recharging structures starting from first order stream gully plugs, stone plugs, check dam, contour bunds, contour trenches, percolation tanks and mini storage tanks are some of the structures usually constructed in the watershed treatment. The surplus runoff through the stream and rivers were made to be stored in by constructing the reservoirs across the course of flow like Annamayya Project, Pincha Project etc. Despite the efforts laid and the steps taken to rise the groundwater level the situation is still to be improved. The major and potential agricultural activities along the delta alluvial plain has severely suffered due to the reduction in river bed sub surface flows. As a result much of the potential ayacut which hitherto are supportive to the rich agricultural activity, production and

employment generation has suffered severely. Cheyyeru river is the main lifeline supporting the lively hoods of 3 mandals 33 villages. Spring channels of about 39 numbers are the main supporting water supply system of channels in this area. Most of these spring channels are at present either dead or vanished. Hence we came to realize to study the problem faced by farmers under Annamayya Project which entertains the Cheyyeru river delta-alluvial plains, starting from Paturu to Pothapi covering of 50000 acres. Within the available resources, time and financial positions we thought of as an interested project to carry out.

## 2. STUDY AREA

The area chosen for the present study is Kadapa district, which belongs to the drought prone area of Andhra Pradesh state, India as shown in Figure. 1. The Cheyyeru river originates in the crystalline rocks such as gneiss, granitic terrain of Chittoor and Kadapa (districts) in the southern side enters into the metamorphic rock belts of Precambrian series of Cuddapah group of rocks. Kadapa district with a geographical area of 15380 Sq Km is situated part of Andhra Pradesh. It is bordered by Chittoor district to its south, Nellore district to the east, Kurnool and Prakasam districts to the north and Ananthapur district to the west.



## Effect of graphene oxide on strength properties of cementitious materials: A review

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### ABSTRACT

Reinforcing nanomaterials (0D nanoparticles, 1D nanofibres, 2D nanosheets) in cementitious matrix presents an opportunity to enhance cementitious composites at nanoscale. Reinforcing graphene based nanomaterials in cementitious matrix, enhancement of mechanical and durability properties has been observed at 0.02%, 0.04%, 0.06%, 0.08% of Graphene Oxide in past research. This paper reviews a comprehensive overview of graphene based nanomaterials (mainly graphene oxide based nanomaterials) at dosages of 0.0%, 0.02%, 0.04%, 0.06%, 0.08% of Graphene Oxide in imparting and altering the properties of cement composites and concrete composites and also points future scope in construction field.

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### 1. Introduction

Ordinary Portland Cement is a most popular construction material of choice in civil engineering field. Cement in concrete is the binding material, holds the aggregate together in presence of water to produce concrete. However, performance of cement and concrete based composites needs to be improved due to their brittle nature resulting in poor resistance to crack formation, low tensile strength. Many investigations have been carried out to improve the performance of cement based composites by employing the properties of cement based composites with admixtures [1–3], by incorporating the supplementary cementitious materials [3–5], and by reinforcing the fibers [3–14]. However, fibers fail to cease the crack initiation at nanoscale. M. S. Konsta-Gdoutos et al., [15] has been reported that incorporation of nanomaterials in the cementitious composites can control the nano and microscale cracks at initial stage. Newly produced techniques in nanotechnology paved to produce nanotized particles, fibers and sheets [e.g. graphene oxide, nanobaliumina, carbon nanotubes], can be used as reinforcing material in cementitious composites to alter the performance of cement based composites [16]. Among the all introduced nanomaterials, graphene oxide appeared to be so ideal material in

imparting the mechanical properties to the cementitious composites. Many past attempts has been reported that the significant improvement in mechanical properties of cementitious composites with the use of graphene oxide in cement mortar composites [17–26]. [19,21], investigated that significant improvement in mechanical properties could be due to the reaction between carboxylic acid group and calcium silicate hydrate producing strong covalent bonds. The current review discusses the mechanical properties of graphene oxide cementitious composites and also the future perspective.

Nanotechnology has wide applications in scientific fields such as construction, telecommunications, informatics, medicine. However, the broadest definition states that the materials having the sizes of individual building blocks are less than 100 nm, at least in one dimension [27].

Graphene is a single layer of sp<sup>2</sup> carbon atoms packed in a honeycomb lattice found in the basic structure of other graphite material with various dimensionalities [28,29]. Graphene oxide (GO), reduced graphene oxide and graphene nanoparticles are some of the other graphene-based nanomaterials [30]. Among all graphene oxide is widely used material in many fields [31,32]. Graphene oxide (C<sub>6</sub>H<sub>6</sub>O<sub>2</sub> + O + (OH)<sub>2</sub> + COOH) is exfoliated into layers from graphite oxide produced by the graphite oxidation [28,33,34,35]. Graphene oxide has a hexagonal network system of carbon atoms with sp<sup>2</sup> and sp<sup>3</sup> hybridised orbitals having hydroxyl and epoxide groups found mostly on its basal plane and carbonyl and carboxyl

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## Effect of graphene oxide on fresh, hardened and mechanical properties of cement mortar

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### ABSTRACT

Nanotechnology has already had an effect on a number of areas, including civil engineering. Cementitious composites containing a variety of nanomaterials have been identified as a novel material with enhanced microstructure, mechanical, and durability properties. In the world of civil engineering, graphene oxide has recently emerged as one of the most promising nanomaterials. However, adding graph oxide to the cement mortar impoves compression strength, tensile strength, division, and bending strength. The ultra-high-resolution field scan microscope (FE-SEM) showed that the cement matrix was well dispersed and GO aggregates were found in samples with fracture surfaces of 0.08 percent GO by weight from cement. When comparing the growth of calcium silicate hydrates in GO cement mortar to regular cement mortar, SEM results showed that GO cement mortar grew faster (C-S-H-Gel).

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### 1. Introduction

Reinforcing materials have become a standard practise in cement-based composites to enhance their mechanical strength. Due to their simple construction process, low energy consumption and wide variety of raw materials from which they can be manufactured, cement-based materials are widely recognised as one of the most important building materials. With the widespread use of cement-based composites, defects such as increased self-weight, brittleness, and tensile strength must urgently be addressed. Nanotechnology is an integral aspect of modern science and technology. It has been discovered that using nanomaterials to modify cement materials and enhance mechanical properties is feasible. Graphene oxide (GO) nanosheets, which are graphene-containing additives, have an extremely high surface-defined surface, excellent mechanical properties, and excellent thermal conductivity, as well as more active oxygen groups on their surface, such as hydroxyl, carboxylic, and epoxy groups. GO-cement composites are simple to make and separate in cement pastes due to their extremely high hydrophilicity. The effect of graphene oxide on cement mortar mechanical properties and the mechanism of cement mortar strengthening revealed an increase in mechanical

properties [1]. According to the results of the effect of graphene oxide with low

oxygen content on Portland cement based composites [2], the modification of OPC with such a type of GO improves the fluidity of cement paste and mortar just after mixing. In the cement mortar, graphene oxide is varied in proportions of 0.1% to 0.15 percent, and bottom Ash is varied in proportions of 0%, 20%, 40%, and 60% by weight of natural fine aggregate, resulting in mechanical and toughness properties [3]. Increased content of water dispersed GO reduces workability, but fine powder GO has less effect [4]. Experiments with GO have shown strong reinforcing and microstructural features. Self-healing and self-repairing materials use Go's nano reinforcing and water dispersion properties [5]. The main goal of this study is to increase Young's modulus in cement mortar by incorporating polymers and graphene oxide [6], the optimum amount of GO required to achieve full concrete compressive, tensile, and flexural strength [7]. Graphene oxide in cement mortar provides better results than standard cement mortar [8]. In cement mortar, the mechanical and ductility properties of graphene oxide were discussed. Hydration rate, setting time, heat of hydration, workability, strain and hardening, and electro-magnetic interference are all areas where this particular form of cement excels [9]. The addition of GO increases viscosity, reduces fluidity, and reduces mortar setting time [10]. The ideal amount of graphene oxide to achieve the highest compressive, flexural, and

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# Solid State Technology

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## Multi Stage Reliability Optimization Usingstochastic Dynamic Programming

Dr K.SATHISHBABU , S.VENKATESWARLU , Dr. N.VENKATACHALAPATHI

### Abstract

A new approach to Reliability is discussed in this paperand it is not the same in each and every product of the same variety of stochastic dynamic programming. Productreliability has tolerance limits of numerical value with certain randomness or with probability. Algorithms used inproblems pertaining to reliability are mainly stochastic or random in nature. To obtain the maximum system reliability different types of components for which reliability follows a random nature, a technique to solve such problem is required. The applicability of the proposed methodology for problems of stochastic nature has been converted into a problem of deterministic nature and the solution is found to be superior.

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# PERFORMANCE ANALYSIS OF HHO GAS ADDITION ON SINGLE CYLINDER FOUR STROKE S.I ENGINE

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## ABSTRACT

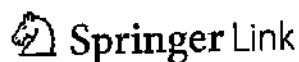
Considering energy concerns and pollution issues today a lot of research has been done on alternative fuels for fossil fuels and reducing the harmful components in the combustion products. Expert studies have shown that hydrogen is one of the best new energy sources with several excellent combustion properties that can be used to enhance the efficiency of combustion and emissions of gasoline-fuelled spark ignition (SI) engines. This article experimentally evaluated the performance and emission of a 4-stroke single-cylinder petrol engine using petrol and HHO as secondary fuel at distinct loads by different speeds. The engine mileage and emissions are examined during working condition of a single 4-stroke cylinder, petrol engine with specified amount of fuel.

**Key Words:** Internal Combustion Engine, Hydrogen Gas, HHO Generator, Spark Ignition, Engine performance, Emissions.

## 1. Introduction

In the face of the ever-increasing cost of traditional fossil fuels, research worldwide is working hard to cost-effectively improve the fuel efficiency and emission attributes of the internal combustion engine (ICE). During recent years, many investigators have mainly focused on the study of green technologies that benefit from optimizing the economic attributes of the engine as well as its pollutants.

Hydrogen has a wide variety of flammability relative to all other fuels. As a result, hydrogen can be burned in an internal combustion (IC) engine around a diverse range of fuel-air blends due to low ignition energy. Generally, the fuel economy is larger and the combustion reaction is more complete when the IC engine is running on a lean mixture. It was shown that the use of high pressure hydrogen gas as a fuel in internal combustion engines has many economic advantages, such as better engine efficiency and reduced concentrations of emissions in exhaust gases [1,2]. many researchers studied on hydrogen-



# An Experimental Studies on the Polymer Hybrid Composites—Effect of Fibers on Characterization

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## Abstract

The present research focused on the polymer hybrid composite fabrication and its characterization. Kevlar fibers (also called Aramid fibers, KF) are mixed with *Sansevieria trifasciata* fiber (snake plant leaf fibers, STF) to improve the performance of the epoxy matrix. Former fiber is synthetic fiber and the later is natural fibers are combined proportionately by the rule of mixtures KF and STF treated fiber systems. Wet-hand layup was used to organize systems with weight ratios of KF/STF for treated, viz. 1:0; 0.5:0.5; 0.75:0.25; 0.25:0.75; 0:1 (typically named as A, B, C, D, and E systems from the left). It was found that tensile strength for system-D (treated) was found improvement due to the fact that dust-free, rough, and improved surface area. Impact strength was found significant for the system-D when compared with others. The interface and voids at the fracture surface were improved for the systems C and D which were observed from the SEM images. Chemical resistance found good all the samples except carbon tetrachloride due to the hit of carbon atoms which consequently imparted erosion of the fiber out of the matrix.

## Keywords



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## Quantification of Execution and Emission Efficiency of a Fueled Diesel Engine

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**Abstract.** A significant portion of the automobile and industrial sector is mostly dependent on the running of diesel engines as it is efficient and shifts a large of the goods around the globe and power various equipment. Also, as the use of energy as diesel fuel is increasing enormously with the expansion of industrial growth, diversification, this led to the accelerating global emissions, global climatic change, health issues, and exhaustion of fuels. To succumb this, alternative fuel is needed to fight against the ill effects and as a replacement to diesel fuel. Thus, vegetable oils as alternative fuels are drawing more attention as they are renewable and do not address the problem of greenhouse gas. In the present work, the cottonseed oil was chosen as the favorite among the vegetable oils due to its advantages like less pollutant level, excessive availability, etc. The transesterification process was used to produce the cottonseed oil biodiesel. This research aims to investigate efficiency, emission characteristics by using smooth diesel, cottonseed oil, and mixtures with varying composition from 20 % to 80 % in 20 % steps to identify sustainable fuel as a substitute for existing fuel and to overcome fuel demand and enviro effects. This test was conducted on single-cylinder four-stroke water-cooled diesel engines. From the results, it was revealed that cottonseed oil and its blends have a significant influence on performance and emission characters.

**Keywords:** water-cooled diesel engine, emission character, cottonseed oil, sustainable fuel.

## 1 Introduction

Biodiesels are separated from plants or creatures and comprising of long-chain unsaturated fat esters. It is typically arranged by substance respond lipids like creature fat, soybean oil, or some other vegetable oil with a liquor, delivering a methyl, ethyl, or propyl ester. Late logical, cultural, and biological changes are compelling the new quest for potential powers for both eatable and non-consumable oil. As of now, the first-creation bio fills, for example, biodiesel and bioethanol, impact the biofuel area. This bio fills can be utilized in low-rate mixes with basic powers and can be administered through the enduring framework.

S. Nagendra et al. accomplished their test work by utilizing coconut oil and cottonseed oil mixed with diesel and Combustion Products Analysis to discover the diesel motor yield. The mixes of these elective powers and diesel differing extents are utilized to control the motor, and significant changes in motor effectiveness and discharge attributes are watched. Thinking about the warm

effectiveness, the cottonseed oil blend (B50) is best as it gives it great bend qualities. [1]. S. Nagendra et.al. Talked about on the Four Stroke CI Engine execution breaks down utilizing Bio-Diesel. The motor was tried utilizing two distinctive cottonseed oil oils and methyl esters dependent on coconut, mixed independently with diesel. The motor's warm effectiveness is nearly higher when joined with coconut oil and expanded by 5.3 % contrasted with cottonseed oil and joined with coconut and cottonseed oils by 26.3 %. It is seen that the motor effectiveness of the coconut oil mix B10 was better contrasted with different mixes of cottonseed oil and coconut and cottonseed oils [2].

## 2 Literature Review

Basavaraj M. Shrigiri et al. investigated the cotton seed methyl esters and neem kernel methyl esters as option biodiesels utilized in low warmth dismissal motors (LHR) to build the warmth in the burning chamber by the warm obstruction coatings. By the trial examinations creator see that at greatest burden the brake warm proficiency is lower



# Heat and Mass Characteristics of Magneto-Newtonian Fluid Through Upright Porous Plate

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Chapter

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## Abstract

An examination has performed to explain the flow characteristics of an unsteady MHD Newtonian fluid past over a vertical porous plate with rotation under the existence of heat and mass transfer. The governed expressions of the flow pattern are solved by using finite difference scheme. The impact of diverse parameters on the fluid velocity, temperature and species concentration is depicted in the form of numerical results and graphical presentations. The obtained results are having the close agreement with the existed literature results and promising the trueness of the numerical method. The enrichment of rotation parameter causes to decline the primary velocity of the fluid and also raises its secondary case velocity.

## Keywords

Rotating fluid Thermal radiation Chemical effect  
Soret number and Dufour effect

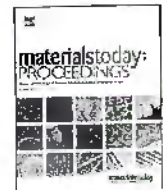
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# A nanofluids and nanocoatings used for solar energy harvesting and heat transfer applications: A retrospective review analysis

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## ABSTRACT

It is known that harvesting the solar power is key issue in current scenario because of scarcity of non-renewable energy in future days to come. Hence the solar harvesting systems takes an important stand globally. Grabbing the solar energy is difficult task due to low thermal conductivity of fluids which are carrying heat and poor optical coatings of solar power devices. In order to enhance the heat transfer rate of fluids there should be an alternative, such alternative is nanofluid. Nanofluids are having nanoparticles suspended in base fluids stably. This paper critically reviewed and conveyed the up to date literature of usage of nanofluids and nanocoating's in solar energy harvesting operating in low, medium and high temperature ranges for effectiveness in performance. Further solar energy conversion systems efficiencies can be raised by using the additives in base fluids termed as nanofluids and nano selective coatings for solar concentrators to improve optical performance.

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## 1. Introduction

Renewable sources are perfect alternative to bridge the gap between scarcity of power and conservation of power globally in current situations. There has been latest development in solar harvesting [2] leads to consider favourable actions pointing towards better projections in solar energy applications. The dearth of the conservative energy sources such as fossil fuels like petrol, gas etc and their perilous influence on the human society is key factor in which researchers are focusing their research in the field of solar energy which can be replenished continuously Fig. 1, Table 1.

Hence, we need to harvest the solar energy by constructing solar collecting systems such as parabolic shaped and flat shaped solar collectors. It is known that coating on the absorber surface greatly influence the performance of solar thermal energy conversion system. Mainly solar absorptance ( $\alpha_s$ ) and low thermal emittance ( $\epsilon_T$ ) of selective coatings during operating condition can effectively convert solar energy in to useful energy. Solar absorber selective coatings are bifurcated in to three segments with respect to thermal emittance such as

a) low-temperature ( $T < 100^\circ\text{C}$ ),

b) mid-temperature ( $100^\circ\text{C} < T < 400^\circ\text{C}$ ),

c) high temperature ( $T$  greater than  $400^\circ\text{C}$ )

The main aim of this paper is to discuss about direct energy conversion, here figure 2 shows that solar energy is utilised as direct and indirect conversion. But here we are focusing on direct conversion, let us focus on it. It is clear that solar harvesting can be done through thermal energy and photovoltaic energy. Many industries have been practicing the Rankine power cycle for power production by means of thermal energy only. It has been known that the photovoltaic solar cell is another source of generating of power for house hold applications. Below Figure 2 shows that how solar energy utilization is categorised into direct and indirect conversion.

## 2. Nanofluids in solar energy conversion and heat transfer applications

The harvesting of Solar Energy can be possible using high end heat carrier fluids such as water or oil. For process heat applications, base fluid [Reddy k s et al 2016] is either water or oil been used to harvest heat from renewable energy using solar collectors.

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## EXPERIMENTAL INVESTIGATIONS ON TWO STROKE SI ENGINE WITH PISTON COATINGS AND GASOLINE BLENDS

By

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### ABSTRACT

The use of alternative fuels in the transport sector can help mitigate the vehicles' greenhouse gas emissions. To achieve this goal, together with a positive energy balance in the global production process of piston coatings and gasoline blends, it is essential that added coatings and gasoline blends to petrol does not reduce the efficiency of the internal combustion engine. The aim of the work has been to characterize the effect of Magnesium Partially Stabilized Zirconium (Mg-PSZ) piston coatings for different gasoline blends of ethanol and butanol on engine behaviour like engine performance parameters efficiencies, and emission characteristics. Blends of proportions of 20% ethanol and 20% butanol gasoline blend has been tested. The engine performance parameters of SFC is 1.78% minimized at B20 for Mg-PSZ, break thermal efficiencies is 4.5% maximized at B20 for Mg-PSZ, emission characteristics of HC is minimized by 2.36% at E20 and CO is minimized by 3.65% at E20 for Mg-PSZ coated piston is compared with the normal piston of gasoline, and gasoline blends at different concentrations have been made through the analysis in the combustion chamber of the testing engine.

**Key words:** Piston Coatings, Gasoline Blends, Engine Performance, Emission Characteristics, Magnesium Partially Stabilized Zirconium.

### INTRODUCTION

Two-stroke engines complete all cycles in a single crankshaft revolution. The two-stroke engines are used extensively in the transport field. These two-stroke engines are presently ignored because they release high combustion gases. Several researchers have done their research using various gasoline blends and different forms of piston thermal barrier coatings to minimize these emissions.

Thermal barrier coatings are duplex systems which consist of a ceramic topcoat and an intermediate metal bond coat. The topcoat is made of ceramic material whose purpose is to reduce the temperature of the less heat-resistant material below it. The bond coat is designed to protect the metal substratum against oxidation and corrosion and to encourage adherence to ceramic

topcoat.

### 1. Literature Review

Vivek Rao Bhamne et al. (2017) investigated the function of potential two-stroke petrol engine. The author explained about the use of composite materials of the cylinder head, piston crown, piston, and combustion chamber to reduce emissions in the two-stroke engines. Gasoline blends are also used to reduce exhaust emissions and improve engine efficiency.

Dudareva et al. (2017) has discussed on thermal efficiency of engine with piston coatings of Micro Arc Oxidation (MAO) on pistons in internal combustion engines. Their primary goal is to reduce the thickness of the coatings and simulate the piston's thermal state with ANSYS. They concluded by the experimental investigations that the MAO coatings are



# PERFORMANCE OF DIESEL ENGINE BY ADDING SECONDARY FUEL AS HHO

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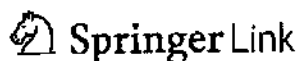
Hydrogen, Alternate Fuel, Electrolysis, Electrodes, Fuel Consumption, Emission,

## Abstract

*From an environmental point of view, emission from the engine exhaust system is a serious problem. Alternative fuels are encouraged for this search. Hydroxy gas (HHO) is considered to be one of the secondary sustainable energy to meet the strict emission standards and maintain the greenhouse effect. Therefore, this paper experiment is carried out adding a secondary fuel hydrogen gas with diesel fuel in the CI engine. HHO is one of the best choices that pertains to the fuel's complete combustion and thus also helps to reduce harmful gas emissions. The experiment is carried out on the 4-stroke, single cylinder engine, using HHO for a diesel engine. At the engine inlet manifold, the HHO gas is supplied by the HHO kit. The HHO gas mixes with fuel, and enhances the process of combustion. The experimental investigation was performed for different HHO gas pressures, and the efficiency was evaluated and compared to pure diesel. The results show that HHO performance at inlet pressure 3 kg/cm<sup>2</sup>, mechanical efficiency is increased by 5%, brake thermal efficiency is increased by 7%, specific fuel consumption is decreased by 0.0262 Kg/KWH, volumetric efficiency is increased by 5.3% compared to pure diesel.*

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# Retinal Vessel Tracking Using Gaussian and Radon Methods

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## Abstract

Retinopathy is one the cause of impairment of eye vision which leads to damage to the retina. Irregular sugar levels in the blood flow, abnormal blood flow in the retina and hypertension causes retinopathy. with the help of computer application tracking and estimating the diameter of a blood vessel is possible. The MATLAB software is used to track and estimate the blood vessel. In this software, the retinal image is given as an input image and the image processing methods are carried out to determine the diameter and track the retinal blood vessel. This technique distinguishes bifurcation focuses which might be valuable for further post - quantitative and compositional investigation.

## Keywords

Gaussian process Radon transform Vessel tracking Retinal imaging

Image processing Diameter estimation

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## References

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# Parametric Optimization of Wire Cut EDM Process on 'AISID3 Steel' using Genetic Algorithm and Grey Relation Analysis

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**Abstract:-** The manufacturing industries are continuously seeking for new and better machining operations in order to achieve the desired profile or contour of their machining parts. In view of this requirement, at present we focused on Wire Electrical Discharge Machining process. The Wire Electric Discharge Machining (WEDM) is a non-traditional process of material from conductive material to produce parts with intricate shape and profiles. Machine trade has created exponential growth in its producing capabilities in last decade however still machine tools don't seem to be used at their full potential. within the gift work, a trial has been created to optimize the machining conditions for surface roughness supported (L9 Orthogonal Array) Taguchi methodology. Experiments were carried out under varying pulse-on-time, pulse-off-time, servo control, and wire feed. An orthogonal array, the genetic algorithm (GA) and grey relational analysis (GRA) were employed to the study the surface roughness in the WEDM of AISI D3 Steel. It was determined that the discharge current was the foremost prestigious factors on the surface roughness. To validate the study, confirmation experiment has been dispensed at optimum set of parameters and expected results are found to be in sensible agreement with experimental findings.

**Key words:** WEDM, Surface roughness, Discharge current, Genetic Algorithm, Grey Relation Analysis

## I. INTRODUCTION

Need for Unconventional Machining Processes was extremely hard and brittle materials or Difficult to machine material are difficult to Machine by traditional machining processes. once the work piece is simply too versatile or slender to support the cutting or grinding forces once the form of the half is simply too complicated. many sorts of non-traditional machining processes are developed to fulfill additional needed machining conditions. once these processes square measure used properly, they provide several blessings over non-traditional machining processes. The wire EDM is one of the vital non-conventional machining techniques. The effect of process parameters on the quality of machining especially surface roughness is much more crucial. Brajesh Kumar Lodhi et.al.[1] studied on optimization of the machining conditions for surface roughness based on (L9 Orthogonal Array) Taguchi methodology. Experiments were distributed below variable pulse-on-time, pulse-off-time, peak current, and wire feed. Jyosha Joshi et.al.[2] Investigated on optimizing the machining parameter of wire electrical discharge machining

(WEDM) for multiple performance characteristics on D3 tool steel using principal component analysis (PCA). Shivade et.al.[3] performed wire discharge machining of D3 alloy steel and Influence of pulse-on time, pulse-off time, peak current and wire speed square measure investigated for MRR, dimensional deviation, gap current and machining time, throughout convoluted machining of D3 alloy steel. Pankaj et.al.[4] are studied the effect of various process parameters such as pulse on time, pulse off time and current for high carbon high chromium cold work tool steel (D2). The experiment has been completed with the help of Design of experiment by Taguchi method is applied to create an orthogonal array of input variables using the ANOVA. M. Siva Kumar et.al.[5] Optimum machining parameter for the wire electrical discharge machining of AISI D3 steel of two different thickness (50mm & 75mm). Omkar Kulkarni et.al.[6] The experimentation has been completed with the help of Taguchi's L25 Orthogonal Array. Grey Wolf Optimizer (GWO) algorithm is stimulated by grey wolves. Mangesh et.al.[7] Performed CNC wire electrical discharge machining (WEDM) of Al 2124 SiCp Metal Matrix Composite (MMC) is analyzed by using dimensional analysis approach (DA) and artificial neural network (ANN). The various investigations [8-12] are carried out on the optimizations of process parameters by using grey analysis and genetic algorithms. Pratik A. Patil et.al.[13] investigated effect of parameter on machining of AISI D2 cold work steel through wire cut EDM. This research deals with Response Surface Methodology approach for maximizing the material removal rate in wire electrical discharge machining. M. Durairaj et.al.[14] investigated effect of parameter on machining of SS304 through wire cut EDM. Amitesh Goswami et.al.[15] Analysis trim cut machining and surface integrity of Nimonic 80A alloy using wire cut EDM with three levels of input parameters. Somvir Singh Nain et.al.[16] Modeling and optimization of process variables of wire-cut electric discharge machining of super alloy Udimet-L605. In this paper, an attempt is made to investigate the influence of WEDM process parameters on the performance measures of surface finish and cutting speed while machining of AISID3 STEEL with three levels of process parameters Pulse-on time, Pulse-off time, Wire feed & servo control.



## MHD JEFFREY FLUID FLOW PAST A VERTICAL PLATE WITH UNIFORM BOUNDARIES

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# Thermal and Mechanical Properties of PLA/ABS/TCS Polymer Blend Composites

- B. Ramanjaneyulu ,
- N. Venkatachalapathi &
- G. Prasanthi

*Journal of The Institution of Engineers (India): Series C* **102**, 799–806 (2021)

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## Abstract

In this study, polylactic acid (PLA) and acrylonitrile–butadiene–styrene (ABS) are, respectively, blended in 70/30, 50/50 and 30/70 ratios to form polymer blends, and tapioca cassava starch (TCS) is added at concentrations of 10, 15 and 20% to form PLA/ABS/TCS blend combinations, respectively. Thermal (DSC and TGA), morphological and tensile properties of these composite were investigated. PLA/ABS and

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# Mechanical and Rheology Properties of PLA/ABS/TCS Polymer Blends

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### Abstract:

Binary and ternary blends of poly lactic acid (PLA), acrylonitrile-butadiene-styrene (ABS) and tapioca cassava starch (TCS) were prepared by the help of melt blend method. Rheological and mechanical properties of the prepared blends were studied. Rheological properties were studied using capillary Rheometer, shear rate, shear stress, the non-Newtonian index, were determined. Mechanical properties were studied in terms of tensile properties, stress at break, strain at break and Young's modulus have been determined by help of Universal Test Machine (UTM-3969). The results shows the ternary blends reveals shear-thinning behavior, over the range of the studied shear rates where the true shear rate of the blend decreases while increasing the shear rate. It also found that the true viscosity of the blend decreases with increased ABS content.

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# Mechanical and Rheology Properties of PLA/ABS/TCS Polymer Blends

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### Abstract:

Binary and ternary blends of poly lactic acid (PLA), acrylonitrile-butadiene-styrene (ABS) and tapioca cassava starch (TCS) were prepared by the help of melt blend method. Rheological and mechanical properties of the prepared blends were studied. Rheological properties were studied using capillary Rheometer, shear rate, shear stress, the non-Newtonian index, were determined. Mechanical properties were studied in terms of tensile properties, stress at break, strain at break and Young's modulus have been determined by help of Universal Test Machine (UTM-3969). The results shows the ternary blends reveals shear-thinning behavior, over the range of the studied shear rates where the true shear rate of the blend decreases while increasing the shear rate. It also found that the true viscosity of the blend decreases with increased ABS content.

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## Optimal Sizing, Selection, and Techno-Economic Analysis of Battery Storage for PV/BG-based Hybrid Rural Electrification System

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### ABSTRACT

The focus of the paper is on the renewable energy-based rural electrification system. Two concepts have been used in finding solutions to the issues related to this micro-grid system. The first is the best fitted model of hybrid configuration system, which utilizes village-owned resources, such as abundant biomass and solar irradiation. The second is that observed improved performance in terms of system sizing, techno-economic performance, and environmental stability of the hybrid model over different power storage backup media. The practical aspects and suggestion over the hybrid village electrification system have been presented through a case study of Korkadu village, Puducherry state, India. A comparative analysis of the hybrid model has been made with different power storage backup systems, namely the solid-state battery (lead acid-ASM battery, Li-ion-ASM battery) and flow battery (Redflow ZBM2 battery) arrangement. The result revealed hybrid rural electrification system with LI battery as the most favourable choice of the electrification system to the village, considering that its economic factor includes the total net present cost, cost of energy are found to be lowest. The technical parameters of power production capacity surface and battery state of charge were observed to be optimum with reduction in the environmental pollution parameter (GHS emission) value.

### KEYWORDS

Comparative analysis, Flow battery (Redflow zinc bromine battery), Hybrid electrification system (PV/biomass/battery), Solid-state battery (lead acid, Li-ion battery), Techno-economic optimization analysis

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### 1. Introduction

Figures of the installed power in India show that major power (65%) share is from fossil fuels and 19.2% power production from renewables [1,2]. Among the available renewable resources, solar is very abundant in India (in the range of 3.5–6 kWh/m<sup>2</sup>/day) [3]. Therefore, the solar-based energy production is the solution needed for the rural electrification system of India and it is the way to achieve the sustainable energy development through clear energy production. The Solar energy has not comfortable through the day due to uncertainty nature. Hence, the system needs a suitable energy alternative technology to supplement the solar energy system [4]. The development of such an alternative energy mix from a village resource will be ideal. Most of the Indian villages concentrate

# Tumor Classification and Extraction from Mammogram Images Using Convolutional Neural Network

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**Abstract**— Tumor diagnosis and screening plays vital role in treating the patient from life threatening illness. The Mammography is the early diagnosis and screening method of taking low energy level x-ray images of the human breast to detect any masses or microcalcifications present which are the early sign of cancerous tumors. Expert Medical Practitioner is required in classifying these tumors as cancerous or non-cancerous. In this paper we proposed a tumor classification and extraction method from Mammogram images using Convolutional Neural Network (CNN). With the help of this proposed method we are extracting and classifying the tumor as malignant (cancerous) or benign (non-cancerous). We developed a Computer Aided Diagnosis (CAD) system with CNN for human breast tumor extraction and classification. The Proposed method is performed in different phases namely Pre-processing by an Adaptive filter, Segmentation by the Gaussian mixture model (GMM), Feature extraction by the relationship of the pixels in Spatial Domain with the help of Gray-Level Co-Occurrence Matrix (GLCM), and finally classification by CNN Classifier. The proposed method experimental results shows greater accuracy of 98.46% in classifying human breast tumor as malignant or benign compared to SVM Classifier. Also the interactive visual system by Graphical User Interface (GUI) designed in MATLAB facilitates the proposed system to be operated on several Mammogram images.

**Keywords**— Mammogram Images, Extraction, Classification, CNN, CAD System, GUI.

## I. Introduction

In and around 1600 B.C, the breast cancer case is found in Egypt. Subsequently in 1860 eight types of ulcers or the cancerous tumors of the human breast found in an ancient Egyptian medical text namely the Edwin Smith Papyrus. The breast cancer is the most common cancer found in the women in the age group of 20 years to 60 years. The survival rate of these cancer patients depends upon the presence of cancer in various parts for example the survival rate of 5 years if this cancer is present only in the breast. So the survival rate of this breast cancer due to tumors or microcalcifications can increase if we detect early. One of the major and familiar technique which takes low energy level x-ray images of the human breast to detect any masses or microcalcifications present which are the early sign of cancerous tumors is Mammography. Now a days 3D- Mammography facilitates us to take one millimeter sized 3D slices to examine the presence of any masses or microcalcifications in the breast. To examine this carefully well trained Medical Practitioner required and sometimes there is a chance of miss interpretation. So we developed a CAD system for Tumor Classification and Extraction from Mammogram images using Convolutional Neural Network. This developed CAD system provides an additional benefit to the Expert Medical Practitioner to classify and extract the tumor as malignant or benign so that can save the patient from life threatening illness. The Mammography is the breast imaging technique captures the mammogram images of breast. Several methods proposed previously with the help of SVM Classifier to analyze the type of the tumors present in the mammogram images. Once if any tumor is present then it is necessary to identify the type of the tumor as it need emergency care and need to perform surgery to remove it.

Practical Simultaneous Scheduling of Machines, AGVs,  
Tool Transporter and Tools in a Multi Machine FMS  
Using Symbiotic Organisms Search Algorithm

N Sivaram Reddy, DV Ramamurthy, K Prabhadr Rao, M Padma Lalitha

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Description

This paper addresses machines, automated guided vehicles (AGVs), tool transporter (TT) and tools simultaneous scheduling in a multi-machine flexible manufacturing system (FMS) to minimize makespan (MSN). The transfer times of tools and jobs are considered. Only one copy of each type of tool is made available due to economic restrictions. The tools are stored in a central tool magazine (CTM) that shares with and serves for several machines. Jobs and tools between machines are transferred by AGVs and TT, respectively. This simultaneous scheduling problem is highly complex in nature as it involves job-operations sequencing on machines, assigning AGVs and tools to job-operations and associated trip operations including the times of empty trip and loaded trip of both AGVs and TT. This paper presents nonlinear-mixed integer programming (MIP) formulation to model and symbiotic organisms ...

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Practical simultaneous scheduling of machines, AGVs, tool transporter and tools in a multi machine FMS using symbiotic organisms search algorithm

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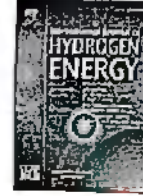




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# Neural network based MPPT control with reconfigured quadratic boost converter for fuel cell application

Suresh Srinivasan <sup>a</sup>, Ramji Tiwari <sup>b,\*</sup>, Murugaperumal Krishnamoorthy <sup>c</sup>, M.Padma Lalitha <sup>a</sup>, K.Kalyan Raj <sup>d</sup>

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## HIGHLIGHTS

- Proposed a converter for fuel cell with high voltage gain and low switching loss.
- Novel MPPT is proposed to extract maximum power at variable operating conditions.
- Incorporation of Novel RBFN strategy and Quadratic Boost converter for fuel cell.
- Validated the proposed system performance with notable classical methodologies.

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## ABSTRACT

An artificial neural network (ANN) based maximum power point tracking (MPPT) technique for proton exchange membrane fuel cell (PEMFC) is analysed and proposed in this paper. The proposed ANN technique employs Radial basis function network (RBFN) based MPPT strategy to extract the maximum available power from fuel cell in different operating condition. In order to achieve high voltage rating, a novel high step up DC/DC converter is incorporated in the proposed configuration. To validate the performance of the proposed configuration, the result is compared with different DC/DC converter and MPPT control strategy. The proposed system is simulated in MATLAB/Simulink platform to analyse the performance of the system.

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# Design of PI Speed Controller for 3-Ph Converter fed DC motor drive using Symmetrical Optimization

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This research paper focuses on the mathematical model of DC motor drive fed from the 3-Ph converter and the design of the PI speed controller for its speed control. To evaluate the gain coefficients of the PI speed controller, Symmetrical Optimum criteria are proposed. The proposed criterion is easier to understand than other advanced control methods. Using this criterion the gains of the PI controller are obtained by developing the mathematical model of the DC motor drive. This controller can be easily implemented for real-time applications of keeping motor speed at any desired set-point speed under varying operating conditions. The speed performance using the proposed method was compared with the S-curve method in MATLAB. The simulation results, with constant operating speed, indicate that the proposed criterion provides superior speed performance than the S-curve method. A similar speed response can be obtained with the selected PI gains for variable speeds. Finally, a comparative study has been done to highlight the proposed method benefits.

**Keywords:** Symmetrical Optimum Criteria; DC motor drive; Converter; PI Controller

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## 1. Introduction

### 1.1. Literature review

Practically, compare to AC drives, the DC drive speed control is simple and less expensive but they required more maintenance than AC drives and they are not suitable for high speed applications because of commutator. With the used of Chopper, it possible to get a variable DC voltage from a fixed DC voltage and with the use of Controlled Rectifiers a variable dc output voltage is obtained from a fixed ac voltage. The Controlled Rectifiers and Choppers made a revolution in modern industrial control equipment and variable-speed drives due to their ability to supply a continuously variable dc voltage [1]. Most of the industrial drives and processes consume DC power with different voltage levels. For example, the Trolley and Subway cars mainly run with fixed DC source but they requires a conversion of fixed voltage DC source to a variable voltage DC source

for their speed control [2]. In [3] the authors have proposed a novel boomerang trajectory control scheme, which omits the reaching phase and follows a semi-elliptical and semi-circular path for a quick convergence. The PID controller is the most popularly used control technique for many decades even though, there is a lot of development in control theory and technology. This is because of robust performance for a wide range of operating conditions. In addition, most of the researcher has given a wide range of control schemes for evaluating/tuning of the parameters of PID controllers in both time and frequency domain. An elaborated and detailed overview on control techniques of controller are given in [4, 5]. This research work proposes a novel method to evaluate the PI coefficients using symmetrical optimum criteria which reduces the drawbacks of Ziegler-Nichols method.

In electric drives, the main functions of closed loop control are to improve the steady state accuracy and to en

## An Implementation of Solar PV Array Based Multifunctional EV Charger

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### Abstract:

The charger is enabled to operate autonomously using a PV array for providing an uninterruptible charging and power to household loads. However, in the absence of the PV array or insufficient PV array generation, the grid connected mode of operation is presented. Moreover, the charger is supported with the synchronization and seamless mode switching control, so that the charger automatically connects/disconnects from the grid without disturbing the EV charging and household supply. The charger is also enabled with the vehicle-to-grid (V2G) active/reactive power support to the grid and vehicle-to-home (V2H) power transfer for supporting the local loads in an islanded condition.

**Keywords** — Electric vehicle, bi-directional charger, solar PV generation, reactive power, power quality.

### 1. INTRODUCTION

In the current scenario, the electric vehicle (EV) is emerging as a promising solution to the problems caused by fossil fuel powered vehicles. However, the adaptability of EV depends on the charging infrastructure. The charging of EV requires a huge amount of electrical energy, which mostly comes from coal/ gas-based power plants. Therefore, in a true sense, the EVs can be a green and clean alternative to the present transport system when the electrical energy required for the charging of EV, comes from the renewable energy sources such as solar, wind etc.. The advantage of this kind of charging station is that the PV array power is generated and used locally. Because of this, the transmission lines need not be upgraded for the high power. Moreover, the charging station does not require to draw power from the grid when the cost of energy is high. Another advantage of PV array-based charging station is that it is not location-specific. The use of office building and parking area for laying down the solar PV panels, as these solar PV panels also work as a shed and prevent the heating of the

vehicles and buildings. Therefore, the use of PV array-based charging station not only avoids overloading of the grid, but it also minimizes the operational cost of the charging station. Moreover, the coordinated operation of the PV array and EV mitigates the impacts of PV generation on the utility, and it eliminates the problems caused by the solar PV generation intermittency. Moreover, this topology is a kind of retrofit solution wherein the PV array can be augmented to the existing charging infrastructure with minimum change in the software (maximum power point tracking control algorithm) alone. However, if the charger is used only for charging the EV, the charger remains idle for at least 50% of the lifetime. Therefore, the converter of the charger has to be used for other tasks to improve the operational efficiency of the charger when the EV is not connected for charging. There are many functionalities proposed in the literature such as the four-quadrant operation of charger, vehicle-to-home operation using the EV battery and active filtering etc.. However, in the available literature, different converters and controls are used for different modes of operation. Moreover, the charger operation is restricted by the grid availability (islanded or grid connected operation), types of mode switching

# MINIMIZING ELECTRICITY THEFT USING INTERNET OF THINGS

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## Abstract:

IOT use things to things connection to access the web of things allow data to store and access services. Services over Internet of things developed as per need of person to person, thing to person, machine to machine interactions without human interference. Energy crisis is one among the main problems that the planet faces today. The simplest solution for this is often not the rise in energy production, but the effective use of obtainable energy. By avoiding energy wastage and properly monitoring our energy consumption, energy crisis are often reduced to a particular extent. Various wireless communication systems are available to identify the power theft, but lacks the specified infrastructure needed to use them. This project's aim is to style a system to watch the power consumed by load and to detect and eliminate the power theft in transmission lines. This work is additionally focused on communicating the theft information to Electricity Board (EB) through IoT. Power theft detector kit has been implemented using IOT. The implementation of this technique will help and save great deal of electricity.

**Keywords** — IOT, Arduino UNO, ESP8266, Current Sensor, Blynk Software.

## I. INTRODUCTION

Now-a-days the demand for electricity is increasing at a constant rate in the population and is being utilized for various purposes like agriculture, industries, household purposes, hospitals etc., so it is becoming more and more complex to handle the electricity maintenance and requirements. Therefore there's an instantaneous requirement to save lots of the maximum amount electricity as possible. As the demand from the newer generations of population for electricity is increasing so in alongside it the technology improvement is required. The proposed system provides a technical twist to the traditional energy meters using the IOT technology. Also there are other issues like power theft which successively generate economic loss to the state.

## II. OBJECTIVES

Monitoring optimized power usage and reduction of wastage in electricity is the major objectives of the system. System is designed depends on three major objectives.

They are:

1. It provides automatic reading of energy consumption of load immediately.
2. It helps in using the electricity in an optimized manner.
3. System reduces the power wastage.

## Research Article

# A Comparative Study on Crack-Healing Ability of $\text{Al}_2\text{O}_3/\text{SiC}$ Structural Ceramic Composites Synthesized by Microwave Sintering and Conventional Electrical Sintering

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This study was conducted to assess and compare the crack-healing ability of conventional electrical sintered and microwave sintered  $\text{Al}_2\text{O}_3/x$  wt. % SiC ( $x = 5, 10, 15,$  and  $20$ ) structural ceramic composites. The crack-healing ability of both conventional electrical sintered and microwave sintered specimens was studied by introducing a crack of  $\sim 100 \mu\text{m}$  length by Vickers's indentation and conducting a heat treatment at  $1200^\circ\text{C}$  for dwell time of 1 h in air. The flexural or bending strength of sintered, cracked, and crack-healed specimens was determined by three-point bending test, and the phase variations by X-ray diffraction and SEM micrographs before and after crack-healing of both the sintering methods were studied and compared. The results show that almost all the specimens recovered their strength after crack-healing, but the strength of microwave sintered  $\text{Al}_2\text{O}_3/\text{SiC}$  structural ceramic composites has been shown to be better than that of conventional electrical sintered  $\text{Al}_2\text{O}_3/\text{SiC}$  structural ceramic composites. The microwave sintered crack-healed  $\text{Al}_2\text{O}_3/10$  wt. % SiC specimen shows higher flexural strength of 794 MPa, which was 105% when compared with conventional electrical sintered  $\text{Al}_2\text{O}_3/10$  wt. % SiC and crack-healed  $\text{Al}_2\text{O}_3/10$  wt. % SiC specimen. It was found by X-ray diffractogram that before crack-healing, all the conventional electrical sintered samples have  $\text{SiO}_2$  phase which reduce the crack-healing ability and microwave sintered samples with 15 and 20 wt. % SiC show lesser  $\text{SiO}_2$  phase and 5 and 10 wt. % SiC samples have no  $\text{SiO}_2$  phase before crack-healing. However, after crack-healing treatment, all the samples have distinct  $\text{SiO}_2$  phase along with  $\text{Al}_2\text{O}_3$  and SiC phases. Microwave sintered  $\text{Al}_2\text{O}_3/10$  wt. % SiC specimen cracks were fully healed which was evident in SEM micrographs.

## DESIGN SECURITY SYSTEM BASED ON ARDUINO USING MOTION TRACKING CAMERA

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### ABSTRACT:

*Advanced technologies make life easier by allowing people to protect their belongings from thieves even if they are located in separate places. Due to theft in homes, offices, and organisations, most people are concerned about how to protect their items such as ornaments, vital documents, and the money kept at home. As a result, the majority of housewives employ almanacks and secure lockers in their homes to protect their valuables. However, they continued to employ a manual lock and key mechanism, offering no notification to the customer when a theft occurred by breaking them.*

*When our belongings are taken away, Arduino sends a notification to your phone. In this paper, we show how Arduino recognises whether or not a robbery has occurred. The Arduino is used in conjunction with a mobile phone and a motion detecting camera in this study to create a security system. The current system does not provide accurate results. The suggested system includes a PIR motion sensor that detects motion in the environment and assists in motion capture using a camera. It also delivers the signals to the Arduino which produces the output. When someone steals his belongings, it makes a call to the owner.*

### I. INTRODUCTION:

Our lives and movable assets are safeguarded by security. It is critical to ensure the safety and security of individuals and their valuables in their homes to avoid illegal protection from invaders through theft, which is not safe. For many people in rural and urban regions, safety has recently become a major concern. Things will try to defraud or steal property, jeopardising the security of their goods such as decorations, essential documents, and money in their homes, offices, and offices. To combat this security issue, most people will instal a slew of locks or devise a sophisticated home security system that includes loss detection devices.

However, robberies are becoming more common as a result of mechanical locks that may be quickly broken by technological tools. I move anything around the motion sensor to see if it's there or not. This sensor enables us to determine the motion. If an event is identified. Arduino will play an alert sound and send a lightweight notification to the owner through call. We also have a motion camera that takes pictures when there is movement at the sensor. An Arduino is a micro control kit that, thanks to its open source hardware characteristic, may be directly utilised by the supplier to purchase it.



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# IoT based lung cancer detection using machine learning and cuckoo search optimization

Venkatesh Chapala, Polalah Bojja

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## Abstract

### Purpose

Detecting cancer from the computed tomography (CT) images of lung nodules is very challenging for radiologists. Early detection of cancer helps to provide better treatment in advance and to enhance the recovery rate. Although a lot of research is being carried out to process clinical images, it still requires improvement to attain high reliability and accuracy. The main purpose of this paper is to achieve high accuracy in detecting and classifying the lung cancer and assisting the radiologists to detect cancer by using CT images. The CT images are collected from health-care centres and remote places through Internet of Things (IoT)-enabled platform and the image processing is carried out in the cloud servers.

### Design/methodology/approach

IoT-based lung cancer detection is proposed to access the lung CT images from any remote place and to provide high accuracy in image processing. Here, the exact separation of lung nodule is performed by Otsu thresholding segmentation with the help of optimal characteristics and cuckoo search algorithm. The important features of the lung nodules are extracted by local binary pattern. From the extracted features, support vector machine (SVM) classifier is trained to recognize whether the lung nodule is malignant or non-malignant.

### Findings

The proposed framework achieves 99.59% in accuracy, 99.31% in sensitivity and 71% in peak signal to noise ratio. The outcomes show that the proposed method has achieved high accuracy than other conventional methods in early detection of lung cancer.

### Practical implications

The proposed algorithm is implemented and tested by using more than 500 images which are collected from public and private databases. The proposed research framework can be used to

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## DEEP LEARNING BASED FOOD DETECTION METHOD AT RESTAURANTS FOR AUTOMATIC BILLING

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### Abstract

Because of the wide range of types of food, image identification of food items is generally very difficult. In this paper, food detection aims to facilitate payment at restaurants, and automatic food price estimation is by using the network. We applied CNN to the tasks of food detection and identification through image processing methods. We constructed a dataset of the most frequent food items in kaggle, and used it to evaluate identification performance. The network classifies the train data and test data and gives the results of classified output. However, deep learning has been shown recently to be a very powerful image identification method, and it is a state-of-the-art approach to deep learning. This network obtained of correctness more than existing methods.

**Keywords:** food detection, automatic billing, CNN, deep learning.

### 1. INTRODUCTION

The restaurant is one of the method to carry out the Food Service sector or part of tourism accommodation that plays a role in helping customer needs. The restaurant is categorised into several types, including the canteen. Canteen is a restaurant associated with offices, factories, and schools, a place where workers or students usually get lunch, take breaks with snacks or work hours, study hours. Due to the more number of customer populations at certain hours, then food payments have to be in queue [1]. The queue is a problem that is common in the society or the production process of goods and services.

The queue can happen because the level of service demand is higher than the facility's ability to provide services. In restaurants, queues are standard at lunch or dinner hours. Convolution Neural Network (CNN) [2] is a evolution from Artificial Neural Network (ANN) to classify the image, image segmentation, and object identification with high correctness and high performance. Using the Convolutional Neural Network (CNN) classification, the food detection system is a recontain of advanced steps of knowledge by

explaining what food is in one frame of the picture taken. This system is applied to food analysis in restaurants, and automatic billing [3], where the cashier only made bills.

One of the problems with food payment happens at the Canteen of Annamacharya Institute of technology & sciences Food payment has two phases: buying food at one of the shops and food is calculated using a manual calculator and then getting a receipt [4]. The customer go to the cashier and pays, and then the receipt is stamped, then the customer must come to the last store to submit a stamped note, the payment phase is very improper.

This situation raises the need for applications that make it possible to detect food types and estimate the total price of food[5]. Automatic detection of food images plays an important role. Let Focus on the restaurants; food identification algorithms can enable price monitoring, making it possible to reduce the services offered by restaurants. Using the Convolutional Neural Network (CNN) classification, the food detection system is a recontaination of advanced phases[6] of knowledge by





4

# An Efficient Method for Detection and Classification of Neoplasm Based on Deep Learning Technique

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## ABSTRACT

Lung and pancreatic cancers are the most common cancers in the world. While lung cancer is the main origin of cancer-related demises in the world, mixed gland cancer has the poorest diagnosis with a 5-year survival rate of only 7% in the United States. Accurate tumor detection is a pivotal step in lung and pancreatic cancer conceal. Typically, these cancers are detected by radiologists on medical images through a extensive examination of CT images that takes considerably more time and inaccurate. So, hybrid model is proposed for detection of such cancers accurately.

The proposed method is executed by image processing techniques since it is a revolutionary diagnostic tool for Bio medical purposes. The proposed method involves two stages. In the first stage the CT image undergoes classification process in which we classify whether the lung and pancreatic tumor are malignant or benign and also for improvement of tumor characterization. In the second stage the tumor part which is detected by using Convolution Neural Network undergoes segmentation process by using U-Net Architecture. Initially, the CT image is pre-processed from the data base for resizing and removal of noise. Later the image is classified by using Convolutional Neural Network(CNN). If the tumor in image is classified as malignant then, the tumor part is segmented by U-Net Architecture. Finally the various parameters like accuracy, specificity, sensitivity, etc. are calculated and compared with results of existing method

**Keywords:** Deep learning techniques, convolution neural network, neoplasm, lung and pancreas.

## INTRODUCTION

In our paper we are using deep learning concepts, in contemporary day technologies are evolving a lot. In order to dwindle human work we are proposing the concept of deep learning. As enforced to consecutive low-dose lung CT imaging for lung cancer detection in high-risk corps. Early detection is in demand because syndromes are non-specific (or absent), aggravated by flap with symptoms of chronic obstructive pulmonary disease (COPD). Early diagnosis using CT relies on the detection of lung nodules and an accurate appraisal of their growth. However manual radiologicalevaluation is problematic because of inter-observer and inter-scan variability. This project will address the key medical imaging challenges arising from co-existent emphysema, inter-current infection, differing in levels of aspiratory efforts and variable accession parameters in patients with CT-detected nodules, by devising novel solutions using machine learning methods, related to the class of deep learning architectures, a looming and specifically promising area of medical image analysis, in order to disclose lung cancer at an early stage.

Pulmonary cancer has the second highest occurrence of cancers world wide. for both the male and female population, and endures the cancer with the highest mortality rate. This is because it remnant seronegative for a long time, and is therefore diagnosed mostly at such a delayed stage that treatment result will be poor. Despite this, the UK at present does not have a pulmonary cancer screening programme for advance detection of lung cancer. This is not only due to extravagancy concerned, if applied to a large section of the population, but also the scarcity of a adequately sensitive diagnostic test, which includes imaging. At present research in screening for pulmonary cancer is therefore bounded to patients recognized at high chance of progressing lung cancer, such as smokers or patients with COPD (or both), but it is predicted that this research could form an important point of departure for a future national screening plan of action.

Machine learning perspectives are becoming more popular in radiology [1]. The lack of adequate amounts of compartmentalized image data render most supervised machine learning techniques unrealistic, but semi-or unsupervised

# DESIGN OF HIGH PERFORMANCE VOLTAGE LEVEL SHIFTER FOR IOT APPLICATIONS

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## ABSTRACT:

To balance energy and speed, the multi supply voltage design technique is widely utilised in recent VLSI designs. Interfacing circuits known as level shifters (LSs) allow multiple voltage domains to be interfaced. Level Shifter that satisfies the requirements of Power, Delay, and voltage level shifting requirements of current IOT applications. The design was achieved using strong current limiters and potency pull down network. The proposed LS was implemented using 45nm technology.

**Keywords** – Current limiter, Delay, IOT application, Level Shifter.

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## 1. INTRODUCTION

A wide performance envelope has become a practical requirement of IoT edge devices. Medium computational performance is used for regular tasks to achieve high energy efficiency, and high computational performance is needed to perform instant reaction when urgent requests come. Supply voltage scaling is an effective way to modify circuit characteristics, while near-threshold operation promises high energy efficiency and moderate computational performance, and high computational performance can be achieved by up scaling the supply voltage into super-

threshold region. Scaling down the supply voltage brings quadratic power reduction of circuits.

In digital systems, there are a variety of scenarios in which two or more components of the network are powered by different voltages from the power source. When signals cross the boundary between power supply regions, a circuit block must be included to shift the logic levels from, say, the level supplied by one domain with a +5 Volt power supply to a sec. The Level Shifter cell is used to change the voltage domain of a collection of signal voltages. This is necessary when the

# DETECTION OF TRIPLE RIDING AND WITHOUT HELMET RIDERS USING YOLOV2 DETECTOR ALGORITHM

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**Abstract:** Motorcycle accidents have been rapidly growing through the years in many countries. In India more than 37 million people use two wheelers. Therefore, it is necessary to develop a system for automatic detection of helmet wearing and triple rides for road safety. So, a custom object detection model is created using a deep learning based YOLOV2 detector algorithm which can detect Motorcycle riders. If the bike riders didn't wear helmets and if they are going with triple rides, can be detected. The process of this project is, there will be some trained images in the database. Then by considering input from the test data, an output will be generated based on the trained data and by using GSM, a message will be sent to the respective person. Simultaneously, a buzzer will sound.

**Keywords:** Triple Riding/Without Helmet, Detection, Deep Learning, YOLO network.

## I.INTRODUCTION

Motorbikes are a highly well-known mode of transportation in almost every country. In any event, there's a major risk related to the shortage of security. It is the way more enticing for cyclists to wear a helmet to cut back the associated risk. Bikes are the foremost common explanation for street accidents. Despite the very fact that irresponsible and hasty driving is that the leading explanation for these accidents, head injuries are the foremost common reason behind death on the streets.

The quantity of traffic accidents caused by bike riders who don't wear protective helmets has been alarming. Consistent with a Delhi Police annual report (published in 2019), 35-40% of fatalities within the city in 2018 were because of riders "not wearing helmets" or "poor quality helmets. The motor cyclist is shielded from accidents by wearing a helmet. Despite the actual fact that wearing a helmet is required in many

countries, some riders fail to try to so or do so poorly. Many studies in traffic analysis are conducted in recent years, including vehicle detection and categorization, further as helmet detection and triple rides.

Motorcycle accidents are on the increase in several countries over the years. Over 37 million individuals in India ride a two-wheeler. As a result, a system for automatically detecting helmet usage and triple rides is required for road safety. A deep learning-based technique is employed to construct a custom object detection model which will detect motorcycle riders by using deep learning based YOLOV2 detector algorithm.

Computer vision algorithms were accustomed develop intelligent traffic systems, like background and foreground image detection to segment moving objects in a very scene and movie descriptors to extract features. To classify the things, computational intelligence technologies like deep learning techniques are applied.

## A FENCING SYSTEM FOR CONTACT TRACEABILITY OF COVID-19

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### Abstract —

COVID-19 is a highly infectious and easily spreadable virus that can become extremely hard to control once it begins to spread. One of the most important and effective steps one can take to break the chain and keep healthy people from becoming infected is social isolation/distancing.

When an infected person comes into contact with a healthy person, that person becomes infected as well, and when both people come into contact with a third or fourth person, they both become infected. As a result, the chain reaction continues, and this dangerous disease spreads throughout the country, killing a large number of people. Because of these factors, it is critical for people to keep as much distance from others as possible in order to avoid contracting the virus or spreading it if they are already infected.

To assist with this, we are currently developing a device (COVID-19 Fencing System) that will alert healthy people when they come into contact with virus-infected areas. We use the GPS module for this, and the module will send the location to the concerned person's email if any person is close to isolated areas.

**Keywords:** IOT, GPS and Raspberry Pi

### 1. INTRODUCTION

#### 1.1. INTRODUCTION TO EMBEDDED SYSTEMS

A special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints, is known as an embedded system. It is typically embedded as part of a larger device that includes hardware and mechanical components. A general-purpose computer, such as a personal computer, on the other hand, can perform a wide range of tasks depending on the programming. Embedded systems have become popular.

Because the embedded system is dedicated to a specific task, design engineers can optimise it, reducing product size and cost while increasing reliability and performance. Some embedded systems are mass-produced to take advantage of economics of scale.

Physically embedded systems range from small portable devices like digital watches and MP3 players to large stationary installations like traffic lights, factory controllers, and atomic power plant control systems. The level of complexity ranges from low (a single microcontroller chip) to very high (multiple units, peripherals, and networks mounted inside a large chassis or enclosure).

In general, "embedded system" is a loosely defined term because many systems are programmable in some way. Handheld computers, for example, share some elements with embedded systems, such as the operating systems and microprocessors that power them, but they are not truly embedded systems because they allow for the loading of different applications and the connection of peripherals.

#### 1.2. INTRODUCTION TO IOT:

The Internet of Things (IoT) is essentially a platform where embedded devices are connected to the internet in order to collect and exchange data with one another. It allows devices to interact, collaborate, and learn from one another experiences in the same way that humans do.

The Internet of Things, or IoT, refers to the billions of physical devices that are now connected to the internet and collecting and sharing data all over the world. Because of the advent of low-cost computer chips and the pervasiveness of wireless networks, it is now possible to turn anything, from a pill to an aeroplane, into a component of the Internet of Things. Connecting up all these different objects and adding sensors to them adds a level of digital intelligence to devices



## DESIGN OF LOW POWER, LOW NOISE CURRENT MIRROR OTA USING 45NM TECHNOLOGY

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### Abstract —

The human brain is of the dimensions of a deflated volleyball which weighs about 3 pounds. We live at a time when the disabled are on the vanguard of a broader societal trend toward the utilization of assistive technology referred to as Brain Computer Interface. Brain-computer interface (BCI) may be collaboration between a brain and a tool that permits signals from the brain to direct some external activity, like control of a cursor or a prosthetic limb. In the BCI system you would like to amplify the neural signals for best performance. Then we use ultra low-power operational transconductance amplifier (OTA), which may be utilized in the implementation of preconditioning stage of implantable neural recording micro systems. In such applications, low-noise performance is both critical and challenging especially at very low power consumption. By means of a replacement structure for OTA, a coffee noise, low-power, and small-silicon-area OTA is proposed. [1] The low power, low noise transconductance amplifier is employed in neural recording and biomedical applications. Because the voltage of the neural is about — 80mv. Such signals got to be pre-amplified and band-pass filtered before any longer processing.

### 1. INTRODUCTION

There is an excellent demand for technologies that enable neuroscientists and clinicians to watch the simultaneous activity of huge numbers of neurons within the brain. Multielectrode neural recordings are getting standard practice in basic neuroscience research, and knowledge gained from these studies is starting to enable clinical and neuroprosthetic applications. Recent advances in MEMS technology have

produced small (less than 4 mm in any dimension) arrays of microelectrodes containing as many as 100 recording sites [2]. Next-generation neural recording systems must be capable of observing 100—1000 neurons simultaneously, during a fully implanted unit. While integrated electronics are developed for small-scale amplification of the weak bioelectrical signals, existing circuits typically have unacceptable noise levels or consume an excessive amount of power to be fully implanted in large quantities. Implantable bioamplifiers must dissipate little power in order that surrounding tissues aren't damaged by heating. A heat flux of only 80 mW/cm can cause necrosis in muscle tissue, so for little chronic implants, power dissipation shouldn't exceed a couple of hundred milliwatts. For a 1000-electrode system, this leads to a maximum power dissipation much but 1 mW per amplifier, and this doesn't include power required by other components within the implanted system like telemetry.

### 2. OBJECTIVE

With a really low power, low noise we'd like to amplify the signals from millihertz to kilohertz with the assistance of operational transconductance amplifier for different low power working applications.

- To reduce size.
- To achieve high gain.

The implanted devices must not consume an excessive amount of power thanks to the harmful effects to the encompassing tissue. Neural recording systems must consume but 100nW.

To achieve an outsized dynamic range, the entire input-referred noise from the recording circuit Author Supply Voltage (V) Midband Gain (dB) Bandwidth (Hz) Input Referred Noise

## FAST FOG REMOVAL TECHNIQUE USING MULTIPLE EXPOSURE IMAGE FUSION

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### Abstract—

Unpleasant weather can diminish the visibility of photos taken outside, lowering their visual quality. Image dehazing is the picture handling task dealing through the reduction of this influence. We describe a new image dehazing methodology in this research that may reduce haze-induced visual degradation without depend on the reverse of a physical model of haze formation while maintaining the model's essential assumptions. As a result, the suggested methodology eliminates the necessity for depth estimation in the sight, as well as time-consuming depth map enhancement methods. To do this, a sequence of gamma-correction processes is recycled to artificially underexpose the original blurry image. A multi-scale Laplacian blending approach is used to combine the multiply exposed images into a haze-free outcome. On both a qualitative and quantitative level, a complete experimental evaluation is offered. The results show that fusing purposely underexposed photos may efficiently remove the haze effect, even in difficult scenarios when other image dehazing techniques currently in use do not produce satisfactory results.

**KEYWORDS:** Fog Removal, Image Fusion, Haze removal, Gamma Correction, Bad visibility, Laplacian Blending.

### 1. INTRODUCTION

Images shot outside may be affected through a reduction in brightness produced by small particles distributed in the atmosphere. The main effect of haze or fog is the reduction of

illumination along its path to the camera, which is referred to as the major effect of haze or fog. As a result, the contrast and sharpness of the collected images and videos is reduced. Color quality has deteriorated, limiting vision in distant sections of the image. In recent years, the task of recovering the graphical quality of weather-degraded photographs has gotten a lot of attention. In this situation, the image processing task is picture restoration, which is the act of removing the impacts of foggy conditions. Getting rid of the haze Image dehazing algorithms are becoming more commonly available, which can help with jobs involving computer vision It must be done in scenarios that take place outdoors, such as surveillance [1], remote sensing [2,3], or autonomous driving in bad weather [4].

This research makes a significant contribution by developing a new single-picture dehazing method that only uses physical models of haze production as a starting point for understanding the features of the image we want to obtain. Single-image haze removal is viewed as a problem of spatially varying contrast and saturation enhancement, with different amounts of processing necessary for different areas of the image.

As a result, a novel image dehazing methodology is developed with the goal of improving visual quality solely in those locations. This is accomplished by using a sequence of gamma-correction processes to intentionally underexpose the unclear image. The outcome is a series of photos that are gradually underexposed, with increased contrast and saturation in some areas. The best-quality portions of each image are extracted and merged into a single haze-free output

## IOT based device for controlling home appliances using hand gestures

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### Abstract—

Gesture based home automation includes the recognizing of the movements of hand and their interactions with the hand-held device. The gestures can be recorded by using sensors or by processing the images. These gestures are also used for different purposes. This can be used for home automation and also to remove the communication barrier. Most of the disabled people or senior citizens cannot able to control home appliances manually. This paper is aimed to reduce the difficulties of the disabled people, can be free of worrying about status of the appliances whether they are in ON or OFF condition. This project also aimed to help the disable people in emergency conditions. By using this device disable person can send emergency messages to their family members for example to bring medicines. Here the messages are sending based up on the hand gesture using gsm. In this paper we develop the device to control home appliances by recognizing the gestures, these gestures can be recorded by using MEMS sensor. Recorded gestures from sensors can be processed and take necessary action.

**Keywords**— hand gesture; MEMS; IOT; Detection; Home appliances; GSM.

### 1. INTRODUCTION

Usually, Automation includes the incorporation of a hard and fast of devices right into a centralized home automation system that goals to enhance power management, protection, welfare and communication. The interaction between the consumer and their domestic gadgets is turning into an essential issue to be taken into

consideration to improve the design of latest patron devices and to therefore attain their public popularity [1]. In reality, the important thing undertaking is improving the person enjoy and the simplicity in its handling.

Home devices have evolved from easy far off controls to domestic automation switchboards, which assure connectivity with mobile gadgets which include smartphones or capsules [2]. For this reason, the modern fashion within the development of new innovative home devices promotes the ability to pick out and manage of any ordinary use tool dealing with the local or far off interconnection with other users. The interplay between the person and the devices through a natural gesture is rather new. The hand gesture is defined as intellectual concept of a user realizes with the intension of achieving a result. This concept related to a movement, reaction or a demand that the machine is capable of controlling and automating nearly all the devices via easy hand gestures. Gesture reputation has significantly attracted the research network as it has a huge variety of practical applications which includes natural human computer interplay, ubiquitous computing, signal language, user authentication and daily pastime assistance [3].

### 2. LITERATURESURVEY

Kishor P Jadhav, Santosh G Bari [4] proposed a system which is complimentary for the remote based system which recognizes the hand gestures and control home appliances based on these gestures. Firstly, camera captures the image of user's hand gesture & then sends it to PC for further processing, based on processing data we control appliances. Images are captured by using

## RETINAL VESSEL TORTUOSITY IN FUNDUS IMAGES

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### Abstract —

The medical analysis, and the attention of some retinal diseases, can play a very important role in the shooting. Some of retinal disease leads to serious problems, what is diabetic retinopathy, etc. We present a new algorithm for retinal diseases by analysis of the vascular tortuosity, use the organization of the photos, the eye, bottom-up, and testing of an open, online database. Advances in retinal imaging techniques, which allowed us to identify new types of retinal vascular tortuosity.

Visually, the eye, the fundus is making computerized screening tool to examine and document the many retinal diseases, but the intervention by the clinical experts. In general, in order to obtain images of the eye fundus is performed with the help of the eye of the camera, the fundus, is a low-power microscope to capture the inner side of the retinal structure, such as the optic disc, leaf, that is, to the macula or posterior pole. The image of the eye, the bottom shows the main structure of the eye, the bottom, and the scene is NPDR with it. It turns out that, visually, the eye fundus in a simple and cost-effective manner, with the skin, the eye doctor to quickly analyze and view the images were taken at different locations, for example, in the countryside, or cities, and then to provide clinical recommendations.

### I. INTRODUCTION

The retina has the highest rate of oxygen consumption per unit weight, compared with other human tissues and cells, as it requires a continuous supply of oxygen and nutrients in order to maintain its normal function. Minds are used to diagnose eye diseases like glaucoma and diabetic retinopathy,

two of the main reasons is to prevent, but the incurable blindness.

The aim of this study was to test the assumption that the reduced oxygen supply to the retinal vessels is associated with an increased vascular tortuosity, we are in healthy and SLE patients. The oxygen concentration in the major retinal vessels were determined quantitatively by us before it is validated oximetry technology. Since there is no universal agreement on the steps that the tortuosity is a good thing, in this study, vessel tortuosity was seen by 2, namely, that the vessel tortuosity index (SERUM), and the vessels of the infection index (VI), as measured using our previously published method.

Oxygen (O<sub>2</sub>) content of both retinal arteries and veins was measured using the method described by Blair et al. In short, a circumpapillary region centered on the ONH were found to range between 1 and 2 of the çevrələrlə in a circle, the ONH. Determine the retinal vessels, with the Frangi, ships filter. The ship, the detection limits are defined by the mining activities of the intensity profiles, which are at right-angles to the dish line, the axis of each of the 5 pixels along the bowl, and the design of the full width at half maximum of the questionnaire. The optical density (OD), which is defined as the image of the waves as the average of the ratio between the intensity value of the inside and the outside of the bowl.

### II. OBJECTIVE

Since the image processing is playing a very important role in the medical analysis of the focus is on some of the diseases of the retina. Some of retinal disease leads to serious problems, what is



# ANALYSIS OF NEPHROPATHY IMAGES USING LPMPR FILTER AND MORPHOLOGICAL WATERSHED SEGMENTATION ALGORITHM

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## Abstract —

Diabetic Nephropathy is a kidney related complication of type-1 and type-2 diabetes. It is the most frequent cause of kidney failure. Approximately a third of people with diabetes are affected by diabetic nephropathy. People with diabetes and renal illness do worse overall than those with kidney disease alone. It is owing to the more likely occurrence of other long-term medical problems such as high blood pressure, high cholesterol, and vascular diseases in individuals suffering from diabetes. The fundamental objective of every image processing application is to extract relevant characteristics from image data, to understand the image, and to better input other automated techniques.

Low-Pass Morphologically Processed Residuals Filter is presented in this project. It combines low-pass linear filtering with nonlinear algorithms to choose significant portions of the image, while maintaining the edges intact. The Morphological Watershed Segmentation can easily separate foreground and background objects. This technique utilizes pictorial data from CT scans of patients and diabetic research facilities. The approach presented is used to examine and determine the most affected regions of the kidneys.

**Keywords:** Nephropathy, Low-Pass Morphologically Processed Residuals Filter, Morphological Watershed Segmentation

## I. INTRODUCTION

Diabetic nephropathy is a chronic kidney disease. It occurs when the adequate insulin is not produced or cannot use the insulin sufficiently in the body. Those who are suffering with diabetes they will suffer with continuous urination, weight loss, increasing hunger and thirsty and similarly in

the blood affects the sugar levels. It is important to identify the kidney damage in the early stages before the kidney gets completely damaged. The medical image processing allows us to identify the unhealthy regions in the kidney. By the mathematics and analysis, it is feasible to find the unhealthy regions of the kidney.

In recent times, image processing is amongst rapidly developing technology. Digital image processing consists of the manipulations are contained in Digital image processing which is used in digital computers. Image Segmentation plays a major part in various fields. Separation of the image into various regions of similar attributes is called Segmentation.

The proposed method aims to provide a better solution towards the digital medical diagnosis of the diabetic nephropathy, which is one of the leading causes of end-stages renal disease. In Diabetic nephropathy patients there will be a gradual increase in the proteinuria (excretion of excess proteins in the urine). Along with this it is also accompanied by blood pressure, and a progressive decrease in GFR.

The Accurate segmentation of the image is still a challenging task even though a lot of research has been done on this part. As there is no ideal solution for this problem. Here we have proposed a method which contributes towards the early-stage identification of the damaged kidney tissues.

## II. PROPOSED METHOD

### Proposed algorithm implementing:

In pre-processing, the images are optimized, making the image regions smooth by reducing the high frequency components and in the post-processing segmentation of data is done.

Pre-processing:

## DESIGN OF MINIATURIZED DUAL-BAND MICROSTRIP ANTENNA FOR WIRELESS LAN APPLICATIONS

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### Abstract —

WLAN (Wireless LAN) is an innovation that consolidates PC organizing with remote correspondence innovation to make a wireless (LAN) inside a space, like a house, school, PC, research centre, grounds, or place of business. In the WLAN setting, the 2.4 GHz and 5.2 GHz and 5.8GHz recurrence groups of the Industrial Scientific Medical (ISM) band is utilized. The radio wire, as a basic part of the WLAN framework, should advance pair with the progression of WLAN correspondence innovation. In this paper, electromagnetic reproduction programming CST is utilized plan another double recurrence microstrip receiving wire (Computer Simulation Technology). The planned radio wire utilized Rogers RT-duroid 5880 material as a dielectric substrate, which has the advantages of minimal expense and little size. The principal receiving wire is taken care of by microstrip line, and the radio wire radiation fix is comprised of a collapsed T-formed transmitting printed antenna to diminish receiving wire size, and two balanced rectangular patches on the two sides of the T-moulded emanating patch.

**Keywords:** WLAN (Wireless LAN); microstrip antenna; dual-frequency; CST(Computer Simulation Technology).

### 1. INTRODUCTION

With the fast progression of remote correspondence innovation as of late, the Wireless LAN correspondence framework has likewise evolved, and the market's application range has developed essentially. WLAN communication systems often require quick, high-efficiency, and reliable two-way data transmitting and receiving, which is reflected in the antenna subsystem. In a wireless communication system, the antenna is crucial. Modern civilization has entered the information era, and people have increased

expectations for antennas, which include features such as a larger frequency band, smaller size, and ease of installation, as well as excellent radiation efficiency and anti-interference performance. As a result, research into multiband and miniaturised antennas has become an important issue in the field of antennas [2].

Miniaturisation of microstrip patch antenna by using various shaped slots for these wireless communication system. These practices increase electrical length of the antenna and reduce the size of the antenna up to 86%. The proposed antenna is operating on multiple bands and able to cover numerous applications. Microstrip antennas are more efficient than standard microwave antennas. Antennas have a low profile, a small size, a low cost, and a light weight, allowing them to meet the demands of miniaturisation. However, due to the inherent narrow bandwidth of microstrip antennas, research into dual-band microstrip antennas is required. This antenna has a simple structure and a low production cost, making them suitable for use with WLAN devices. Microstrip antenna research is primarily focused on small scale, broadband, multi polarisation, multi band, and high gain, among other things. Heng-Tung Hsu et al., for example, designed a dual-band microstrip antenna. It is primarily concerned with the dual frequency characteristics of microstrip antennas. WLAN can use dual frequency microstrip antenna designed with CST (Computer Simulation Technology). The simulation results show that the antenna performs satisfactorily [3].

A broadband dual band printed antenna for WLAN is designed. A dual frequency dual band microstrip antenna is designed, which is used to realize the dual band operation on the radiation side. It has numerous advantages. They are compact in size, light in weight, simple to integrate, and mass produced. The antenna is fed via microstrip line feeding. The microstrip line

## REAL TIME WATER QUALITY MONITORING SYSTEM USING IOT

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### Abstract —

Innovative solutions for ensuring the quality of the water are becoming more and more important with the development of information technology. The leading causes of water quality problems include over-exploitation of natural resources. The poor quality of the water from the spread of the disease leads to death, and impedes socio-economic development. In this project, is to provide a comprehensive overview of the latest developments in the intelligent monitoring of the quality of the water. It also features an energy-efficient and simpler solution for in-line monitoring of water quality on the basis of the Internet of Things technology. The developed model is used for the testing of the samples, and the analysis of the data, which are available for download on the Internet.

In this paper, Turbidity Sensor, Temperature and TDS Sensor is placed in the water to be tested which can be used in either stored water or running water. Sensors convert a physical parameter, in a similar measured electrical quantity which is fed to the driver's input. The main function of the controller is reading data from sensors, process it, and send it to Blynk applications with the help of a Nodemcu and communication technologies. A liquid crystal display (LCD) is used for displaying the messages. The data can be uploaded to the cloud (ThingSpeak), with the help of a Nodemcu.

**Keywords:** Turbidity Sensor, Temperature Sensor, TDS Sensor, LCD, Nodemcu and ThingSpeak.

### I. INTRODUCTION

In this century a lot of inventions have taken place, but with developments it has created many environmental pollutants such as global warming and other day-to-day issues. Especially drinking water is polluted due to rapid industrial development and population growth and waste disposal. There is therefore a need to monitor and control water pollution by taking quality limits in real time.

The Central Pollution Control Board (CPCB) has established several continuous water monitoring stations across the country, which monitor the water level either monthly or annually. This is to ensure that the water level is maintained at the desired level. And it is important that it be checked daily. Pollution control requirements and effective water pollution control measures are eliminated by monitoring Water quality monitoring. The CPCB has plans to build a standard water monitoring network across the Ganga river.

All channels are operational in real time and the central location can receive data from the few channels above using Nodemcu. And the price of the system varies depending on the elements used. Our proposed model has a variety of sensors that calculate the water level in real-time performance, and are economical, accurate, and have very little human energy required.<sup>[1]</sup>

### II. LITERATURE REVIEW

Autonomous water quality monitoring system using GSM:

# LOW POWER, LOW NOISE CURRENT MIRROR OTA USING 45NM TECHNOLOGY FOR BIOMEDICAL APPLICATIONS

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## Abstract —

The human brain is of the dimensions of a deflated volleyball which weighs about 3 pounds. We live at a time when the disabled are on the vanguard of a broader societal trend toward the utilization of assistive technology referred to as Brain Computer Interface. Brain-computer interface (BCI) may be collaboration between a brain and a tool that permits signals from the brain to direct some external activity, like control of a cursor or a prosthetic limb. In the BCI system you would like to amplify the neural signals for best performance. Then we use ultra low-power operational transconductance amplifier (OTA), which may be utilized in the implementation of preconditioning stage of implantable neural recording micro systems. In such applications, low-noise performance is both critical and challenging especially at very low power consumption. By means of a replacement structure for OTA, a coffee noise, low-power, and small-silicon-area OTA is proposed. [1] The low power, low noise transconductance amplifier is employed in neural recording and biomedical applications. Because the voltage of the neural is about — 80mv. Such signals got to be pre-amplified and band-pass filtered before any longer processing.

## 1. INTRODUCTION

There is an excellent demand for technologies that enable neuroscientists and clinicians to watch the simultaneous activity of

huge numbers of neurons within the brain. Multielectrode neural recordings are getting standard practice in basic neuroscience research, and knowledge gained from these studies is starting to enable clinical and neuroprosthetic applications. Recent advances in MEMS technology have produced small (less than 4 mm in any dimension) arrays of microelectrodes containing as many as 100 recording sites [2]. Next-generation neural recording systems must be capable of observing 100—1000 neurons simultaneously, during a fully implanted unit. While integrated electronics are developed for small-scale amplification of the weak bioelectrical signals, existing circuits typically have unacceptable noise levels or consume an excessive amount of power to be fully implanted in large quantities. Implantable bioamplifiers must dissipate little power in order that surrounding tissues aren't damaged by heating. A heat flux of only 80 mW/cm can cause necrosis in muscle tissue, so for little chronic implants, power dissipation shouldn't exceed a couple of hundred milliwatts. For a 1000-electrode system, this leads to a maximum power dissipation much but 1 mW per amplifier, and this doesn't include power required by other components within the implanted system like telemetry.

## 2. OBJECTIVE

With a really low power, low noise we'd like to amplify the signals from millihertz to kilohertz with the assistance of operational

# TRAFFIC MANAGEMENT BY MONITORING WEATHER PARAMETERS AND POLLUTANTS REMOTELY USING RASPBERRY PI

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## Abstract —

This study intended to make a prototype System, which utilizes an embedded system utilizing raspberry pi for watching the climate interchanges in various areas. This prototype talks about an observing System which gives data about ecological position on a progressively nearby dimension, the execution region is classified by modern, home and office applications and quickly contacts the innovative headways in checking nature and drawing out the new extension in checking the present condition issues.

The proposed method is a stand-alone IoT system to measure few weather parameters at a dense location with heavy traffic and provide the corresponding live data. The system uses a low-power mini-computer Raspberry Pi 3B+. The various sensors are used to sense different parameters like temperature, pressure, carbon dioxide, carbon monoxide and humidity. The data collected by the Raspberry Pi is sent to the cloud and stored which can be viewed by anyone and anywhere at any time. Future measures can be taken using available recorded-data if there are unhealthy readings measured by the system set up at a location.

## I. INTRODUCTION:

The model System is created utilizing open source equipment Raspberry pi and WIFI which demonstrates practical and having low power utilization. The existing sensors are accumulating the information of different natural affection and give it to Raspberry pi, which goes about from central server. The Raspberry pi dispatch the information utilizing WIFI and the prepared information will be shown on PC through getting to the server that is on the recipient side. It has a terrible effect on human wellbeing, amphibian life and creatures.

The existing approach use Arduino along with different set of sensors where a separate component for internet connection is necessary for data transfer to the cloud. The proposed approach is used for Traffic management and also helps is easy traffic movement and keeping the environment clean by less combustion of fuel.

## OBJECTIVE:

The proposed system is used to measures various parameters like temperature, atmospheric pressure, carbon monoxide, carbon dioxide and humidity at selected locations. If the measured values are above safe level then authorities can take required steps in diverting the traffic through other routes. This helps in traffic management and allows the rider to take the safe healthy route and diverting the traffic results in stabilizing and reversing the various parameters back to safe level. The system helps in having a reasonably good quality of air for the people on the streets and around.

## NEED AND IMPORTANCE:

Exponential increase in number of motor vehicles on road is leading to air pollution, contaminating the environment because of harmful gases, particles emitted during combustion. In urban cities there is problem of heavy traffic due to poor management of traffic which results in release of more pollutants and making the air toxic at many locations. Such locations with heavy traffic movement should be on the observatory radar. Meteorological Department has setup various high-cost weather and air quality monitoring units all over India to measure various weather parameters and pollutants, but each unit is separated by hundreds of kilometers. In order to reduce pollution we are using this technique.

Among other things the commercial devices could be too expensive for some applications purposes. This project deals with the

High Speed, Low Power Radix-4 Booth Multiplier

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**Abstract:** The radix-4 Booth algorithm is widely used to improve the performance of multiplier because it can reduce the number of partial products by half. However, numerous additional combinational devices would cause the power consumption of the Booth multiplier to be considerable. In this project, a new radix-4 Booth multiplication (R4BM) is proposed to reduce the power consumption of the Booth multiplier. The proposed design can effectively reduce the power of the Booth multiplier dissipated in the redundant partial product activities. Particularly, since the control signals are generated early at the pipeline input register before the multiplier, the performance of our design will compare with the traditional Booth multiplier. Design and simulation of the R4BM can be carry in the Xilinx platform. **Keywords:** Booth Algorithm, Low Power Multiplier, partial product, Radix-4 Booth Multiplier.

I. INTRODUCTION

Device functionality based on the Intra- or interconnecting peripherals, the intra connectors rely chosen by designers and interconnections are user choice. The designer's preference involves comments (inputs), algorithms, etc. This article concentrates on designing an algorithm for fast discrete signal processing applications. This article explores and generates the advanced version of the standard discrete signal processing tool(s) (Discrete Fourier Transform) is called FFT. It is very common in many signal- processing applications in different areas, including medical, engineering, communications etc.

A quick transition from the T-domain into the F-domain and vice-versa. Fundamental concepts were popularized in 1965, although some FFTs were recognized earlier than 1805. Many different mathematical FFT algorithms vary from easy theory of complex numbers arithmetically to

group and numerical theory; this paper provides an available technical outline and few characteristics while explaining the particular algorithms in the subsidiary sections.

The DFT is accomplished by breaking down a sequence of values into different frequency components in (1 & 2). This procedure is useful in a variety of fields but is still too slow to use directly from the definition.

$$X(k) = \sum_{n=0}^{N-1} x(n)e^{-j\frac{2\pi}{N}kn} ; 0 \leq k \leq N - (1)$$

$$x(n) = \frac{1}{N} \sum_{k=0}^{N-1} X(k)e^{j\frac{2\pi}{N}kn} ; 0 \leq n \leq N - (2)$$

DFT only describes finite length series. Each point in the X(k) series includes N multiplications. Therefore, to test all the possible values (0 to N-1) of the DFT, the calculation involves N<sup>2</sup> multiplications. Every k point in X(k) requires N-1 additions are needed. Therefore, the DFT requires N(N-1) additions values to be evaluated. It also needs an elaborate architecture in order to implement a fast processor, which is possible with the Fast Fourier Transform. The FFT is one of the new ways to calculate the similar result faster: it takes N<sup>2</sup> arithmetical multiplications and N<sup>2</sup>-N addition operations to naively compute the DFT of N-points the speed difference may be huge, especially in long data sets where N may be higher and higher. FFT can compute the DFT for N log<sub>r</sub> N multiplications and N log<sub>r</sub> N additions corresponding operation alone using twiddle factor WN = e<sup>j2π/N</sup> [4, 6- 7]. The improvement in the calculation is roughly given in (3).

$$\frac{N^2}{\frac{N}{r} \log_r N} = \frac{2N}{N \log_r N} \times \frac{(N^2-N)}{N \log_r N} = \frac{(N-1)}{\log_r N} (3)$$

The DFT estimation was practical due to these huge changes. For a broad range of applications, FFTs are of great importance – from DSP (Digital Signal Processing) to

**FIXING DRC AND LVS OF THE LAYOUT FOR SENSE AMPLIFIER****Dr. CH. Nagaraju<sup>1</sup>, U. Hima Bindu<sup>2</sup>, B. Khadeej ul Umerah<sup>3</sup>,****N. Chandrasekhar<sup>4</sup>, P. Chakradhar Raju<sup>5</sup>**<sup>1</sup>Professor, Head of the Department, Dept of ECE, AITS, Rajampet, India.<sup>2,3,4,5</sup>Student, Electronics and Communication Engineering, AITS Rajampet.<sup>1</sup>[chrajuaits@gmail.com](mailto:chrajuaits@gmail.com), <sup>2</sup>[bindureddy4755@gmail.com](mailto:bindureddy4755@gmail.com), <sup>3</sup>[umerah1999@gmail.com](mailto:umerah1999@gmail.com)<sup>4</sup>[sekhar17417@gmail.com](mailto:sekhar17417@gmail.com), <sup>5</sup>[chakrir166@gmail.com](mailto:chakrir166@gmail.com)**Abstract:**

Memory technology in early 1940s sometimes only allowed a few bytes of capacity. As the time went by the semiconductor memories came into existence and more operations could be carried out without using much of the memory. The memory mainly used in the computer memory architecture is Random Access Memory. The RAM has many types in which the SRAM is the one which is implemented in the computer memory. The SRAM has very low sensing capability and the sometimes fail to read the input data. So, in addition with the SRAM a sense amplifier is used. The sense amplifier helps to sense the low voltage signals and amplify them to the needed voltage.

So, while designing the sense amplifier in the software it is obvious to make some errors without the designer's knowledge. Therefore, to avoid the problem in the long run the designed layout has to go through some tests namely Design Rule Check (DRC) and Layout Versus Schematic (LVS). The designing of the schematic and layout of the sense amplifier is carried out in CADENCE whereas the testing and

compiling of the layout takes place with the help of ASSURA tool.

**Keywords:** *Memory, Semiconductor memory, SRAM, Computer memory architecture, Sense amplifier, CADENCE VIRTUOSO, ASSURA tool.*

**I. Introduction:**

Memory is a device or system used to store data for immediate use in a computer or any equipment related to computer hardware and digital electrical devices in computing. Memory and primary storage or main memory are frequently used in computing. Volatile and Non volatile semiconductor memory are the two primary types of memories. Volatile memory is a type of computer memory that requires power to keep its contents safe. Static RAM and Dynamic RAM make up the majority of the current semiconductor volatile memory. SRAM is easy to control and interface and control because it retains its contents for as long as the power is connected. SRAM is not useful for desktop memory, which is dominated by DRAM, but it is utilized for cache memories. SRAM is widely used in small embedded devices with memory requirements of few tens of kilobytes or less.

## A HYBRID METHOD FOR VASCULAR ENHANCEMENT AND ARTERY SEGMENTATION ON 2D RETINAL IMAGES

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**Abstract**— *Vascular enhancement filtering is commonly practiced in medical imaging before the segmentation and centerline identification of vessels, which gives valuable pathological detail and is important for vessel quantification. In this work we establish a quick and precise vascular improvement filter technology, which includes two major steps: diffusion of the vessel and improved vessel filter based on its own value ratio. This technique explores the Hessian matrix of the original images and constructs the vessel filter based on the eigenvalues of the Hessian matrix. The new technique is evaluated on the public 2D retinal datasets quantitatively and qualitatively. Our method will perform better when compared to other existing works.*

**Keywords**— *Vascular Enhancement, Image Processing, Hessian Matrix, Retinal Images.*

### 1. INTRODUCTION

Usually Biomedical imaging is a major part of medical applications. This deals with the clinicians to directly or indirectly show the things which are not visible in a plain by utilizing the ultrasound, magnetism, radiology etc. Imaging technologies are essential to the medical devices. The biomedical imaging plays a major role in patient care and spanning the scale and molecular to visible the whole body of the patient and encompassing many areas of medicine like radiology, pathology, ophthalmology and dermatology. Biomedical imaging is a method and process of generating internal body visual images for medical care and clinical study, as well as portraying the organs or tissues. Medical imaging helps to reveal the internal structures concealed by the skin and to diagnose the disease; it stores the images to database from normal anatomy and physiology to identify the abnormalities. The radiology utilizes the imaging technologies like x-ray radiography, MRI, ultrasound techniques etc. The medical images are having set of techniques that noninvasively produced images of internal organs of the patient. The medical branch concerned with the creation and use of imaging instruments and techniques to obtain internal anatomical images and to examine tissues and organs biochemically and physiologically.

The processing of an image is characterized by the need for covering a large experimental work to create the fact achieved for the given problem in proposed solutions. A main significant characteristic of processing image techniques is that an

examination is needed before arriving of an acceptable solution. The characteristic implies a way to formulate approaches easy and fast prototype the person solutions. It plays a main role in less cost and time in experimental work.

### 2. LITERATURE SURVEY

[1] S. K. Zhou: This book describes the technical problems and solutions for automatically recognizing and parsing a medical image into multiple objects, structures, or anatomies. It gives all the key methods, including state-of-the-art approaches based on machine learning, for recognizing or detecting, parsing or segmenting, a cohort of anatomical structures from a medical image. Written by top experts in Medical Imaging, this book is ideal for university researchers and industry practitioners in medical imaging who want a complete reference on key methods, algorithms and applications in medical image recognition, segmentation and parsing of multiple objects.

**Survey:** Provides a comprehensive overview of state-of-the-art research on medical image recognition, segmentation, and parsing of multiple objects.

[2] M. M. Frai, P. Remagnino, A. Hoppe, B. Uyyanonvara, A. R. Rudnicka, C. G. Owen, and S. A. Barman: Retinal vessel segmentation algorithms are a fundamental component of automatic retinal disease screening systems. This work examines the blood vessel segmentation methodologies in two dimensional retinal images acquired from a fundus camera and a survey of techniques is presented. The aim of this paper is to review, analyze and categorize the retinal vessel extraction algorithms, techniques and methodologies, giving a brief description, highlighting the key points and the performance measures. We intend to give the reader a framework for the existing research; to introduce the range of retinal vessel segmentation algorithms; to discuss the current trends and future directions and summarize the open problems. The performance of algorithms is compared and analyzed on two publicly available databases (DRIVE and STARE) of retinal images using a number of measures which include accuracy, true positive rate, false positive rate, sensitivity, specificity and area under receiver operating characteristic (ROC) curve.

**Survey:** Proposed retinal vessel extraction algorithms.

[3] Z. Huang, Q. Li, H. Fang, T. Zhang, and N. Sang: Low-rank regularization approximated by a nuclear norm has been proven its ability in image denoising. However, the nuclear norm is just a sub optimization of the rank norm, resulting in a big error when reducing noise. In this



## SALIENCY BASED IMAGE SEGMENTATION TO ANALYSE COVID-19 INFECTED CTSCAN IMAGES

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### Abstract:

Noise or artefacts in an image, such as shadow artefacts, deteriorate the performance of state-of-the-art models for the segmentation of an image. In this study, a novel saliency-based region detection and image segmentation (SRIS) model is proposed to overcome the problem of image segmentation in the existence of noise and intensity in homogeneity. Herein, a novel adaptive level-set evolution protocol based on the internal and external functions is designed to eliminate the initialization sensitivity, thereby making the proposed SRIS model robust to contour initialization.

In the level-set energy function, an adaptive weight function is formulated to adaptively alter the intensities of the internal and external energy functions based on image information. In addition, the sign of energy function is modulated depending on the internal and external regions to eliminate the effects of noise in an image. Finally, the performance of the proposed SRIS model is illustrated on complex real and synthetic images and compared with that of the previously reported state-of-the-art models. Moreover, statistical analysis has been performed on corona virus disease (COVID-19) computed tomography images and THUS10000 real image datasets to confirm the superior performance of the SRIS model from the viewpoint of both segmentation accuracy and time efficiency. Results suggest that SRIS is a promising approach for early screening of COVID-19.

### 1. INTRODUCTION

The COVID-19 pandemic is an infectious disease that has affected millions of individuals all over the world, and it has caused thousands of deaths since December 19, 2019, according to the World Health Organization (WHO). On January 30, 2020, the WHO designated the outbreak of this novel corona virus that had not been seen before in humans to be a "public health emergency of international concern." This was followed by the declaration of a pandemic on March 11, 2020. COVID-19 presents a significant challenge to medical professions due to the widespread effect of this pandemic. Its influence on the practice of diagnosis and monitoring of ground-glass opacity (GGO) and pulmonary infiltrate (PI) by medical image processing is the subject of this work.

GGO is a descriptive term referring to an area of increased attenuation in the lung on computed tomography (CT) with preserved bronchial and vascular markings. It is a nonspecific sign with a wide etiology including infection, chronic interstitial disease, and acute alveolar disease. PI is a substance that is denser than air, such as pus, blood, or protein, which lingers within the lung parenchyma. PI is associated with pneumonia, tuberculosis, no cardio is, and now COVID-19. PI can be observed on a CT.

## POWER ANALYSIS OF LOG-2 SUB BAND ENCODING FOR WEARABLE EEG RECORDER

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**ABSTRACT-** This paper is about a time-domain based lossless data compression technique called Log2 Sub-band encoding which is designed on wearable devices like EEG recorder. The sudden fluctuations such as seizure signals is a disappointing factor in the 2- Stage compression technique where the data is compressed by both differential pulse code modulation (DPCM) and Huffman coding. This drawback is tackled by Log2 Sub-band compression technique and its performance is measured based on Compression Ratio (CR). It gives higher CR Comparing to the 2- Stage compression technique and the power consumption during the process is used to evaluate overall improvement of EEG, EMG recorders with minimal hardware system. The simulation presents the compressed data, by which CR is evaluated that helps in analyzing power consumption.

**Keywords:** Wearable wireless device; Biomedical data; Lossless compression technique; Compression Ratio

### I.INTRODUCTION

Medical signal processing is a fast-growing field of research that is producing increasingly sophisticated applications in today's high-tech medicine. Monitoring brain activity can play an important role for

understanding the functioning of human brain, as well as in preventing mental disorders or improving our quality of life. Since its discovery by Berger, many research activities have centered on how to extract useful information about brain's condition automatically based on the distinct characteristics of EEG signals. Many applications require acquisition, storage, and automatic processing of EEG during an extended period of time, like 24 h monitoring of a multiple-channel EEG is needed for epilepsy patients.

Where transmission requires a wired or wireless link, and/or data requires temporary storage in a device, every bit of data has an associated power cost, and every bit that can be eliminated via compression will potentially save power, given appropriate conditions. Therefore, where a power reduction can be gained, by virtue of compression of the data to be stored or transmitted.

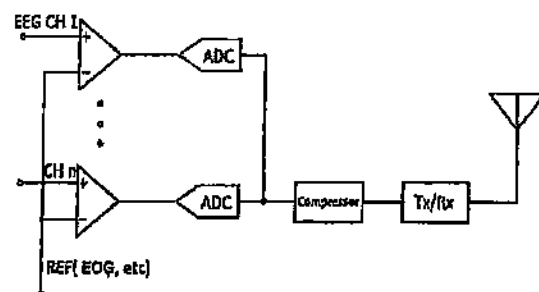


Figure 1: Simplified wearable wireless device model with data compression unit implemented

# HYBRID FULL SUBTRACTOR CIRCUIT USING FULL SWING XOR-XNOR CELL

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**Abstract**— The full subtractor circuit plays a vital role in the design of arithmetic circuits. In this article, a low power, high speed arithmetic circuits using full swing XOR-XNOR cell was proposed. The proposed circuit reduces the delay upto 41%. The performance of the proposed circuit can be measured by simulating it in tanner tool software.

**Keywords** — Full Subtractor, XOR, XNOR, Full Swing.

## 1. INTRODUCTION

The Full Adder is designed in a single module using MOS transistors. The complementary CMOS Full Adder is an example. The selected design uses 28 transistors to realize pull-up and pull-down networks of the FA. It provides full swing outputs and robustness against voltage scaling and transistor sizing. The main drawback of this circuit is high input capacitance as each of the inputs is connected to the gates having at least a PMOS and an NMOS transistor which degrades the speed of the adder. In the classical approach, FA can also be designed using pass transistors. However, the pass transistor have an inherent threshold voltage drop problem. When logic "1" and logic "0" is passed through NMOS and PMOS respectively, full swing logic "0" and logic "1" are not obtained at the output. To resolve the issue, a transmission gate (TG)-based approach has been developed. In this style, an NMOS transistor and PMOS transistor are connected in parallel and controlled by complementary control signals. These PMOS and NMOS are turned on simultaneously and provide paths to both logic "1" and logic "0" to provide full swing output. TG-based adder consumes low power however, it has weak driving capacity. Performance of this circuit can be enhanced by using the buffer at the output.

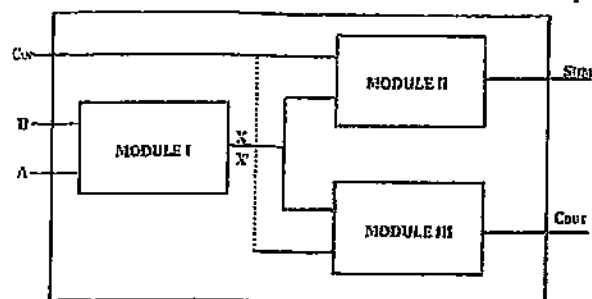


Fig.1. Full Adder Block Diagram


As shown in the Fig.1, Module I generates full swing XOR and XNOR outputs of two input signal (A and B) simultaneously. These XOR-XNOR signals must have good driving capabilities as these signals have to drive other two modules. Module II and the Module III is the sum and the carry circuit which provides the sum and carry outputs (COUT), respectively, using the output of

Module I and third input signal (CIN). The main advantage of the hybrid style is that all the modules can be optimized at the individual level, and the number of transistors can be reduced, which reduces the internal power dissipation nodes. The performance of hybrid style FA is as good as a single unit or small chains, however, they lack driving capabilities in higher bit address implemented through cascading stages.

Performance of XOR-XNOR circuit plays a vital role in the performance of hybrid FA design. Various approaches to designing XOR-XNOR circuits can be presented in recent years. These approaches can be broadly classified into two categories. In the first approach, the XOR circuit is synthesized initially, and then XNOR output is generated using an inverter. This approach has a drawback that XOR and XNOR outputs are not generated simultaneously, which increase the chance of generating false switching and glitches in the output of the modules II and III. In another approach, the XOR-XNOR circuit is designed such that the XOR and XNOR outputs are generated simultaneously. In this approach, the delay difference between XOR and XNOR signals is tried to be minimized. An XOR-XNOR circuit using CPL gives the simultaneous generation of XOR-XNOR outputs. The output voltage level in the circuit is recovered using the feedback transistor. In digital circuits, circuits are the most critical components used in processor of portable devices, full subtractor is a combinational digital circuit that performs 1-bit subtraction with borrow-in. Subtractors are useful for Digital Signal Processing and networking based systems. The full subtractor generates two output bits: the difference and borrow out. There are two types of subtractors: half subtractor and full subtractor. In this paper we have used full subtractor. In the proposed circuit there are 22 transistors which reduce the delay. The complementary pass transistor logic (CPL) provides high speed, full swing output and good driving capabilities because of high speed differential stage. The Arithmetic circuits are extensively used in the data paths consuming almost one third of power in the high performance of microprocessors. Therefore it can enhancing the performance for improving the whole system significantly. To realize a full subtractor(FS) circuits, several static

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# Performance investigation of spectral- efficient high-speed inter-satellite optical wireless communication link incorporating polarization division multiplexing

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- [Amit Grover](#),
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- [Metrics](#)

## Abstract



## Second Order Continuous Time Incremental Sigma-Delta Modulator Based Analog-To-Digital Converter

P. Brundavani, Dr. D. Vishnu Vardhan

### ABSTRACT

Novel VLSI system design has shown vital role in wide variety of neural recording network models. In the front end, an analog-to-digital converter (ADC) is a major block in neural recording system. The speed and resolution of ADC are affecting the neural recording process while acquiring neuro potentials. The power consumed with ADC block is higher compared to other blocks. This paper suggests second order continuous time incremental sigma-delta (CTIEA) analog-to-digital converter for neural recording applications, which has low power consumption and high resolution as well as faster conversion time. The sigma-delta modulation is achieved by using a dynamic summing comparator, which reduces the signal swing by incorporating cascaded integrators in forward path. However, performance degradation is expected to increase, which is overcome with adjustment of coefficients. The proposed structure is designed in 180nm CMOS process and simulated for transient and power analyses

Abstract

### HOW TO CITE

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## A Dual Channel OTA with Adaptive Reference Control Module and Current Mirror for Biomedical Applications

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Keywords: ECG (electrocardiography), Cardiac rhythm, cardiovascular diseases, Operational Transconductance Amplifier (OTA), current mirror.

### ABSTRACT

The Wearable and implantable ECG (electrocardiography) monitors, such as cardiac rhythm and heart failure, are commonly used to monitor individual's heart condition for early detection of cardiovascular diseases. In terms of power, noise and linearity, an ECG sensor is one of the most critical elements. A low noise and low power feedback amplifier based on a current-reused Operational Transconductance Amplifier (OTA) and current mirror OTA that meets the stringent requirements of ECG recordings is present in the existing system. In the proposed system, design of OTA for ECG sensors is digitalized through threshold converters and current mirror OTA the various references is fetched to extract the unique points. A dual channel OTA is implemented here with an adaptive reference control module and current mirror approach. The proposed architecture is designed and simulated by using the Xilinx Modelsim (method 1) and Tanner tool (method 2). The proposed architectures focus on reduced power consumption and size of the circuit.

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# Analysis of CMOS 45nm Transmission Gate based Pulsed Latch

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**Abstract:** Pulsed latches are becoming more popular. By combining latch and flip-flop features, they can provide an appropriate sequential element with superior performance, area, and low power consumption. Despite the fact that circuit reliability and robustness against voltage, and temperature variations are key issues in today's technology solutions, no substantial reliability study for pulsed latch circuits has indeed been proposed. The goal of this paper is to look into the effect of different  $V_T$  variations upon on behavior of pulsed latches, taking both the pulser and the latch into account. Furthermore, a transmission gate design approach is presented to improve the reliability of pulsed latch circuits while retaining their primary benefits of high performance, low power consumption, and small size. Experiments with Tanner EDA CMOS 45nm demonstrate the proposed approach's ability to maintain the same level of reliability across a wide range of supply voltages and temperatures while requiring very little area overhead.

**Keywords:** Tanner EDA, CMOS 45nm, Latch, transmission gate

## I. INTRODUCTION

In traditional ASIC designs, flip-flops are the most frequently used sequential element. This is because their timing model is simple, which simplifies the process of designing and verifying timing. Master-Slave Flip-Flops (MSFFs) are the most common and traditional implementations of flip-flops due to their reliable operation and simple timing characteristics. However, so because MSFF microarchitecture is frequently implemented utilizing two sequential latches, it's indeed time, power, and space inefficient. As shown in Figure 1.1, a typical MSFF. [1]

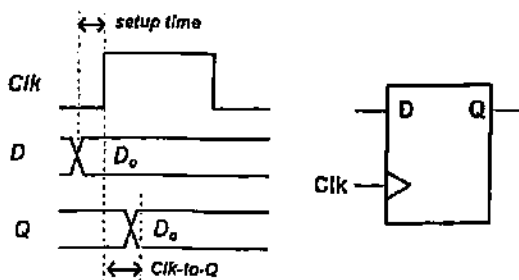


Fig.1. A simple schematic depicting a master-slave flip-flop's timing overhead.

On several occasions, pulsed latches have been proposed as a more efficient sequential element implementation than flip-flops. Pulsed latches are latches that are driven by short pulses generated by a pulser circuit from a conventional clock signal. Pulsed latches have a lower timing overhead and consume less power than flip-flops. Additionally, because the latch is significantly smaller than the flip-flop, significant area savings can be expected when a single pulser is shared by multiple latches. Additionally, novel methods for increasing the dependability of pulsed latches without sacrificing performance, area, or power must be developed. In addition to being used in logic routes, sequential components are occasionally used to create register files for data storage. While flip-flops and latches are frequently used

in certain applications, pulsed latches may be a more attractive alternative. By utilizing pulsed latches, it is possible to reduce the size of the register file while reducing latency and power consumption. However, it must be compared to commonly used SRAM-based register files. Along with single-read and single-write register files, which are common in most designs, multiport register files are especially advantageous for a limited number of applications. On the other hand, the conventional method of creating multiport register files incurs significant overhead in terms of space, power, and performance. Due to their versatility, pulsed latches can be an attractive and more efficient alternative implementation of multiport register files. [2,3].

We begin by comparing the performance of a latch implemented in GDI, static CMOS, and transmission logic. By comparing the implementation of these techniques, it was determined that a pulsed latch circuit could be implemented using a transmission gate.

The second section discusses the literature survey. Section III discusses various techniques for implementing D-latch. Section IV discusses the transmission gate pulsed latch that is proposed for 45nm CMOS technology under supply voltage scaling. Section V discusses the findings.

Finally, section VI draws some conclusions.

## II. LITERATURE SURVEY

Pulsed latches have long been proposed as a way to reduce power consumption while increasing performance. [4] employed PLs with fairly wide pulse widths to enable cycle lending and to tolerate clock skew. [5] demonstrated the use of PLs as the primary sequential elements to enhance the effectiveness of the Intel XScale microprocessor without requiring excessive clock power.

Baumann et al. [6] suggested three strategies for selectively replacing MSFFs with PLs in order to boost the ARM926 microprocessor's performance. However, due to the buffer insertion, some area as well as power overhead were introduced. Baumann et al. [7] implemented that PLs be used

# A NOVEL TECHNIQUE FOR AUTHENTICATION USING ECG

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**Abstract:** The primary focus of this paper is to use ECG signals to authenticate the user. The electrocardiogram (ECG) is an electric signal that indicates heart activity and has highly discriminative capabilities for human identification. Although ECG-based authentication has already had a lot of success recently, selective extraction of features and effective classification techniques now have a long way to go. In the current environment, authentication systems have become an essential necessity for protecting the integrity of systems and confidential data. Passcodes have given a means of controlling sensitive data, but they have also revealed some fundamental flaws. We develop an authentication mechanism called "A novel technique for authentication using ECG" that can accurately grant access to the user. Using assessment metrics, this authentication primarily contains filtering type, segmentation, feature extraction, and health status on ECG biometrics.  
**Keywords:** ECG Biometric, Authentication.

## I. INTRODUCTION

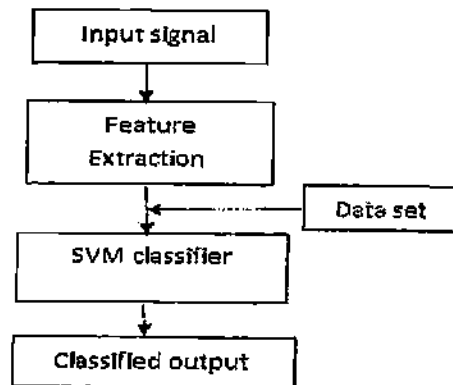
Face detection, as the often used biometric attribute by human beings, has been a challenge for the researchers for ages, which has some applications in consumer goods and software. In comparison to many other biometric qualities such as fingerprint recognition or iris, the face has a distinction for being easy accessible and non-intrusive. Therefore, in mischievous situations, this benefit will become a drawback, allowing hackers to easily produce clones and fake face detection systems. The process of outwitting a biometric system by providing a false proof in terms of achieving identification is known as a spoofing attack. The images or videos of a valid user can be easily acquired from a distant or received through the network, it is quite easy to create such an attack for face recognition systems.

In the case of 3D facial mask attacks, approaches that rely on the assumptions of a planar surface for a fake face are made useless. Facial masks, made possible by advances in 3D printing technology, take malicious activities a step further and present new problems for countermeasure research. The safety of confidential data, services, or facilities can be accomplished by providing that only authorized individuals have access. Despite the fact that passcodes include some protection and security access, they are sometimes so weak that they can be quickly guessed. Complex passwords are more safe, but they're also more harder to recall, therefore they're frequently "stored" in less secure ways. Moreover, having similar passcode is frequently reused in several apps or devices, allowing a fraud to access multiple resources with a broken password. Biometric technology is an attractive approach for authentication.

Generally, biometric technologies operate in one of two modes: 1) verification or 2) identification. The goal of an authentication system is to validate or verify an user's identity but the goal of an identification system is to identify a particular person. In the last decade, live-ness identification has been a high priority, with several solutions to the problems described. ECG is an essential signal, and its

availability confirms that the patient is alive. Stealing someone's ECG is significantly more challenging. But apart from its benefits, ECG accuracy is inferior to those of some other established biometrics such as fingerprints. Our ECG signals come from our fingertips. Fingertip ECG has two advantages: first, it removes the need for the user to undress in order to insert electrodes, and second, it makes the fingerprint a logical candidate for ECG fusion. The number of heartbeats captured is the same for all users, ignoring the fact that some individuals have a very constant ECG and do not require as many readings as others with a less stable ECG. Hence, ECG based authentication is most appropriate for authentication.

## II. EXISTING METHOD



The technique for intra-body communication was used to obtain intra-body propagation signals. For intra-body communication, three transmission mechanisms have been proposed: simple circuit type, electrostatic coupling type, and waveguide type. The waveguide type, in particular, considers the human body to be a waveguide via which an input signal at an input electrode pair is propagated as an electromagnetic wave to an output electrode pair.



# LANE DETECTION FOR AUTO-PILOT VEHICLES USING PERSPECTIVE AND HISTOGRAM APPROACH

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**Abstract:** The automobile industry has experienced a faster rate of growth in recent years. The vehicles design has moved from a simple mechanical model to a smart, fast, comfort, and automatic driving vehicles. However, providing safety and avoiding road accidents are main things to perceive, in which LANE DETECTION plays a crucial role and it is critical component of self-driving and autonomous cars. Once the lane positions are obtained, the vehicle will know where to go and avoid the risk of running into other lanes or getting off the road. This can prevent the car from drifting off the lane. The existing methods for automatic lane detection are Minimalistic approach, LIDAR and RADAR. But these methods provide detection for small lengths, suitable only for straight lanes detection and the cost level is high.

The proposed method for lane detection is the- "Perspective and Histogram analysis for lane detection". This method will overcome the limitations of the previous existing methods like detecting the curved and the steep lane markings. The need and importance of this method is to provide the optimal safety to the passengers, to avoid the accidents and promoting safe lane shifting of the vehicles. This method consists of two important components- the camera and the computer vision, which helps the self-driving cars perceive the surroundings around them. The sensing camera is fixed at the front of the vehicle, which is the source of data will extract the relevant information from the surrounding environment. The computer vision will understand the digital images and videos send by the camera using the image processing techniques along with the perspective and histogram algorithms. Through this approaches the vehicles are guided to go in correct lanes and can shift the lanes automatically with safety. In this work, MATLAB computing tool is utilized to detect the lanes with easy analysis.

**Keywords:** Histogram, Lane detection, Matlab.

## I. INTRODUCTION

An image is a two-dimensional representation of a genuine entity or a human having the same appearance as another thing. A two-dimensional, photographic, screen display and a three-dimensional, statue-like image are both examples of image. Visual instruments such as lenses, mirrors, cameras, detectors, microscopes, and anomalies and natural objects like as water particles or the human eye can capture them. Every two-dimensional image, such as a pic chart, graph, map, or abstract artwork, is referred to as an image in the broadest meaning. Images can also be created manually in this larger sense, for example, by painting, drawing, carving, or automatically by type-setting technology, or digital graphics are generated by a mixture of technologies, especially in pseudo-photography. It is determined by the mathematical equation  $f(x, y)$ , where  $x$  is the horizontal coordinate and  $y$  is the vertical coordinate.

### 1.1 Literature Review

The perception of a road or lane is a critical issue. The perception of the road or lane is a key enabler for advanced driver assistance systems. As a result, for the past two decades, it has been a hotbed of research. With significant progress made in recent years The perception of a road or lane is a critical issue. A component that allows advanced driving assistance systems to work. As a result, it has been a hotbed of research over the past decade. . The subject was tackled in a variety of scenarios, each with a different task definition, resulting in the use of distinct sensing modalities and methodologies. In this study, we examine the

methodologies and computational strategies used to solve the problem during the last 5 years, several methods. We give a general breakdown of the problem into its functional building pieces, as well as a comprehensive list of possible solutions. The plan For each functional block, we discuss and examine the many implementations that have been suggested hypotheses. While great progress was demonstrated in a few cases, a closer look at the requirements for next-generation systems exposes major gaps. We identify these chasms and propose research avenues that could fill them.

Vehicles are rapidly incorporating advanced driver aid systems, which either notify the driver in dangerous situations or actively participate in driving. Such systems are projected to get increasingly complicated as time goes on. During the following decade, we will have complete autonomy. The perception problem [1], which has two aspects, is the fundamental bottleneck in the development of such systems is the perception problem [1], which consists of two parts: road and lane perception and obstacle detection (i.e. automobiles and pedestrians). The first is taken into account in this survey.

The key perceptual clues for human driving are road colour and texture, road limits, and lane markings. Semi-autonomous and fully autonomous vehicles are intended to coexist with human drivers, therefore this trend is projected to continue to rely on perceptual cues similar to those used by humans. While different infrastructure cueing for human

# DESIGN OF SRAM MEMORY USING REVERSIBLE AND GDI LOGICS

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**Abstract:** Power consumption is a critical issue in VLSI design. Reversible logic and GDI logic have gained popularity in recent years because to their low power consumption features. These logics have a wide range of uses in upcoming technologies. This logic is critical for the development of low-power structures that are required for the creation of arithmetic circuits used during quantum computing, nanotechnology, and other low-power designs. The GDI method is used to build a variety of reversible logic gates in this paper. A SRAM memory cell has been built utilizing the developed reversible logic gates for improved performance over current designs. Additionally, performance factors like as quantum latency and transistor count are examined for various SRAM designs. Tanner EDA Tools utilizing CMOS 45nm technology are used to simulate the process.

**Keywords:** Reversible logic gates, GDI logic, SRAM

## I. INTRODUCTION

The increasing use of mobile phones as well as other handheld devices, along with the simplicity with which fast communication networks may be accessed, has led to a considerable rise in demand of audio and visual administrators on the system. One of these gadgets' main objectives is to build energy-efficient frameworks that allow longer battery life. Due to the increased handling and capacity requirements for these hand-held devices, high-resolution photography has worsened the problem of intensity usage. To be honest, embedded static random access memory (SRAM) alone accounts for about 30% of power usage [1]. Dynamic power consumption is linear with voltage, and memories are intended to run at extremely low voltages in order to gain substantial power savings during memory operations. [2]. While this presents a major hurdle to incorporating such memories into mainline processors, it is beneficial in processors intended for interactivity applications, that are known to just be error-tolerant [3].

Due to the rising need for more functionality at a reduced energy cost, high density and low-power designs have become increasingly critical for a wide variety of applications. With increasing need for greater memory capacity and speed, it has become essential to guarantee that control consumption is decreased and dependability is raised at a quicker rate for both individual memory cells and the memory framework as a whole.

Designers have faced many difficulties in the creation of conventional design components during the last few years.

The primary issue with these traditional methods is power dissipation, which is a critical component in today's integrated circuit designs. Because traditional circuits waste more power in VLSI design, reversible logic is a potential technology for addressing this issue owing to its inherent ability to reduce power dissipation. It has received significant research and implementation for VLSI architectures. It encompasses a variety of applications, including low-power CMOS, quantum computing, and nanotechnology. Additionally, reversible computing will result in an increase in the system's total energy efficiency.

Advances in reversible logic technology have aided in the performance enhancement of computer architectures. In this

section, we compare the power, slew rate, and latency of several reversible logic gates in order to determine their potential uses in VLSI circuits.

Reversible logic circuits have an equivalent number of inputs & outputs as well as a one-to-one mappings between the input & output vectors; this guarantees that the input state vector is always recoverable from the output state vector. The main objectives of reversible circuit design are to reduce gate count, garbage outputs and quantum cost. Any reversible circuit must utilize as few reversible logic gates as feasible.

GDI (Gate Diffusion Input Method) - In[4], a new low-power modeling method was created to address a wide range of low-power issues. The GDI method enables the use of a broad range of dynamic combinational logic with just two transistors. This method is ideal for creating fast, low-power circuits by employing less transistors whilst enhancing power characteristics and enabling the creation of basic Shannon circuits utilizing theorems[4,5].

## II. IMPLEMENTATION OF GDI LOGIC

Gate diffusion input (GDI) is used as a replacement to static CMOS logic. The primary distinction between CMOS and GDI is that even in GDI, the supply & ground allocation to pMOS & nMOS are not set. It just needs two transistors to execute two different and complex logic operations. As a result, this is a circuitry with less transistors, and the fundamental GDI circuit saves power due to logic flexibility. However, performance fluctuations occur as a consequence of threshold voltage drops[6,7]. The three inputs in GDI are as follows:

• N- input to the nMOS source/drain • P- input to the pMOS source/drain

The straightforward digital gates (AND, OR, XOR) are designed to maximize swing. In comparison to static CMOS-based circuits, a GDI-based digital circuit uses less power, has a shorter latency, and occupies less space. In this part, basic logic gates are constructed using GDI technology and emulated using CMOS 45nm technology.

# An Organized Approach for Analysis of Diabetic Nephropathy Images Using Watershed and Contrast Adaptive Thresholding



Syed Musthak Ahmed, Fahimuddin Shaik, Vinit Kumar Gunjan, and Mohammed Yasin Ali

**Abstract** The main origin of enduring kidney disease and a significant source of coronary mortality is diabetic nephropathy. Diabetic Nephropathy was divided into phases: micro albuminuria and macro albuminuria. Nephropathy is characterized pathologically by thickening of glomerular and tubular basal membranes in persons with type diabetes, with gradual mesangial extension (diffuse or nodular) contributing to gradual reduction of glomerular filtration surface. It raises the risk of death, primarily from cardiovascular causes, and in the absence of other renal disorders, it is characterized by increased urinary albumin excretion (UAE). A new algorithm is proposed in this work to examine the fundamental problems present in acquired Diabetic Nephropathy images. Through integrating these two approaches, a pre-processing technique such as (Contrast Enhancement, CLAHE) as well as post-processing technique such as (Cell Detection) segmentation provides an integrated worldview of picture handling techniques that is utilized to make the casing work and is helpful for basic translation just as an educational asset for the normal man. Investigating and exploring the significance of less broadly utilized estimation parameters in clinical picture examination stage is acted in this examination.

**Keywords** Diabetic nephropathy · Diabetic mellitus · Cardiovascular mortality

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# A Literature Survey on Identification of Asthma Using Different Classifier and Clustering Techniques

Modern Approaches in Machine Learning and Cognitive Science: A Walkthrough pp 69-80 | Cite as

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Chapter

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## Abstract

Asthma disease are the scatters, gives that influence the lungs, the organs that let us to inhale and it's the principal visit disease overall particularly in India. During this work, the matter of lung maladies simply like the trouble experienced while arranging the sickness in radiography are frequently illuminated. There are various procedures found in writing for recognition of asthma infection identification. A few agents have contributed their realities for Asthma illness expectation. The need for distinguishing asthma illness at a beginning period is very fundamental and is an exuberant research territory inside the field of clinical picture preparing. For this, we've survey numerous relapse models, k-implies bunching, various leveled calculation, characterizations and profound learning methods to search out best classifier for lung illness identification. These papers generally settlement about winning carcinoma discovery methods that are reachable inside the writing. The probability of endurance of patients with maladies is frequently made conceivable if the sickness is recognized and analyzed in perfect time. (SVM), (KNN) and vector machine, Random help in the recognition of lung mass. A numeral of procedures has been started in malignancy recognition strategies to advance the productivity of their identification. Different applications like as help vector machines, neural systems, picture preparing methods are widely used in for asthma illness recognition which is explained during this work.



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## Simulation of Optimized Architecture for the Estimation of Congestion during Placement and Routing

Shaik Karimullah, Dr. D. Vishnuvardhan

### ABSTRACT

This work presents backend estimation of design parameters for placement and routing flow with the help of existed Floorplan approach done by using Hybrid Optimization Algorithm to estimate the value of Congestion. Effective area utilization plays key role in VLSI Circuit design, wherein reduction of Congestion is also associated with it for the improvement of Floorplan, Placement and Routing. This improvement significantly helpful for compact design and performance of the circuit. Congestion is a fundamental key issue in Very Large Integration for estimating the density of area underlies with routing among various Computational blocks. Here we used ICC II simulation tool for simulation of Floorplanned area of Standard Benchmark Circuit for the betterment of placement. Prior approaches estimated the values of congestion for standard architectures whereas this work considered the Floorplan and Placement outputs of standard MCNCBM Circuit using IHS Algorithm which gave best results for placement and routing for VLSI circuits, and simulated it for the estimation of Congestion for the circuit design

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## A Simple Shape Descriptor Merging Arithmetical Wrap Around Technique with Absolute Localized Pixel Differences

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### Abstract

The quest for computationally simple, highly accurate and precise shape descriptors supporting retrieval continues to be an active research area in computer vision. In this paper, a simple feature descriptor is realized by blending Modulo Arithmetic (MA) with Local Absolute Pixel Differences (LAPD) labelled as MA-LAPD. MA initially refines edges of images through modulo normalization and later operated by LAPD to capture local texture patterns. Subsequently, LAPD encodes the local intensity transitions in eight directions with regard to center pixel. The two prominent directional indices are converted into unique decimal codes that represent each pixel position, thus, transforming each image into a collection of LAPD codes. The ensuing LAPD image is then fabricated into histograms for characterizing the distribution of local features, used for matching and retrieval. Quantitative and qualitative investigations on Kimia's 99, MPEG-7 Part-B and Tari-1000 datasets reveal consistent Bull's Eye Retrieval (BER) scores above 91%. Also, relative analysis exposes the superiority of MA-LAPD with its predecessors in majority of the datasets.

**Keywords** Bull's eye retrieval · Image histogram · Local absolute pixel differences · Modulo arithmetic · Shape retrieval

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# Lung Cancer Detection using Bio-Inspired Algorithm in CT Scans and Secure Data Transmission through IoT Cloud

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**Abstract**—Primary recognition of pulmonary cancer nodules eloquently increases the odds of survival, also leads it solidier problem to resolve, as it often relies on a tomography scan filmic examination. By increasing the possibility of effective treatment, earlier tumor diagnosis decreases lung cancer mortality. Radiologists usually diagnose lung cancer on medical images by a systematic analysis that consumes more time and is unreliable often, because of the substantial improvement in the transmission of data in the healthcare sector, the protection and integrity of medical data has been a huge problem for healthcare applications. This study utilizes computational Intelligence techniques. For detection and data transmission, a novel Hybrid model is therefore proposed in this paper. Two steps are involved in the proposed method where diverse Image processing procedures are used to detect cancer in the first step using MATLAB and data transfer to authorized persons via the IoT cloud in the second stage. The simulated steps include pre-processing, segmentation by Otsu thresholding along with swarm intelligence algorithm, extraction of features by local binary pattern and classification using the support vector machine (SVM). This work demonstrates the dominance of swarm-Intelligent framework over the conventional algorithms in terms of performance metrics like sensitivity, accuracy and specificity as well as training time. The tests carried out show that the model built can achieve up to 92.96 percent sensitivity, 93.53 percent accuracy and 98.52 percent specificity.

**Keywords**—Pulmonary; mortality; carcinogenic; swarm intelligence; IoT

## I. INTRODUCTION

A malicious tumor characterized by uninhibited cell evolution in lung tissues is lung cancer. Carcinomas are the majority of cancers that originate in the lungs. Most of the patients are diagnosed at an advanced stage due to no apparent early cancer symptoms [1], which typically results in high costs and a worse prognosis. In medical diagnosis and treatment, medical imagery has become important. These images play a extensive part in clinical applications since medical professionals expose attention in exploring the interior structure [2]. Several procedures have been established based on cross-sectional images, such as magnetic resonance imaging (MRI) or computed tomography (CT) or other topographic modes [3,4,5]. The application of medical

image processing has played an important role in both technological and clinical aspects in helping to identify and examine anomalies by making it easier for medical practitioners to work with more scientific and sophisticated approaches to solve the problem [6]. A CT Scan obtains images of an organ that cannot be seen on a regular x-ray that results in earlier diagnosis [7]. The biggest issue with lung cancer is that these cases of cancer are later diagnosed, making treatments more complicated and decreasing the probability of survival subsequently [8]. It is therefore important to recognize a modern, robust method for diagnosing lung cancer at an earlier stage [9]. For cancer diagnosis, CT scan images are being used; they are analyzed by radiologists to recognize and identify nodules into malignant and benign nodules [10]. These techniques, require highly trained radiologists who are not in particular, accessible to people in remote regions. In addition, in manual testing, there seems to be a significant chance of human error, and therefore optimization-based systems are required that can assist radiologists in diagnosing and help minimize the incidence of false results [11]. To detect the nodules, their form, scale, and other characteristics from CT scans, digital image processing techniques can be used. In order to design specialist support systems for the diagnosis of various diseases such as lung cancer identification, medical image processing has been widely and rapidly implemented. In addition, the existence of nodules that define a patient's destiny is also very complex, as their shape and size differ from slice to slice. They are often connected, such as arteries or bronchioles, to other pulmonary structures [12]. It can also vary the color in which they appear on CT scans. These variables contribute to the difficulty of defining them.

In this work an efficient framework is proposed to decipher the lung cancer at an early stage and also data transmission to medical practitioners. Detection stage involves pre-processing, separation of nodules with optimization, feature extraction and classification. Transmission stage involves transmission of statistical parameters through IoT as well as MATLAB IoT cloud Thing speak. As direct data transmission is not possible, thingspeak module has been considered for effective transmission. The structure of this paper contains Section II: related work, discusses about the



# An Optimized Novel Technique for Video Synopsis Using Bayesian Object Tracking Algorithm

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This paper presents another analytical video description of the methodology, which is far superior in pressure and depth to previous methodologies. In preparation, the video of the reconnaissance was usually packed by moving the pushing objects alongside the time hub, which undoubtedly resulted in a real crash and ordered issue antiques between the items being pushed. The main idea in this paper is that these antiques can be reduced by using the Bayesian calculation for fragmentation, and the last approach for foundation extraction is used following the products. We offer the best way to integrate these three heterogeneous activities into a single improvement system and achieve excellent outline performance. The Calculation of Metropolis does not like past methodologies that usually use optional improvements to fathom summary improvements to find the answer for our three-variable progress problem. A range of research demonstrates the feasibility of our technology.

**Keywords:** Video Extraction, Object Segmentation, Tracking, Background Subtraction, Synopsis Video.

## 1. INTRODUCTION

The passion for technology is getting ready and assessed as state-of-the-art software moves quickly. There is a need for risk and human effort to detect captivating events at a time when huge video perception data are available. The best way to identify suspicious events and help customers interpret video data is easily converted into a fundamental problem for the video observation industry.

Analysis video, which seeks to provide the conceptual video with relevant details as an integral use of video content analysis. There can be two classes: a static video description and a dynamical video conceptual Video structure separate or show the content of the video from a video feed by moving keyboards. In any case, such a technique does not completely inform the operation and elements of video return articles, which are not acceptable in applications such as video recovery. It is a video, but much easier than the first. It can quickly recognize the object of related events, reduce the primary frame spatial overflow, which effectively contracts the frame length for useful video monitoring, evaluation, and restoration.

The main video development material is evacuated and more substance than a stationary is extracted from the core processes of the packaging plan [1]. Existing video

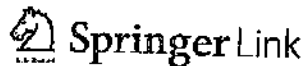
repair procedures usually depend on improving the diagram proposed by Pritch et al. [2] after limited imperative work. However, it is impressive and difficult to measure the cap that affects the smooth implementation of the video overview period. Similarly, the video sometimes does not include all moving items and springs. Similarly, the thickness of items in the video summation is not even reduced, so that a video synopsis is imperfect.

## 2. VIDEO SYNOPSIS-METHODOLOGY

Right now, propose a novel philosophy for streamlining a molecule-based item revamp strategy [3] to deliver successive abstract video subject. An event is described as an article's spatiotemporal progression. The key idea right now to also iteratively evaluate the bearing relationship, event closeness between events, and then find each event in the video volume synopsis. We use the common data of frontal region artifacts, obtained by straight figure based after computation, to keep the main momentary solicitation. We use spatial bearing data of items to select the thickness of the once-over video to prevent the effect of wonder. Finally, to retain the integrality of a singular event to settle the single event subsection problem realized by imperfect after, morphological information of articles-based shift is proposed. This paper is shifted as required.

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# A Tuberculosis Management Through ADR Study, Feature Extraction and Medical Bio Informatics

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Conference paper

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## Abstract

Enhanced research into tuberculosis has long been ignored because of the complexity of the risk of infection. The novelty of this project is the approach in which computer vision technology as well as laboratory work for improving mankind are carried out. The techniques of image processing are important for automatic research. In this work, the gap between clinical and technical research has been reduced by the collaboration and successful analysis.

## Keywords

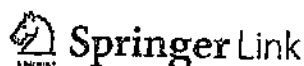
Adverse drug reactions Tuberculosis Image processing Clinical

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## Notes

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# Detection and Analysis of Pulmonary TB Using Bounding Box and K-means Algorithm

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## Abstract

Improving TB studies has long been a overlooked area, partly because of the complexities involved in getting the infection at risk. The novelty of this job lies in the strategy in which both computer vision methods and laboratory-based work are carried out to improve the human race. In this job, the gap between clinical research and technical studies has been decreased by bringing both the job together. Image processing is a field that does not require contact processes to be detected with patients. Over the previous two centuries, several algorithms have been created to extract the contours of homogeneous areas within the digital image. It is possible to acquire the input for image processing algorithms from scanned Lungs X-ray images. To detect the lung region, the fundamental image processing methods are applied to the CT scan picture. In this project, Image segmentation of the input pictures is carried out using a suggested technique developed from the K Means algorithm and bounding box algorithm along with Morphological Image Processing to acquire the output pictures and outcome comparison.

## Keywords

Image Tuberculosis

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## Notes

# The LTE Indoor and Outdoor Performance Evaluation Using OFDM



K. Riyazuddin, S. Nazeer Hussain, O. Homa Kesav,  
and S. Javeed Basha

**Abstract** In the present technology the rapid expand of wireless data digital communications call for wireless structures which can be reliable and feature an excessive spectral performance. Orthogonal Frequency Division Multiplexing (OFDM) has been diagnosed for its proper overall performance to achieve excessive statistics prices. Fast Fourier Transforms (FFT) has been used to provide the orthogonal sub-carriers. Due to the drawbacks of OFDM-FFT primarily based gadget consisting of high height-to-common ratio (PAR) and synchronization and plenty of other works have replaced the Fourier rework part via wavelet transform. In this paper, a suitable method for the OFDM system and the proper usage of FFT is provided. This system shows a superior overall performance with traditional OFDM-FFT systems through an Additive White Gaussian Noise (AWGN) channel. Bit error rate (BER) defines the overall performance of the device as a characteristic of signal to Noise Ratio (SNR). Here in this work OFDM is evaluated using LTE. LTE stands for long term evolution. The LTE performance is evaluated in indoor and outdoor applications. Moreover, the proposed gadget gives nearly an excellent reconstruction for the input signal inside the presence of Gaussian noise. This work concentrates on reduction of errors and improving the SNR by using some of the digital modulation techniques such as Phase Shift Keying, Quadrature Amplitude Modulation and the Fourier transforms.

**Keywords** OFDM · SNR · FFT · Bit error rate · Sample error rate

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# Development of Hybrid Pre-coding Technique for Mimo Systems Based on Kalman Filter



C. H. Najaraju, G. Chandana, B. Manoj Kumar,  
and C. Kishore Kumar

**Abstract** Channel contact with millimeter wave is a crucial enabler to addressing bandwidth shortage of potential 5G networks. In order to overcome the higher route failure, millimeter wave communications throughout the 60 GHz range requires massive antennas clusters at the sender and recipient nodes to obtain signal amplification benefits. Analog approaches could not employ the power of evolutionary income. In addition, band pass filters with maybe vibrating strings processes can be electronically regulated, thereby reducing the likelihood of sophisticated processes and culminating in poor results. Hybrid systems are exciting nominee approaches which transcend their drawbacks of shaping mere virtual or analog beams, because they combine all methods' advantages. Through utilizing multiple concurrent beam transfers, hybrid systems growing bandwidth learning relative to analog-only systems.

Analog signal amplification will obtain a only a spectral efficiency of around 3 bps/Hz at 20 dB, and being under the similar circumstances our suggested hybrid analog/digital signal amplification gets 10 bps/Hz. We are proposing an incremental Kalman derived multi-user hybrid approach that reduces the error here between nodes (BS) transmitted declaration of independence as well as the cell station (MS) approximate information obtained. The system includes a specially constructed error model, followed by a two-step process to first measure the pre-coding/mixing matrix of RF and instead models the pre-coding of the digital firmware at the BS.

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# Automated Speed Braking System Depending on Vehicle Over Speed Using Digital Controller



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Ch. Nagaraju, G. Thirumalaiah, N. Rajesh, B. Bala Manikanta,  
N. Sai Sivaram, and T. Prakash Raj

**Abstract** The point of this extend is to construct a system for keeping the vehicle secured and protecting it by the intruders' occupation. The project's goal is to set up a programmed velocity control for vehicles and mischance evasion framework utilizing programmable logic controller (PLC) and encoder sensor. The encoder sensor send's out signals persistently to the PLC. When wheels begin turning and once the speed will reach greatest constrain the PLC will off the control supply consequently. After accepting this flag PLC sends a flag to the engine to decrease the car speed consequently which can control car speed quickly so that the car is worked consequently without any manual operation conjointly deliver buzzer sound to caution to the driver.

**Index terms** Programmable Logic Controller (PLC) · Encoder sensor

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# Performance Analysis of LTE Based Transceiver Design Using Different Modulation Schemes



C. H. Najaraju, P. Veera Prasad Reddy, Nidiginti Suneel,  
and Gona Naveen Kumar

**Abstract** Creation of wireless transceiver designs based on Long-Term Evolution (LTE) architecture initiated by the 3GPP consortium. Initially, a performance comparison on Bit error rate (BER) and Signal to noise ratio (SNR) is evaluated for a single transmitter and receiver storage system, both in fading (Rayleigh channel) and non-fading (AWGN) channels. Specific modulation schemes are used including Binary Phase Shift Keying (BPSK), Quadrature Phase Shift Keying (QPSK), and Quadrature Amplitude Modulation (QAM).

Later, the transceiver designs implement multiplexing of the Orthogonal Frequency Division (OFDM) with the required requirements for the LTE modulation formats. BER and SNR performance assessments on designed transceiver structures are analyzed. This paper further assesses the channel's efficiency or throughput using Shannon efficiency equation for a band-limited AWGN channel with an average transmit power limit. The channel efficiency is evaluated using parameters such as bandwidth and conveying power as constraints. Such parameters describe communication device boundaries.

**Keywords** LTE · Rayleigh · QAM · SNR · BER · Capacity · Transceiver · OFDM

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# Color Image Segmentation Using Superpixel-Based Fast FCM



Jala Himabindhu and V. Sai Anusha

**Abstract** A large number of improved variants of the Fuzzy c-means were used to segment the gray scale and color image. Nevertheless, some of them take time to yield the best and optimal results and for two reasons cannot produce adequate segmentation results for color images. This work proposes a simple FCM clustering algorithm based on the Super pixel Algorithm (SFFCM), which is considerably faster and more robust for image segmentation applications which are based purely on the color parameter. In this research work, to attain an accurate contour super pixel image for improved local spatial neighborhoods, an efficient algorithm referred as multi-scale morphological gradient reconstruction (MMGR) operation is originally described. The significance of the proposed method lies in the relationships between the pixels and how they are utilized in the flow of the application. Compared to the conventional adjacent fixed-size and shape frame, the super pixel image provides improved adaptive and exact amount of irregular local spatial communities which help to enhance color image segmentation. Coming to the next step, the original color image is essentially based on the obtained super pixel picture, and the number of pixels in each super pixel region easily decides its histogram. Ultimately, FCM is implemented to obtain final segmentation results that increase the histogram parameter on the super pixel picture. The performance of the proposed method is computed using Matlab computing language and also a statistical measure is carried out based on different parameters and their respective graphical representations.

**Keywords** Pixel · Clustering · Image segmentation · FCM · Images

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# Low Power Enhanced Leach Protocol to Extend WSN Lifespan



Shaik Karimullah, D. Vishnuvardhan, K. Riyazuddin, K. Prathyusha, and K. Sonia

**Abstract** WSN (Wireless Sensor Network) is characterized as a wireless sensor nodal network where one of the most challenging issues is the routing technique. Some of the critical issues with Wireless Sensor Networks is that the network sensor nodes have insufficient battery power. The battery power plays an important role in improving node lifespan. In Wireless Sensor Network, energy usage is among the most essential considerations for routing between various routing techniques. The best-known protocols are hierarchical routing protocols to reduce energy consumption. For application-specific type an enhanced protocol architecture for a Wireless Sensor Networks (WSN), a Low-Energy Adaptive Clustering Hierarchy (LEACH) was introduced. The proposed En-Leach protocol (Enhanced Leach) is an enhanced energy-efficient routing protocol that saves a large portion of the power of communication within the network. In do so, the proposed network topology chooses CH (Cluster Head) nodes from the higher residual energy of the sensor nodes, Further and a lesser range from the BS (base station). It then properly manages the SN (sensor nodes) and generates clusters to maximize the lifespan of the WSN and reduce the average energy dissipation per each sensor node.

**Keywords** Wireless sensor nodes · Sensor nodes · LEACH · Cluster head · Base station · En-LEACH

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# A Genetic Algorithm with Fixed Open Approach for Placements and Routings



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Shaik Karimullah, Syed Javeed Basha, P. Guruvyshnavi,  
K. Sathish Kumar Reddy, and B. Navyatha

**Abstract** Multiple traveling salesman issues can model and resolve specific real-life applications including multiple scheduling, multiple vehicle routes and multiple track planning issues etc. Though traveling salesman challenges concentrate on finding a minimum travel distances route to reach all communities exactly again by each salesman, the goal of a MTSP is just to find routes for  $m$  sellers with a reduced total cost, the amount of the commute times of all sellers through the various metropolises covered. They must start by a designated hub which is the place of departure and delivery of all sellers. As the MTSP is an NP-hard problem, the new effective genetic methodology with regional operators is suggested to solve MTSP and deliver high-quality solutions for real-life simulations in a reasonable period of time. The new regional operators, crossover elimination, are designed for speed up searching process consolidation and increase the consistency of the response. Results show GAL finding a decent set of directions compared with two current MTSP protocols.

**Keywords** MTS · MTSP · NP-hard problem · GAL

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# Retinal Vessel Tracking Using Gaussian and Radon Methods



N. Jaya Krishna, Fahimuddin Shaik, G. C. V. Harish Kumar,  
D. Naveen Kumar Reddy, and M. Bala Obulesu

**Abstract** Retinopathy is one the cause of impairment of eye vision which leads to damage to the retina. Irregular sugar levels in the blood flow, abnormal blood flow in the retina and hypertension causes retinopathy. with the help of computer application tracking and estimating the diameter of a blood vessel is possible. The MATLAB software is used to track and estimate the blood vessel. In this software, the retinal image is given as an input image and the image processing methods are carried out to determine the diameter and track the retinal blood vessel. This technique distinguishes bifurcation focuses which might be valuable for further post - quantitative and compositional investigation.

**Keywords** Gaussian process · Radon transform · Vessel tracking · Retinal imaging · Image processing · Diameter estimation

## 1 Introduction

Image is a meaning of light intensity  $f(x, y)$  in which  $x$  and  $y$  are spatial coordinates,  $f$  is a grey or brightness scale. Colour image types, binary image, grey image, indexed image [1]. With the development of medical imaging and computer

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375-384

# Optic Disk Segmentation for Glaucoma Detection in Retinal Images



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G. Obulesu, Fahimuddin Shaik, C. Sree Lakshmi, V. Vijay Vardhan Kumar Reddy, M. Nishanth, and L. Siva Shankar Reddy

**Abstract** Segmentation of optical disk and optical cup from retinal fundus images help to diagnose the abnormalities such as Glaucoma and can help to create awareness among the common man to plan for proper treatment plan in order to avoid complete visual morbidity. The original input image is at first filtered by means of histogram processing and further subjected to morphological image processing in order to classify the positions of optic cup and optic disk. This complete computation procedure is simulated using Matlab technical computing language.

**Keywords** Recognition of the features · Graphic retinal fundus · Morphological closure · Optical disk and cup · Segmentation

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# Speckle Based Anisotropic Diffusion Filter for Ultrasound Images



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P. Siva Kalyani, S. Nazeer Hussain, N. Vishnu Teja, S. Younus Hussain, and B. Amarnatha Reddy

**Abstract** Imaging of Ultrasound (US) presents significant challenges in visual medical inspection and creation of automated speckle-based analytical approaches that adversely influence tissue boundary detection and the efficacy of automatic segmentation techniques. A number of filtering strategies are usually used as a pre-processing phase before automatic review or visual inspection methods to minimize the impact of speckle. Many state of the art filters seek to decrease the speckle effect without recognizing its significance to tissue structure classification. This loss of expertise is further magnified due to the iterative process of some speckle filters, e.g. diffusion filters, which tend to produce over filtering during the diffusion period due to a progressive shortage of critical details for diagnostic reason. In this one we suggest a filter of an anisotropic diffusion that contains probabilistic-driven memory of probabilistic-driven scheme which can solve problem of over filtering by pursuing philosophy of a selective tissue. In general, we can design formula for the function of memory as a diffusion differential equation for the tensor of diffusion whose behavior depends on statistics of the tissue, by speeding up the cycle of diffusion in unnecessary regions and by utilizing the effect of memory in places where valuable knowledge must have to be stored in reliable manner. Tests of two photos which are real ultrasound and synthetic photos confirm the usage of the mechanism of probabilistic memory to maintain scientifically appropriate frameworks that the state-of-the-art filters are removing.

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421 - 929

# Investigation of Level Set Segmentation Procedures in Brain MR Images



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S. Fayaz Begum and B. Prasanthi

**Abstract** The task in this research is to evaluate the efficiency of the six level-set algorithms in 2D brain segmentation on a given MRI image. For both algorithms and the comparison contour used for the computation of the dice criteria, the initialization used is the same MATLAB tool-backed application is used to measure the efficiency, particularly in biomedical image processing, of different level-based segmentation algorithms. This work includes a comparative study of clustering algorithms according to their performance. Although some findings indicate that MRI images segmentation of the brain tumor is time-consuming, it is an essential work.

**Keywords** MR images · Image enhancement · Brain tumor · Level set · Image processing

## 1 Introduction

An abnormal development of the brain cell is caused by the brain tumour. Brain tumor usually grows from brain cells, blood vessels or brain nerves. Early brain tumor diagnosis is required because the mortality levels in people with brain tumours are higher [1]. According to 2007's figures, in India there are completely 80,271 tumors [4]. Since several decades, vision detection methods have been in use for brain tumor sensing [8]. We aim to utilize the technology developed through this project as a Computer Automated based GUI to provide ease of access to medical professionals, researchers and health care providers. A simple prerequisite of internet knowledge is enough to use this product. Picture segmentation is the separation into several parts of a visual image (sets of pixels, or superpixels) [2].

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# Enhancement of Cerebral and Retinal Vascular Structures Using Hessian Based Filters



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Fahimuddin Shaik, J. Chittemma, S. Mohammed Islam, B. Lakshminath Reddy, and S. Damodhar Reddy

**Abstract** A large vascular disorders such as stenosis, aneurysm and malformations, which involve different anatomical locations, are detected and handled through a set of techniques for imaging them. The need to diagnose and manage vascular disorders early has now contributed to the creation of numerous techniques in vascular imaging. Image manipulation plays an significant part of medicine's study of photographs from different methods for the treatment of eyes. The goal of the novel method for enhancing visualization by using hessian-based filters is to highlight the secret vessels, to improve angiographies as well as the possible pathological locations. The pictures found come from the computed tomography and retinal data. The goal of the novel method for enhancing visualization by using hessian-based filters is to highlight the secret vessels, to improve angiographies as well as the possible pathological locations. The pictures found come from the computed tomography and retinal data. The novel upgrading feature suggested has many applications such as retinal vasculatures, neck, lung and fundus, but only retinal and cerebral vasculatures are taken into account.

**Index terms** Digital image processing

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# Throughput Comparison of Majority Logic Decoder/Detector with Other Decoders Used in Communication Systems



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(50)

J. Chinna Babu and N. Mallikharjuna Rao

**Abstract** The Low Density Parity Check (LDPC) codes are linear block codes, which are Shannon Limit codes. These codes are attained least error floors of data bits for data transfer applications used in communication systems. However, the proposed LDPC codes are more beneficial than Turbo codes because of reduction in the decoding complexity and detection of the errors in less cycle time. This results the reduction of decoding time, low decoding latency and as well as least error floors in communication, when the transmitted data contains multiple error bits. This paper is proposed to represent the majority logic decoding/detecting of LDPC codes. This paper proposes the Generation of Generator and Parity Check matrices for both Binary and Non-Binary LDPC Codes. Here, the proposed Majority Logic Decoder/Detector (MLDD) is Hard decision decrypting scheme and it uses majority logic decoding based on the data transmission and reception in communication channel. This paper also elaborates the effective implementation of encoding and decoding of LDPC Codes.

**Keywords** LDPC codes · Turbo codes · Coding theory · Communication · Signal processing

## 1 Introduction

### 1.1 Low Density Parity Check (LDPC) Codes

Low density parity check (LDPC) codes are superior type of error detecting and correcting codes, which are famous for their less complexity of the decoding Process and speed of operation. Many techniques have been designed for the

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475 - 49 )

# A Review on OTA with Low Power and Low Noise Techniques for Medical Applications



J. Chinna Babu and A Thirilokanatha Reddy

**Abstract** Wearable Electrocardiography (ECG) sensors are most commonly used in monitoring a patient heart condition to detect cardiovascular diseases like heart failure and cardiac arrhythmia and many more. The amplifier that records noise, power and linearity performance in an ECG sensor is the crucial part. In the existing systems, different approaches are proposed for optimization in power and noise. However, the OTA is implemented by using various techniques that can mainly either reduce the power consumption or have lower Noise Efficiency Factors (NEF). In the proposed paper, different research works are observed and studied and hence results are compared between the works and discussed here.

**Keywords** Patient heart rate · Monitoring · Amplifier · Noise efficiency · Optimization

## 1 Introduction

Analog IC design will always exist because we are living in time where Analog Design plays a prominent role. To interface Analog designs and Digital designs, Analog-to-Digital converters (ADCs) and Digital-to-Analog converters (DACs) are required. CMOS analog design is considered to be an art which mainly depends on knowledge and perception. Meanwhile, more precise device models are too perplexing, and are non-responsive to hand evaluation [1]. In addition to that, there is no such selective systematic procedure that an engineer can be followed for designing an analog block, which can even be a fundamental block such as Operational Transconductance Amplifier (OTA) which shows that a designer should rely on simulation tools, more practice, and perception for any design to

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# Image Segmentation with Complex Artifacts and Correction of Bias



Fahimuddin Shaik, P. Pavithra, K. Swarupa Rani, and P. Sanjeevulu

**Abstract** ChanVese (CV) model ultimately solves many image segmentation issues based on area. Nevertheless, this procedure does not succeed when the given images of any particular application are skewed by means of the objects (outliers) and lighting bias which compensate the real contrast values. Within a single operational energy, the following two points are implemented in this research work, firstly a complex artifact class that prohibits strength outliers of skewing the image segmentation, and then within Retinex type of procedure, which disintegrate the concerned image into a piece-constant structural element and a smooth biased part. The parameters of CV-segmentation then function only on the design, and only in regions that are not recognized as objects. The process of Segmentation is considered as parametric process using a phase-field, effectively reducing threshold dynamics. The proposed method on a compilation of representative images from various modalities representing artifacts and/or bias are mentioned in this work. This method is considered useful where image distortion prevents conventional CV segmentation of activity and where artifacts and bias are of particular concern in the application area of medical imaging, for instance the magnetic resonance imaging (MRI) modality, where identification of lesions and correction of bias area is most preferred.

**Keywords** Image processing · Segmentation · Contour · Artifacts

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# Morphological Watershed Approach for the Analysis of Diabetic Nephropathy



P. Siva Kalyani and G. Sasikala

**Abstract** The main cause of progressive kidney failure and a significant cause of coronary mortality is diabetic nephropathy. The application of Watershed segmentation and Gradient magnitude has produced encouraging results among the image processing methods for detecting anomalies. The suggested algorithms using optimization as pre-processing and as post-processing approaches for segmentation. Clahe histogram equalization is an improvement of the previous approach that operates on specific parts of the image named tiles rather than the entire image, and even another tool named dilation-based morphological reconstruction is used for pre-processing. Otsu Thresholding is used as a post-processing tool and is used to do automate image Thresholding. The Median filter is also used to eliminate noise from the signal and often retains the image edges when eliminating noise. The Segmentation of the Morphological Wetlands will accurately distinguish items on the foreground and context. The picture collection for this phase is from CT photographs of patients with diabetic nephropathy, as well as from Diabetic research institutes.

**Keywords** Diabetic nephropathy · Image processing · Median filter · Gradient magnitude · Morphological watershed algorithm

## 1 Introduction

Diabetic nephropathy in diabetic patients is referred as leading end-stage renal disease. Proteinuria (excretion of excess protein in the urine) is gradually increased. There is an urgent need to develop a non-invasive image processing algorithm to

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# Robust Algorithm for Segmentation of Left Ventricle in Cardiac MRI



M. Venkata Dasu, P. Tabassum Khan, M. Venkata Swathi,  
and P. Venkata Krishna Reddy

**Abstract** The left ventricle is one of four heart chambers. It is situated underneath the left atrium in the bottom left portion of a heart, divided by the mitral valve. The left ventricle was the thickest chamber in the heart and is essential for pumping oxygenated blood through tissues in the entire body. Left ventricular failure occurs where left ventricle dysfunction induces inadequate blood circulation to vital body organs causes breathing problems, which seems to be a threat to people. The non-invasive medical imaging techniques would be more effective in early diagnosis for left ventricle dysfunction. In this real connection different medical imaging techniques, such as image enhancement and image segmentation, were developed based only on the basics of image processing techniques. The objective of this study is to develop a novel and robust algorithm that can enhance the efficiency of automatic LV segmentation on short-axis cardiac resonance imaging (MRI). This project shall be carried out on the basis of different thresholding methods and related qualitative analysis, in order to determine the best algorithm. It can also be implemented with the Matlab R2015b method or above. The outcome of this work is aimed for early detection and also to carry out effective care and measures.

**Keywords** Image enhancement · Image segmentation · Left ventricular segmentation · Magnetic resonance images

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# An Optimized Clustered Based Video Synopsis by Using Artificial Intelligence



G. Thirumalaiah, S. Immanuel Alex Pandian, D. Teja Sri,  
M. Karthik Chowdary, and A. Kumarteja

**Abstract** The proposed paper is about a static video rundown strategy based on the development of Artificial Bee Colony, which refers to the outline of a video by the most indispensable edges present in that particular video. First the video outlines pixel bunches or regions of interest that capture the most important varieties of substances are differentiated. A tale set of highlights estimated as far as the normal tone estimations of every one of these areas is then used to describe the edges. In view of these highlights, the grouping of casings the Artificial Bee Colony Advancement Measurement divides the video into parts. The serving lengths are increased to the point that all the edges of a specific fragment have comparative highlights, while, the center edges of various sections are essentially not the same as one another. These center edges are viewed as the key-edges of the concerned video. Any excess present in the main outlines chosen is dispelled by looking at their histograms of shades. The proposed work is accepted on this freely accessible SumMe dataset and also, on other hazardously selected web video recordings.

**Keywords** Video summarization · Panorama video synopsis · Clustered based video synopsis

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# Unsupervised Segmentation of Image Using Novel Curve Evolution Method



Fahimuddin Shaik, B. Vishwaja Reddy, G. Venkata Pavankumar,  
and C. Viswanath

**Abstract** Here, a novel algorithm for unsupervised field-depth (DOF) image segmentation is defined. To detect the object of interest (OOI) in the saliency space, a multi-scale re-blurring technique is used first. Firstly blurring is carried out to remove artifacts, later reblurring procedure. Thereafter, an active contour model based upon hybrid energy system is suggested to evaluate the OOI boundary. A global energy element relevant to the saliency map is implemented in this model to find the globally minimum, and a local energy term about the low DOF picture is used to increase the precision of segmentation. Additionally, this model is equipped with an elastic parameter to offset the weight of global and local resources. In addition, an unsupervised approach for initializing curves is intended to reduce the amount of iterations for evolution. More the iterations, the complexity and computation time to obtain the results may hike up leading to slow up the process of acquiring precise contours. Lastly, we perform experiments on different low DOF pictures, and the resultant demonstrates the high precision and robustness of the proposed method.

**Keywords** Depth of field · Object of interest · Segmentation · Reconstruction · Enhancement

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## AN INTELLIGENT SMART BLACK BOX SYSTEM FOR CRASH RECOVERY

J. Chinna Babu, N. Nikhil Chandra Reddy, M. Malleswari, M. Manoj,  
G. Naga Jyothi, B. Maneesha

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**Abstract:** *The person who is sitting inside the vehicle faces so many problems due to this accident in an important state of conditions that several vehicles get accident they lost their lives to this heap of person. The project will avoid such type of problems by using different sensor networks. The sensor will work as a providing security to the owner who is inside the vehicle. With these sensor networks some wireless communication technologies are used to alert the person whenever the accident occurs. The person who is the owner of the vehicle he is connecting some mobile communication application to his vehicle with one positioning system for find out the particular location of accident occurrence. The sensor network provides not only provides security to the driver but also used for checking vehicle condition in different situations of the person inside the vehicle. The project is designed to record information such as video recording and live streaming etc. in order to revolutionize the investigation of motor vehicle accidents it can also use to be GPS and GSM technology map vehicles and other vehicles. The raspberry pi 3 module is used to develop this project.*

**Keywords:** *video recording, live streaming, raspberry pi3 module, vibratory sensor, USB cams.*

### 1. Introduction:

In today's life it is very hard to detect the person who has stolen or get accident with vehicle. Because there is no smart system to detect the position of the vehicle, so police face many problems in theft detection. Calling police then observing situation and after detection also sometimes there is no result so that there is need of advance system for which get complete information by our project. The designed system is used for the police investigation with the proper information by the live streaming and the data storing in the external stored device.

### 2. Objective and Scope of the Project:

The objective of the project is live streaming and data storing. When vehicle is tracking then intimate the condition of the victim who met with accident. If an accident occurs quick message to emergency care centers and relatives will be sent. For safety, system will record the data when the vibratory sensor activated that is when the vehicle met with an accident within 1-minute vibratory sensor is activated.

### 3. Implementation of Proposed Idea:

#### 3.1 Raspberry Pi 3 Module:

The raspberry pi 3 module B is the raspberry pi of the third generation. For many applications, this powerful single board credit card computer can be used and replaced original raspberry pi 2 module B and raspberry module B

While maintaining the popular board format raspberry pi 3 module B gives you a more powerful processor, 10 times faster than raspberry pi's first generation. It also adds wireless LAN and Bluetooth connectivity, which makes it the ideal solution for powerful connected waves.

# A Novel Low Power, Minimal Dead Zone Digital PFD for Biomedical Applications

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**Abstract**—Chronic diseases and rising aging populations are the major reasons towards the usage of low power, low noise, life time performance Biomedical Implantable Devices. Efficient architectural designs will be responsible for the requirements set out above. This paper focuses on the ADPLL DPFDF architecture for implantable biomedical devices. For high performance DPFDF, the dead zone, lock in time is a seldom limitation to ADPLLs. In the present paper, a new approach to design a dead zone free with fast and high locking time and low phase noise DPFDF is considered to be a challenge. This can be accomplished by carefully controlling the reference and feedback clock frequencies of the phase detector with the proposed NIKSTRO/SURAV latch based sense amplifier. The proposed architecture was developed and simulated using 45nm technology and it is observed that it provides a 20ns dead zone with 4.8mW of power consumption at the rate of 1.8GHz, while the lock in time for the proposed method is 340ns with moderate phase noise. It is also noted that the designed one showed better results when compared to the existing ones.

**Keywords**—Biomedical Implantable Device (BIMD); Digital Phase Frequency Detector (DPFDF); Digital Controlled Oscillator (DCO); Sense Amplifier Based Flip-flop (SAFF); NIKSTRO or SURAV

## 1. INTRODUCTION

Archaeological research reveals that the Greek civilization used instruments to study the human body in order to understand human anatomy and to treat healthy and pathological conditions. This idea has placed roots for the growth of a biomedical tree. In addition to this, the technical advancements throughout medical sciences have always played an important role by making remarkable advances in health care resulting in emerging a field called biomedical engineering. The new science and technology of biomedical engineering have contributed to the manufacture of cutting-edge biomedical implantable over the last five decades, helping to improve clinician's know-how to improve the human anatomy [1]. A more precise diagnosis, which can be achieved by highly technical biomedical devices / BIMD's, is necessary for medical professionals to prescribe an effective cure. These BIMDs range from sensors, GES and cardiac pacemakers, ICD, to DBS, nerve (PNS, SCS), and bone stimulators.

While a variety of biomedical implants exist for many applications, each IMD consists mainly of an electronic system and battery [2]. Because of the IMD area and size limits, a Chip Specific System (AS-SoC) system is currently covering main portions of the IMDs. The main functionality of these devices is to monitor and analyze body physiological signals, to deliver the drugs needed precisely if necessary, to resurrect the malfunctioning organ or body part, for transmission of the diagnostic data, to receive the external commands, to stimulate the body's organ while it is not functioning properly, thus transceiver is the most important component in BIMDs. Conventional devices have been used for short-range magnetic IMDs that are easily affected by EM wave interference resulting in transmission imprecision [3]. In order to provide the safety measures, whole ball of wax the medical applications should be carried out at Medical Implant Communication Services (MICS) ranging from 401 MHz to 406 MHz (intra range is 402 MHz to 405 MHz). The key building block in BIMDs is PLLs, but the conventional analog PLLs need a wider silicon area to accommodate LC oscillators, charge pump and RC LPFs and therefore not easily portable to other technology nodes. To overcome the analog PLL drawbacks, All Digital PLLs (ADPLLs) have been proposed. For detailed information on, How ADPLLs subsume the PLLs & Digital PLLs (DPLLs)? block diagram of PLL, categories of DPLLs, reader has suggested to read [3-8].

## II. ALL DIGITAL PHASE LOCKED LOOP

The advancements in CMOS technology scaled down the supply voltages  $\leq 1$  V, making the traditional analog PLL design for designers in current deep-submicron CMOS processes very challenging. Nevertheless, short channel CMOS process has preferred digital circuits and is therefore highly focused on digital circuits today. All these distinct factors lead to undergo a change in velocity of the growth of ADPLLs in which all the sub-blocks of the conventional analog PLL were replaced by their comparable/equivalent digital blocks. The general ADPLL block diagram is shown in Fig. 1 consisting of Digital Phase Frequency Detector (DPFDF), loop filter and Digital Controlled Oscillator (DCO).

## Application of Hybrid Genetic Algorithm in VLSI Physical Design Automation for Placement of Different Blocks

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### Abstract:

With the view of reducing chip area, Optimization of VLSI Physical Design, region minimization and situation of squares is a significant target in actual plan mechanization of exceptionally huge scope mix chips. The target of limiting the region and arrangement of squares would downsize the size of coordinated chips. An Optimal Solution must be found for actual plan segments like apportioning, floor arranging, arrangement, and directing. This work assists with playing out the streamlining of the benchmark circuits with the above said segments of actual plan utilizing progressive methodology of developmental calculations.

### 1. INTRODUCTION:

In contrast to the previous transformative calculations, which zeroed in on change and could be considered as clear improvements of slope climbing techniques, Holland's GA had an additional fixing—the possibility of recombination. It is intriguing in such manner to think about a portion of the thoughts being advanced during the 1960s in the field of operational examination (OR). On the other hand labourers had at that point started to foster procedures that appeared to be ready to give 'great' arrangements, regardless of whether the quality was not provably ideal (or even near optimal). Such techniques got known as heuristics. A famous procedure, which stays at the core of a large number of the met heuristics portrayed in this handbook, was that of neighbourhood search, which has been utilized to assault an immense scope of combinatorial enhancement issues Quite possibly the most compelling papers in this setting was that distributed by Lin [8], who discovered fantastic answers for the mobile sales rep issue by researching neighbourhoods framed by breaking any 3 connections of a visit and re-interfacing them





# Scheduling and resources allocation in network traffic using multiobjective, multiuser joint traffic engineering

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## Abstract

Reciprocal optimality is a desirable characteristic from the end user perspective, for both Best Effort and Quality of Service (QoS) datagrams delivery within a network. A cohesive solution to such issues is the expected outcome of this work. It is also aimed to formulate and evaluate enhanced scheduling algorithm for packets delivery, focusing on maximal user satisfaction and minimal networking operation costs. Mathematical optimization techniques have been applied to Application, Transport and Network layers of Open System Interconnection model. Novel elucidation of optimal packets switching, traffic engineering, congestion avoidance and QoS improvements are discussed. A simplified routing mechanism is devised, along with the formulation and analysis of nonlinear constrained Multiobjective, multiuser joint traffic engineering case. This approach would be useful for networking and digital communication domains.

**Keywords** Reciprocal optimality · Congestion avoidance · Quality of service (QoS) · Optimal packets switching

## 1 Introduction

A typical information quantity (sequence of bits), is usually referred to as packet or datagram. The packets undergo delays while travelling from source to destination due to throughput perturbations (propagation delay), networking devices processing (queueing delay), and wave propagation through network links. Such networks can be easily modeled as a graph. From the end user perspective, the traffic

stream must satisfy certain application timing requirements. However, for the network operator there is certain cost of effort to provide a particular throughput (bit rate) to each user on a link, keeping in view the overall capacity of the link. Bandwidth is regarded as the maximum possible bits transfer rate for a particular single path (link), measured as bits/s. However, throughput is the actual bit transfer rate on a particular link, also measured as bits/s. Scheduling can be regarded as the allocation of a particular link to a particular user. Latency/delay is measured in seconds, and packets length is measured in bits. Congestion in a computer network occurs when there is a mismatch between particular links transmission rates. Packet delays and losses are major indicators of congestion, and congestion management is an end to end problem.

The correct allocation of shared resources of network would aid in protecting the network from traffic congestion, which is a common problem of Transport Layer. Congestion control is tightly interrelated with resource allocation and scheduling, that occurs at several layers of OSI model [1]. Congestion control shares a few mechanisms with the flow control, however the former relates to rate balancing on link to link basis, whereas the later relates

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# An Efficient Web Scraping Method Using Web Pages Contained Additional Data

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## ABSTRACT

*Web scraping is a cycle of separating significant and fascinating content data from web pages. The vast majority of the current examinations focusing on this errand are for the most part about mechanized web information extraction. In the extraction measure, these investigations initially make a DOM tree and afterward access the fundamental information through this tree. The development interaction of this tree expands the time cost contingent upon the information design of the DOM Tree. In the current web scratching writing, it is seen that time proficiency is overlooked. This examination proposes a novel methodology, specifically UzunExt, which concentrates content rapidly utilizing the string strategies and extra data without making a DOM Tree. The string techniques comprise of the accompanying sequential steps: looking for a given example, at that point figuring the quantity of shutting HTML components for this example, lastly removing content for the example. In the creeping cycle, our methodology gathers the extra data, including the beginning situation for improving the looking through measure, the quantity of internal tag for improving the extraction cycle, and label reiteration for ending the extraction interaction. The string strategies for this novel methodology are around multiple times quicker than extricating with the DOM-based strategy. Also, utilizing these extra data improves extraction time by 2.35 occasions contrasted with utilizing as it were the string strategies. Moreover, this methodology can undoubtedly be adjusted to other DOM-based examinations/parsers in this assignment to upgrade their time efficiencies.*

**INDEX TERMS:** Archive object model, calculation plan and investigation, Computational proficiency, web creeping and scratching

## 1. INTRODUCTION

A site page contains superfluous substance like menus, promotions, flags, footers, sitemaps and essential substance like title, outline, primary content, cost, and description as far as data that clients need. With the expansion of superfluous substance on the pages, it has become fundamental to dispose of superfluous substance and to extricate necessary content that can be utilized by the content preparing applications, for example, web indexes, question-noting frameworks, proposal frameworks, pattern discovery/checking, sentiment investigation, and online business market observing. Numerous examines [1] in this undertaking around deciding the extraction of the information/design consequently. In any case, the time effectiveness of this cycle isn't contemplated in these studies. Along these lines, this investigation manages the speed increase of the extraction measure as opposed to choosing the extraction design. What's more, this investigation presents a novel methodology, in particular UzunExt, which



## An Opinion Analysis for Dragging of Item Reviews from Various Web Pages using ML Algorithms

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### ABSTRACT

Estimation investigation is the computational errand of consequently figuring out what sentiments an author is communicated in text. Notion investigation is acquiring a lot of consideration as of late. It is frequently outlined as a paired differentiation, for example positive vs negative, however it can likewise be an all the more fin-grained, such as distinguishing the particular feeling a creator is communicating like dread, satisfaction or outrage. Universally, business ventures can use assessment extremity and assumption, subject recognition to acquire further comprehension of the drivers and the general degree. Subsequently, these bits of knowledge can progress cut through sight and improve client assistance in this way making a superior brand picture and giving a competitive edge. To extricate the substance from web based business site utilizing web scratching method. It will circle through then number of pages or so of remarks for every one of the items. In this work, online item audits are gathered utilizing web scratching method. The gathered online item audits are broke down utilizing assessment or notion investigation utilizing order models like KNN(K Nearest Neighbors), Support Vector Machine(SVM), Random Forest, CNN (Convolutional Neural Network) furthermore, proposed mixture SVM-CNN. Investigations for the grouping models are performed with promising results.

Keywords : Catch phrases: Web scratching, Sentiment examination, KNN, Random Forest, SVM, CNN

### 1. INTRODUCTION

Assessment is a mentality, thought or judgment provoked by feeling. Assessment examination which is otherwise called assessment mining alludes to the utilization of Natural Language Processing (NLP), text examination and computational etymology to distinguish and separate emotional data from the source materials. It means to decide them equality of an author with regard to a particular point or the in general context oriented extremity of a report [9]. The web is a creative spot concerning assessment data. From a client's point of view, individuals can post their own substance through different online media, like discussions, miniature web journals, or online informal communication locales. From a specialist's point of view, numerous web-based media locales discharge their application programming interfaces (APIs), provoking information assortment and examination by analysts and engineers [3]. Consequently, assumption examination appears to have a solid fundament with the help of massive online information. In any case, those sorts of online information have a few defects that possibly ruin the cycle of supposition examination. The principal blemish is that since individuals can uninhibitedly post their substance, the nature of their feelings can't been sure. For instance, rather than imparting subject related insights, online



## Different Machine Learning Approaches for Predicting Students' Performance

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### ABSTRACT

*In today's world, due to the advancement of technology, predicting the students' performance is among the foremost helpful and essential analysis topics. Data processing is extraordinarily useful within the field of education, particularly for analyzing students' performance. It's an undeniable fact that predicting the students' performance has become a severe challenge as a result of the unbalanced datasets during this field, and there's not any comparison among totally different resampling ways. This paper tries to check numerous resampling techniques like Borderline SMOTE, Random Over Sampler, SMOTE, SMOTE-ENN, SVM-SMOTE, and SMOTE-Tomek to handle the unbalanced information drawback whereas predicting students' performance mistreatment two totally different datasets. Moreover, the distinction between multiclass and binary classification, and structures of the options are examined. To be able to check the performance of the resampling ways higher in solving the unbalanced drawback, this paper uses numerous machine learning classifiers together with Random Forest, K-Nearest-Neighbor, Artificial Neural Network, XG-boost, Support Vector Machine (Radial Basis Function), call Tree, provision Regression, and Naïve Thomas Bayes. Moreover, the Random hold-out and Shuffle 5-fold cross-validation ways are used as model validation techniques. The achieved results mistreatment different analysis metrics indicate that fewer numbers of categories and nominal options can lead models to better performance. Also, classifiers don't perform well with unbalanced information, thus resolution this drawback is necessary. The performance of classifiers is improved mistreatment balanced datasets. in addition, the results of the pregnancy test, that could be an applied mathematics significance check, ensure that the SVM-SMOTE is a lot of economical than the opposite resampling ways. Moreover, The Random Forest classifier has achieved the simplest result among all alternative models whereas mistreatment SVM-SMOTE as a resampling technique.*

*Index Terms: Classification, data mining, educational data mining, imbalanced data problem, machine learning, resampling methods, statistical analysis.*

## Monitoring Fake Product Reviews Using Opinion Mining

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### ABSTRACT

Product reviews are crucial in determining whether or not to sell particular items on e-commerce sites or apps such as Flipkart, eBay, Amazon, Meeshow, Snapdeal, and others. We provide context in this document for using smart analytics to detect fraudulent or counterfeit reviews. Sentiment analysis is another term for it. We strive to gather client input via text while assessing sentiment. We first conduct a review and use a decision tree to check if the review is product-specific. Practicing a trash dictionary. to detect spam in comments. In text mining, we use many different algorithms and get specific results based on these algorithms.

**Keywords:** Spam review detection, Opinion mining, Decision tree, Text mining.

### 1. INTRODUCTION

Today's world commercial marketplace, in-kind testimonials play an important role in online shopping for end users. Most people check before buying any product online. These ratings can be positive or negative for the product. Customer service as negative feedback. In-kind valuation can undermine any business and also lead to financial losses or profits. Customers have posted numerous reviews to express their opinion on the product they purchased. Real Reviews There are a number of fake reviews that can interfere with vertical product purchases. Usually for financial reasons. reviews will appear on e-commerce sites and apps like Amazon, eBay, and Flipkart. While real consumers post many reviews in kind to Fake reviews have surfaced on e-commerce platforms for financial motives to voice their ideas and share their purchasing experience with others. For example, if a client writes a negative comment on an Apple review site about a phone like the iPhone 8 because of bad service.

These tests showed that the iPhone 8 had a negative impact on potential customers and a devastating impact on their business, so the owner of the company, Apple, could collude with several people to write fake reviews and avoid business damage caused by real reviews. Because of these false reviews, shoppers get caught and buy substandard products, and false reviews can ruin good service or quality products. People who deliberately flag these malicious comments to defraud Spammers are commonly referred to as consumers or sentiment analysis systems, and spam comments are commonly referred to as misleading comments. Recognize the difficulty of detecting spam, let's first give a simple example of comments on oyo.com (Indian version). Written by someone trying to promote this hotel is hard to tell. if this review is incorrect: "If you are comfortable with small rooms (usually in India), would you live in this place 10 minutes walk from the station? Cleanliness is a priority for the hotel ... great Oyo style party and tea / coffee, great deal and very affordable prices, you cannot complain.

"Other people's thoughts and ideas" have always been an obligatory source of statistics when making today's decisions. Long before the Internet came along and even became as ubiquitous as it is today, people still asked each other about products and product reviews or consulting surveys to come to a conclusion.

The time has changed. Due to the growing popularity of the World Wide Web, people have started to buy goods on the Internet. As more and more people feel comfortable and relaxed on the Internet, more and more people are posting their reviews, ratings and comments on the Internet. This review is also very helpful for other users who use the online platform to buy products.

## **Efficient Detection of Location Based Routing Attack by Routing Attack Mitigation in Mobile Agent Systems**

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### **Abstract**

New advancements are required to confront new situations because of the quick spread of the Internet. Recent years, PC frameworks have effectively developed from unified solid computing devices supporting static applications, into client-server situations that permit complex types of distributed systems for computing. The present work has been focused on finding out the network attacks happened in mobile agent systems. The proposed work is to detect the location based routing attack by Routing Attack Mitigation Algorithm which is one of the variant of classification based data mining concept. The parameters such as throughput, packet delivery, packet loss and end-to-end delay has been analyzed for evaluation using network simulator. The outcome of all the performance evaluation parameters has been depicted to improve the efficiency of the network.

**Keywords:** Location based routing, mitigation attacks, network performance, mobile agent system, intrusion detection, data mining

### **1. Introduction**

The Mobile Agent Systems (MAS) depends on the presumption that works in an open world. The organized condition where an agent is working is open and without limits; it is dynamic in nature from the point of view of system topologies, specialized agent capacities and operator areas; and the arranged condition is questionable, that is, a similar operator that gave a response to a prior solicitation may not be accessible when called upon more than once.

In the MAS there is likewise a support that regularly there will be some level of administration or useful replication so that one agent could come up short, one or numerous different specialized agents and specialized agent organizations can be found to substitute for the inefficient agent. MAS framework must be space autonomous and a reusable substratum on which MAS frameworks, administrations, and parts live, convey, communicate and interoperate; the foundation should bolster specialized agents and encourage their social collaborations with one another, as opposed to force itself.



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## An IoT Based Smart Wearable Device for Women Safety

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### Abstract

Women are subjected to an increasing amount of harassment these days, which is troubling. The situation is extremely serious in both developing and developing countries. As a result, it poses a serious threat to women's empowerment as well as a country's fiscal development. We are developing IoT software and an Android app to make women's movement safer in this project. By pressing the device's emergency button, women will receive immediate and comprehensive safety assistance. In the event of an incident, this system will monitor the user's location in real time and send it to a local police station and volunteer. This device will also provide the user with the location of the nearest safe zone. Furthermore, this interface can be used both online and offline. If the user does not have access to the internet, the computer can also be used to contact the nearest police station and volunteer assistance. Arduino uno, GPS, GSM, Bluetooth, and other components make up the system. The combination of both of these factors makes this product both inexpensive and simple to use.

**Keywords:** Women empowerment, IOT Software, Arduino UNO, GPS, GSM, Women safety.

### 1. Introduction

Acts of abuse and assault against women have increased in recent years. As the number of female workers in industries and other sectors of the commercial market grow, it is becoming increasingly necessary for females to work late and travel to distant and remote locations. However, in recent years, the exponential rise in attack and abuse against women has posed a threat to women's growth and development. It is necessary to establish a security solution that gives women a sense of security. Women are often stated to be immobilized in the aftermath of an assault. As a result, there is a need for a simpler safety solution that can be triggered as easily as pressing a button and can send warnings to the victim's immediate surroundings. This project focuses on a security

infrastructure that is specifically designed to ensure the security and safety of women. The aim of this study is to develop a portable safety device for women that includes the Sends an emergency alert to family and friends. S. A. More's investigation [1] addresses the use of temperature and pulse rate sensors to automatically identify the possibility of an emergency and alert family and friends through a mobile app. [2] explores how to use image processing to identify any potential danger and offers a variety of options to defend her. The authors of [3] created a system that used a PIC16F876A microcontroller and a SIM808 module with GPS, GSM, and GPRS support to alert friends and family when the emergency button is pressed. A framework based on facial features is built in [4]. A report is filed if the facial

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1622531671\_65247.pdf | International Journal of Intelligent Systems Research | Parametric Analysis of Texture Classification Using Modified Weighted Probabilistic Neural Network

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### Parametric Analysis of Texture Classification Using Modified Weighted Probabilistic Neural Network (MWPNN)

Authors: A. K. Saha, P. K. Saha, S. K. Saha

Chapter First Online: 27 April 2022

Part of the book: Computer Science and Information Technology, 1001-1004 (2022)

#### Abstract

Texture classification is one of the sort-out methods in pattern recognition. In this research work, a novel proposal called Modified Weighted Probabilistic Neural Network (MWPNN), which can be used to classify the textures, is proposed. It outperforms the parson method by adding inherent capabilities with respect to the weighing characteristics. The weights are modified with help of the Sensitivity Analysis (SA) Method. This MWPNN includes the Self-Organizing Maps of the Neural Network (SOM) and including weighting factors extracted from a supervised labeling process. The proposed approach is tested on sample textures and the results obtained are compared to the Probabilistic Neural Network (PNN) and the Weighted Probabilistic Neural Network (WPNN) with bench mark machine learning algorithms such as Naive Bayes Classifier and Multi-Layer Perceptron. The efficiency of this method is compared to Mean Standard Deviation, Mean Square Error (MSE) and Peak Signal to Noise Ratio (PSNR). The entire simulation is carried out using MATLAB computing tool with the help of Image Processing and ANN toolboxes along with required matrix functions and blocks.

#### Keywords

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# Fully-connected Committee Machine (FCM) based Online Learning under Concept Drift

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## Abstract

The term “drift” refers to unanticipated changes in the transmission of data in the primary distribution over time. Conceptual drift research entails developing methods and strategies for detecting, interpreting, and adapting to drift. Machine learning approaches can produce poor learning outcomes in the conceptual drift environment if drift is not addressed. Furthermore, due to developments in the concept of drift, revealing a method not mentioned in the literature, the concept of drift learning methodologies has been significantly systematic in recent years. We used a layered neural network framework to experiment with different scenarios of online learning under concept drift using a fully-connected committee machine (FCM). We conduct experiments in various scenarios using a layered neural network framework for online learning under concept drift. In neural layered networks, sigmoidal and ReLU activation functions are considered for learning regression. When the layered framework is trained from the input dynamic data stream, the regression scheme changes consciously in all scenarios. A fully-connected committee machine (FCM) is trained to perform the tasks described in online learning with  $M$  hidden units on dynamically generated inputs. In this method, we run Monte Carlo simulations with the same number of units on both sides,  $K$  and  $M$ , to define the dynamic advancement of intersections between several hidden units and the calculation of generalization error. This is applied to over-learnability as a method of over-forgetting, integrating weight decay, and examining its effects in the presence of concept drift.

**Keywords:** Online Learning, Fully-connected Committee Machine (FCM), Concept Drift, Dynamic data streams.

## 1. Introduction

Contemporary hypothetic studies show that the generalization and representation power of neural networks will increase as the depth of neural networks increases [2, 22]. But, dynamic data stream analysis remains unexplored in neural network environments.

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the data to be communicated between the nodes. Computationally, it is a light-weight algorithm and better suitable for devices like sensor nodes because of their limited computing resources.

**Keywords:** Wireless sensor networks; DNA Computing; DNA Replication; DNA Cryptography & DNA Steganography.

- Machine Learning-Based HR Appraisal System (ML-APS)**  
by Madan Mohan Kumar, Vinit Kumar, Gurjan, Mohd. Dilshad Ansari  
**Abstract:** Appraisal systems hold critical importance in organizational human resource management. The way HR departments have developed over the period to the recent trends of AI-based human resource management systems and practices reflect on the emerging importance of effective HRM. In this present work, one of the key functionalities of the HRM process the Appraisal systems are focused upon. This work presents a comprehensive model of appraisal system that relies on the machine learning solution for predicting/evaluating the appraisal score. The developed model is trained with SVM classifier and is tested with 600+ records for evaluation. The precision and recall values indicated by the test results reflect that the model is potential and if more effectively pursued in terms of training and incorporating more in-depth analysis, the model can be a sustainable solution for human resource appraisal system.  
**Keywords:** Machine learning-based appraisal system; ML-APS; 360 degree performance system analysis.
- Binary and Multi-class Classification of Android Applications using Static Features**  
by Meghna Dhaloria, Ekta Gangosa  
**Abstract:** In recent years, the Android platform has ruled the market of smart mobile phones. As a result, there is a massive increase in Android applications such as banking, education and gaming etc. With the increase in the number of mobile applications and the dependency of users on these, Android has become the prime target of the attacker. Thus, the growth of sophisticated and complex Android malware is increasing that poses various threats such as stealing information, system damage etc. Thus, there is a need to find new ways to detect Android malware. For this purpose, machine learning algorithms have been used to build classifiers. To train such classifiers, there is a need of set of features that could describe the behavior of applications. Thus, we have created two datasets (binary and multiclass datasets) and made them publicly available on GitHub. In this paper, a framework has been proposed which is capable of performing binary and multi-classification of Android applications. Static features such as intents, permissions, API calls

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Image Encryption Algorithms Using Machine Learning and Deep Learning Techniques—A Survey

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Abstract

In this world, the present situation is coming from text to multimedia content transmission. In multimedia data, images play major role for transmission and it is very important to protect the image data while transmitting over network. This can be achieved by image encryption. There are so many different techniques should be used to protect confidential image data from unauthorized access. In this paper, a survey has done on existing works which is used different techniques for image encryption by using machine learning and deep learning algorithms and it helps to analyze different algorithms for different images and also for image data sets.

Keywords

Cryptography Image Encryption Machine Learning Deep Learning

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# An intelligent internet of things-based secure healthcare framework using blockchain technology with an optimal deep learning model

T. Veeramakali<sup>1</sup> · R. Siva<sup>2</sup> · B. Sivakumar<sup>3</sup> · P. C. Senthil Mahesh<sup>4</sup> · N. Krishnaraj<sup>5</sup>

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## Abstract

Today, the internet of things (IoT) is becoming more common and finds applications in several domains, especially in the healthcare sector. Due to the rising demands of IoT, a massive quantity of sensing data gets generated from diverse sensing devices. Artificial intelligence (AI) techniques are vital for providing a scalable and precise analysis of data in real time. But the design and development of a useful big data analysis technique face a few challenges, like centralized architecture, security, and privacy, resource constraints, and the lack of adequate training data. On the other hand, the rising blockchain technology offers a decentralized architecture. It enables secure sharing of data and resources to the different nodes of the IoT network and is promoted for removing centralized control and resolving the problems of AI. This study develops an optimal deep-learning-based secure blockchain (ODLSB) enabled intelligent IoT and healthcare diagnosis model. The proposed model involves three major processes: secure transaction, hash value encryption, and medical diagnosis. The ODLSB technique comprises the orthogonal particle swarm optimization (OPSO) algorithm for the secret sharing of medical images. In addition, the hash value encryption process takes place using neighborhood indexing sequence (NIS) algorithm. At last, the optimal deep neural network (ODNN) is applied as a classification model to diagnose the diseases. The utilization of OPSO algorithm for secret sharing and optimal parameter tuning process shows the novelty of the work. We carried out detailed experiments to validate the outcome of the proposed method, and several aspects of the results are considered. At the time of the diagnosis process, the OPSO-DNN model has yielded superior results, with the highest sensitivity (92.75%), specificity (91.42%), and accuracy (93.68%).

**Keywords** IoT · Healthcare · Blockchain · Deep learning · Hashing · Encryption

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## Personal finance transaction index scoring using machine learning model

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### ABSTRACT

Proposed personal finance score index is an algorithmic model developed based on the some of the functional aspects of personal financing models combined with system approach for predicting the accuracy of the system in more pragmatic conditions at the user level. While there are many apps that are integral to handling the personal finance data as per the given inputs, validation and program models designed for the application, very few systems enable the companies in handling the solutions in the form of predictive analytics-based guidance solutions, wherein the users are able to have track of inputs that are integral to their personal finance conditions.

The model enables the users with prediction inputs on the category of the transaction as suitable or ineffective or other classifications. SVM classifier based trained model reflects the potential factors integral to the model and how the solution is pragmatic for decision making. Test results of the model indicate that if the proposed system is integrated into personal finance applications that has scope for integration, it can help the user base in estimating the transaction worthiness.

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Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

## 1. Introduction

### 1.1. Outlook

Information and communication technologies have changed the dynamics of using the systems for information management and transaction processing. One of the key areas wherein the role of information systems, web and mobile applications have become integral to the user's lives are in the financial domain.

Today, there are many solutions that are being integral to handling personal finance solutions. The scope of personal finance could be detailed as a facet wherein the users shall be able to create some financial goals, have budgets planned, considering the income flows, expenses, savings requirements, and contingent factors into account. There are a plethora of online applications and even handy mobile application sorts that enable the users in setting financial goals and continue tracking their personal finance goals [1]. This is where budget management apps come in the picture and solve the issue. These apps use complex machine learning

algorithms and provide insights that help to plan and budget expenses accordingly. Apart from analyzing previous expenses, these apps are built to track daily payments and throw meaningful insights.

Due to the use of complex algorithms, these apps with ML analyze previous and current spending and can caution the user about overspending or underspending. It can also give inputs to the areas where they can save. Going forward, their apps can be able to suggest stores and restaurants that offer discounts over others which don't. To help customers, few of the banks have built applications in their apps with machine learning, that help customers to understand their spending patterns and control expenses which might not be needed. A global bank identified customers who had budget planning issues and using Machine learning models, enabled the customers with suggestions to help customers ways of improving personal finance. Instances of these help banks to build customer confidence and customers to plan their finances better [2].

The quantum of customer base reported by the personal finance apps reflects the fact about the rising number of users keen on relying on business intelligence solutions to guide them in their personal finance management conditions. While there are many

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# IoT Based Smart Farming Using Thingspeak and MATLAB



**N. Penchalaiah, Jaladanki Nelson Emmanuel, S. Suraj Kamal, and C. V. Lakshmi Narayana**

**Abstract** Climate changes have contributed to the growing importance of monitoring of the climate. A continuous monitoring of the environmental parameter is important to assess the value of the atmosphere. The IoT technology had taken revolution to any area of human life, making it digital and insightful. IoT is a collection of things that make up a network for self-configuration. Since the IoT is the most advanced technology, the collection of data from the sensor system plays a key role. This paper presents a Arduino UNO Wi-Fi module (ESP8266) which helps processing and transfers sensed information to the thing speak cloud, usually comprised of various sensors such as temperature, humidity and moisture, etc. Then, the obtained parameters are stored on the cloud server. A cloud computing system tracks environmental changes as a repository. Things talk will provide a function for a public channel, which is measured and calculated by the general public. A free access to measurement parameters is provided with an Android framework. This paper is aimed at proposing a new smart IoT based farming that supports farmers in obtaining live data (temperature, soil humidity) for successful environmental monitoring so that they can make smart farming and increase overall production and value of their products. The Novel Intelligent IoT Farming is embedded with Arduino Technology and the breadboard can be obtained from Thingspeak.com with different sensor modules and live data feeds. A supporting, open API platform for IoT's Thingspeak's internet services is a host for a range of

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# IoT Based Automatic Irrigation System Using Wireless Sensor Networks



**N. Penchalaiah, Jaladanki Nelson Emmanuel, S. Suraj Kamal, and Kadiyala Ramana**

**Abstract** In ancient times, farmers estimated the maturity of the soil and the reserves to generate revenue. A lower concentration of humidity, water level and certain climatic conditions is becoming increasingly difficult for a farmer. Wireless Sensor Network (WSN) contains different sensor nodes with the option of detection, computer and wireless communication. WSN technology is used to control and monitoring of the environment and soil parameter in the field. WSN used as part of farming for a few reasons, such as indicates high Interpretation, increase the production of harvest, low energy consumption and collection distributed data. Effective management of water plays an important role Agriculture. Shortage of water resources and high pumping costs make good water more critical management. Today is one automatic irrigation system (AIS) used to improving the use of water resources into increase production. This one part of the irrigation system allows development in different places with water deficit. In this way a productive planning of watering system gives the highest efficiency low amount of water.

**Keywords** Internet of Things (IoT) · Wireless Sensor Networks (WSN) · Automatic Irrigation System (AIS)

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## Image Texture Classification using Fuzzy Inclusion and Fuzzy Entropy Measures

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### ABSTRACT

Texture classification is one of the sort-out methods in pattern recognition. Selection of features plays a crucial role in enhancing Machine Learning efficiency as it significantly improves the performance of Texture classification by discarding insignificant features from the original set. Most of the Feature Selection techniques are statistical. They are not versatile to accommodate human thinking and thus the evolving demands and desires of real-life processes. We only make a choice between including and excluding a feature. In the very least, the fuzziness of human thought and perception is not known to enhance the collection of features and thus the precision of the classifier. Accuracy in database classification can be achieved through feature selection while at the same time can speed up the classification rate. The main objective of the work is to choose the most significant features in the feature set to perform given task. In this paper, Fuzzy Inclusion and Fuzzy Entropy measures are applied in feature extraction and the experimental results show that accuracy in classification is proved with other techniques. A comparison is formed between the prevailing methods and therefore the proposed method. The proposed method shows better results than existing methods with best classification rate.

**Key words:** Image Texture Classification, Feature Selection, Fuzzy Inclusion, Fuzzy Entropy, Accuracy

### 1. INTRODUCTION

Texture classification is the method by which specific textures are identified from the specified images. While the description of the textures themselves sometimes seems irrelevant in its own way, however, it is possible to implement a large number of real-life problems related to unique textures of various

materials [1]. The texture is characterized by a non-uniform spatial distribution of image intensities. There are mainly three different ways of pattern recognition on Texture Classification [9]. Statistical, Structural and Neural Network Pattern Recognition Texture based classification methods are used in a number of applications in the real world, such as content-based image recovery [2], face recognition [3], rock classification, and wood species recognition, classification of fabrics and geographic segmentation of the landscape. The aim of the texture classification is to classify the sample image in one of a number of known texture classes. There are two types of texture classification that are supervised and unsupervised. In the supervised classification, the classifier is equipped with the characteristics of the known classes. In the unsupervised classification process, the classifier identifies various classes on the basis of the similarities of the input characteristics, so there is no previous preparation of the classifier.

Classification methods texture can be divided into three pixel-related categories based on local and local characteristics [4]. Choosing a feature is the job of choosing the most suitable and typical features. The approach reduces several features by removing obsolete, irritating and least important features. Function collection is often made either globally or locally [5]. Global Feature Selection (GLF) methods measure the general importance of the feature regardless of its application to any individual class [6]. Local Feature Selection (LFS) methods are those that are determined separately on each eligible class and then the selection is based on distinct scores [6]. The selection strategies are often predictive and state the status of the feature as either essential or not essential. But in real situations, selections are not easy and take into account a variety of human uncertainties. This can happen due to a number of realities that could not be constrained by [0,1] selection [7]. This outcome indicates that owing to this subjective existence of statistical techniques, the





## An Improved Convolutional Neural Network with LSTM Approach for Texture Classification

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### ABSTRACT

Texture classification is a problem that has several applications, such as remote detection and recognition of forest species. Solutions tend to be customized for the dataset used, but are not generalized. Machine learning algorithms play an important role in the current Texture Classification. However, these algorithms are suffering with low accuracy and classification rate. Deep learning is another sophisticated technique to solve these challenges because texture classification performance is not strong in traditional machine learning systems. The Convolutional Neural Network (CNN) in combination with Long Short-Term Memory (LSTM) forms a robust selection between a powerful invariant feature extractor and an accurate classifier. This model should automatically determine the efficient properties of the feature samples so that the texture samples can be classified accurately. Expert fusion provides stability in classification rates between different data sets and the proposed model will significantly increases texture classification performance. From the experimental analysis, it is ascertained that CNN-LSTM is outperforms with existing state of the art of the algorithms SVM and CNN.

**Key words:** Texture classification, Machine Learning, Convolutional Neural Network (CNN), Long-Short Term Memory (LSTM), Support Vector Machines (SVM) and Performance Measures.

### 1. INTRODUCTION

Texture classification is the method by which specific textures are identified from the specified images. While the description of the textures themselves sometimes seems irrelevant in its own way, however, it is possible to implement a large number of real-life problems related to unique textures of various materials [1]. The texture is characterized by a non-uniform spatial distribution of image intensities. There are mainly three different ways of pattern recognition on Texture Classification [40,41] Statistical pattern recognition,

Structural pattern recognition and Neural pattern recognition Texture-based classification techniques are being used in a variety of real-world applications, such as content-based image recovery [2], face recognition [3], rock classification, and wood species recognition, classification of fabrics and geographic segmentation of the landscape. The purpose of texture classification is to classify a sample image into one of a set of known texture classes. There are two types of texture classification, supervised and unsupervised classification. In the supervised classification method, a classifier trained with the characteristics of the known classes. In the unsupervised classification method, the classifier recognizes different classes based on the similarity of the input characteristic, no previous training of the classifier occurs. Classification methods texture can be classified into three categories based on pixels, based on local characteristics and based on regions [4].

The first two methods of texture classification are the Co-Occurrence matrix [5] and the Markov Random Fields (MRF) [6], which has been widely used to distinguish textures to a relatively small region [7], Gabor and wavelet filters [8]. The extraction and classification of texture features within a unified framework that incorporated multi-channel filtering principles are presented in [9]. Neural network architecture is widely gained popularity in texture classification. The first network they have built is a three-layer control network (including the input layer), that is, a multi-layer sensor (MLP), with each input node fully linked to a specific  $M \times M$  scale area in the input image. The second network is close to that suggested by [10], and uses a weight distribution method to link secret neurons to the anterior layer. The previous network has an approximate cost of 5,000 pesos and has been equipped with an automated back-propagation algorithm.

A class of machine learning algorithms, called deep learning, has been used more and more in classification and pattern recognition in recent years. In a hierarchical architecture, deep learning applies multiple layers of information processing to generate a deep model [36]. A small range of academic studies have examined deep learning in the area of

## A Proactive-based Malware Detection Approach for Android Smartphone

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### Abstract

*Today, ubiquitous devices typically can be associated with two important sides in the context of offering online business. Although one side brings lot of potential in terms of reaching end-users, the other side mounts up huge number of threatens to them through malware. Particularly, Android mobile phones now symbolize an idyllic option for malware developers. This paper proposes a behavior based approach for detecting and preventing malicious activities of the processes inside an application to be installed in Android devices. In order to appraise our system, we have taken testing data that consists of both legitimate samples and malicious samples. The experimental analysis and practical results show that our system is more efficient in malware detection with high detection rate with minimal false positive.*

*Keywords: We would like to encourage you to list your keywords in this section*

### 1. Introduction

Today, mobile Smartphone turn out to be the fastest growing technology which becomes an essential communication tool for personal and business growth. Different mobile phones use different Operating System (OS). Android is the most popular OS and very efficient when compared to other OSes. According to Gartner's First Quarter of 2019 Report, the worldwide Android mobile phone sale to end-users has achieved 373 millions. Android OS is based on embedded Linux which is open source software available for free. Android platform provides easy way for programming interfaces. Malware writers not only targeting traditional computers, but also they can also ensure that their creations run in mobile phone as well. McAfee Mobile Threat report has found there is a gradual raise in Android OS malware in 2019 [1]. Thus, it becomes a major issue for preventing Android platforms from malware attacks.

Behavior monitoring and interception techniques are widely used in security tools for desktop computers. So far, some achievements related to the behavior monitoring and interceptions in Android platform have been proposed. All of them are based on monitoring and intercepting system calls in kernel level. However, monitoring malware activities at the kernel level is less encouraged. The most important reasons are listed as follows. First, it is not efficient as it permits user-mode privilege to access kernel-mode indirectly through system call interface provided by the OS. JAVA Application Programming Interface (API) to be invoked by the Android application will intercept system calls in kernel level that will affect all other running processes.



# Fuzzy C Means Method for Cross – Project Software Defect Prediction

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## Abstract

*Cross-project software defect prediction helps increase the chances of delivering a bug-free product from the software industry. The ultimate goal of predicting cross-project software defects is to reduce the cost and time of the project in the software testing phase to improve the quality of the software. Many defect data sets are publicly available online and are used as historical data. But the data sets are not the same; the environments, the projects are different and most of the projects have multiple visions. The objective of this research is to show the performance of both types of data sets using the machine learning approach. After that, a high-performance data set of all selected data sets will be identified based on their performance, which will help predict future data.*

*This paper presents a Fuzzy C Means algorithm that is proposed to predict and classify software defects in defective and non-defective modules. The Fuzzy C Means algorithm that efficiently classifies and predicts the accuracy of software defect detection. This algorithm also makes use of a selection of heuristic features through the fitness function. The empirical analysis showed that the proposed approach can be used effectively with a high accuracy rate. In addition, a measure of comparison accuracy is applied to compare the proposed prediction model with the current state of the algorithms. The collected results showed that the delineated algorithm achieved better performance with respect to Accuracy measurements.*

**Keywords:** *Cross-project software defect prediction, Fuzzy C Means, Accuracy, Classification, F1-Measure*

## 1. Introduction

The use of software is increasing continuously; As a result, prediction of cross-project software defect prediction has become an important research topic in software engineering. The defect is a bug or error in the software source code, it may cause software failures. Finding and correcting defects is expensive for the development and maintenance of both fields. Nowadays, the software grows enormously and questions and attention also arise in size and complexity [1]. Before delivering it to customers, it is very important to predict and correct defects because ensuring software quality takes a long time. Here the prediction of defects is important to fight for large and complex

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# An Ensemble based approach for Node Failure Detection in Mobile Wireless Networks

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## Abstract

The mobile ad-hoc network (MANET) is a constant automatic configuration; Communications are less mobile strategy networks are wirelessly associated. All devices are in a complementary MANET to change only in any direction and, therefore, the determination to modify their associates to previous devices is frequent. It is very difficult to identify node failures in mobile wireless networks because the network topology can be very dynamic, the network is not always linked and resources are limited.

In this paper, mobile wireless networks are designed to systematically incorporate an Ensemble-based method and a node malfunction prediction scheme with decentralized tracking, position estimation and node coordination. Extensive simulation results in connected and disconnected networks show that our schemes achieve high failure detection rates and incur a low communication overhead. In the first approach, we use the input from the Ensemble, the node cannot respond to the start of an alternative node and it uses the individual data of the option. However, our solution has the advantage that it extends to both connected and disconnected networks, while centralized control refers only to connected networks. Our approach has up to 80% overhead communication and only slightly lower detection rates compared to approaches that use centralized monitoring.

**Keywords:** Mobile Wireless Networks, Ensemble Feedback, Node failure

## 1. Introduction

Mobile ad hoc networks (MANET) are built ad hoc on mobile devices in order to do so. The devices involved in such networks have the ability to communicate wirelessly with transmitters of limited range, so they can talk directly with other devices within their range. Some of the machines often volunteer to forward some of the communications they receive, or in other words, they serve as routers, creating a network as a result. However, there is no established system, the network is constantly changing and routers are chosen on demand. The figure 1 shows the basic architecture of a wireless mobile network.

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# Fully-connected Committee Machine (FCM) based Online Learning under Concept Drift

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## Abstract

The term "drift" refers to unanticipated changes in the transmission of data in the primary distribution over time. Conceptual drift research entails developing methods and strategies for detecting, interpreting, and adapting to drift. Machine learning approaches can produce poor learning outcomes in the conceptual drift environment if drift is not addressed. Furthermore, due to developments in the concept of drift, revealing a method not mentioned in the literature, the concept of drift learning methodologies has been significantly systematic in recent years. We used a layered neural network framework to experiment with different scenarios of online learning under concept drift using a fully-connected committee machine (FCM). We conduct experiments in various scenarios using a layered neural network framework for online learning under concept drift. In neural layered networks, sigmoidal and ReLU activation functions are considered for learning regression. When the layered framework is trained from the input dynamic data stream, the regression scheme changes consciously in all scenarios. A fully-connected committee machine (FCM) is trained to perform the tasks described in online learning with  $M$  hidden units on dynamically generated inputs. In this method, we run Monte Carlo simulations with the same number of units on both sides,  $K$  and  $M$ , to define the dynamic advancement of intersections between several hidden units and the calculation of generalization error. This is applied to over-learnability as a method of over-forgetting, integrating weight decay, and examining its effects in the presence of concept drift.

**Keywords:** Online Learning, Fully-connected Committee Machine (FCM), Concept Drift, Dynamic data streams.

## 1. Introduction

Contemporary hypothetic studies show that the generalization and representation power of neural networks will increase as the depth of neural networks increases [2, 22]. But, dynamic data stream analysis remains unexplored in neural network environments.

## Research Article

# A New Hybrid Deep Learning Algorithm for Prediction of Wide Traffic Congestion in Smart Cities

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The vehicular adhoc network (VANET) is an emerging research topic in the intelligent transportation system that furnishes essential information to the vehicles in the network. Nearly 150 thousand people are affected by the road accidents that must be minimized, and improving safety is required in VANET. The prediction of traffic congestions plays a momentous role in minimizing accidents in roads and improving traffic management for people. However, the dynamic behavior of the vehicles in the network degrades the rendition of deep learning models in predicting the traffic congestion on roads. To overcome the congestion problem, this paper proposes a new hybrid boosted long short-term memory ensemble (BLSTME) and convolutional neural network (CNN) model that ensemble the powerful features of CNN with BLSTME to negotiate the dynamic behavior of the vehicle and to predict the congestion in traffic effectively on roads. The CNN extracts the features from traffic images, and the proposed BLSTME trains and strengthens the weak classifiers for the prediction of congestion. The proposed model is developed using Tensor flow python libraries and are tested in real traffic scenario simulated using SUMO and OMNeT++. The extensive experimentations are carried out, and the model is measured with the performance metrics likely prediction accuracy, precision, and recall. Thus, the experimental result shows 98% of accuracy, 96% of precision, and 94% of recall. The results complies that the proposed model clobbers the other existing algorithms by furnishing 10% higher than deep learning models in terms of stability and performance.

## 1. Introduction

The vehicular adhoc network is one among the puissant research applications in the intelligent transportation system (ITS) that furnishes the information to prevent or reduce the traffic congestion. For exchanging the information in a network, the vehicular adhoc network has vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication. When a conveyance directly communicates with other con-

veyance in a network is V2V communication and when a conveyance directly communicates with roadside units (RSU), then, it is V2I communication [1]. The momentous standards of VANET are the dedicated short-range communication (DSRC) protocol, IEEE 802.11 [2], and wireless access in vehicular environment (WAVE) [3, 4]. Delays due to traffic, traffic that leads to congestion, consumption of energy, and the emission of pollution are the disputable in traffic management for smart cities [5–9]. The traffic



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# Hand Gesture based Sign Language Recognition System

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**Abstract:** One of the significant disadvantages of our general public is the boundary between incapacitated or impeded people and ordinary individuals. Correspondence is the solitary medium by which we can share our musings or pass on the message however for an individual with hard of hearing and unable to speak will face trouble in correspondence with an ordinary individual. For some, hard of hearing and unable to speak individuals, gesture-based communication is essential for correspondence. Gesture-based communication acknowledgment intends to naturally decipher gesture-based communications by a PC to assist the hard of hearing with imparting hearing society advantageously. Our point is to plan a framework to help the individual who prepared the meeting disabled to speak with the remainder of the world utilizing communication through signing or hand motion acknowledgment methods. In this framework, include recognition and highlight extraction of hand motion is finished with the assistance of SVM and OpenCV.

**Keywords:** Sign language, Hand Gesture, SVM, OpenCV, Machine Learning

## 1. INTRODUCTION

Picture handling is a rapidly developing region in a variety of applications, for example, interactive media programming, information correspondence, biomedicine, biometrics, remote sensing, surface setting, design acknowledgment, material-based retrieval, pressure, and many more. This is about how a computer can detect pictorial information after preparing a picture. Signs that people naturally make when talking to each other include very interesting pointing movements for correspondence and are perhaps the most institutionalized interface for choice. They open up the opportunity to display items and fields naturally, e.g., do a robot transfer movement course or just print some article. This is especially valuable in the mix with discourse acknowledgment as punctuation marks can be used to indicate the boundaries of the area in oral explanations. This innovation can help people with disabilities who are unable to speak. Similarly assuming that the individual has an unexpected language compared to a collector, in addition, it is usually used as an interpreter. It has always been viewed as a test of promoting a characteristic interface of cooperation, where individuals combine with innovation as they are used to collaborate with this current reality. A hands-free interface, in the face of human movements, where no device is connected to the client, will usually move the client from this current reality to the virtual climate.

It gives you the ones that use human organs to control the actual items. To get this explanation, individuals often use their hands to transmit and connect machines. The original Production for the computer is the mouse and keyboard and you need to use a booth with these widgets. The date of significant and rapid operation generally between man and machine is by visual and real guidance, but this is uneven. Overlay PCs of this age People with 1024 \* 768 pixels at a 15-second horse rim rate and contrast with a decent typewriter Compose 60 words singing with a normal time word horse with 6 letters. To help this tracker cure many mice, however, this is restricted. Although most hands are typically used for related day-to-day control firms, occasionally not used in addition for correspondence. Hand movements that support us in our daily correspondence convey messages. Hands are usually important for vanilla and hearing loss, Verity relies on its hands and movements to express, the user's hand movements are crucial for correspondence in gesture-based communication. For a computer capable of interpreting and understanding hand movements, it was a step forward in the field of



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## Personal finance transaction index scoring using machine learning model

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### ABSTRACT

Proposed personal finance score index is an algorithmic model developed based on the some of the functional aspects of personal financing models combined with system approach for predicting the accuracy of the system in more pragmatic conditions at the user level. While there are many apps that are integral to handling the personal finance data as per the given inputs, validation and program models designed for the application, very few systems enable the companies in handling the solutions in the form of predictive analytics-based guidance solutions, wherein the users are able to have track of inputs that are integral to their personal finance conditions.

The model enables the users with prediction inputs on the category of the transaction as suitable or ineffective or other classifications. SVM classifier based trained model reflects the potential factors integral to the model and how the solution is pragmatic for decision making. Test results of the model indicate that if the proposed system is integrated into personal finance applications that has scope for integration, it can help the user base in estimating the transaction worthiness.

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Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

## 1. Introduction

### 1.1. Outlook

Information and communication technologies have changed the dynamics of using the systems for information management and transaction processing. One of the key areas wherein the role of information systems, web and mobile applications have become integral to the user's lives are in the financial domain.

Today, there are many solutions that are being integral to handling personal finance solutions. The scope of personal finance could be detailed as a facet wherein the users shall be able to create some financial goals, have budgets planned, considering the income flows, expenses, savings requirements, and contingent factors into account. There are a plethora of online applications and even handy mobile application sorts that enable the users in setting financial goals and continue tracking their personal finance goals [1]. This is where budget management apps come in the picture and solve the issue. These apps use complex machine learning

algorithms and provide insights that help to plan and budget expenses accordingly. Apart from analyzing previous expenses, these apps are built to track daily payments and throw meaningful insights.

Due to the use of complex algorithms, these apps with ML analyze previous and current spending and can caution the user about overspending or underspending. It can also give inputs to the areas where they can save. Going forward, their apps can be able to suggest stores and restaurants that offer discounts over others which don't. To help customers, few of the banks have built applications in their apps with machine learning, that help customers to understand their spending patterns and control expenses which might not be needed. A global bank identified customers who had budget planning issues and using Machine learning models, enabled the customers with suggestions to help customers ways of improving personal finance. Instances of these help banks to build customer confidence and customers to plan their finances better [2].

The quantum of customer base reported by the personal finance apps reflects the fact about the rising number of users keen on relying on business intelligence solutions to guide them in their personal finance management conditions. While there are many

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# Thermal Radiation Effects on MHD Flow of Nanofluid over an Exponentially Stretching Sheet with Heat and Mass Fluxes

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## ABSTRACT:

This research work addresses the thermal radiation effects on magneto hydrodynamics (MHD) flow of an incompressible nano fluid due to an exponentially stretching sheet with heat and mass fluxes boundary conditions. Similarity transformations are used to obtain the self-similar equations which are then solved numerically using shooting technique along with fourth order Runge-Kutta method. Characteristics of various sundry parameters on the non-dimensional velocity, temperature, nanoparticle volume fraction, local Nusselt and Sherwood numbers are visualized. Besides these the numerical values of skin friction coefficient, local Nusselt and Sherwood numbers are also computed and analyzed.

**Keywords:** Thermal Radiation; Magneto hydrodynamics (MHD); Nanofluid; Heat and Mass fluxes.

## 1. INTRODUCTION:

In recent years, the analysis of flow and heat transfer over a stretching surface have achieved extensive attention because of its wide applications, such as continuous casting, exchangers, metal spinning, bundle wrapping, foodstuff processing, chemical processing, equipment and polymer extrusion. Crane [1] was the first who study the Newtonian fluid flow caused by a stretching sheet. Many researchers Dutta *et al.* [2], Chen and Char [3] and Gupta [4] modified the work of Crane [1] by taking the effect of mass transfer under various circumstances. Nadeem *et al.* [5] took the exponential stretching sheet to discuss the heat transfer phenomenon of water-based nanofluid. Mukhopadhyay *et al.* [6] scrutinized the heat transfer flow over a porous exponential stretching sheet with thermal radiation. Zhang *et al.* [7] concentrates the heat transfer of the power law nanofluid thin film occur due to a stretching sheet in the presence of velocity slip effect and magnetic field. The boundary layer flow of ferromagnetic fluid over a stretching surface is demonstrated by Majeed *et al.* [8]. Pal and Saha [9] examined the unsteady stretching sheet to discuss the heat and mass transfer in a thin liquid film with the effect of non linear thermal radiation. Weidman [10] studied a unified formulation for stagnation point flows with stretching surfaces.

The study of magnetohydrodynamics (MHD) flow of an electrically conducting fluid over a stretching sheet has promising applications in modern metallurgical as well as in metal-working procedures. Many professional techniques regarding polymers require the cooling of



# Thermal radiation and viscous dissipation effects on steady MHD heat and mass transfer flow of a micropolar fluid over an inclined isothermal permeable surface in the presence of thermophoresis

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**Abstract:** In this paper, The combined effects of thermal radiation and viscous dissipation on steady free convection Magnetohydrodynamic flow of a micropolar fluid over an inclined isothermal plate in the presence of thermophoresis is considered. The governing non linear partial differential equations of the problem are transformed into a system of nonlinear ordinary differential equations through appropriate similarity transformation and shooting technique method with Runge–Kutta Fourth order integration scheme. The effects of various physical parameters on the dimensionless velocity, microrotation, temperature, and concentration profiles are discussed and presented graphically. Finally, numerical values of the physical quantities, such as the local skin friction coefficient, the local Nusselt number and the local Sherwood number are tabulated with the variation of thermal Grashof number, modified Grashof number, magnetic parameter and coupling constant, Radiation parameter, Eckert number, thermophoretic parameter and Schmidt number parameters.

**Keywords:** *Thermal Radiation; Viscous Dissipation; MHD; Heat and Mass Transfer; Micropolar fluid; Thermophoresis.*

## 1. Introduction:

The theory of micropolar fluids has received enormous attentions during the recent years since the traditional Newtonian fluids cannot specifically depict the feature of fluid with suspended particles, polar fluids, suspension solutions, liquid crystals, colloidal solutions and fluid containing small additives. Physically, micropolar fluids may present the non-Newtonian fluids consisting of short rigid cylindrical elements or dumb-bell molecules, polymer fluids, fluids suspensions and animal blood. The existence of dust or smoke particular in a gas may also be modeled using micropolar fluid dynamics. Eringen [1] first derived the theory of micropolar fluids, which illustrates the microrotation effects to the microstructures. Eringen [2] extended his idea to the theory of thermomicropolar fluids, which interest to the special effects of microstructures on the fluid flow. The mathematical theory of equations of micropolar fluids and applications of these fluids in the theory of lubrication and in the theory of porous media are given in recent books by Eringen [3] and Lukaszewicz [4]. Free convection in the boundary layer flow of a micropolar fluid along a vertical wavy surface was investigated by Chiu and Chou [5]. Hassanien and Gorla [6] studied the heat transfer to a micropolar fluid from a non-isothermal stretching sheet with suction and blowing. Mixed convection boundary layer flow of a micropolar fluid on a horizontal plate was derived by Gorla [7]. Furthermore, The flow characteristics of the boundary layer of micropolar fluid over a semi-infinite plate in different situations have been studied by many authors in Refs. [8–15]. In the above mentioned works the effect of the induced magnetic field was neglected.

# Thermal Radiation and Viscous Dissipation Effects on (MHD) Bioconvection Flow of Maxwell Nanofluid over a Permeable Vertical Plate Due to Gyrotactic Microorganisms

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**Abstract:** This article concentrates on thermal radiation and viscous dissipation effects on magnetohydrodynamic (MHD) bioconvection flow of a novel type of water based the upper convected Maxwell, Nanofluid containing nanoparticles and motile gyrotactic microorganisms past a permeable vertical moving plate. Nanofluid bioconvection is generated by the combined effects of buoyancy forces and magnetic field on the interaction of motile microorganisms and nanoparticles. The governing non linear partial differential equations of the problem are transformed into a system of nonlinear ordinary differential equations through appropriate similarity transformation and shooting method technique coupled with Runge–Kutta–Fehlberg integration scheme, the model boundary value problem is tackled numerically. A parametric study of the entire flow regime is carried out to illustrate the effects of the governing parameters, namely bioconvection Lewis number  $L_b$ , traditional Lewis number  $L_e$ , bioconvection Peclet number  $Pe$ , buoyancy ratio parameter  $N_r$ , bioconvection Rayleigh number  $R_b$ , Brownian motion parameter  $N_b$ , thermophoresis parameter  $N_t$ , Hartmann number  $Ha$ , Grashof number  $Gr$ , radiation parameter  $R$  Eckert number  $Ec$ , the microorganisms concentration difference parameter  $\Omega$  and the suction/injection parameter  $fw$  on the velocity, temperature, nanoparticles volume fraction and motile microorganisms density profiles as well as the skin friction coefficient, the local Nusselt number, the local Sherwood number and the local density number of the motile microorganisms.

**Keywords:** Thermal radiation; Viscous dissipation; MHD; Bioconvection; Maxwell Nano fluid; Microorganismisms.

## 1. INTRODUCTION:

Bioconvection is used to describe the phenomenon of macroscopic convection motion of the fluid originated due to the density gradient created by collective swimming of microorganisms. These self-propelled motile microorganisms tends to concentrate near the upper portion of the fluid layer, and this accumulation makes the upper layer much denser than the lower region and ultimately produce instability, which results in generating the various flow patterns into the system (for details see Refs. [1–6]). Bioconvection has numerous applications in biological and bio-microsystems, for instance, enzyme biosensors and biotechnology due to the mass transport enhancement and mixing, which are important issues in many micro-systems. Another potential application of bioconvection theory is microbial-enhanced oil recovery, where microorganisms and nutrients are injected in oil-bearing layers to correct permeability variation.

## RELEVANCE AND SIGNIFICANCE OF TECHNICAL COMMUNICATION COURSE CONTENTS: A CRITICAL EVALUATION IN THE STATE OF ANDHRA PRADESH

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### Abstract

*In this world of gizmos, Master of Computer Application students are in dire need of enhancing their career opportunities and job prospects, possessing good communication and employability skills to achieve success in campus drives. To meet this demand, Technical Communication course in a three year MCA programme is viewed in a positive perspective in terms of reaching their goals and reducing the unemployment rate among Computer Application graduates.*

*Against this backdrop, the present study specifically aimed at critically examining the Course Contents of the Technical Communication course for MCA programme in select institutions of Andhra Pradesh. Structured questionnaire has been administered to major stakeholders (i.e. students and faculty) to collect the data which is further analyzed both quantitatively and qualitatively. Making use of the descriptive analysis and frequency distribution method, the results and recommendations are provided to the respective university officials to customize the course contents of Technical Communication course as per the students' and industry needs.*

*Keywords: Technical Communication, Grammar and Vocabulary, Course contents, employability skills, Job opportunities, analysis and findings.*

### 1. Introduction

In this modern world Master of Computer Application has become an instrumental pathway for young Computer Professionals to open the better avenues for successful careers. In the global arena, opportunities in Multi-National Companies, Private or recognized Banks and Media are so rampant so also the demand for this course. Inevitably, the range of candidates for this course is from undergraduate to senior professionals, employed to entrepreneurs, from primary sectors (such as agricultural and mining) to secondary sectors (production and manufacturing) to tertiary sectors (banking). The students who opt and enroll for MCA (Master of Computer Application) are varied demographically in case of age, qualification and experience. This momentum has achieved due to the right fulfillment of course objectives and learners' needs.

In this context, universities are paying a lot of attention in allowing the right platform and opportunities for MBA participants to improve better language skills by introducing Technical Communication course. As part of designed course content they are destined to gain the required oral and written skills along with the Basic English skills like grammar, vocabulary, punctuation, pronunciation besides the concepts of business communication. Such courses which come under the category of ESP are being offered in various universities as a part of MCA programme. The syllabus contents of this course at this level of study are obviously different from the general English syllabus which focuses more on grammatical aspects and literary appreciation and less on acquisition of communication skills.

As the course of Technical Communication is equally challenging and at par with the core subjects prescribed for the students of MCA and as it is also one of the determining factors in

# Teaching English Language and Communication Skills through Eclectic Approach for Engineering Students - An Experimental Study

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**Abstract**— The importance of learning communication skills has assumed greater significance in today's world. The need of the hour is that the teacher has to come up with many innovative methods to enhance communication skills of his or her students. This paper tries to explore how a novel method called Eclectic approach help engineering students to promote their communication skills. Eclectic approach is a methodology that makes use of the varied language learning approaches instead of confining to one approach. It is a skilled based approach as the teacher can base his method or approach on the basis of the learner's age, knowledge and aims and objectives of the lesson. This study was conducted for engineering students by dividing them into two groups such as control and experimental groups. Each group consists of sixty students of first year B.Tech hailing from rural background.

**Keywords**— Teaching and Learning, English Language, Eclectic Approach, Role of Teacher, Communication Skills, Class Room.

## I. Introduction

The importance of English has increased all over the world by leaps and bounds and has been playing an instrumental role in social, economic and cultural life of people living across the globe. In today's competitive world, name any discipline the use of English language has become an expedient thing to be acquired. So, Students cutting across their profession are craving for learning English language. Now the time has come for an English teacher to impart umpteen number of innovative methods among engineering students to make them gain proficiency in English language. So it is challenging for a teacher to make students learn various techniques to bolster their communication skills. If the teacher gets acclimatized with various approaches and the methods to use them in an appropriate manner, then the job of the teacher becomes easier to bestow upon such skills among the students. Also means that the English teacher should have certain objectives in his mind to which he might made them mandatory for his students to strictly emulate.

The following are the objectives of English language Teacher / Teacher:

- To enable students to learn the spoken forms and make them more vocal
- To develop student's proficiency levels to communicate effectively in their day-today life
- To make them read articles and make them comprehend the same
- To enable students to write in English correctly and meaning fully to express their ideas

The above mentioned objectives can be achieved by employing certain methods and particularly by making use of The Eclectic approach.

The UGC report advocates an approach to the teaching of English based on the needs for language learning both at the national and individual level. The report says that English must serve as the Window of the world at the national level, and it provides opportunity for an individual who seeks socio-economic advancement in the individual level. According to the report, the teaching of English at college level should aim at:

1. Equipping the student with communication skills necessary to cope with the situations be is likely to encounter (these should be predictable) and
2. Providing the kind of information context which is relevant to contemporary culture. (Syllabus Reform English 1977:4)

## Thermal Radiation and Thermophoresis Effects on Steady MHD Free Convection Flow of a Micropolar Fluid through a Porous Medium with Variable Heat and Mass Flux Boundary Conditions

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**Abstract:** In this paper, the combined effects of thermal radiation and thermophoresis on steady magneto hydrodynamic free convection flow of a micro polar fluid in the presence variable heat and mass fluxes are taken into account is considered. The governing non linear partial differential equations of the problem are transformed into a system of nonlinear ordinary differential equations through appropriate similarity transformation and Runge-Kutta Fourth order with shooting technique method. The effects of various physical parameters on the dimensionless velocity, microrotation, temperature, and concentration, local skin friction coefficient, local Nusselt number and local Sherwood number are tabulated and discussed.

**Keywords:** Thermal Radiation, Thermophoresis, MHD, Micropolar fluid, Porous Medium, Heat and Mass flux.

### I. Introduction

The theory of micro polar has received enormous attentions during the recent years since the traditional Newtonian fluids cannot specifically depict the feature of fluid with suspended particles, polar fluids, suspension solutions, liquid crystals, colloidal solutions and fluid containing small additives. Physically, micropolar fluids may present the non-Newtonian fluids consisting of short rigid cylindrical elements or dumb-bell molecules, polymer fluids, fluids suspensions and animal blood. The existence of dust or smoke particular in a gas may also be modeled using micro polar fluid dynamics. Cogley et al. [i] showed that in the optically thin limit, the fluid does not absorb its own emitted radiation but the fluid does absorb radiation emitted by the boundaries. Kim and Fodorov [ii] considered the case of mixed convection flow of a micropolar fluid past a semi-infinite, steadily moving porous plate with varying suction velocity normal to the plate in the presence of thermal radiation. The transient free convection interaction with thermal radiation of an absorbing emitting fluid along moving vertical permeable plate was studied by Makinde [iii]. Ibrahim et al. [iv] discussed the case of mixed convection flow of a micropolar fluid past a semi infinite, steady moving porous plate with varying suction velocity normal to the plate in presence of thermal radiation and viscous dissipation. Rahman and Sattar [v] studied transient convective heat transfer flow of a micropolar fluid past a continuously moving vertical porous plate with time dependent suction in the presence of radiation.

Most of the real time industrial processes involve heat and mass transfer. Heat or mass flux must be removed, added or moved from one stream process to another. In many practical situations occur in which the hot surface is subject to a constant heat flux instead of being at a prescribed

temperature. Dutta et al. [vi] first investigated the effect of uniform heat flux on the temperature field in case of flow due to a stretching sheet. Similar studies are found in [vii-x]. Most of previous works are not studied heat and mass transfer MHD free convective flow of micropolar fluid through a porous medium with heat and mass fluxes in the presence of the thermophoresis. Hence, in the present work, we have performed a numerical investigation on the combined effects of thermal radiation and thermophoresis on steady magnetohydrodynamic free convective heat and mass transfer flow of a micropolar fluid past a past a vertical porous plate with heat and mass flux boundary conditions.

### II. Mathematical analysis

Let us, consider a steady two-dimensional MHD free convective flow of viscous incompressible electrically conducting fluid past a semi-infinite permeable inclined flat plate, while a magnetic field of uniform strength  $B_0$  is applied in the  $y$ -direction which is normal to the flow direction. Fluid suction is imposed at the plate surface and the suction hole size is taken to be constant. The temperature of the surface is held uniform at  $T_w$  which is higher than the ambient temperature  $T_\infty$ . The Roseland approximation is used to describe the radioactive heat flux in the  $x$ -direction which is considered negligible in comparison to the  $y$ -direction. The effects of thermophoresis are being taken into account to help in the understanding of the mass deposition variation on the surface. Under the above assumptions, the governing equations for this problem can be written as:

(i) Continuity:

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0 \quad (1)$$

(ii) Momentum:

$$u \frac{\partial u}{\partial x} + v \frac{\partial u}{\partial y} = \nu_* \frac{\partial^2 u}{\partial y^2} + \frac{S}{\rho} \frac{\partial N}{\partial y} + g \beta_T 2 (T - T_\infty) + g \beta_C (C - C_\infty) - \frac{\sigma B_0^2 u}{\rho} - \frac{\nu_*}{K'} (u - U_\infty) - \frac{b}{K'} (u - U_\infty)^2 \quad (2)$$

(iii) Angular momentum:

$$u \frac{\partial N}{\partial x} + v \frac{\partial N}{\partial y} = \frac{\nu_*}{\rho j} \frac{\partial^2 N}{\partial y^2} - \frac{S}{\rho j} \left( 2N + \frac{\partial u}{\partial y} \right) = 0 \quad (3)$$



# Convective Heat Transfer and Mass Transfer Observations of MHD Cu-Water Nanofluid In a Rotating System

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**Abstract:** The present study is the detailed investigation on convective heat and mass transfer effects of MHD Cu-water nanofluid bounded by a semi-infinite flat plate in a rotating frame with variable heat flux. The plate is assumed to be oscillating in time with steady frequency so that the solutions of the boundary layer are the similar oscillatory kind. The entire system rotates about the axes normal to the plate. The dimensionless governing differential equations are solved analytically by using perturbation technique. The effects of various important parameters on velocity, temperature, concentration, skin friction, Nusselt number and Sherwood number within the boundary layer are discussed for Cu-water based nanofluid with the help of graphs and tables. Increasing values of suction parameter, Schmidt number, chemical reaction parameter and heat source results in increasing the skin friction.

## INTRODUCTION

Many researchers had a great interest of studying convective heat transfer using nanofluids over a decade due to its fascinating and significant applications in sciences and in engineering. The term nanofluid is first introduced by Choi [1] which represents the fluid in nanoparticles with the diameter than 50 nm suspended in the base fluid. Nanofluids are used to enhance the thermal conductivity and improving heat transfer capacity to achieve better cooling. The applications of nanofluids include cooling involved in cancer therapy, transformers, super computers, biomedicine, safer surgery, electronic devices etc. The applications of nanofluids include high thermal conductivity involved in electronics and automotive needing improved heat transfer. Some theoretical and experimental investigations were carried in which they exhibit higher thermal conductivities using nanofluids from [2]-[5]. Later Khan et al. [6] studied the boundary layer nanofluid flow over a vertical surface with constant heat flux. Convection is usually the dominant form of heat transfer in liquids and gases. Convective flows in porous media have been studied extensively during the last decades due to many theoretical and practical applications such as industrial, geothermal extraction, oil recovery processes, thermal insulation engineering, cooling of electronic components, casting and welding of manufacturing process etc. Gorla et al. [7] analyzed the natural convective boundary layer flow over a horizontal plate embedded in a porous medium saturated with a nanofluid. Free convection boundary layer flow over a horizontal circular cylinder with Newtonian heating is studied by Salleh et al. [8]. Kuznetsov [9] discussed the natural convective boundary layer flow of a nanofluid past a vertical plate. Reddy T.S et al. [10] studied unsteady MHD radiative and chemically reactive free convection flow near a moving vertical plate in porous medium.

Many researchers were attracted to study the heat transfer under the influence of magnetic field in a rotating frame for an electrically conducting fluid in view of its applications in many industrial engineering to design turbines and turbo mechanics, geophysical engineering to study the migration of under water, and gases and

# Analytical Study of Buoyancy Effects on MHD Visco-Elastic Fluid Past an Inclined Plate

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**Abstract:** This analysis reveals an analytical study on heat and mass transfer effects on MHD visco-elastic fluid flow past an inclined vertical plate embedded in porous medium. The nature of the flow is examined with the influence of thermal radiation, heat source, chemical reaction, Prandtl number and Dufour number. A closed analytical solution is evaluated for the flow velocity, temperature and concentration from the equations that govern the flow. Graphical presentations are taken to discuss the impact of considered parameters. Further the variations in skin friction, Nusselt number and Sherwood number are examined under the impact of related parameters.

## INTRODUCTION

Viscoelastic materials are popular in our daily activities and also in small (large) scale industries due to their unique properties like recover, ability to sink, soak up energy and experience stress reduction. When compared to Newtonian fluids, the complex viscoelastic fluids have an efficient strategy for tumbling turbulent skin friction in major-scale flows. Non-Newtonian fluids follow macroscopic properties that disregard our intuition. Hence the researchers are showing prominence to these flows. As a result plenty of papers on the special properties of this type of flows were published.

An exact solution for the flow of MHD viscoelastic fluid was given by Kumeresan and Vijay Kumar [1] in unsteady case. Nayak et al. [2] examined this flow surrounded by porous surface along with the existence of chemical reaction. Chowdary and Islam [3] established and reported on viscoelastic fluid past an immeasurable plate with free convection model. Choudhury and Kumar Das [4, 5] analyzed the impact of heat and mass transfer on this flow under the occurrence of chemical reaction and radiation simultaneously. Chandra Reddy et al. [6, 7] analyzed thermal and solutal buoyancy impacts on this flow under varying suction and variety of parameters. Further the survey is done on the flows past inclined plates. Reddy et al. [8] discussed and concluded the mass transfer and heat source consequences on MHD flows through inclined porous vertical porous surface. Bhuvaneshwari et al. [9] analyzed exactly the radiative flow over an inclined plate under simultaneous heat and mass transfer. Rajput and Gaurav Kumar [10] considered mass diffusion and changeable temperature and analyzed this type flow. Srinivasa Raju et al. [11, 12] used finite element method to examine the nature of Casson viscous dissipative flows and then adding cross diffusion parameters.

The above literature shows that the analyses were done on viscoelastic fluids past vertical porous plates. Flows through inclined plates were considered on Newtonian fluids only. Hence we have chosen the flow of viscoelastic fluid past an inclined plate and examined its nature. The research paper of Nagaraju et al. [13] is taken into contemplation and extended. As the novelty of the work, the angle of inclination, impact of Dufour effect and heat generation effects are included.



# THERMOPHORESIS EFFECT ON MHD FLOW OF A MICROPOLAR FLUID UNDER VARIABLE HEAT FLUX

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## ABSTRACT

This paper consist of the combined effects of thermal radiation and thermophoresis on steady magnetohydrodynamic free convection flow of a micropolar fluid past a vertical porous plate through a porous medium under variable heat flux. The governing non linear partial differential equations of the problem are transformed into a system of nonlinear ordinary differential equations through appropriate similarity transformation and then solved by Runge–Kutta Fourth order with shooting technique method. The effects of various physical parameters on the dimensionless velocity, microrotation and temperature profiles are discussed and presented graphically. Finally, numerical values of the physical quantities, such as the local skin friction coefficient, The couple stress coefficient and the local Nusselt are tabulated and analyzed.

**Keywords:** Thermal Radiation, Thermophoresis, MHD, Micropolar fluid, Heat flux.

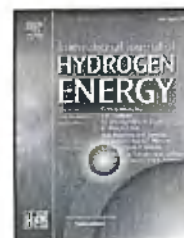
## 1. Introduction:

Thermophoresis is an excellent phenomenon by which small sized particles suspended in a non-isothermal gas acquire a velocity relative to the gas in the direction of decreasing temperature. The velocity acquired by the particles is called thermophoretic velocity and the force experienced by the suspended particles due to the temperature gradient is known as thermophoretic force.

Many articles was published which are related to combined effects of thermal radiation and thermophoresis on steady magnetohydrodynamic free convection flow of a micropolar fluid. Chen [1] established the effects of magnetic field and suction/injection on convection heat transfer of non-Newtonian power-law fluids past a power law stretched sheet with surface heat flux. Reddy [2] explained heat generation and radiation effects on steady MHD free convection flow of micropolar fluid past a moving surface. Talbot et al. [3] reported thermophoresis of particles in a heated boundary layer. Noor et al. [4] analyzed mixed convection stagnation flow of a micropolar nanofluid along a vertically stretching surface with slip effects. Bhattacharyya et al. [5] discussed the effects of thermal radiation on micropolar fluid flow and heat transfer over a porous shrinking sheet. Bourantas and Loukopoulos [6, 7] analyzed the modeling of MHD natural-convection flow in an inclined square enclosure filled with a micropolar-nanofluid. Rashidi et al. [8] established MHD stagnation point flow of micropolar nanofluid between parallel porous plates with uniform blowing. Chandra Reddy et al. [6, 7] analyzed thermal and solutal buoyancy impacts on this flow under varying suction and variety of parameters.

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## Short Communication

# One-pot hydrothermal synthesis: Enhanced MOR and OER performance using low-cost $Mn_3O_4$ electrocatalyst



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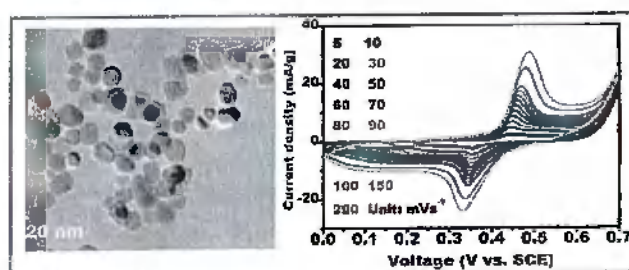
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## HIGHLIGHTS

- A successful synthesized  $Mn_3O_4$  NPs via simple one-pot hydrothermal method.
- The synthesized  $Mn_3O_4$  NPs were cubic, spherical, and hexagonal.
- The  $Mn_3O_4$  NPs were studied the MOR and OER at room temperature.
- The  $Mn_3O_4$  electrocatalyst showing excellent stability in MOR, and lower Tafel slope.

## GRAPHICAL ABSTRACT



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## ABSTRACT

$Mn_3O_4$  NPs were synthesized using a simple, rapid, and cost-effective hydrothermal method. High-resolution transmission electron microscopy showed that most of the synthesized NPs were cubic, with some NPs being spherical and hexagonal. The electrochemical results showed that the  $Mn_3O_4$  cubes were exhibited good oxygen evolution activity (OER) and methanol oxidation activity (MOR) and stability in alkaline media, making them a promising and efficient material in energy applications.

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# UNIFORM BOUNDARY LAYER FLOW OF CASSON FLUID PAST A VERTICAL PLATE THROUGH POROUS MEDIUM IN CONDUCTING FLUID

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## Abstract:

The present study is related to investigation of unsteady MHD Casson fluid flow of a past a vertical porous plate through a porous medium in the presence of a uniform transverse magnetic field. The effects of radiation, heat generation/absorption, radiation absorption and homogeneous chemical reaction are considered. The coupled nonlinear partial equations are turned to ordinary by super imposing solutions with steady and time dependent transient part. Finally, the set of ordinary differential equations are solved with a perturbation method to meet the inadequacy of boundary condition. The impact of different parameters on the flow is revealed by the help of graphs and tables.

**Keywords:** Casson fluid, heat and mass transfer, radiation absorption, porous plate, thermal radiation, chemical reaction.

## 1. Introduction

An important class of two dimensional time dependent flow problem dealing with the response of boundary layer to external unsteady fluctuations of the free stream velocity about a mean value attracted the attention of many researchers. Besides that convective flow through porous medium has applications in geothermal energy recovery, thermal energy storage, oil extraction, and flow through filtering devices. Nowadays Magneto hydrodynamics is very much attracting the attention of the many authors due to its applications in geophysics and engineering. MHD flow with heat and mass transfer has been a subject of interest of many researchers because of its varied application in science and technology. Such phenomena are observed buoyancy induced motions in the atmosphere, in water bodies, quasi solid bodies such as earth, etc. Talbot et al. [1] reported thermophoresis of particles in a heated boundary layer. Noor et al. [2] analyzed mixed convection stagnation flow of a micropolar nanofluid along a vertically stretching surface with slip effects. Bhattacharyya et al. [3] discussed the effects of thermal radiation on micropolar fluid flow and heat transfer over a porous shrinking sheet. Bourantas and

# Heat and Mass Characteristics of Magneto-Newtonian Fluid Through Upright Porous Plate



P. Chandra Reddy, P. V. Sanjeeva Kumar, L. Rama Mohan Reddy and M. C. Raju

**Abstract** An examination has performed to explain the flow characteristics of an unsteady MHD Newtonian fluid past over a vertical porous plate with rotation under the existence of heat and mass transfer. The governed expressions of the flow pattern are solved by using finite difference scheme. The impact of diverse parameters on the fluid velocity, temperature and species concentration is depicted in the form of numerical results and graphical presentations. The obtained results are having the close agreement with the existed literature results and promising the trueness of the numerical method. The enrichment of rotation parameter causes to decline the primary velocity of the fluid and also raises its secondary case velocity.

**Keywords** Rotating fluid · Thermal radiation · Chemical effect · Soret number and Dufour effect

## 1 Introduction

Rotating flows along porous media has received extensive importance in the modern research on computational fluid dynamics. Tremendous treatises on this topic with advantages in planetary sciences and geophysics have been published before the year 1950 onwards. The shared impact of heat transfer and mass transfer is much inspired to analysts in dynamic applications especially in chemical and manufacturing processes industries.

The theoretical concepts of revolving fluids were described by Greenspan [1]. Hydrodynamic resistivity and heat thrashing of revolving solids were established by

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## Flow characteristics of unsteady MHD Newtonian fluid past a rotating vertical porous plate \*

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**Abstract** A theoretical analysis with numerical solutions is performed to explain the flow characteristics of an unsteady MHD Newtonian fluid along a vertical porous plate with rotation under the existence of heat and mass transfer. The governing equations of the flow pattern are converted to non-dimensional form and then solved by using finite difference scheme. The effects of different physical parameters like thermal radiation, heat source and sink, thermal diffusion and Dufour number are considered. The impact of these parameters on the fluid velocity, temperature and species concentration is depicted in the form of numerical results and graphical presentations. The current results are compared with the previously published ones and they confirm the correctness of the numerical method. The primary velocity of the fluid increases when the value of rotation parameter increases and the secondary velocity decreases in the same case.

**Key words** Rotating fluid, Thermal radiation, finite difference scheme, Soret number and Dufour effect.

**2020 Mathematics Subject Classification** 76M20, 76S05, 76S99, 76U05, 76U99, 76W05, 76W99.

### 1 Introduction

Rotating flows through porous media have received extensive importance in the modern research in computational fluid dynamics. Tremendous treatises on this area with applications in geophysics and planetary sciences have been in existence in the literature since the early 1950's. The joint impacts of heat and mass transfer in rotational hydrodynamics have largely been inspired due to their applications in chemical engineering and manufacturing processes in the industries.

The theoretical concepts of rotating fluids are given by Greenspan [1]. Hydrodynamic resistance and the heat loss of rotating solids are established by Dorfman [2]. Kreith [3] invented the convective mode of heat transfer in rotating fields. The detailed information on higher order heat transfer from a rotating sphere was given by Takhar and Whitelaw [4]. Hossain and Takhar [5] considered the rotating bodies and established radiation-conduction interaction in mixed convection. Naroua et al. [6] explained natural convection flow of rotating fluids with finite element method under the existence of radiation mode of heat transfer. The nature of the fluid flow along an accelerated horizontal plate in

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# MHD Flow of Nano fluid Past A Vertical Permeable Semi-infinite Moving Plate With Constant Heat Source

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**Abstract.** The effects of radiation-absorption, diffusion-thermo on MHD free-convective flow of a Nano-fluid bounded by porous medium past an infinite smooth plate are investigated. The plate is budged with a fixed velocity, temperature and concentration are presumed to be erratic from a fixed mean near the plate. The governing equations are resolved by using the perturbation-method. The effects of overriding flow parameters on main quantities are conferred through graphs. We evaluated the skin friction, Nusselt number and Sherwood number and computationally discussed.

**Keywords:** convective flows, Nano fluid, heat source, MHD, moving plate

## INTRODUCTION

Trying through experimental and theoretical methods to recognize the impact of increasingly absorbent media. Simple Stream is interested in the stream of water through agricultural technology, groundwater sources and drainage, marine technology, natural gasoline, petroleum and petroleum refining and purification operations. For petroleum extraction operations, it is significant to stream absorbent media. In addition to giving to existing knowledge, many problems have important practical significance. Absorbent materials used due to the efficiency of applied automated engineering, remediation and modern applications, as the principle of rolled liquid is really substantial because it used there are many natural events and a state worthy of being ruled by the Corolis forces directly. Oceanography, meteorology, climatology, and impressive science are all significant and significant sorts of revolving liquids over a broad field. In that respect are various important and significant properties of a wide range of rolling liquids of knowledge. The presented liquid stream problems have attracted the attention of different researchers who have examined the smooth and rarely liquid hydrodynamic stream of the circulating the media looks at various aspects of the problem. Due to their geographical and astronomical importance and the usage of liquid engineering, the problem of hydro magnetic flux in the surrounding environment has been of outstanding interest for the past few decades. The other are a few significant things in the Earth's magnetosphere, from non-earthly liquid sources to non-formic, Internal rotation, rotation of powerful stars, measurement of earth's problems and solar dynamo; MHD Random Pump, Turbo Machine, hydro chromatograms. The flow of the MHD generator at the point is driven straight off by the corals and the split drum of the magnetic flux is the ITE type. The Major





# Synthesis and properties of (Fe, Ni)-doped zinc sulfide nanopowders

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## Abstract

Pure and (Fe, Ni)-doped ZnS nanopowders have been successfully synthesized by chemical co-precipitation method using Poly Vinyl Pyrrolidone (PVP) as capping agent. Powder X-ray diffraction (XRD) studies reveal that the synthesized powders are in cubic blended structure. The average crystalline size of pure and doped ZnS nanopowder conform around 2–3 nm. In the investigations, Ni is kept constant at 3 mol% and Fe is increased from 1 to 5 mol%. Transition electron microscopy (TEM) is also used to investigate the average size of the nanopowders. TEM results are reasonably in good agreement. SEM micrographs of the (Fe, Ni)-doped nanopowders result in agglomeration with spherical in shape. The EDAX spectra show the chemical composition of dopants is uniform in ZnS. Optical absorption spectra show the absorption edge at 310 nm. Photoluminescence (PL) studies are conducted with excitation wavelength of 306 nm. Pure ZnS exhibits sharp emission peaks at 438 nm, 450 nm and 466 nm. (Fe, Ni)-doped ZnS samples also exhibit the sharp emission peaks at 450 nm and 467 nm with decreasing intensity. The magnetic measurements reveal that 5 mol% Fe- and 3 mol% Ni-doped ZnS nanopowders exhibit a weak ferromagnetic behavior.

## 1 Introduction

Semiconducting materials doped with magnetic materials are known as dilute magnetic semiconductors (DMS) [1]. The authors have a lot of interest in transition and rare-earth dopants and hence in DMS due to their charge and spin controlling features, DMS materials have created a lot of interest in various scientific fields. The semiconducting materials like II–VI and III–V group compounds are popular host materials for transition metals (TM) and rare-earth metals (RE). These materials have found applications in spintronics and other bandgap engineering devices, light emitting diodes, field detectors, lasers, magnetic resonance imaging (MRI) and solar cells [2–7]. II–VI compounds such as CdS, CdSe, ZnS, ZnO and ZnSe are most popular host materials which are doped with transition metals (TM) or rare-earth metals (RE) [8–13]. ZnS is a wide bandgap material (3.72 eV) and a favorable host for transition metals due a

variety of applications. Many have investigated the optical and magnetic properties of ZnS-based DMS nanostructures [14–29]. Some important studies are electrical and magnetic properties of cold compacted Fe-doped ZnS nanoparticles [30, 31]. A gradual increase of magnetization in (Fe, Ni)-doped samples has been observed at room temperature. Sambavisham et al. [32] have reported induced magnetism in Fe-doped ZnS nanoparticles. Pure ZnS nanopowders have exhibited diamagnetic behavior and Fe-doped ZnS samples a superparamagnetic-like behavior with weak ferromagnetism. Eryong et al. [33] have observed the reduction in the intensity of photoluminescent (PL) peaks and superparamagnetism in the Fe-doped ZnS nanopowders. Various studies on PL and magnetic studies of TM-doped ZnS nanostructures are available in the literature. However, room temperature magnetism induced in TM-doped ZnS DMS nanostructures still remains as an enigma. Fe-doped nanopowders are expected to have future applications in solar cells, biomarkers, bandgap engineering devices, lasers and nanoelectromechanical systems (NEMS) [34–40].

Pure and (Fe, Ni)-doped ZnS nanostructured materials have been synthesized by using chemical co-precipitation method. XRD results show that all the synthesized samples are in cubic blended structure. The average crystalline sizes of pure and (Fe, Ni)-doped ZnS nanoparticles are found to be around 2–3 nm. These results have been confirmed by the

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# Analytical Study On MHD Convective Non-Newtonian Fluid Flow Under The Influence Of Diffusion-Thermo And Heat Source Effects

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**Abstract:** An analysis has been carried out to study an unsteady MHD convective non-Newtonian fluid flow in the presence of heat source and radiation absorption. The governing partial differential equations along with the boundary conditions are first cast into a dimensionless form and then the equations are solved by closed analytical method. The effect of various physical parameters like porous permeability, Prandtl number, heat source, radiation absorption, diffusion-thermo, Schmidt number and chemical reaction parameter on velocity, temperature and concentration profiles are presented graphically. The effects of all these parameters on wall velocity gradient, wall temperature gradient and wall concentration gradient are also discussed with the help of tables. Temperature increases in the presence of heat source, radiation absorption parameter and Dufour number while decrease in the presence of Prandtl number and radiation parameter.

**Keywords:** MHD, Radiation absorption, Diffusion-thermo, Non-Newtonian fluid.

## INTRODUCTION

A porous medium is a continuous solid phase with many pores in it. Examples are sponges, clothes wicks, paper sand gravel, filters, concrete, bricks, plaster walls, many naturally occurring rocks, packed beds used for distillation, absorption etc. Most of the studies of flow in porous media assume the Darcy's law is valid. However, this law is known to be valid only for relatively slow flows through porous media. In general, we must consider the effect of fluid inertia as well as of viscous diffusion at boundaries which may become significant for material with high porosities such as fibrous and foams. Agarwall and Ahmed [1] studied MHD mass transfer flow past on inclined plate with variable temperature and plate velocity embedded in a porous medium. Bhargavi and Sharath Kumar Reddy [2] examined an analytical study of forced convection in a channel partially filled with porous material with effect of magnetic field. Sheikholeslami et al. [3] analyzed Lorentz forces effect on NEPCM heat transfer during solidification in a porous energy storage system. Raju et al. [4] deliberated analytical study of MHD free convective, dissipative boundary layer flow past a porous vertical surface in the presence of thermal radiation, chemical reaction and constant suction. Effect of rotation and hall current on mixed convection mhd flow through a porous medium in a vertical channel in presence of thermal radiation was studied by Singh and Pathak [5]. Seth et al. [6] considered effect of rotation on unsteady hydro magnetic natural convection flow past an impulsively moving vertical plate

# MHD Double Diffusive Convective Flow Of Heat Generating Fluid In The Presence Of Soret Effect

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**Abstract.** The article gives a theoretical observation on convective fluid flow under heat growth and thermal diffusion involving MHD transfer in conducting field. The governing flow expressions are first converted into non-dimensional form and the solutions of those equations in terms of velocity, temperature and species concentration are gained by exact analytical method. The consequences occurred in the above profiles are exhibited and summarized with the utility of graphical presentations. In addition to this, the impact of significant parameters on friction at the wall, rates of heat and mass transmissions are revealed in the form of tables.

**Keywords:** MHD, chemical reaction, heat and mass transfer, thermal diffusion, closed analytical method.

## INTRODUCTION

Analysis of hydro magnetic free convection flow with mass and heat transfer in porous and media has drawn major attention of quite a limited researchers due to its applications in astrophysics, electronics, geophysics, aeronautics, chemical, meteorology, metallurgy, and petroleum industries. Krishna murthy et al. [1] considered MHD Double Diffusive free convection process beside a perpendicular wavy surface implanted in a doubly stratified fluid-saturated porous medium under the inspiration of Soret and Dufour result. Umamaheswar et al. [2] examined the chemical reaction effect on MHD double diffusive fluid flow over a rotating porous plate. Ibrahim et al. [3] investigated MHD stagnation point of Double-Diffusive flow of nano-fluid over a stretching sheet. Reddy et al. [4] discussed MHD convective laminar flow of boundary layer past an accelerated perpendicular plate. Seth et al. [5] considered the transient behavior of MHD Double-Diffusive free convection in vertical channel. Alam et al. [6] studied MHD boundary free convective heat and mass transfer flow with effect Soret and hall current over an inclined porous plate with moveable suction. Raju et al. [7] investigated effect on MHD boundary layer flow of a visco-elastic fluid bygone a porous plate with variable suction and heat source. Swarnalatha et al. [8] considered Hall effects on MHD flow of heat generating/absorbing fluid through porous medium in a rotating parallel plate channel. Girinath et al. [9] investigated the effects of variable viscosity and porosity of fluid, Soret and Dufour mixed Double Diffusive convective flow over an accelerating surface. Mallikarjuna et al. [10] considered effects of Soret and Dufour on double diffusive convective flow through a cylindrical annular region in the presence of heat sources. Hayat et al. [11] studied Dufour and Soret effects on peristaltic transport in curved channel with radial magnetic field and convective conditions. Reddy et al. [12] considered chemical reaction and radiation absorption effects on MHD flow of heat creating Casson fluid past oscillating perpendicular porous plate. Seddeek et al. [13] calculated the effect of variable viscosity and chemical reaction on hydro magnetic mixed convection heat and mass

# Unsteady MHD free convective flow of a radiating fluid past an inclined permeable plate in the presence of heat source

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**Abstract:** In this manuscript we analyzed an unsteady MHD free convective flow of a radiating fluid past an inclined permeable plate in the presence of heat source, chemical reaction and thermal radiation with uniform temperature and species diffusion. The dimensionless governing partial differential equations are solved by using closed analytical method. The effects of various physical parameters on the velocity, temperature and concentration are shown graphically and discussed in detail. Numerical results for the skin friction, rates of heat and mass transfer are presented in the form of tables and discussed. Velocity increases with increase in  $Gr$ ,  $Gm$  and  $K$  while it decreases with increase in  $M$  and  $\alpha$ .

## INTRODUCTION

Several industrial applications involve the flow of non-Newtonian fluid and thus the flow behavior of such fluids finds a great relevance. Molten metal's, plastic, pulps, emulsions, slurries and raw materials and fluid state are some examples to mention. Non-Newtonian flow also finds practical applications in bio-engineering, where in blood circulation in human/animal artery is explained by an appropriate Visco-elastic pulsatile flow helps in understanding the mechanism of dialysis of blood through an artificial kidney. Naga raju et al. [1] discussed MHD visco elastic fluid flow past an infinite vertical plate in the presence of radiation and chemical reaction. Ravi kumar et al. [2] investigated combined effects of heat absorption and MHD on convective Rivlin-Ericksen flow past a semi-infinite vertical porous plate with variable temperature and suction. Chamkha [3] discussed unsteady MHD convective heat and mass transfer past a semi-infinite vertical permeable moving plate with heat absorption. Ravi Kumar et al. [4] discussed theoretical investigation of an unsteady MHD free convection heat and mass transfer flow of a non-Newtonian fluid flow past a permeable moving vertical plate in the presence of thermal diffusion and heat sink. Sucharitha et al. [5] investigated radiation absorption and thermal diffusion effects on conducting fluid past an exponentially accelerated vertical plate with exponentially varying temperature and concentrations. Umamaheswar et al. [6] discussed Unsteady MHD free convective Visco-elastic fluid flow boundary by an infinite inclined porous plate in the presence of heat source, viscous dissipation and ohmic heating. Raju and Varma [7] studied Unsteady MHD free convection oscillatory couette flow through a porous medium with periodic wall temperature. Seth et al. [8] studied effects of hall current and rotation on unsteady MHD natural convection flow with heat and mass transfer

# Marangoni Convection Impact On Magneto-Nano Fluid In Porous Medium

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**Abstract:** A laminar magnetohydrodynamic (MHD) forced convection two phase nanofluid model in porous medium is considered along with Marangoni convection. It is assumed that the surface tension varies linearly with both the temperature and concentration and that the interface temperature and concentration are quadratic functions of the interface arc length  $x$ . Numerical solutions for the velocity, temperature and concentration distributions are obtained by using Shooting method. Influences of the Marangoni ratio, Schmidt number, Brownian motion parameter, magnetic number and thermophoretic parameter on the hydrothermal characteristics are presented through graphs and tables. Results depict that the temperature increases with increase of Permeability of porous medium, the Schmidt number, Brownian motion, magnetic number and the thermophoretic parameters but it reduces with the rise of the Marangoni ratio.

**Keywords:** MHD; Free convection; Marangoni convection; Brownian motion; Porous medium.

## INTRODUCTION

Marangoni boundary layers are dissipative layers which may occur along liquid-liquid or liquid-gas interfaces. The surface tension gradients that are responsible for Marangoni convection can be both temperature and/or concentration gradients. The basic research work in this field was first promoted by Napolitano [1, 2]. As reported by Christopher and Wang [3] and Eyer et al. [4], Marangoni flow induced by surface tension variations along the liquid-fluid interface causes undesirable effects in crystal growth melts in the same manner as buoyancy induced natural convection. According to Straub [5], these undesirable effects become dominant in the absence of buoyancy forces in the microgravity environment of space-based crystal growth experiments. Later, Magyari and Chamkha [6] stated that, Marangoni convection appears due to surface tension gradients and also proved that liquid-liquid interfaces can generate Marangoni boundary layer. As per these reports, newly, innovative kinds of fluids are required to reach more efficient performance in this case. Hence, a nanofluid was proposed by several researchers in the current research as innovative way to enhance heat transfer characteristics. In a review article, Sheikholeslami and Ganji [7] elaborately presented various applications of nanofluids in several fields. They found some uncertainties with the variation of the nanofluid volume fraction of heat transfer change. Various aspects related to nanofluids were studied by Ma et al. [8, 9], and many more others [10-14]. Motivated by the above

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**RADIATION ABSORPTION AND SORET EFFECTS ON MHD  
 CONDUCTING FLUID FLOW PAST AN EXPONENTIALLY  
 ACCELERATED VERTICAL PLATE**

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**Abstract:** In this article an investigation is done on hydromagnetic effects on electrically conducting fluid past an exponentially accelerated infinite vertical plate with exponentially varying temperature and concentration. The influence of thermal diffusion and radiation absorption is considered in this analysis. The problem is governed by coupled non-linear partial differential equations which are solved by finite difference method. The plate temperature is increasing linearly with time and the concentration level near the plate is increased. Among the effects of various



## THREE DIMENSIONAL LAMINAR FLOW OF MAGNETITE WATER BASED NANOFLUIDS UNDER HEAT GENERATION AND COUPLE STRESS EFFECTS

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### Abstract

The present investigation reveals a study on the flow of magnetite water based nanofluids under heat generation and couple stress effects over a stretching sheet in conducting field. The governing partial differential equations are reduced into ordinary differential equations with the help of suitable similarity transformations and solved numerically by shooting method using MATLAB code under the

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Keywords and phrases: couple stress, heat generation, conducting field, nanofluid, stretching sheet and shooting method.

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# The Characteristics of Heat and Mass Transfer on MHD Fluid Flow over a Moving Melting Surface



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and P. V. Satya Narayana

**Abstract** The magneto-hydrodynamics (MHD) fluid flow above a moving melting surface in the existence of sticky intemperance under heat in addition mass transfer characteristics are examined theoretically and to be furnished in this article. The flow equivalent equations are solved by means of R-K method of 4th order. The impact of notable parameters on velocity, concentration, and temperature is deliberated through graphs. A comparison is made with the previous literature to validate the method and found good agreement. Concentration of the fluid decreases up to  $\eta = 2$  and it increases for  $\eta > 2$  with increasing values of Sc and Sherwood number increases for raising Sc values.

**Keywords** Moving melting surface · MHD · Viscous dissipation · Heat as well as mass transfer

## Nomenclature

$B_0$	Constant
$C_f$	Skin friction coefficient
$C_s$	Heat capacity of the solid surface
$Ec$	Eckert number
$H$	Dimensionless melting parameter
$M$	Magnetic field parameter

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# Radiation and Partial Slip Effects on Magnetohydrodynamic Jeffrey Nanofluid Containing Gyrotactic Microorganisms Over a Stretching Surface

*In this study, the impact of thermal radiation and partial slip on magnetohydrodynamic flow of the Jeffrey nanofluid comprising motile gyrotactic microorganisms via vertical stretching surface is analyzed. The governing partial differential equations are reformed to a system of coupled ordinary differential equations by utilizing the similarity transformations. The transformed equations are of order four, which are complex to solve analytically and hence, the coupled system is solved computationally by using the shooting technique along the Runge–Kutta integrated scheme. The ramifications of different thermophysical parameters on the density of gyrotactic microorganisms, Jeffrey nanofluid velocity, nanoparticles concentration, temperature, Sherwood number, and Nusselt number are illustrated graphically. Comparing this study with the results already published favors the validity of this study. It is established that the Nusselt number is boosted on enhancing the thermal radiation parameter, and the reverse trend has been observed on increasing the Richardson number, whereas the gyrotactic microorganisms density is more in case of viscous nanofluid compared to the Jeffrey nanofluid. [DOI: 10.1115/1.4048213]*

**Keywords:** bio-heat and mass transfer, heat transfer in manufacturing, magnetohydrodynamic (MHD), micro/nanoscale heat transfer, porous media, radiative heat transfer

## Introduction

Nanofluid is an innovative form of heat transfer comprising nanoparticles that are distributed consistently and steadily in the base fluid. Such scattered nanoparticles with a particle size 1–100 nm, usually a metal or metal oxide, significantly improve the nanofluid's thermal conductivity and increase the convection and conduction coefficients, enabling further heat transfer. Owing to their importance, they are used in applications such as drug delivery and oil recovery, vehicle thermal management, and cooling of electronics. Initially, Choi and Eastman [1] first proposed the new class of nanofluids, and they discovered high thermal conductivity nanofluid that depends on suspending metallic nanoparticles of size less than 100 nm. Free convection flow over a nonisothermal plate in a porous medium saturated with the nanofluid was studied by Gorla and Chamkha [2]. Mahanthesh et al. [3] explored the influence of nanoparticles shape factor over an infinite disk with Marangoni convective effects. Bazdar et al. [4] studied numerically the influence of turbulent flow and heat transfer of a nanofluid over a curved channel with different wavelengths. They reported that the Nusselt number does not change significantly due to low Reynolds number, whereas it augments for high Reynolds number. Many researchers [5–9] studied nanoliquid flows in different flow geometries.

Motile microorganisms in suspensions are slightly impenetrable than water, and their self-propelled nature typically swims in the upward direction that increases the thickness of the based fluid. It leads to an unstable dense upper surface. Bioconvection starts when the microorganisms are collected in the uppermost section of the liquid as a result of uneven density stratification of certain

microorganisms. Bioconvection plumes form during this cycle and the microorganism travel from the upper liquid section to the inferior liquid section due to the difference in density. Kuznetsov and Avramenko [10] studied the stability of a suspension of motile gyrotactic microorganisms in a horizontal layer. Khan et al. [11] discussed the joint impact of the magnetic field and Navier slip on the frontier layer stream with heat transfer and mass transfer of a nanofluid results in gyrotactic microorganisms over a vertical plate. Chamkha et al. [12] examined the radiation effects on the bioconvection flow of a nanoliquid comprising gyrotactic microorganisms with the variation of surface temperature. Sudhagar et al. [13] explained the ramification of gyrotactic microorganism via a vertical cylinder. Rashad et al. [14] investigated the mixed bioconvection flow of a nanofluid containing gyrotactic microorganisms past a circular cylinder. Khan et al. [15] presented a model on motile microorganisms past a truncated cone. Ferdows et al. [16] examined the heat transfer analysis of bioconvection and nanofluid flow over an exponentially stretching sheet with magnetic effects. A few researchers addressed the impact of different parameters of water-based nanofluid containing motile microorganisms [17–19].

In recent decades, there have been important developments in the study on non-Newtonian fluid flows due to its vast applications in industrial and emerging engineering processes such as food and paper production, polymer processing, and technology. The non-Newtonian fluids are viscoelastic in nature, for example, oils, paints, ketchup, and fluid polymers. In view of this, numerous authors [20–23] deliberated the different non-Newtonian fluid flows in various geometrical phases. Hayat et al. [24] explored the homogeneous and heterogeneous effects of the Maxwell fluid at the stagnation point. Oyelakin et al. [25] explored the transfer of mass and heat on the Casson nanoliquid flow along a vertical channel with gyrotactic microorganisms. They conveyed that the skin friction coefficient retards with increasing microorganisms.

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# Analytical Study of Buoyancy Effects on MHD Visco-Elastic Fluid Past an Inclined Plate

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**Abstract:** This analysis reveals an analytical study on heat and mass transfer effects on MHD visco-elastic fluid flow past an inclined vertical plate embedded in porous medium. The nature of the flow is examined with the influence of thermal radiation, heat source, chemical reaction, Prandtl number and Dufour number. A closed analytical solution is evaluated for the flow velocity, temperature and concentration from the equations that govern the flow. Graphical presentations are taken to discuss the impact of considered parameters. Further the variations in skin friction, Nusselt number and Sherwood number are examined under the impact of related parameters.

## INTRODUCTION

Viscoelastic materials are popular in our daily activities and also in small (large) scale industries due to their unique properties like recover, ability to sink, soak up energy and experience stress reduction. When compared to Newtonian fluids, the complex viscoelastic fluids have an efficient strategy for tumbling turbulent skin friction in major-scale flows. Non-Newtonian fluids follow macroscopic properties that disregard our intuition. Hence the researchers are showing prominence to these flows. As a result plenty of papers on the special properties of this type of flows were published.

An exact solution for the flow of MHD viscoelastic fluid was given by Kumeresan and Vijay Kumar [1] in unsteady case. Nayak et al. [2] examined this flow surrounded by porous surface along with the existence of chemical reaction. Chowdhury and Islam [3] established and reported on viscoelastic fluid past an immeasurable plate with free convection model. Choudhury and Kumar Das [4, 5] analyzed the impact of heat and mass transfer on this flow under the occurrence of chemical reaction and radiation simultaneously. Chandra Reddy et al. [6, 7] analyzed thermal and solutal buoyancy impacts on this flow under varying suction and variety of parameters. Further the survey is done on the flows past inclined plates. Reddy et al. [8] discussed and concluded the mass transfer and heat source consequences on MHD flows through inclined porous vertical porous surface. Bhuvaneshwari et al. [9] analyzed exactly the radiative flow over an inclined plate under simultaneous heat and mass transfer. Rajput and Gaurav Kumar [10] considered mass diffusion and changeable temperature and analyzed this type flow. Srinivasa Raju et al. [11, 12] used finite element method to examine the nature of Casson viscous dissipative flows and then adding cross diffusion parameters.

The above literature shows that the analyses were done on viscoelastic fluids past vertical porous plates. Flows through inclined plates were considered on Newtonian fluids only. Hence we have chosen the flow of viscoelastic fluid past an inclined plate and examined its nature. The research paper of Nagaraju et al. [13] is taken into contemplation and extended. As the novelty of the work, the angle of inclination, impact of Dufour effect and heat generation effects are included.



Original Article

# Corrosion protection performance of titania nanoparticles filled poly(4-methyl-5-vinylthiazole) applied on mild steel in 3.5% sodium chloride solution

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I Pugazhenthii and  
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## Abstract

Mild steel materials have wide applications in marine construction, because they are low cost, available and easy to handle. However, they have to be protected from corrosive media by coating with polymer hybrid materials. This paper focuses on the anticorrosive properties of poly(4-methyl-5-vinylthiazole) PVTZ coatings on mild steel. Further the coating resistance is enhanced by incorporating Titania Nano particles ( $\text{TiO}_2$ NPs). The nanoparticles were evaluated using X-ray diffraction studies (XRD) and transmission electron microscopy (TEM). PVTZ and its  $\text{TiO}_2$  nanocomposite were coated on mild steel. Their anticorrosive behavior was analyzed by potentiodynamic polarization and electrochemical impedance spectroscopy in 3.5% (w/v) NaCl.

## Keywords

Vinyl polymer coatings, PVTZ/ $\text{TiO}_2$ , anticorrosive coatings,  $\text{TiO}_2$  polymers nanocomposites, polyvinyl thiazole

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# Hall Effects on MHD Rotating Nano Fluid Over a Moving Flat Plate with Radiation and Chemical Reaction



Pushpabai Pavar, L. Harikrishna, and M. Suryanarayana Reddy

**Abstract** In this manuscript, we have deliberated an unstable free convection stream of Nano fluid limited with a “moving vertical flat plate” through a porous medium in revolving framework with conditions of diffusion and convection and also bringing current of Hall into account. We acknowledged two kinds of Nano fluids: they are  $\text{TiO}_2$ -water and Ag-water. The governing equations would be illuminated analytically by utilizing the method of perturbation. Last, the impacts of different dimensionless factors on temperature, velocity, and concentration profiles along with Sherwood numbers, shear stress, and local Nusselt are deliberated with support of graphs.

**Keywords** Nano fluid · Rotation · Radiation · MHD · Chemical reaction

## 1 Introduction

The exchange of convective temperature in Nano fluids has various applications and participates in a critical part in engineering and sciences. They exist in almost each methodology that needs solar energy, exchange fluids of temperature (cooling or heating), and nuclear reactors and so on. Therefore, from previous years, the scientists of fluid dynamics have demonstrated an interest in the investigation of Nano liquids because of their requisitions in different fields. It may be the way that the usually utilizing liquids displays less “thermal conductivity” compared with the metals. Consequently, it will be needed to combine the metals and liquid expanding the heat exchange capacity of liquids. The “suspension of Nano-sized elements” in

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# Photostable electroactive polymer based nanocomposite films for the protection of mild steel from corrosion

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## Abstract

The deterioration of organic film due to chemical and UV attack is an increasing concern in paint technology. Thus, the development of new material for UV blocking anticorrosive film draws significant attention in materials science research. This can be achieved by the incorporation of wide band gap nanoparticles like titania (TiO<sub>2</sub>NPs) and zirconia (ZrO<sub>2</sub>NPs) in electroactive polymer namely poly(pyridine-4-yl-methyl) methacrylate-co-butyl methacrylate (poly(PyMMA-co-BMA)) film (hybrid film) for the protection of mild steel (MS) from corrosion. The TiO<sub>2</sub>NPs and ZrO<sub>2</sub>NPs in combination with polymer absorb more UV light which prevents the deterioration of film. The hybrid material made of poly(PyMMA-co-BMA) and wide band gap nanoparticles was prepared by *in situ* solution polymerization. The resultant hybrid materials were characterized by various techniques namely X-ray diffraction studies (XRD) and transmission electron microscopy (TEM). The hybrid materials were deposited as film on the MS by spin coating method. The anticorrosive performance of hybrid films was analysed out using potentiodynamic polarization and electrochemical impedance spectroscopy (EIS) studies. The surface examination of films were characterized with scanning electron microscope to confirm the formation of poly(PyMMA-co-BMA) and its different nanocomposite films on MS. The UV blocking studies were also carried out using UV-visible spectroscopy. The electrochemical and optical studies reveals that the poly(PyMMA-co-BMA)/TiO<sub>2</sub> film on MS in 3.5% (w/v) NaCl provides better protection against corrosion than ZrO<sub>2</sub> based nanocomposite hybrid film.

## Keywords

Polymer, nanoparticle, nanocomposites, UV protective coatings, anticorrosive coatings

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## Introduction

The protection of steel surface against corrosion in marine environment is typically done by using organic coatings. Nevertheless, degradation of organic coating takes place upon exposure to UV radiation on its coated surface. Hence, researchers are combining the inorganic nanoparticle with the organic polymer attributes to boost the anticorrosive properties and stability of organic coating materials.<sup>1–5</sup> Ammar et al. reported that the incorporated nano ZnO particles in the hybrid polymeric matrix had improved the hydrophobicity, anticorrosive and thermal properties of coating.<sup>2</sup> The inclusion of titanium dioxide nanotubes significantly enhances the thermal stability, corrosion and heat resistant ability of epoxy resin.<sup>3</sup> It is apparent that the addition of nanoparticles in polymers could improve the anticorrosive property of resultant organic hybrid coatings. According to Ramezanzadeh et al. the progress in corrosion protection performance of the organic hybrid coatings (epoxy based) can be explained with the following mechanism: first, well-dispersed nanoparticles within the polymeric matrix lead to improve the quality of coating by reducing the porosity and tortuousness in the diffusion pathways. Secondly, the inclusion of the nanoparticles strengthens the adherence of the cured epoxy on the surface of the substrate.<sup>6</sup>

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# Signal optimized rough silver nanoparticle for rapid SERS sensing of pesticide residues in tea

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## ARTICLE INFO

### Keywords:

Tea  
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## ABSTRACT

Trace detection of toxic chemicals in foodstuffs is of great concern in recent years. Surface-enhanced Raman scattering (SERS) has drawn significant attention in the monitoring of food safety due to its high sensitivity. This study synthesized signal optimized flower-like silver nanoparticle-(AgNP) with EF at 25 °C of  $1.39 \times 10^6$  to extend the SERS application for pesticide sensing in foodstuffs. The synthesized AgNP was deployed as SERS based sensing platform to detect methomyl, acetamiprid-(AC) and 2,4-dichlorophenoxyacetic acid-(2,4-D) residue levels in green tea via solid-phase extraction. A linear correlation was twigged between the SERS signal and the concentration for methomyl, AC and 2,4-D with regression coefficient of 0.9974, 0.9956 and 0.9982 and limit of detection of  $5.58 \times 10^{-4}$ ,  $1.88 \times 10^{-4}$  and  $4.72 \times 10^{-3}$  µg/mL, respectively; the RSD value < 5% was recorded for accuracy and precision analysis suggesting that proposed method could be deployed for the monitoring of methomyl, AC and 2,4-D residue levels in green tea.

## 1. Introduction

Green tea is one of the leading non-alcoholic beverage in the world on account of its unique flavor and benignant medicinal activities, conserve various phenolic compounds, carbohydrate, amino acids, vitamins and minerals which aids to cure cardiovascular diseases, gastritis and various types of cancers such as liver, lung, epidermal, breast, prostate and colon; it is produced after deactivating the tea polyphenol oxidase (a heat-labile enzyme) in plucked fresh young tea leaves by introducing steam or heat (Senanayake, 2013; Zhang, Feng, Alula, & Yao, 2017; Zhu et al., 2018). It has multifarious applications as raw material in different industries like beverage, confectionery, chocolate, pharmaceuticals, cosmetics, oil, meat and so on (Senanayake, 2013). Consequently, tea should be free from toxic heavy metals, pesticides and pathogenic bacteria as well. However, the cultivation of tea is in danger due to miscellaneous diseases, weeds, and pests, causing the use of insecticide, pesticide and herbicide are regular practice to eradicate them during cultivation and also post-harvest storage.

Methomyl (S-methyl- N-(methylcarbamoyloxy)thioacetimidate), an oxime carbamate insecticide, is recurrently employed against aphids, mites, coleoptera, diptera, and hemipteran, etc. to protect agricultural crop (Rahman et al., 2017). Acetamiprid (AC) is extensively applied neonicotinoid insecticide in agricultural land owing to low mammalian

and high insecticidal toxicity to control the growth of sucking and chewing pest (Ru-Yan et al., 2013). Whereas, 2,4-D, an organochlorine herbicide, is recurrently used to control the growth of broad-leaf weeds via the imitation of plant growth hormone auxin (Costa et al., 2009). They all are water soluble and typically choose water route to kill insects and weeds (Costa et al., 2017, 2009; Hassan et al., 2019a; Valencia-Quintana et al., 2016). However, AC and methomyl inhibit the catalyze activity of acetylcholinesterase (AChE) to cleavage the acetylcholine and other shorts of choline esters which acts as a neurotransmitter in the central nervous system; resulting in nerve or tissue signal transmission is interrupting which causes cell damage, hypersensitive reaction, autoimmune diseases and cancers in the body (Hassan et al., 2019a; Valencia-Quintana et al., 2016). Additionally, methomyl induces genotoxic effects such as micronuclei, sister-chromatid interchange and chromosome aberrations as well as instigates cytotoxicity through DNA damage (Guanggang et al., 2013; Valencia-Quintana et al., 2016). Meanwhile, 2,4-D treated as potential carcinogenic and mutagenic agent for the human being (Aziz et al., 2018). Methomyl has classified as a restricted insecticide by the US Environmental Protection Agency (US EPA) in 1978 (Van Scoy, Yue, Deng, & Tjeerdema, 2013). On the consideration of the toxic effect on humans, World Health Organization (WHO) has treated methomyl and 2,4-D as "highly hazardous" (Class Ib) and "moderately hazardous" (Class II)

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# Synthesis and photoluminescent characteristics of Sm<sup>3+</sup>-doped Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> phosphor hierarchical architectures

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## ARTICLE INFO

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## ABSTRACT

Highly uniform, petal-like, 3D-structured Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> phosphors were fabricated by facile wet chemical aqueous solution route. The production mechanism of Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> petal structure was optimized using XRD and SEM analysis grown under various temperatures and reaction times. Phase transition of Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> from the hexagonal to rhombohedral occurred with increasing reaction temperature. The Rietveld refinement based XRD phase analysis demonstrated the successful formation of monophase Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>. Later, Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> was doped with various amounts of Sm<sup>3+</sup> ions and with charge balance by Li<sup>+</sup> ions. Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>:Sm<sup>3+</sup>+Li<sup>+</sup> samples at 0.05 mol of Sm<sup>3+</sup> concentration displayed maximum luminescence intensity in response to 402 nm excitation. Increasing the Sm<sup>3+</sup> content over the 0.06 mol, emission quenching behavior was observed and it was explained by Dexter's theory. The chromaticity coordinates of the Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>:Sm<sup>3+</sup>+Li<sup>+</sup> phosphor material were calculated to be (0.5558, 0.4380), suggesting that it will be a potential yellow phosphor for use in W-LEDs in combination with blue LEDs chips.

## 1. Introduction

Metal phosphate-based materials have gained great attention in the industrial and scientific community due to their promising applications such as optoelectronics, sensors, supercapacitors, photocatalysts, lithium-ion batteries, and 3D printing [1–6]. Metal phosphates having the advantage of abundance, eco-friendliness, and cost-effectiveness and thus are emerging as a promising class of luminescent optical materials. Among alkaline earth orthophosphates, barium orthophosphate (Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>) is a vital phosphor material because of its good luminescence efficiency and color purity and combined with a low preparation temperature, stoichiometric, and friendly environmentally characteristics [7,8]. Moreover, with PO<sub>4</sub><sup>3-</sup> building unit it can be a good host matrix to accommodate a wide range of luminescent rare-earth ions.

A comprehensive review of the literature on the fabrication of Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> phosphors shows that Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> is a flexible host material with the ability to form visible-emitting phosphors doped with a selection of transition metal ions (e.g., Ni<sup>2+</sup>, Mn<sup>2+</sup>, Mn<sup>3+</sup>, Mn<sup>5+</sup>) [3,5,9],

single lanthanide ion dopants (e.g., Eu<sup>2+</sup>, Ce<sup>3+</sup>, Sm<sup>3+</sup>, Eu<sup>3+</sup>, and Tb<sup>3+</sup>) [10,11], and lanthanide co-dopant ions (e.g., Ce<sup>3+</sup>-Dy<sup>3+</sup> and Eu<sup>3+</sup>-Tb<sup>3+</sup>) [12,13] and to form infrared-emitting phosphors with the addition of Mn<sup>5+</sup> ions [3]. All these previously reported doped Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> materials were synthesized by a regular solid-state reaction (SSR) route, which has disadvantages of producing block-shaped particles with poor particle size distribution and defects, resulting in sub-optimal performance. In addition, the long sintering time and high-temperature in the SSR method significantly increase cost and several impurity phases in the product materials. To overcome these disadvantages of the SSR method, soft chemical synthesis methods such as sol-gel, precipitation, hydrothermal, and ion exchange syntheses [8,10,12–13] methods were developed.

Several wet chemical methods have attracted attention for preparing phosphors with well-controlled sizes and different shapes. Wet chemical methods offer uniform mixing of the precursor materials, low reaction temperature, and remarkable chemical homogeneity. For example, Cheng et al. successfully synthesized Eu<sup>2+</sup>- and Tb<sup>3+</sup>-doped Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>

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## Green synthesized AgNPs decorated on Ketjen black for enhanced catalytic dye degradation

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### Abstract

The green synthesis of nanoparticles using plant-based materials as an alternative to chemical and physical routes provides economic and environmental benefits. In the present study, silver nanoparticles (AgNPs) were fabricated using *Pseudocycdonia sinensis* fruit extract. The fabricated NPs were then decorated on commercial Ketjen black-300 (AgNPs@KB-300) and Ketjen black-600 (AgNPs@KB-600). The synthesized materials were characterized via XRD, FTIR, XPS, SEM-EDX, and HR-TEM studies. The SEM and HR-TEM results revealed that the synthesized AgNPs were spherical and successfully decorated on KB-300 and KB-600. Additionally, the catalytic ability of the synthesized samples during the degradation of methyl orange in the presence of NaBH<sub>4</sub> was studied. Notably, the catalytic activity of AgNPs@KB-600 was higher than that of AgNPs@KB-300.

**Keywords** Green synthesis · AgNPs · Ketjen black · Methyl orange · Catalytic activity

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# Facile One-Pot Decoration of SnO<sub>2</sub> Quantum Dots on the Surface of the Iron Phosphate Nanosheets for Enhanced Catalytic Decolorization of Methylene Blue Dye in the Presence of NaBH<sub>4</sub>

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## Abstract

Herein, a SnO<sub>2</sub> quantum dots (SQDs) @ FePO<sub>4</sub> nanosheets (FPNSs) was prepared by a simple procedure without additional instruments and characterized using XRD, FTIR, SEM, and TEM. SQD@FPNSs nanocomposite (FP-Sn) exhibited improved catalytic activity for the degradation of methylene blue (MB). Approximately 92% of the MB was successfully decolorized within 6 min using FP-Sn in the presence of NaBH<sub>4</sub>.

**Keywords** SQDs@FePO<sub>4</sub> · Nanocomposite · Methylene blue · Catalytic study

## Introduction

Water pollution by textile dyes has become a major environmental problem nowadays. Organic dyes are extensively used in the textile, paper, leather tanning, pharmaceutical, food, and cosmetic industries [1]. Especially, the textile and dyeing industries release a large amount of wastewater, which pollutes the environment and also adversely affects human health, aquatic organisms, animals, and plants [2]. Therefore, industrial wastewater treatment has received considerable attention as a clean environment is essential to life. Methylene blue (MB) is a cationic azo dye (molecular formula: C<sub>16</sub>H<sub>18</sub>N<sub>3</sub>SCl) widely

used in the paint, textile, paper, and printing industries and causes vomiting, eye burns, skin irritation, breathing hazards, mental disorders, hyperhidrosis, and severe central nervous system toxicity and ecological damage if discharged without proper treatment [3–5]. Therefore, the development of a simple and rapid method for the efficient degradation of dyes has attracted extensive attention. Nanocatalysts increase the catalytic degradation of organic dyes activity because their higher surface area [6].

Iron phosphate has been successfully used as a catalyst in the steel and glass industries [7], an electrode material for lithium batteries [8], and in water purification applications [9] due to its abundant resources, low price, eco-friendliness, high catalytic and electrochemical, properties and ion exchangeability [10, 11]. To date, among the various types of metal-oxide nanoparticles used for several applications, SnO<sub>2</sub> is the best material due to its significantly high conductivity, chemical stability, transparency [12] and wide application in Li-ion batteries [13], catalysts [14], gas sensors [15], optoelectronic devices [16] dye-sensitized solar cells [17], and energy-storage device applications [18]. Archita and Ahmaruzzaman [19] reported the catalytic reduction of p-nitrophenol using green synthesized SnO<sub>2</sub> quantum dots. Francis and Venugopal [20] synthesized SnO<sub>2</sub>-SiO<sub>2</sub> nanocomposite using rice husk extract. The synthesized nanocomposite showed high catalytic activity of rhodamine B (90%) and crystal violet (93%) in the presence of NaBH<sub>4</sub>.

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# Magnetic properties of (Mn, Al) doped SnO<sub>2</sub> nanoparticles: synthesis and characterization

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## ABSTRACT

Pure and (Mn, Al) co-doped SnO<sub>2</sub> nanoparticles were synthesized using coprecipitation method. Different concentrations of Mn (1, 3, 5 mol%) were doped into SnO<sub>2</sub> at 5 mol% constant concentration of Al. The X-ray diffraction (XRD) studies revealed the formation of single tetragonal rutile-type phase in pure and (Mn, Al) doped SnO<sub>2</sub> nanoparticles. The particle sizes were in the range of 20–30 nm, as calculated from the XRD data. Raman studies revealed that the pure and (Mn, Al) doped SnO<sub>2</sub> nanoparticles have active modes at 150 (B1g), 306 (Eu), 476 (Eg), 625 (A1g) and 776 cm<sup>-1</sup> (B2g) corresponding to tetragonal rutile-type phase SnO<sub>2</sub>. The SEM micrographs show that the surface morphology of samples was formed by non-uniform spherical in shape particles. The chemical composition of samples was analyzed by EDAX spectra analysis. The presence of Sn<sup>4+</sup>, Al<sup>3+</sup>, O<sup>-2</sup> and Mn<sup>2+</sup> ions was confirmed in the prepared samples. The observation of TEM micrographs confirmed the non-uniform spherical shape surface morphology of nanoparticles and their sizes about 20–30 nm. The UV–VIS absorption spectra show absorption edge at ~ 320 nm, whereas the photoluminescence spectra show the emission peaks at 419, 420, 442, 445 and 462 nm under the excitation at 350 nm. The vibrating sample magnetometer shows diamagnetic nature for pure SnO<sub>2</sub> and Ferro magnetism for co-doped SnO<sub>2</sub> samples. The ferromagnetism increased in (Mn, Al) co-doped SnO<sub>2</sub> samples at higher Mn concentrations.

## 1 Introduction

Diluted Magnetic Semiconductors (DMS) doped with transition metals (TM) are suitable materials for spintronics applications. These are examined intensively due to their sole properties and novel

applications at high temperatures (T<sub>c</sub>) [1]. The room temperature ferromagnetism (RTFM) in various TM doped oxides such as SnO<sub>2</sub> [2–4], ZnO [5, 6] and TiO<sub>2</sub> [7, 8] was studied. Among these, Tin dioxide (SnO<sub>2</sub>) is an n-type semiconductor, it has wide band gap (3.6 eV) and pronounced potential in spintronics

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## Heat transfer over a stretching porous surface on a steady MHD fluid flow

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### ABSTRACT

In clinical and medical research the magnets are extremely important to create three-dimensional images of anatomical and diagnostic importance from nuclear magnetic resonance signals. The steady MHD convective flow of viscous nano-fluid is brought about by a permeable exponentially extending surface has been discussed in this chapter. Water is considered as base fluid, while nanoparticles comprise Cu and Al<sub>2</sub>O<sub>3</sub>. Fluid is electrically conducting subject to applied magnetic field with constant strength. Similarity transformations, to an ordinary differential condition, minimise the non-linear partial differential equations governed the flow with convective boundary conditions. Convergence of the solutions is obtained. A parametric study of the physical parameters for velocity and temperature is carried out and the local shear stress and Nusselt number near plate are shown graphically along with a set of statistical results.

### ARTICLE HISTORY

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### KEYWORDS

MHD nanofluid;  
exponentially extending  
sheet; porous medium;  
convective limit conditions

### 1. Introduction

In recent years, the new production of heat transfer fluids, in the heating systems, fields, heat transfer systems and automotive cooling applications, has been recognised as brilliant thermal performance of nanoliquids. Various benefits of the use of nano-liquids include increased heat transfer, decrease in the heat flow process, microchannel cooling and framework reduction. From an earth-shattered perspective, the flow boundaries and heat transmission across a stretching sheet are significant, both from a theory of fluids on applications in the polymer sector, paper manufacturing, food and crystal production for the perfect quality of the finished products. El-Kabeir, El-Hakim, and Rashad (2008) discussed the unsteady 3-dimensional, laminar, viscous boundary layer flow of a deliberated permeable surface implanted on a porous medium with a uniform attractive field of activity and effects on generation/absorption effects. In the sense of a vertical container, inserted into a thermally stratified liquid nano-plunge submerged in a non-Darcy permeable medium, Rashad, Abbasbandy, and Chamkha (2014) investigated a non-flattered surface with standard convection boundaries. Chamkha, Rashad, and Al-Meshaiel (2011) found flim, laminar, warmth layer flow and mass transfer of nano-liquids on a flat plate under the uniform transversal magnetic fields, liquefying and heat generation/absorption effects.

In view of the heat and mass transfer effects with the external radiation, Bakier, Rashad, and Mansour (2009) have reactivated a problem of hydromagnetic warmth through a mixed convection along the vertical plate in a fluid through a permeable medium. Rashidi et al. (2012) have investigated the viscous, laminar-mixed convection boundary layer over a plane with a chemical response. Rashidi et al. (2016) have examined the peristaltic waves on MHD blood flow of nano-liquid. Stagnant point flow through an MHD-impacted penetrative stretching sheet,

using a gradual linearisation process, is investigated by Bhatti, Abbas, and Rashidi (2018). Shahmohamadi and Rashidi (2016) discussed a new analytical approach has been performed by using both similarity transformation and variational iteration method on the silver, copper, copper oxide, titanium oxide and aluminium oxide nanofluids flowing through a rotating channel with lower stretching porous wall under the squeezing MHD flow conditions. Rashidi, Abelman, and Freidooni Mehr (2013) examined the investigation of the second thermodynamic law related to an electrically conducting incompressible nanofluid over a porous rotating disc in the presence of an externally applied uniform vertical magnetic field. Krishna and Chamkha (2019) discussed the MHD squeezing flow of a water-based nanofluid through a saturated porous medium between two parallel discs, taking the Hall current into account. Nadeem, Ahmad, and Muhammad (2020) discussed the impact of heat transport phenomenon in a ferrofluid via magnetic dipole. Khan, Nadeem, and Muhammad (2020) investigated the heat transfer rate and the fluid flow of a micropolar fluid along with temperature-dependent transport properties in the presence of heat generation. The microvascular blood flow, with heat and mass transfer in complex wavy microchannel modulated by electro-osmosis, has been discussed by Nadeem, Kiani, et al. (2020). Ahmad and Nadeem (2020a) investigated that the chemical reaction and entropy generation in mixed convection MHD hybrid nanoliquid flow across a porous medium containing Hall and ion slip currents. The nanomaterial flow of micropolar fluid in rotating frame and the SWCNT and MWCNT are taken with the base fluid, namely pure water into account to analyse the flow behaviour over stretching surface, as discussed by Nadeem, Abbas, et al. (2020). Ahmad and Nadeem (2020c) investigated a simplified mathematical model in the current analysis to review the Casson hybrid nanofluid through a lubricated sur-

## Heat generation and Chemical reaction impact on MHD Rotating flow past a Vertical Porous plate

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**Abstract:** The purpose of this article is to examine the second-grade fluid MHD rotary stream past the imprudently flowing porous upward platter with the impact of warm and chemical reactions. The dimensionless controllers are paired with nonlinear configurations for analytical consequences, calculated by the method of finite differences. The speed, temperature and concentration profiles are expressed graphically, whilst the skin friction, Nusselt, and Sherwood numbers are offered in an understandable form for momentous flow parameters. Thermal radiation and warm dissemination both are thundering the boundary layer area help to increase the fluid temperature. Mass distribution continues to maximize concentration across the whole border region. The pivot and fluid parameter of the second grade appear to boost in x and z directions. The velocity, temperature and concentration outlines are built in particular for different control boundaries. Hartman Number (M2), Heat Source (Q0), Thermal Radiation Parameters (N), Thermal Grashof (Gr), Mass Grashof (Gc), Prandtl (Pr). The thermal boundary layer thickness is indicated to be substantially increased if the content of the Dufour number is expanded. The existence of a chemical reaction enhances the mass transfer rate, the optimal consequence of the organisms' progression.

**Keywords:** Chemical reaction, MHD, Finite difference method, Porous plate, Heat source.  
MSC 2020 No.:76W05, 76M55, 76D05, 76S05

### 1. Introduction

Non-Newtonian fluids are commonly employed in a variety of scientific, biological, medical, agricultural, etc. The equations of Navier-Stokes are scarce in the analysis of non-Newtonian liquids owing to the nonlinear interaction between stress and strain rate; thus, the rheological models used for Navier-Stokes equations are different. MHD is the synthesis of magnet fields and fluids, MHD fluxes exist in ionosphere generators, sun and electricity generators, etc. Special hydromagnetic effects are essential for the analysis of non-Newtonian fluids. The analysis of fluids of non-Newtonian nature under a heat source or sink control has numerous applications such as chemical refining, nuclear plants, electric conductions and cooling. The radiation influence of free convection flow was exposed by Chamka, A.J. et al.[3], past a semi-unbounded upward platter with mass transfer. Ganesan, P. et al. [4-8] examined the expected convection effects of heat and mass propagation on the pulsed inclined plate. K. VB kumar et al. [9] studied the steady MHD Casson In the presence of Soret Ohmic heating and the viscous dissipative fluid stream, Hall and Ion-slip currents move an unbounded upward porous layer. Summary Nandita et al. [10] possessed In Hall current and rotation the unstable Free movement of convective MHD going past a porous vertical platform with periodic movement and slipping age. B. R. Sharma et al. [12] The MHD movement, heat and mass transfer was researched by under the influence of radiation, chemical reaction and heat production or absorption effects in permeable revolving vertical cones. M. Veera Krishna et al.[17] has examined MHD Spinning Flow Heat and Mass transmission of Second Grade Fluid, and has passed an Infinite Square in Uniform Permeable object with Hall Results.

In the application of geophysics, petrochemistry, meteorology, oceanography and aeronautics, the principle of fluid movement and mass transmission via a porous object in revolving atmosphere plays an important part. The stimulus for scientific studies on the rotating fluid system is primarily extracted from geophysical applications and fluid engineering. The rotational flow principle shall be used to calculate fluid viscosity, rotor shape and other centrifugal machinery. The fluid flow issues in rotating media have brought many researchers to focus on who has studied the hydrodynamic flux of viscous and incompressible fluid in a rotating medium in various ways. F. The chemical reaction results of an MHD spinning fluid were explored by Mabood et al. [11]



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## [Improving knowledge and competency of students in higher educational institutions by employing Lean Six Sigma model](#)

by N. Mallikharjuna Rao; Sasidhar Choragudi; Samhitha Nuka; Ashritha Nayana Orampati  
*International Journal of Six Sigma and Competitive Advantage (IJSSCA), Vol. 12, No. 2/3, 2020*

**Abstract:** The Lean Six Sigma (LSS) is a technique that comprises collective team effort to improve performance by thoroughly erasing unwanted phases and tumbling variation in higher education institutions (HEIs). The study proposed lean model to critically evaluate for improving the efficiency and effectiveness of higher education institutions. The study mainly focuses on students to improve their knowledge and competency in respective domain/field of engineering and also explore the fundamental issues, barriers and critical success factors by employing LSS in the education scenario. At the end of the study is to understand the role of tools and techniques for the sustainability of this inventiveness for improving the education system more efficient and effective.

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**Outcome-based education: a paramount model for higher educational Institutions in India**  
 by N. Mallikharjuna Rao; Sasidhar Choragudi  
*International Journal of Continuing Engineering Education and Life-Long Learning (IJCEELL), Vol. 31, No. 4, 2021*

**Abstract:** In the year 2014, India became a full member of the Washington Accord that facilitates for accreditation process in engineering education system with desired policies and procedures. It signifies that our accreditation process in the engineering institutions is in full conformity with the requirements of the Washington Accord with the outcome-based education. This study supports to determine the challenges in the present engineering education and discusses the outcome-based education implementation in engineering institutions. At the end, this study reviewed the assessment approaches.

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# Seasonal forecasting of mobile data traffic in GSM networks with linear trend (/articles/jase-202009-23-3-0011)

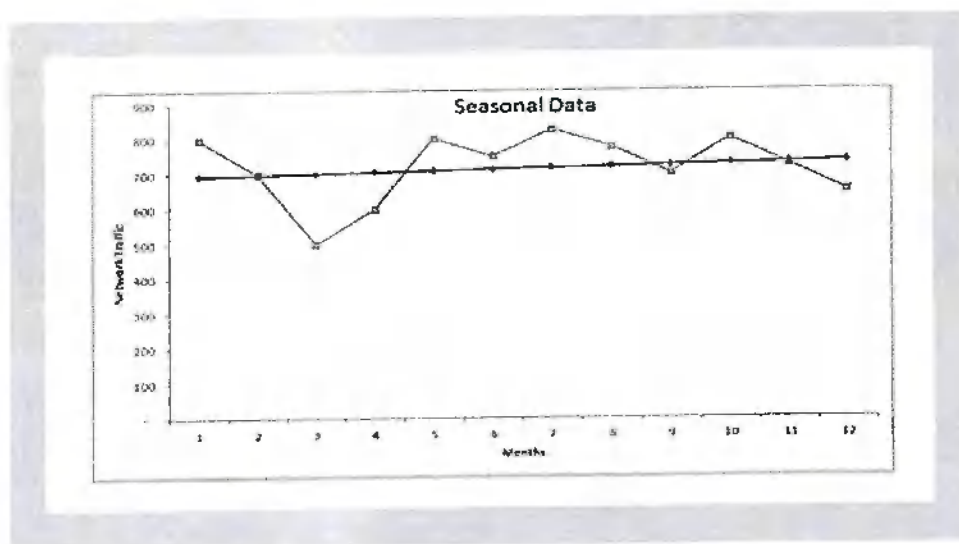
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Computer Science and Information Engineering (/articles/categories/computer-science)

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Seasonal Data of Users with Linear Trend.

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## ABSTRACT

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# Enhancement of Degraded Images via Fuzy Intensification Model

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Chapter

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## Abstract

The poor conditions of weather dust substantially reduce the overall quality of both the images taken, thus preventing useful image data from is being detected. A simple membership function is used in the proposed technique to set the pixels of a given channel to the range of zero to one, fluctuating intensifying operators applied according to various threshold and a new adjustment method designed specifically for this technology. Fuzzy theory provides a major issue—solving method between classical mathematics accuracy and the real world 'is inherent imprecision. Fuzzy logic addresses the study of potential logic or several valued logics; instead of specified and accurate rationale, it applies approximation. This research aims to check the processing capability of the method proposed, whereby the findings acquired are able to filter the numerous degraded images.

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