

Wang-OSO₃H catalyzed one-pot sonochemical synthesis of 1,2,4-benzothiadiazine-1,1-dioxide derivatives: Their *in silico* / *in vitro* assessments against *MtbCM*[☆]

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ABSTRACT

The sonochemical synthesis, *in silico* assessment and *in vitro* *MtbCM* inhibitory activities of a series of 1,2,4-benzothiadiazine-1,1-dioxide derivatives are described. These compounds were synthesized via a one-pot two-step sonochemical method involving the Wang-OSO₃H catalyzed reaction of 2-aminobenzenesulfonamide with aldehydes followed by treatment with NaHSO₃ in the same pot. The reaction proceeded at room temp in pure water affording the desired products in good yields. The use of heterogeneous catalyst, common oxidant, water as a solvent and ultrasound as the source of green energy in addition to the mild conditions, shorter reaction time and simple operational procedure are the key features of this methodology. *In silico* studies suggested that most of the synthesized compounds interacted with the external surface pockets of the *MtbCM* (PDB: 2FP2) active site cavity. Indeed, a curved loop site was noted where these compounds were binding and aligned. Three compounds e.g. **3c**, **3d** and **3e** interacted well with *MtbCM* via the -NHSO₂- moiety of their 2H-benzo[e][1,2,4]thiadiazine-1,1-dioxide ring showing a common H-bond with SER70. They also showed good (55–63%) inhibition of *MtbCM* *in vitro* when tested at 10 μM. According to the SAR study a 4-substituted phenyl ring was preferred over a 3- or 2-substituted phenyl moiety at the C-2 position and the 4-MeOC₆H₄ substituent at this position was most effective in terms of activity. On the other hand, mediocre to low activity was observed when a heteroaryl ring or the bulky 2-naphthyl moiety was present at the C-2 position. Based on *in silico* and *in vitro* studies along with the ADME predictions the 1,2,4-benzothiadiazine-1,1-dioxide derivatives **3c**, **3d** and **3e** emerged as pre-hits for further pharmacological evaluations.

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1. Introduction

Benzothiadiazines belong to the bicyclic heteroarene class of compounds containing two different types of heteroatoms such as nitrogen and sulfur as part of the heteroarene ring. Particularly, the 1,2,4-benzothiadiazine-1,1-dioxide that can exist in two tautomeric forms, e.g. **A** and **B** (Fig. 1) has been found to be integral part of many bioactive agents [1] including the well-known antihypertensive drug chlorothiazide **C** (or Diuril) and antihypoglycemic drug diazoxide **D** (or Proglycem). Besides, compounds containing this framework has also been explored as potential antitubercular agents when the oxazolidinone and furan conjugated 1,2,4-benzothiadiazine-1,1-dioxides exhibited encouraging antitubercular activities against *Mycobacterium tuberculosis* (*Mtb*) H37Rv strains [2,3].

Notably, the disease tuberculosis (TB) is continuing to be one of the serious concerns to the global human health and nearly 10% of the TB related deaths occurred due to the resistant strains of *Mtb* [4]. The situation has been complicated further by the drug-resistant TB or DR-TB including the multidrug resistant TB or MDR-TB [5]. While drugs such as levofloxacin, bedaquiline, clofazimine, delamanid, linezolid and amikacin are currently in patients use [6] several of these drugs often show some toxic side effects [7].

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Abbreviations: Wang-OSO₃H, Sulfonic acid-functionalized Wang resin.

[☆] Dedicated to Professor Dr. Kamakhya Prasad Guha (Chemistry Department, Krishnath College, Berhampore, West Bengal, India) on the occasion of his 77th birthday (January 1, 1946).

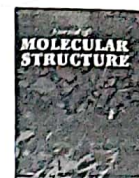
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N-Unsubstituted 1,2-benzothiazine 1,1-dioxides: Pd-catalyzed one-pot sonochemical access and *in silico* / *in vitro* evaluation against *Mtb*CM

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ABSTRACT

The Pd-catalyzed one-pot sonochemical synthesis followed by *in silico* and *in vitro* evaluation of a range of N-unsubstituted 1,2-benzothiazine 1,1-dioxide derivatives is reported. The synthesis involved ultrasound assisted coupling-cyclization of 2-iodobenzenesulfonamide with terminal alkynes in the presence of (PPh₃)₄Pd, CuI, ZnCl₂ and Et₃N to afford the expected products in 73-80 % yield. This is the first example of accessing N-unsubstituted 1,2-benzothiazine 1,1-dioxides via Pd-catalyzed coupling-cyclization strategy in a single pot. Moreover, the use of mild conditions and ultrasound as the source of green energy are the main features of this approach. *In silico* studies suggested that all the synthesized compounds interacted with the loop near the active site of *Mtb* chorismate mutase or *Mtb*CM. Indeed, these compounds showed H-bonding with residues in the hinge region of the active site loop and the benzothiazine 1,1-dioxide moiety was responsible for H-bonding with GLU68, SER70 and GLY71 residues. Three compounds e.g. 3d, 3e and 3f interacted well with *Mtb*CM via the aforementioned H-bonds and their orientations seemed to be influenced considerably by the effective non-H-bond interactions with LEU65 and PRO66. They also showed encouraging (54-62 %) inhibition of *Mtb*CM *in vitro* when tested at 10 μM. The outcome of *in silico* and *in vitro* studies along with the ADME predictions identified compound 3c, 3d and 3e as pre-hits for further pharmacological study.

1. Introduction

Compounds containing the 1,2-benzothiazine 1,1-dioxide (also called benzosultam) framework have attracted particular attention in the discovery and development of non-steroidal anti-inflammatory drugs (NSAIDs) such as oxicams (Fig. 1) [1]. However, this framework has also attracted attention in the identification of antimicrobial agents [2] and some of which showed promising activities against certain Gram-positive as well as Gram-negative species [3]. In a separate study the oxicams e.g. piroxicam and meloxicam have been suggested to be potential inhibitors of the *Pseudomonas aeruginosa*, an opportunistic human pathogen and a common Gram-negative bacterium in hospital-acquired infections [4]. All these reports prompted us to explore this framework for the identification of possible anti-tubercular agents. While the anti-tubercular properties of 1,2-benzothiazine 1,

1-dioxide derivatives are not known, a benzothiazinethione derivative has been identified as a potent preclinical candidate for the treatment of drug-resistant tuberculosis [5].

The disease tuberculosis (TB) though preventable and curable is continuing to be one of the serious concerns to the global human health. Nearly 1.6 million people died because of TB (including 187 000 people with HIV) in 2021 [6] and hence TB has become the second leading killer after COVID-19. The data suggest that 10 % of the TB related deaths occurred due to the resistant strains of *Mtb* (*Mycobacterium tuberculosis*) [7]. The situation has been complicated further by the drug-resistant TB or DR-TB including the multidrug resistant TB or MDR-TB [8]. Currently, a number of drugs such as levofloxacin, bedaquiline, clofazimine, delamanid, linezolid and amikacin are being prescribed for the treatment of drug-resistant tuberculosis [9]. However, usage of these drugs has been reported to be associated with some

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Design, synthesis and *in silico* docking techniques of new 1,2,3-triazolylpyrrolidines bearing chalcone derivatives: Discovery of potent antitubercular agents

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ABSTRACT

Compounds with a pyrrolidine scaffold play an important role in organic synthesis and especially in the synthesis of bioactive organic compounds, therefore, the development of new methods for modifying this scaffold is a very interesting framework of this study. We developed a rational approach for the synthesis of 1,2,3-triazolylchalcone substituted pyrrolidines derivatives, which were then examined using a variety of spectroscopic techniques such as ¹H NMR, ¹³C NMR, FT-IR, mass spectroscopy and elemental analysis. Biological profiles showed that compounds 5e, 5h had better antibacterial inhibitory potency against *S. aureus*, *E. coli* with zone of inhibition 34 ± 0.1, 33 ± 0.3 mm, whereas 5a, 5e showed potent antifungal activity against *C. parapsilosis*, *A. flavus* with diameter zone of inhibition 26 ± 0.2, and 30 ± 0.2 mm respectively. Among the tested compounds 5b, and 5h were the most potent antitubercular activity against *Mycobacterium tuberculosis* H₃₇Rv and showing MIC values 5.23 µg/mL, 6.85 µg/mL respectively, which are similar activity that of the standard Streptomycin (MIC = 5.02 µg/mL). The binding mode for compound 5 inside the catalytic pocket of *M. tuberculosis* cytochrome P450 CYP121A1 and produced a network of hydrophobic and hydrophilic interactions (6GEO). From docking results, 5b demonstrated highly stable binding amino acids SerA:237, ArgA:386, ArgA:286, CysA:345, MetA:62, GlnA:385, AspA:282, PheA:280, LeuA:284, ValA:83, ProA:285, AlaA:337, HisA:343, AsnA:74, and ThrA:65, which are plays a crucial role in ensuring efficient binding of the ligand in a crystal structure of tubercular receptor. Furthermore, the physicochemical and ADME (absorption, distribution, metabolism, and excretion) filtration molecular properties, estimation of toxicity, and bioactivity scores of these scaffolds were evaluated.

Introduction

Tuberculosis (TB) is a preventable and usually curable disease. Yet in 2022, TB was the world's second leading cause of death from a single infectious agent, after coronavirus disease (COVID-19), and caused almost twice as many deaths as HIV/AIDS. More than 10 million people continue to fall ill with TB every year, a number that represents an

increase for the first time in over a decade by the World Health Organization as one of the main causes of mortality and morbidity globally. [1,2] Without renewed efforts and commitment to improving TB treatment, the global impact of this ancient disease will continue to expand. According to the Global Tuberculosis Report 2018, it is the most common infectious disease and its prevalence is higher than that of HIV/AIDS. [3] Multidrug-resistant tuberculosis (MDRTB) and extensively

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Deep Neural Networks Using Event Profiles Based on Cyber Threat Detection

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ABSTRACT

One of the major challenges in cybersecurity is the provision of an automated and effective cyber-threats detection technique. In this paper, we present an AI technique for cyber-threats detection, based on artificial neural networks. The proposed technique converts multitude of collected security events to individual event profiles and use a deep learning-based detection method for enhanced cyberthreat detection. For this work, we developed an AI-SIEM system based on a combination of event profiling for data preprocessing and different artificial neural network methods, including FCNN, CNN, and LSTM. The system focuses on discriminating between true positive and false positive alerts, thus helping security analysts to rapidly respond to cyber threats. All experiments in this study are performed by authors using two benchmark datasets (NSLKDD and CICIDS2017) and two datasets collected in the real world. To evaluate the performance comparison with existing methods, we conducted experiments using the five conventional machine-learning methods (SVM, k-NN, RF, NB, and DT). Consequently, the experimental results of this study ensure that our proposed methods are capable of being employed as learning-based models for network intrusion-detection, and show that although it is employed in the real world, the performance outperforms the conventional machine-learning methods.

INTRODUCTION

With the emergence of artificial intelligence (AI) techniques, learning-based approaches for detecting cyberattacks, have become further improved, and they have achieved significant results in many studies. However, owing to constantly evolving cyberattacks, it is still highly challenging to protect IT systems against threats and malicious behaviors in networks. Because of various network intrusions and malicious activities, effective defenses and security considerations were given high priority for finding reliable solutions [1], [2], [3], [4]. Traditionally, there are two primary systems for detecting cyber-threats and network intrusions. An intrusion prevention system (IPS) is installed in the enterprise network, and can examine the network protocols and flows with signature-based methods primarily. It generates appropriate intrusion alerts,

called the security events, and reports the generating alerts to another system, such as SIEM. The security information and event management (SIEM) has been focusing on collecting and managing the alerts of IPSs. The SIEM is the most common and dependable solution among various security operations solutions to analyze the collected security events and logs [5]. Moreover, security analysts make an effort to investigate suspicious alerts by policies and threshold, and to discover malicious behavior by analyzing correlations among events, using knowledge related to attacks. A learning-based method geared toward determining whether an attack occurred in a large amount of data can be useful to analysts who need to instantly analyze numerous events. According to [10], information security solutions generally fall into two categories: analyst-driven and machine learning-driven solutions. Analyst-driven

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Audio to Sign Language Translator Using Python

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Abstract:


This project is based on converting the audio signals receiver to text using speech to text API. Speech to text conversion comprises of small, medium and large vocabulary conversions. Such systems process or accept the voice which then gets converted to their respective text. This paper gives a comparative analysis of the technologies used in small, medium, and large vocabulary Speech Recognition System. The comparative study determines the benefits and liabilities of all the approaches so far. The experiment shows the role of language model in improving the accuracy of speech to text conversion system. We experiments the speech data with noisy sentences and incomplete words. The results show a prominent result for randomly chosen sentences compared to sequential set of sentences.

1. Introduction:

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comparative study determines the benefits and liabilities of all the approaches so far. The experiment shows the role of language model in improving the accuracy of speech to text conversion system. We experiments the speech data with noisy sentences and incomplete words. The results show a prominent result for randomly chosen sentences compared to sequential set of sentences.

Text to sign language conversion is mainly focused on communication between ordinary people and ordinary people and deaf-mute people. Sign language paves the way for deaf-mute people to communicate. Sign language is a visual language that is used by deaf and dumb as their mother tongue. It is figure out about 240 sign language have exist for spoken language in the world. Sign language is a type of language that uses hand movements, facial expressions and body language to communicate. It is used by the people who are deaf and people who can hear but cannot speak. The Conversion system consists of following steps:-


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Full Length Research Paper

Land Use Land Cover and Significance in Ground Water Dynamics in and around of Shaikpet Division, Hyderabad, Telanagana, India.

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In the present scenario rapid changes were observed in land cover by different land use patterns in globally, the land use and land cover is the major dynamics to developing countries and developing cities, and to understand the urbanization impact on the resources in any region, the study area in and around of Shaikpet, It is a division of the metropolitan city Hyderabad district, Telanagana state, which has experienced a rapid urbanization changed the community activities as well as rural to urban establishments within a span of two decades, the study objectives are investigate the land use and land cover pattern and water quality taking in to consideration of watershed areas in the study area shaikpet with remote sensing and GIS technology, As the land use land cover change detection using Resources at -LISS IV satellite data is further used for application in observing the significance of ground water dynamics of the study area, the water samples are collected from different sampling stations, and analysed in the laboratory as per the methodology to find out the physic chemical and biological parameters, the results reveals that EC and TDS concentrations are exceeded the permissible limits and coli form bacteria are observed in the surface water samples in the study area. The ph levels are in the permissible range as per the WHO standards in the study are, turbidity indicates the dissolved and suspended solids in the water, turbidity, electrical conductivity, TDS levels are high in the water samples, colour of the water is in pale red indicated as brackish water due to addition of suspended solids and also nitrate concentrations are high indiated that contamination if water in the study area. Based on the water quality analysis the surface water has been contaminated due to direct discharge of municipal sewage in to fresh water bodies, hence it need the treatment of water before consumption Trends of changing cropland in the research region to agricultural plantations, built-up areas for habitations, and much of the land is left as open scrub are identified.

Introduction

Surface waters could be regarded as including all inland waters permanently or intermittently occurring on the earth surface in either liquid (rivers, temporary streams, lakes, reservoirs, bogs) or solid (glaciers, snow cover) condition. Surface waters play a very important role in economics and the functioning of ecosystems (Gummadi et al., 2014). The water quality can be assessed by biological, chemical and physical parameters. These parameters are considered for the analysis purpose of water quality such as biochemical and dissolved oxygen, pH, faecal coli form, temperature, taste, odour, etc. (Prasad et al., 2013). It has advantages for both the humans and the environment. The Anthropogenic pressures of population, over consumption, and technology leads to nature imbalance or degradation of the biophysical environment. Land use/land cover of a particular area is essential for study, to understand the planning and management strategies for resources and to understand their availability in the study area. To meet the growing demands for basic human needs and welfare of them., To make the land use and land cover maps using integrated approach of remote sensing and geographical information system. Land cover is the physical characteristics of the earth's surface, captured in the sharing

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Generation of Land use Land Cover Map and its Significance in Ground Water Dynamics: For Part of Hyderabad City

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Abstract: *With focus on the impacts of urbanization on the groundwater, land use land cover mapping, an important central component, provide strategies for monitoring and managing natural resources. Land use land cover is the major dynamic process in developing countries and developing cities, where urbanization cause land degradation thereby increases in management of water resources for growing urban population. Shaikpet is part of Hyderabad city, which has experienced a rapid urbanization and turned from rural community to urban establishment within a span of two decades. The study aims at investigating the dynamics of land use land cover over the water quality monitoring for a period of five years 2015 to 2020 taking in to consideration of the watershed area were Shaikpet is geographically located. As the land use land cover, change detection using RESOURCESAT –LISS IV satellite data is used for application, in observing the significance of ground water dynamics of the study area by taking water sampling and its analysis. Water samples collected at nine different locations and analysis has been done for testing physical, biological and chemical properties of the samples.*

Keywords: Remote sensing, land use landcover, GIS, ArcGIS, Water Sampling, Drainage

1. Introduction

Although the terms "land use" and "land cover" are frequently used interchangeably, each term has a distinct definition. The term "land cover" describes the material that covers the surface of the ground, vegetation, urban infrastructure, water, bare soil, etc. Land cover identification creates the baseline data for tasks like thematic mapping and change detection analyses. The term "land use" describes the function that a piece of land performs, agriculture, wildlife habitat, or recreation.

When the terms "Land Use" and "Land Cover" are used combined, they refer to the grouping or classification of human activities and natural elements on the landscape throughout a certain period of time using recognised scientific and statistical methods of analysis of pertinent source materials. Change detection is a crucial stage in keeping track of urban development. It enables quantitative examination of the area of interest's spatial distribution.

1.1 Study area

Telangana is a state in India, and Hyderabad is its capital and most populated city (17°21'42"N 78°28'29"E). With 9.7 million people living in the municipal zone and 6.9 million people living within the city limits, Hyderabad is India's fourth - most populated city and the sixth - most populous metropolitan area, 2011 Census of India. Hyderabad has the fifth - largest economy in India, with a GDP of \$74 billion. Shaikpet area is geographically located

1.2 Study Objectives

To prepare the digital thematic maps namely Base map, Transport network map, Land use/ Land cover, Drainage map etc. using satellite data, collateral data and field data on

ARC/INFO GIS platform. This constitutes the spatial database.

2. Conventional approach of LULC Mapping

The traditional method of gathering LULC data in the nation has been compilation from revenue records by the Directorate/Bureau of Economic and Statistics (DES/BES) of the relevant states. A nine - fold classification system is available for the land use data that was "derived" from the individual plot - level agricultural inventory. Without any mention of spatial locations, these data are provided as statistical records. Another source of LULC data is Survey of India's topographical maps, which provide very broad land use classifications that were plotted mostly from ground data at scales between 1: 50, 000 and 1: 25, 000. However, this data on land use does not reflect the state of land use today or any recent changes.

2.1 Remote Sensing based Approach

The development of remote sensing, primarily accomplished through aerial photography, resulted in the mapping of land cover. Due to the advantages it provides (wide area coverage, frequent revisits, multispectral, multisource, storage in digital format to facilitate subsequent updating, compatibility with GIS technology), remote sensing technology has proven to be a very useful and affordable method for an accurate classification of land cover. The parameters of land cover information produced by remote sensing data are determined by a number of crucial factors.

There isn't a single best category for describing land use and cover, and it's unlikely that one could ever be created. Even when an objective numerical approach is utilised, there are various points of view in the classification process, and the process itself has a tendency to be subjective. Given that patterns of land use and land cover fluctuate to meet

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Optimal placement of time-varying distributed generators by using crow search and black widow - Hybrid optimization

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ABSTRACT

This paper focuses on the optimal reorganization of radial distribution system (RDS) and the superlative location of time-varying power generation distributed generators, considering time-varying loads. The electric generators, utilizing non-conventional energy sources, are directly connected to the distribution grids with lower ratings compared to conventional source-driven generators. In this study, a combination of optimization techniques, such as the black widow and crow search techniques, is employed to enhance performance in terms of optimal reorganization and superlative location of distribution generation. The reorganization problem is examined and analyzed by considering various scenarios in a standard 69-bus grid, as well as in larger-scale 119-bus and 135-bus systems, with and without the presence of distributed generation resources. The analysis of the proposed optimization techniques with the obtained results is well discussed in this paper.

1. Introduction

Global warming has prompted the world to shift towards pollution-free sources of electricity generation. While small generators are insufficient to meet the high demand for power, larger power plants have their limitations [1–6]. However, factors such as increasing consumption, geographical limitations in power transmission, advancements in power electronic technologies, restructuring of the power industry, and environmental concerns have led to a reevaluation and utilization of distributed generators in the power generation sector. Distributed generation (DG) refers to electric energy generation units with capacities of less than 10 MW, connected to the grid at distribution feeders or customer levels [1].

Connecting DG to the distribution grid can have advantages and disadvantages, depending on the capacity and location of the resources [7]. The DG alters the power flow in the distribution grid, which affects the grid's overall performance. The existing grid structure may no longer be optimal for loss reduction in the presence of DG, necessitating grid reorganization to optimize costs and improve grid reliability [8].

Distribution feeder reconfiguration (DFR) is commonly performed through switch management in the distribution grid to reduce losses and enhance reliability. The reconfiguration process involves adjusting the status of switches to achieve specific objectives. Several constraints must be considered during the reorganization process, including maintaining the radial structure of the grid, supplying all loads, preserving node voltage within specified limits, and ensuring line loading [9]. The DFR is a nonlinear and non-convex problem, making traditional mathematical techniques unsuitable due to limitations related to objective functions and constraints, such as discontinuity and differentiability. While numerous studies have been conducted on distribution grid reorganization, many have not thoroughly examined the impact of DG on grid operation. The necessity and benefits of reorganization in normal grid conditions can be explored from various perspectives [10].

Nowadays, reducing losses in distribution grids is a top priority in power grid design and operation [11,12]. A significant percentage of electric energy generated in power plants is lost during transmission and distribution. Among the various levels of the power system, distribution accounts for approximately 75% of the losses. Studies have shown that line losses in the distribution grid account for around 5–13% of the total

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An Efficient Analysis Scheme for Classification of Heat-Shrinkable Material Based on Ageing with the Aid of Learning Techniques

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Abstract: Ageing of mechanical structures generally refers to prejudiced or failure of their capability to accomplish the intention for which a product is developed. Ageing is generally a slow, time variant and irrevocable procedure that results over a period of time. Ageing usually affects the industrial factors with various defects in static and dynamic responses, structural capacity, failure mode and position of failure instigation. The major impact that arise due to ageing of components are inability to withstand different challenges like environmental issues, natural calamities and also the proper functioning of products. This remains to be a major drawback in number of mechanical application which uses Heat-shrinkable material that can results in improper functioning of the products. To reduce or overcome the issues of ageing related drawbacks, we propose a novel machine techniques based scheme where in we use the data available regarding each material to be analyzed in order to find out the ageing scenarios. The major consideration here will be to classify the Heat-shrinkable material that are designed based on the ageing properties thereby we can analyse the properties in various time span.

Keywords: Ageing, Heat-shrinkable materials

1. Introduction

After the polymer and the manufacturing procedure, ageing is entirely identified with the external elements. Whether heat-shrinkable tubes for switchgear busbar can maintain fantastic electrical and mechanical properties during the long term activity relies primarily on the counter ageing performance. Heat shrink material involves polymeric materials submitted to a high-energy electron shaft which causes the adjacent atoms to be changelessly cross-connected or intermolecularly joined. Hydrogen iotas are isolated from the polyethylene chains, and the carbon elements between the adjacent strings form consolidating associations. The heat contract material loses its dissolving characteristics due to cross-link, allowing it to be heated to temperatures past the dissolving stage of crystalline without liquefying. The heat shrink can be expanded and framed over this temperature in shapes that will remain in place while the temperature decreases again below the crystalline softening point.

In the expanded framework, heat shrink products are given to the customers in easy set-up packs. The objects supervisor back to their distinctive form at the stage when installers warm the products up again past the crystalline dissolving point, with a gaslight or tourist weapon. As a consequence, this versatile memory remains for the entire lifetime of the product allowing an unlimited period of usability under specific circumstances of ability and distribution centre. As the polymeric materials shrove during set-up, they also create heavyweight making electrical behaviour additionally splendid fixation.

Dielectric materials are the key elements of the electric energy distribution system. Fabricated products have now traded materials such as impregnated papers used as old

insulation materials for several centuries, and polyethene is the most widely used material among these engineered materials. The use of cross-linked polyethylene is presently being replaced by polyethene as the mechanical and thermal stability is much higher and more prominent than it is. Besides, a distinctive polymer keeps the dielectric features (Gulmine et al., 2006).

Heat-shrinkable material

This section will discuss the situation, standard, level and particulars of Heat-shrinkable materials. Heat shrinkable tubes were examined in terms of relevance and thermo-electrical performance as HV protection for intricate conductor design. Overall, the tests demonstrate the high capacity of heat shrinkable frameworks for such application. However, to create secured conductors from pre-produced tubes, additional upgrades of the electrical design of the full protection framework are required just as application handling is requested.

Shape-memory polymers, for instance, temperature. Polyethylene (PE) is a non-polar polymer, can adopt a compact shape and recover their distinctive way when presented to external upgrades. It is discovered at room temperature in a semi-crystalline framework. When the material is cooled off the melt, the crystalline fraction is framed. During cementing, the lamellae structure depends on the characteristics of thermal treatment and the crystallization states. Lamellae develop radially in the typical compliance, occurring in spherulites that are made from both crystalline and formless regions. Because of the non-polar nature of PE, conduction processes should be linked to the proximity of free possessors. In any case, polar contribution may emerge from the presence of C=O carbonyl groups created by PE oxidation, even though polar

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DESIGN AND ANALYSIS OF DRUM BRAKE

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Abstract

A brake is a mechanical device which inhibits motion. A drum brake is a brake that uses friction caused by a set of shoes or pads that press against a rotating drum-shaped part called a brake drum.

The brake drum is a critical component that experiences high temperatures and develop thermal stresses during application of brakes. In addition, the application of shoe pressure gives rise to mechanical loads. So the analysis takes into account both the thermal stresses and mechanical stresses together.

Brakes in cars and trucks are safety parts. Requirements not only in performance but also in comfort, serviceability and working lifetime are high and rising. i.e. the brake pad with the friction material, the counter body and caliper, can be modeled.

So in this project we design the model of drum brake (drum, liners, springs etc.) And perform the structural and thermal analysis in solid works premium 2016.

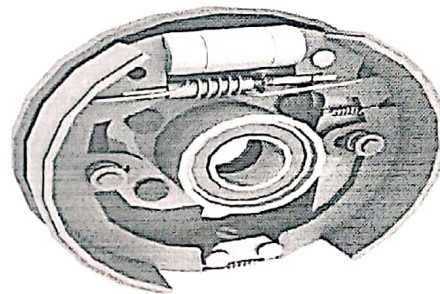


Fig: Drum brake

1. Introduction:

A brake is a device which is used to bring to rest or slow down a moving body. Safe operation of vehicle demands dependable brakes is required to absorb the kinetic energy of the moving parts or the potential energy of the object being lowered by host when the rate of descent is controlled. The energy absorbed by brakes is dissipated in the form of heat. This heat is dissipated in the surrounding atmosphere to stop the vehicle, so the brake system should have following requirements:

- The brakes must be strong enough to stop the vehicle with in a minimum distance in an emergency.
- The driver must have proper control over the vehicle during braking and vehicle must not skid.
- The brakes must have well anti fade characteristics i.e. their effectiveness should not decrease with is constant prolonged application.



Peristaltic Motion of Pseudoplastic fluid in an Inclined Channel Bounded by Permeable Walls

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ABSTRACT

This article deals with the peristaltic motion of a pseudoplastic fluid in an inclined channel bounded by permeable walls. The walls of the channel must be flexible, and the channel is under the influence of a uniform magnetic field. Fluid is a conductor of electricity where the induced magnetic field is ignored as a function of small Reynolds number. The expressions for velocity, pressure rise and the frictional force were evaluated by the perturbation analysis in the wave frame of reference under the assumptions of long wavelength and low Reynolds number. The changes of the pressure rise and frictional force with flux over wavelength are shown graphically.

Keywords: pseudoplastic fluid, Inclined channel, permeable wall, perturbation.

1. INTRODUCTION

Peristaltic motion is now well known to the physiologists as one of the major mechanisms for fluid transport in many biological systems and is additionally a crucial research topic due to its large number of applications in engineering. In Industrial applications it is common in sanitary fluid transport, carry corrosive fluids, and blood pumps in heart-lung machines. The phenomenon of peristalsis also manifests itself during the functioning of the roller and finger pumps. Pseudo-plastic fluids are spoken as shear-thinning fluids. The viscosity of these fluids will decrease as shear rate increases. In contrast to a Bingham fluid, a pseudoplastic fluid may be a fluid that increases viscosity as force is applied. A characteristic phenomenon of viscoelastic materials is that the Weissenberg effect, which occurs as an abnormal formation on the surface of the fluid within the Couette flow. The viscosity of these fluids will decrease with increasing shear rate.

Several theoretical and experimental studies of peristalsis are performed since the initial work of Latham [1]. Variety of investigations concerning flow through porous medium in channels are available within the literature. It is well known that flow through porous medium has employment especially in geophysical fluid dynamics, sample of natural porous medium are beach sand, sand stone, limestone, wood, rye bread, the channel gall bladder with stones, small blood vessels and human lung. In some cases the distribution of fatty cholesterol and artery clogging blood clots in the lumen of coronary artery can be considered as equivalent to porous medium. Hayat et al. [2] studied hall effect of peristaltic flow of a Maxwell fluid in a porous medium. Srinivas and Kothandapani [3] analyzed the influence of wall properties within the MHD peristaltic transport with heat transfer and porous medium. Vajravelu et al. [4] investigated the influence of heat transfer on peristaltic transport of a Jeffrey fluid during a vertical porous stratum. Hemadri et al.[5] made a close investigation on peristaltic transport of a pseudoplastic fluid bounded by permeable walls with suction and Injection. Hayat et al.[6] studied on peristaltic motion of pseudoplastic fluid in a curved channel with heat/mass transfer and wall properties. Yuan et al. [7] conducted an experimental study of pseudoplastic fluid flows in a square channel with strong curvature. Sreenadh et al.[8] discussed a detailed investigation on Combined influence of velocity slip, temperature and concentration jump conditions on MHD peristaltic transport of Carreau fluid in a non-uniform channel. Ramesh et al.[9] studied on Magnetohydrodynamic peristaltic flow of pseudoplastic fluid in a vertical asymmetric Channel through porous medium with Heat and Mass Transfer. Noreen et al [10] made an investigation on peristaltic flow of pseudoplastic fluid in an asymmetric channel.

In view of these, we study peristaltic motion of a pseudoplastic fluid in an inclined channel bounded by permeable walls is investigated. The expressions for velocity, pressure rise and the frictional force were obtained by the perturbation analysis



To predict mechanical properties of XLPE insulation cables under thermal ageing using neural networks and fuzzy logic techniques

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ABSTRACT

The widespread use of cross-linked poly-ethylene (XLPE) as insulation within the manufacturing of medium and high-voltage cables could even be attributed to its outstanding mechanical and electrical properties. However, it's well-known that degradation under service conditions is that the key problem within the utilization of XLPE as cable insulation. Laboratory testing of aging insulation is time consuming and expensive. To avoid such costs, we've got developed two models which are supported artificial neural networks (ANNs) and logical system (FL) to predict the insulation properties under thermal aging. The proposed ANN can be a supervised one supported radial basis function Gaussian and trained by random optimization method algorithm. The FL model relies on the utilization of fuzzy inference system. Both models are accustomed predict the mechanical properties of thermally aged XLPE. The obtained results are evaluated and compared to the experimental data comprehensive by using many statistical parameters. it's concluded that both models give practically the identical prediction quality particularly, they need ability to breed the nonlinear behavior of the insulation properties under thermal aging within acceptable error. Furthermore, our ANN and FL models are utilized within the generalization phase where the prediction of the long run state (not reached experimentally) of the insulation is created possible. Additionally, costs and time is reduced.

Keywords XLPE insulation. Neural network .Fuzzy logic

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I. INTRODUCTION

Electric cables are important elements which make sure the transmission of power. In such cables, polymer materials provide electrical insulation [1]. Compared to some varieties of polymers like vinyl polymer (PVC), ethylene-propylene copolymer (EPR) and ethylene-acetate copolymer (EVA) which are of common use for such purpose, the polyethylene (PE) in its cross-linked form (XLPE) is incredibly recommended [2]. This material is widely employed in medium-voltage (MV) and high-voltage (HV) cables up to 500 kV [3] because it's excellent dielectric strength and electrical resistivity, similarly as of its excellent physical properties including resistance to cracking and moisture penetration [4]. Many factors can cause the cable failure. Among others, one can quote: presence of voids and impurities within the material, incorrect handling during installation, inappropriate mechanical and electrical use and aging of polymeric insulation under service conditions. This latter presents the foremost

important explanation for the cable failure [1]. Under operating conditions, cables are permanently exposed to electrical, thermal, mechanical, and environmental loads [5]. When exposed to heat, thermal degradation occurs, causing irreversible damage to the cable insulation. Under heat conditions, thermal aging occurs and causes an irreversible damage of the cable insulation. Under temperature stress and over a period of your time, chemical composition [6] and physical morphology [7, 8] of XLPE may change. Consequently, several properties may alter. for instance, volume resistivity reduces, dielectric losses increase [9] and mechanical properties decrease [10]. The great importance of XLPE as insulation motivates researchers in laboratories worldwide to research many experimental techniques so on induce more insight on the state of the insulation. the knowledge derived from this overall work helps to know the degradation mechanisms of the fabric under service conditions. On the opposite hand, these investigations are focused on the XLPE insulation



Review Article

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Improvements in the Performance of the Base Station Antenna Due to the Use of Mimo in a Mobile Communication System

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Abstract

Space-Division Multiple Access (SDMA) is a telecommunications device that allows the access point to connect concurrently using more mobile users. Each foundation network's capacity effectively segregates different applications geographically relies upon pairing cross-relations among the devices' stream bundles (the multi-connection).

Throughout this article, we present an optimized null guidance channel toward the Orthogonal Frequency- Multiplexing Division (OFDM) division system, which lowers the inter-user correlation and the near-distant issue, which significantly improves system performance. Numerous multi-antenna configurations of access points are being deployed throughout this time in a given region. Every other antenna interacts only with the core network through coaxial cable connections and all data transmission preprocessing is done at the transmitter. Cross subscribers are aside from the high, whereby the OFDM indication exclusively serves a fraction of customers. All supplied users are chosen based on a cross-functional and cross interrelationship mechanism. Because the distribution of the grids around the clients also regulates the specific medium which reduces the impact of such near-far issues significantly. Every customer's transmission rate is considered to be interrelated and the form of a contract is disbursed. Different information representations exhibiting good reproducibility and excellent overall data throughput may be dynamically duplicated within each user around each OFDM frequency.

Keywords: MIMO, OFDM, SDMA; ROF; Null steering downlink

Introduction

Multi-Input And Multi-Output (MIMO), modulation dynamic spectrum polarisation (OFDM), Radio-Over-Fiber (ROF), and multimedia extra room division (SDMA) systems are four key components associated to deliver very temporally effective wireless communication and thus fulfill the high-speed requirements of wireless technologies in subsequent generations I.

Electromagnetic MIMO systems use micro intensity modulations that

provide an improved set of attributes with a considerable improvement in network lifetime. Increasing growth is accomplished by utilizing sophisticated pattern recognition techniques that take advantage of spatial multiplexing require extra transmitted amplitude or frequency, for example, BLAST [1,2].

OFDM is a multi-career module defined for many communication networks including audio signals and requirements applicable (DVB), Europe made HIPERLAN 2 (US IEEE 802.11a), and Japan made MMAC OFDM's primary benefit is its resilience towards specific bandwidth transmission schemes, which is achieved by transforming the network into multiple multipath subchannels. Integrating OFDM with MIMO offers outstanding resource utilization via the use of variation between both spectrum and location dimensions [3].

radio-over-fiber transmissions consist of several spectral efficiencies dispersed about a sensor node and linked by optical communication to an access point [4,5]. During a wireless channel, a Radio Frequency (RF) component regulates database information that activates a piezoelectric transducer. Analytic transmission of the radio frequency signal through the fiber to an antenna's position would be only necessary for spectroscopic adapters and radio frequency-amplifiers [6,7]. Such complex integrated architecture is uncomplicated since radiofrequency frequency converting or specialized reception machinery is not required at transmitter sites and enables for the distribution of a changeable radio frequency carrier and/or an OFDM subsidiary from conventional wisdom transmitting place.

Multiplexing technique SDMA is a telecommunications technology that allows many mobile devices to concurrently connect the same core network in almost the same range of frequencies with very minor modifications with everyone. In far too many publications, different SDMA technologies were suggested. Nishimura et al. studied two SDMA techniques, and the overall creation of content that optimizes the quality of the sound to be transmitted to the recipient (MRC) as well as a zero guidance technique [8]. Zero directing has been proven to provide improved advantages over beamed directing. Rim suggested an SDMA integrated MIMO method, which would convey large quantities of data towards each various reason simultaneously over the flattened, decreasing, rich dispersion channel [9]. Choi et al. created a transmit power from before the technology which decomposes random variables smooth MIMO multipath environment disappearing broadcasts into several simultaneous independent member MIMO downlinks [10]. Spencer et al. invented a technology that technique several co MIMO the natural, enabling each number of co-client to collect large quantities of data upon every channel [11].

Very few of the SDMA experiments listed before examined connected pathways or the relatively close conundrum, although both are significant problems that must be considered. For instance, interpersonal and inter causal relationships seen between identity and image sample covariance matrix may significantly decrease the accessible frequency of spatiotemporal sub channels shall be bound rank [12]. Another major association problem for SDMA technologies is now the combined cross-relation in between cable equations of several android platforms in special occurrence usually the case whenever users were situated nearby. Such based on cross-correlation

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COMPLEMENT TIMING OF INJECTION ON DIESEL ENGINE FUELED WITH TAMARIND BIO-DIESEL

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ABSTRACT

There is lot of demand for alternative fuels as fossil fuels are expending day by day. Oils from seeds of plants are acceptable for diesel fuel, as there is no necessary for swapping engine model. But snag related to oils from seeds of plants like glutinous consistency and low flammable characteristics led to change of oils from seeds of the plant into biodiesel by the process known as esterification. However, biodiesel has moderate viscosity which calls for low heat rejection (LHR) engine, with air gap piston, air gap liner and ceramic coated cylinder head with the layer of coating 0.3 mm. Workability parameters were identified with LHR engine and correlated to normal engine, with tamarind biodiesel by differing timing of injection and opening pressure of injection. BTE hiked by 7 %, while at full load operation- soot particle density got down by 38 % relatively with LHR engine with biodiesel at 30°bTDC with respect to normal engine operated by diesel at 27°bTDC and a pressure of injection of 190 bars.

KEYWORDS: Diesel Fuel, Ceramic Coated Cylinder, Low Heat Rejection

Article History

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INTRODUCTION

There was scarcity of conventional fuels, with exhaustion of sources, multiplication of products of exhaust with natural fuels and load on economy sector India due to bring in petroleum the explore for different fuels is relevant. Oils from seeds of the plant and alcohols are treated as other fuels in diesel engines as they are regenerated. But, utilize of alcohols need changes of engine moderation as its cetane number is less. Oils from the seeds of the plant can conveniently be reused in diesel engines due to comparable cetane number. But the snags of low vaporous and glutinous consistency of oils from the seeds of plants had shown the importance of LHR engine. Cooling of the engine is inevitable in order to prevent the expansion of the piston and other components of the engine. The output power indicates sum of the BTE, coolant heat losses and exhaust gas enthalpy. If the coolant heat losses are prevented with thermal insulation, either BTE would increase or exhaust gas enthalpy would increase. There are wide varieties of LHR engines like, incorporating divergent approaches like spraying layers on the parts of the engine, creation of air gap in the various constituents of the engine.

Investigations on Pollutants of Biodiesel Run Insulated Diesel Engine with Exhaust Gas Recirculation

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ABSTRACT

In the context of fast depletion of fossil fuels, ever increase of pollution levels with fossil fuels and increase of economic burden on Government of India due to import of crude petroleum, the search for alternative fuels has become pertinent. Alcohols and vegetable oils are important substitutes of diesel fuel. However, alcohols have low cetane number, while vegetable oils have high viscosity and low volatility to use them in diesel engines. Hence biodiesel which has oxygen in its molecular composition and high cetane number is good substitute for diesel fuels. Biodiesel is prepared from vegetable oils by the process known as esterification. The concept of the insulated engine or low heat rejection (LHR) engine is to minimize the heat loss to the coolant by providing thermal insulation in the path of heat flow to the coolant, thereby increase heat flow rate and provide faster rate of combustion and hence these engine are suitable for burning low calorific value fuels. Exhaust emissions from diesel engine are particulate matter (PM) and nitrogen oxide (NO_x) levels and breathing of which cause many health hazards and also cause environmental disorders like acid rain and Greenhouse effect. Hence control of these emissions is an immediate step. Investigations on carried out on LHR four-stroke, single-cylinder, 3.68 kW at the rated speed of 1500 rpm, water cooled diesel engine with air gap insulated piston and air gap insulated liner with tamarind biodiesel with exhaust gas recirculation (EGR). Exhaust emissions of PM and NO_x levels were reduced by 50% when compared without EGR.

Key words : Biodiesel, Exhaust Gas Recirculation, Air pollution


Introduction

Investigations on conventional engine with biodiesel

Several researchers conducted experiments with biodiesel with four-stroke, medium speed conventional diesel engine. They concluded that at manufacturer's recommended injection timing, brake thermal efficiency marginally improved, particulate emissions marginally decreased and NO_x levels drastically increased with biodiesel operation

(Murali Krishna *et al.*, 2014; Murali Krishna *et al.*, 2015) when compared with neat diesel operation. Comparative studies were made between waste cooking oil operation and its biodiesel with engine of the same configuration as mentioned in reference (Srikanth *et al.*, 2013) with varied injection timing and injector opening pressure. The optimum injection timing was found out to be 31°bTDC with biodiesel, while it was 32°bTDC with crude vegetable oil. They reported from their investigations that at optimum injection timings, brake thermal efficiency increased by 5-8%, particulate emissions

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Investigation on Structural Analysis of Flat Head Piston

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ABSTRACT

In the investigation on structural analysis of flat head piston deflection and stress equations plays major role in mathematical modeling. The same has been used in this analysis. In the part of the analysis the thickness of the flat head of the piston is considered as the same of that of simply supported circular plate and the loads are applied on it reacts with the supports held at the top of the gudgeon hole. The piston is same as one side closed cylinder and ended with flat circular plate. It is the most general that the deflections due to axial loads are neglected. Hence the deflection and stress equations of the simply supported circular plate are adopted. Aluminum is taken as material of the component throughout the analysis and grey cast iron is taken as material for the rings in the modeling of the piston. Flexural rigidity plays a major role in the calculation for the analysis. The results of the mathematical analysis have been compared with the same of that of simulation using ANSYS software.

Key words: Flat Head Piston, Deflection, Stress, Structural Analysis

1.INTRODUCTION

A piston is an important and main component of an Internal Combustion(IC) engine moving in between top and bottom dead centers. Every IC engine is working on the combustion of liquid or gaseous fuel like diesel, bio-diesel, petrol or compressed natural gases etc [1]. Thermal expansion of gases during and after combustion of fuel takes place and as a result the forces exerted on the piston head causes deflection and stresses induced on it due to fatigue loading in the cyclic process. This takes place due to long time running of an engine[2],[3]

In view of design and modeling of the strengthened piston these deformations and stress induced are necessary to determine and can be done by the structural analysis. The crown or flat head of the piston can be considered as circular plate. The circular plate undergoes the deformation and stress

induced due to loads applied on it. In the similar way the top of the flat head undergoes deformation and stress induced the stress due to thermal loads applied on it. In the cyclic process the fatigue loading takes place due to these thermal loads for long time running of the piston. In case of the piston the thermal loads are considered as the loads applying on the circular flat head which are normal to the surface.

The supports in case of the piston are fixed at gudgeon hole as its pin lift and reacts to the thermal loads applied on the top and similar to that of circular plate. The deflection due to axial loads are however negligible. Hence the supports can be held at any point of the distance from the head of the piston.

The analytical solution for the deformation and stress induced in the flat head of the piston can be obtained in the same way that of circular plate. The same has been analyzed using ANSYS software for the comparison of the results.

2.MATERIALS

Aluminum alloys can be selected as base metal for piston since it has good thermal conductivity [4]. The performance can be improved on heat treatment process [5]. Most generally the cast iron can be used as a metal for the piston rings [6].

The temperature will rise and fall on combustion of fuel takes place on the top and cooling of engine respectively. As a result of the thermal loads acts on the piston head, the structure of the piston will undergoes to deformation and stresses will be induced^{[7][8]}. Hence the thermal properties are also important along with the physical properties. Therefore thermal properties will also be taken into consideration while modeling and design of the piston for structural analysis. The following Table I represents the maximum values of physical and thermal properties aluminum and cast iron for piston and piston rings respectively [9]-[13].

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Magneto hydrodynamic of Peristaltic Motion Of Pseudoplastic Fluid in A Channel With Permeable Walls

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ABSTRACT

This paper deals with the Magneto hydrodynamic of peristaltic motion of a Pseudoplastic fluid in a Channel with permeable walls. The expressions of velocity, pressure rise and the frictional force were evaluated by analyzing the disturbances in the wave frame under the assumptions of long wavelength and low Reynolds number. The changesn of the pressure rise and frictional force with the flux over one wavelength are shown graphically. It is observed that the higher the Magneto hydrodynamic parameter, the higher the pressure rise against the pump works.

Keywords: MHD, Pseudoplastic fluid, permeable wall, perturbation.

INTRODUCTION

Peristalsis is now well known to physiologists as an important fluid transport in many biological systems. In particular this mechanism is involved in the transport of urine from kidney to the bladder, in the movement of the ovum in the fallopian tubes, in the movement of chime in the gastro intestinal tract, in the transport of spermatozoa in the ductus efferent of the male reproductive tracts and in the cervical canal, egg movement in the female fallopian tube, in transport of lymph in the lymphatic and the vasomotor transport in small vessel lymphatic vessels of small blood vessels. In recent years, Rajendra et al.[1] has been studied on MHD effects on Peristaltic flow of a couple stress fluid in a channel with permeable walls. Rathod et al. [2] made a detail Investigation on Peristaltic transport of a conducting Bingham fluid in an inclined channel with permeable walls by ADM. Hemadri et al.[3] made a detailed investigation on Peristaltic Transport of a Pseudoplastic Fluid bounded by permeable walls with suction and Injection. Hayat et al.[4-5] studied on peristaltic motion of pseudoplastic fluid in a curved channel with heat/mass transfer and wall properties. Banu et al.[6] investigated Entropy analysis in MHD pseudo-plastic nanofluids through a vertical porous channel with convective heating. Yuan et al. [7] did a Experimental study of pseudoplastic fluid flows in a square duct of strong curvature. Sreenadh et al.[8] discussed a detailed investigation on Combined influence of velocity slip, temperature and concentration jump conditions on MHD peristaltic transport of Carreau fluid in a non-uniform channel. Ramesh et al.[9] studied on Magneto hydrodynamic Peristaltic Flow of Pseudoplastic Fluid in a Vertical Asymmetric Channel through Porous Medium with Heat and Mass Transfer. Noreen et al [10] made a investigation on Peristaltic flow of Pseudoplastic fluid in an asymmetric channel. In View of these, we study the Magneto hydrodynamic of peristaltic motion of a Pseudoplastic fluid in a Channel with permeable walls under the low Reynolds number and long wavelength.

Mathematical Formulation

Consider the peristaltic transport of a pseudoplastic fluid bounded by permeable walls of the channel of width 2a. Channel walls must be flexible. the channel under the effect of the uniform magnetic field $\mathbf{B} = (0, 0, B_0)$. The fluid conducts electrically where the induced magnetic field is ignored due to the small Reynolds number.

The wall deformation is given by

$$H(X,t) = a + b \cos(X-ct)$$

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Design of Efficient Approximate Reverse Carry Propagate Adder

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Abstract- Adders plays vital role in many digital signal processing applications and An efficient Reverse carry signal propagates from MSB bit to LSB bit, here carry input signal has more significance compared to output signal. Here in this paper we propose three different designs of the reverse carry propagate full-adder cell with different delay, energy, and accuracy configurations. And also we use some hybrid structure in the n bit adder design were least half of the adder design is implemented with this RCPA and most significant half will be added by using some accurate high speed adder like Kogge stone adder which can enhance the adder speed. The Hybrid adders realized utilizing these structures are studied and compared those with conventional approximate adders using Xilinx ISE 14.7 with Verilog HDL coding.

Keywords- Full Adder, digital signal processing (DSP), Reverse carry propagate adder (RCPA), Kogge-Stone adder (KSA).

I. INTRODUCTION

Adder blocks, which are the main components in arithmetic units of DSP systems, are power hungry and often form hot-spot locations on the die. These facts have been the motivations for realizing this component using the approximate computing approach. Prior researches on approximate adders have taken two general approaches of focusing on error weight and error probability reductions. Power consumption reduction and speed improvement are the key goals in the design of digital processing units, especially the portable systems. Normally, an increase in the speed is achieved at the cost of more power Consumption for exact processing units.

One of the approaches to improve both the power and speed is to sacrifice the computation exactness. This approach, which is approximate computing, may be used for the applications where some errors maybe tolerated. The first approach is based on a hybrid structure adder where two different parts, exact MSB's, and approximate least significant bits (LSBs) are utilized. The error appears in the carry input of the exact most significant bit (MSB) part and the summation

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in the LSB part. It limits the error weight to the weight of the carry input of the MSB part. Since normally most of the activities occur in the LSB part. In the second approach, pure approximate adder structures are employed. For these adders, reducing the error probability of the summation as well as reducing the power and delay is the key design criteria.

In this approximate adder propagates the input carry from the higher significant bit to lower significant bit to form the carry output. In this type of adder, the propagation is performed by introducing a forecast signal acting as an output signal. The MSB half will be added with the help of parallel prefix adder which can have better speed of operation. Lower part will be added with the help of approximate reverse carry propagate adder.

II. LITERATURE SURVEY

Designing an adder with carry propagation will take more delay so if we avoid the carry propagation while designing an adder will effects the better adder performance so we go for reverse carry propagate adder in which the carry is propagated in reverse direction.

Ripple carry adder: It is simplest adder among all adders but slowest adder, it requires $O(n)$ and delay of $O(n)$, where n represent the operand size

Carry look ahead adder: It has good area $O(n \log n)$ and good delay of $O(\log n)$, but suffers from irregular layout design

Carry select adder: It has area of $O(n)$ and delay with $O(n^{1+2^{l+1}})$, and it is the best adder in terms of area and delay

Carry save adder: Requires area $O(n)$ and delay of $O(\log n)$ Carry select adder is the fast adder as it reduces computation time for operation among all adders but suffers from fanout limitation. The sorting problem is defined as the rearrangement of N input values so that they are in ascending order, merge sort method uses divide and conquer algorithm and uses recursion to perform sorting

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Delay Improved 4-bit Multiplier using Pyramidal Adder

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Abstract- Improving the performance of digital adder is needed as they are widely used in FPGA based VLSI environment and DSP Processor operations. Binary multiplier basically made up of rearrangement of adders and so multipliers completely depends on adders. Adder plays vital role in DSP processing applications and FPGA based VLSI environment where power, delay, speed and area are important parameters, so we need to reduce all parameter values as possible as possible. Power, delay, speed and area all are important values and are depend on multiplier which in turn depends on adders. So if we modify the adders namely half adder and full adder we can reduce required parameter values. By implementing normal half adder and full adder we can reduce the delay.

Keywords- digital signal processing (DSP), multiplexer (MUX), half adder (HA), full adder (FA), and field programmable gate array (FPGA).

I. INTRODUCTION

Multiplication of two bits carried out by completely with adders, multiplication includes generation of partial products, adding of partial products, methods such as parallel computing of partial products and carry propagating, all these approaches are implemented with combinational devices.

In arithmetic operations addition is the major operation to perform arithmetic operations like multiplication, subtracting, dividing, comparing and finding a square root. In multiplication operation, addition is the basic operation to find multiplication of two binary bits. Addition plays crucial role in DSP processor applications, in FPGA based binary multipliers and in computer application. In all applications power, delay and area requirement all are depend on multipliers which in turn depends on adders.

Binary half adder is hardware formed complex circuit with five logic elements, if we use such half adder in multi-combinational adders it gives more complex circuit for example for 1024-bit DSP processor, and also speed is reduced due to serial connecting logic elements. For $n \times n$ bit multiplier, $n \times n$ AND gates and $n(n-1)$ OR gates are required, in terms of adders n half adders and $n(n-1)$ full adders are required. Improving the performance of digital adder is needed because execution of binary operation completely

depends on adders, there are so many adders are implemented such that to meet the requirements of FPGA based VLSI environment and DSP Processor operations.

Ripple carry adder: It is simplest adder among all adders but slowest adder, it requires $O(n)$ and delay of $O(n)$, where n represent the operand size

Carry look ahead adder: It has good area $O(n \log n)$ and good delay of $O(\log n)$, but suffers from irregular layout design

Carry select adder: It has area of $O(n)$ and delay with $O(n^{1+2/n+1})$, and it is the best adder in terms of area and delay

Carry save adder: Requires area $O(n)$ and delay of $O(\log n)$

Carry select adder is this fast adder as it reduces computation time for operation among all adders but suffers from fanout limitation. The sorting problem is defined as the rearrangement of N input values so that they are in ascending order, merge sort method uses divide and conquer algorithm and uses recursion to perform sorting.

2. EXISTING METHOD

Hardware complexity of multipliers can be greatly reduced by using so many hardware structures and in those one of the structure is pyramidal adder. The Structure of 4×4 bit multiplier using pyramidal adder which consists of inputs $a_3, a_2, a_1, a_0, b_3, b_2, b_1, b_0$ whose partial products are given to four

Novel Covid-19 Detection and Diagnosis System Using IOT Based Smart Helmet

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ABSTRACT:

Corona virus is the new virus that has not been identified in humans before which it causes the corona virus disease called COVID-19. This disease was firstly discovered in Wuhan, China, on December 2019 and spread to the world until now. The virus can easily pass from person to person which make it spreaded rapidly. One of the common symptom of COVID-19 that can be easily identified is fever. Since the virus outbreak, thermal screening using infrared thermometers are used at public places to check the body temperature to identify the indicated infectee among crowd. This prevention still lacking because it spends a lot of time to check the body temperature from every person and the most importance is the close contact of the infectee might lead to spreading it to the person who do the screening process or from the one in charge of screening to the checked people. This study proposes the design of system that has capability to detect the corona virus automatically from the thermal image with less human interactions using smart helmet with Mounted Thermal Imaging System. The thermal camera technology is integrated to the smart helmet and combined with IoT technology for monitoring of the screening process to get the real time data. In addition, the proposed system is Equipped with the facial-recognition technology, it can also display the pedestrian's personal information which can automatically take pedestrians' temperatures. This proposed design has a high in demands from the healthcare system and can potentially help to prevent for corona virus spreading wider.

Keywords: COVID-19, Corona virus, IoT Technology, Smart Helmet.

1. INTRODUCTION

A corona virus is a sort of virus that can make ailment in animals [1] and individuals [2,3]. The function of normal body is disturbed by the action of such virus which breaks into cells within their host and exploits them to replicate itself. The name of Corona viruses was taken from Latin term 'corona', that means crown, since they are encompassed by what look like royal crown

of a spiked shell shape. The World Health Organization (WHO) officially announced that a new virus had been identified which then is called by 2019-nCoV on January 2020 [4]. The virus was recognized as part of the corona virus group, which involves SARS and the other known colds [4,5]. The first reported case was from Wuhan, China and has infected 7,711 people and 170 reported deaths in China before corona virus was declared as a global pandemic which

Privacy-Protected Data Transmission in IoT-Based Healthcare Systems

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ABSTRACT:

Due to the significant advancement of the Internet of Things (IoT) in the healthcare sector, the security, and the integrity of the medical data became big challenges for healthcare services applications. This paper proposes a hybrid security model for securing the diagnostic text data in medical images. The proposed model is developed through integrating either 2-D discrete wavelet transform 1 level (2D-DWT-1L) or 2-D discrete wavelet transform 2 level (2D-DWT-2L) steganography technique with a proposed hybrid encryption scheme. The proposed hybrid encryption schema is built using a combination of Advanced Encryption Standard, and Rivest, Shamir, and Adleman algorithms. The proposed model starts by encrypting the secret data; then it hides the result in a cover image using 2D-DWT-1L or 2D-DWT-2L. Both color and gray-scale images are used as cover images to conceal different text sizes. The performance of the proposed system was evaluated based on six statistical parameters; the peak signal-to-noise ratio (PSNR), mean square error (MSE), bit error rate (BER), structural similarity (SSIM), structural content (SC), and correlation. The PSNR values were relatively varied from 50.59 to 57.44 in case of color images and from 50.52 to 56.09 with the gray scale images. The MSE values varied from 0.12 to 0.57 for the color images and from 0.14 to 0.57 for the gray scale images. The BER values were zero for both images, while SSIM, SC, and correlation values were ones for both images. Compared with the state-of-the-art methods, the proposed model proved its ability to hide the confidential patient's data into a transmitted cover image with high imperceptibility, capacity, and minimal deterioration in the received stego-image.

KEYWORDS: Cryptography, DWT-1level, DWT-2level, encryption, healthcare services, Internet Things, medical images, steganography.

1. INTRODUCTION

IoT creates an integrated communication environment of interconnected devices and platforms by engaging both virtual and physical world together [1]. With the advent of remote digital healthcare based IoT systems, the transmission of medical data becomes a daily routine. Therefore, it is necessary to develop an efficient model to ensure the security and integrity of the patient's diagnostic data transmitted and received from IoT environment [2]–[8]. This goal is carried out using steganography techniques and system encryption algorithms together to hide digital

information in an image [9]–[16].

Cryptography is another term for data encryption [17]. Encryption cryptography is the process of encoding messages in a way that hackers cannot read it, but that can be authorized personnel. The two main algorithms used for data encryption in this work are the Advanced Encryption Standard (AES) and the Rivest-Shamir-Adleman (RSA) algorithm [18]. AES is a symmetric cipher where the same key is used on both sides [19]. It has a fixed message block size of 128 bits of text (plain or cipher), and keys of length 128, 192, or 256 bits. When longer

3)

ANNULAR APERTURES SHAPING AND SHADING WITH DEFOCUS IN TWO - LINE RESOLUTIONS

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Abstract:

The defocus aberration of the optical system the investigations of Shaping of the apertures for the obscuration parameter $\epsilon = 0$ to 1 in the increments of 0.1 distance of separation of two bright line objects at $Z_0 = 2.5$ in the annular apertures the different apodising parameter when the optical system is applied with the Hanning amplitude filter $\cos(\pi\beta r)$ filter with the coma aberration and defocus aberration of the optical system for partial apodisation for the distance between two bright line objects for the annular apertures

Key words aberration, defocus and Hanning amplitude etc

1.1 INTRODUCTION:

The formation of the image and the higher spatial frequencies control the fine details in the image Fourier techniques were applied in the interpretation of the Abbe's work by Portar who experimentally showed their physical reality. The

1.2 MATHEMATICAL FORMULATION:

$$H(Z) = \left| 2 \int_{0.1}^1 \cos(\pi\beta r) \cos[2\pi(Z + Z_0)r] r^{1-\frac{\epsilon}{2}} dr + 2\epsilon \int_{0.1}^1 \cos(\pi\beta r) \cos[2\pi(Z - Z_0)r] r^{1-\frac{\epsilon}{2}} dr \right|^2$$

$$H(Z) = \left| 2 \int_{0.2}^1 \cos(\pi\beta r) \cos[2\pi(Z + Z_0)r] r^{1-\frac{\epsilon}{2}} dr + 2\epsilon \int_{0.2}^1 \cos(\pi\beta r) \cos[2\pi(Z - Z_0)r] r^{1-\frac{\epsilon}{2}} dr \right|^2$$

$$H(Z) = \left| 2 \int_{0.3}^1 \cos(\pi\beta r) \cos[2\pi(Z + Z_0)r] r^{1-\frac{\epsilon}{2}} dr + 2\epsilon \int_{0.3}^1 \cos(\pi\beta r) \cos[2\pi(Z - Z_0)r] r^{1-\frac{\epsilon}{2}} dr \right|^2$$

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POWER QUALITY IMPROVEMENT AND DISTRIBUTED CONTROL IN HYBRID AC/DC USING MICRO GRIDS

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ABSTRACT:

Combining the DC microgrid and the dominated AC system forms the scenario hybrid AC/DC microgrid, which would be, in concept, the presence of both DC and AC microgrids with sources, storages, loads and appropriate interlinking converters (ICs) tied between them. Hybrid AC/DC microgrid has been becoming a popular concept to provide an effective solution for unlimited large-scale integration of various DGs and distributed storages (DSs) because of its higher efficiency and better compatibility. This paper proposes a distributed control strategy that considers several source characteristics to achieve reliable and efficient operation of a hybrid ac/dc micro grid. The hierarchical control scheme for standalone DC microgrids, the fully decentralized control for hybrid AC/DC microgrids, the distributed control for hybrid AC/DC/DS microgrids and power quality improvement for hybrid AC/DC microgrid have been verified. The proposed hybrid ac/dc microgrid is composed of converters and distributed generation units that include renewable energy sources (RESs) and energy storage systems (ESSs). The proposed control strategy is verified in various scenarios experimentally and by simulation.

Keywords: ac/dc hybrid microgrid, power quality, harmonic compensation, reactive power compensation

INTRODUCTION:

Nowadays, most renewable energy sources (RESs) and distributed generation (DG) Units; including photovoltaic (PV) arrays and fuel cells, directly produce DC output power, while other sources like microturbines or wind turbines deliver variable frequency/voltage AC output power. In both modes, the connection of DG to DC systems is usually simpler, more efficient, and more economical. In recent years, the development of power electronics technology has made DC microgrid architectures and controls a promising area for researchers. DC microgrids possess competitive control advantages over AC microgrids, including low transmission loss and simple control algorithms because there is no reactive power flow, frequency regulation, and synchronization. In DC microgrids, the traditional control methodology is voltage droop control. Different types of droop control are found in the literature. Droop control is widely used to maintain the proportional current sharing between distributed resources by reducing their output voltage, following a predefined droop characteristic. Thus, the enhancement of droop control in the current sharing attenuates the DC bus voltage stability. An increment in droop parameters for instance, results in increased accuracy of the current sharing, but an increased bus voltage drop. Comparatively, a reduction in droop parameters results in a decreased bus voltage drop, but inaccuracy in current sharing.

LITERATURE REVIEW:

Wei Feng et al (2018) when connected to distorted grid utility, droop-controlled grid-connected microgrids (DCGC-MG) exhibit low equivalent impedance. The harmonic and unbalanced voltage at the



Implementation of 1024-Point FFT Processor with Reduced Hardware Architecture

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ABSTRACT: Radix- 2^k delay feed-back and radix-K delay commutator are the most well-known pipeline architecture for FFT design. The radix- 2^k fast Fourier transform (FFT) algorithm is used to reduce the number of twiddle factor multiplication. 1024-point FFT processor with two parallel data paths is implemented in 65nm CMOS process technology. The FFT processor occupies an area of 3.6 mm², successfully operates in the supply voltage range from 0.4–1 V and the maximum clock frequency of 600 MHz. 1024-point FFT processor with two parallel data paths is implemented parallel path technique in 65nm CMOS process technology. The FFT processor occupies an area of 3.6 mm², successfully operates in the supply voltage range from 0.4–1 V and the maximum clock frequency of 600 MHz. Four parallel path FFT architecture utilizing the advantages of the radix-4 algorithm, such as simple butterflies and less memory requirement. The entire FFT algorithms were implemented in Verilog hardware description language and synthesized with Xilinx ISE design suite.

KEYWORDS: Discrete Fourier Transform), butterfly stage, commutator, sample/clock, twiddle factor.

I. INTRODUCTION

The Fourier transform (FT) is a technique to transform a signal from the time domain into the frequency domain to analyze the signal's frequency components. In the frequency domain, the absolute value at each frequency represents its contributing amount to the original signal while the complex value explains the phase offset of the sinusoid at that frequency. By decomposing a time domain signal into a summation of multiple sinusoid signals, FT offers a great conversion tool for processing a signal that is difficult or even impossible to handle in the time domain, which makes it one of the most important algorithms in digital signal processing.

Fast Fourier Transform (FFT) is a commonly used technique for the computation of Discrete Fourier Transform (DFT). DFT computations are required in the fields like filtering, spectral analysis etc. to calculate the frequency spectrum. However, direct computation of Discrete Fourier Transform (DFT) requires on the order of N^2 operations where N is the transform size. FFT is used in digital video broadcasting and OFDM systems. The FFT algorithm, first explained by Cooley and Tukey, opened a new area in digital signal processing by reducing the order of complexity of DFT from N^2 to $N \log_2 N$. There are a number of different 'Fast Fourier Transform' (FFT) algorithms that enable the calculations much faster than a DFT. FFT algorithms used for quick calculation of discrete Fourier transform of a data vector. FFT is used to speed up the DFT, it reduces the computation time required to compute a discrete Fourier transform and improves the performance by factor 100 or more over direct evaluation of DFT.

In Cooley-Tukey radix-2 algorithm, the N point DFT is sub divided into two $(N/2)$ point DFTs and then $(N/2)$ point DFT is recursively divided into smaller DFTs until a two point DFT, whose butterfly is just an addition and a subtraction of input complex numbers. It is the best suitable algorithm for a number N , which is a power of 2. Higher radix algorithms such as radix-4, radix-8, etc can be employed to reduce the complex multiplications but the butterfly structure becomes complex with the multiple input complex adders.

In Single-path pipelined structures are useful for high-speed, real-time applications that have a sequential input/output data. On the other hand, most transforms require global data inter connections, which calls for parallel hardware structures. However, the parallel structures typically use many arithmetic units in hardware, which leads to a large chip area and high power consumption.

In some real-time applications such as OFDM or ultra-wide band (UWB) systems, where high throughput is a requirement, it is important to be able to process the input samples in parallel. Also, it is a challenge to process several samples of an input sequence in parallel when they are received in parallel. Thus, parallel pipelined FFT architectures have become popular in recent times. In this paper, we propose four path-parallel Radix-4 MDC, which is more power efficient than the regular Radix- 2^2 MDC and is suitable for use as an accelerator. Also, it has a simpler butterfly structure and simple control than the corresponding Radix-4 architecture.

DESIGN OF FOUR PATH 1024-POINT RADIX-4 FFT PROCESSOR

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ABSTRACT: 1024-point FFT processor with two parallel data paths is implemented in 65nm CMOS process technology. The FFT processor occupies an area of 3.6 mm², successfully operates in the supply voltage range from 0.4–1 V and the maximum clock frequency of 600MHz. Four parallel path FFT architecture utilizing the advantages of the radix-4 algorithm, such as simple butterflies and less memory requirement, it is more hardware efficient when implementing parallelism for higher throughput using multiple delay commutators or feed-forward data paths. FFT processor achieves the lowest hardware requirements for multipliers which is 20% lesser and power consumption which reduces more than 30% when compared with two parallel paths Radix-2² FFT. Four parallel path FFT processor provides high throughput and less area requirement. The entire FFT algorithms were implemented in Verilog hardware description language and synthesized with Xilinx ISE 14.7 design suite.

I. INTRODUCTION

Fast Fourier Transform (FFT) is a commonly used technique for the computation of Discrete Fourier Transform (DFT). DFT computations are required in the fields like filtering, spectral analysis etc. to calculate the frequency spectrum. The FFT algorithm, first explained by Cooley and Tukey, opened a new area in digital signal processing by reducing the order of complexity of DFT from N^2 to $N \log_2 N$. There are a number of different 'Fast Fourier Transform' (FFT) algorithms that enable the calculations much faster than a DFT. FFT algorithms

used for quick calculation of discrete Fourier transform of a data vector. FFT is used to speed up the DFT, it reduces the computation time required to compute a discrete Fourier transform and improves the performance by factor 100 or more over direct evaluation of DFT. The Fast Fourier transform is one of the most important and widely used functions in the field of digital signal processing (DSP) and image processing. Pipelined architectures are largely preferred for FFT computations as these provide higher throughput, low latency, and low area and reduced power consumption. The FFT plays a key role in the field of different type of communication systems such as Audio signal broadcasting or Digital video, Wireless LAN with IEEE 802.11 Standards, Digital Subscriber Lines with very High Speed etc [4]. FFT play a vital role in the applications of ultrasound simulations. Fast Fourier Transform (FFT) and Finite Impulse Response (FIR) algorithms are implemented in Radar Signal Processing in order to ease the capture of a desired signal. FFT-core is implemented for transfer time to frequency domain. FFT significantly increased the speed in trigonometric functions like add/multiply computations as compare to Fourier Transform. Fast Fourier Transform (FFT) and the Discrete Fourier Transform (DFT) implementation core algorithm of DSP.

In Single-path pipelined structures are useful for high-speed, real-time applications that have a sequential input/output data. On the other hand, most transforms require global data inter connections, which calls for parallel hardware structures.



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Evaluation of Compressive Strength of Concrete Made With Fly Ash and M Sand

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Abstract

Concrete is the most commonly used material by humans which stands next to the water in terms of consumption in the world. Due to the rapid growth in the construction sector, the amount of concrete to be used is increasing day by day which requires a huge quantity of natural materials such as river sand and aggregates. Due to the illegal sand mining and overexploitation, the availability of river sand is getting scarce day by day. The cement which acts as a binding material is one of the important materials in concrete. The most commonly used cement is Portland cement. For the generation of 1 ton of cement, approximately 1 ton of CO₂ is released into the atmosphere. To overcome these problems, Supplementary cementitious materials to be used as a replacement for the cement. In this experimental work, fly ash and M Sand are used as a replacement to the cement and river sand. The strength properties such as compressive strength and tensile strength were compared with the conventional concrete of M25 grade with the concrete made by using replacement materials.

Keywords: M Sand, Fly Ash, Compressive Strength.

1. Introduction

Concrete is the most common and widely used material in the construction industry all over the world. The constituents of concrete are binding material, Fine and coarse aggregates, and water. Sometimes, admixtures are also used. The most commonly used binding material in concrete is cement. There is a variety kind of cement available in the market. Depending upon the situation, a suitable type of cement is used. Among all the varieties of cement, Portland cement is most commonly used in all the general works of construction. When comes to the fine aggregate,

natural river sand conforming to zone – II will be used in the concrete. Due to the rapid industrialization and urbanization, the consumption of concrete for meeting the above-mentioned needs are increasing day by day which leads to an increase in consumption of naturally available materials such as river sand. In general, for the production of 1 ton of cement, approximately 1 ton of CO₂ is released into the atmosphere which is a threat to the environment creating an impact on human life[1]. Hence, the researchers are focusing to use available alternate materials in the concrete which preserves the environment from negative impacts, savings in the

DESIGN AND THERMAL ANALYSIS OF CERAMIC LAYER PISTON WITH AL-2014&5019 MATERIALS

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ABSTRACT

A piston is a object which responds inside a chamber. It is either moved by the liquid or it moves the liquid which enters the chamber. The fundamental capacity of the piston of an IC motor is to get the motivation from the extending gas and to communicate the energy to the driving rod through the interfacing bar

The aim of our project is to design a piston for a two wheeler using theoretical calculations, designing with Creo software.

The substance utilized is Al 2014&5019 and steel (existing material) are utilized to decide the great material for manufacturing of the piston here we dissect the two materials with the assistance of fem. So as to improve results here we are including 0.25mm ceramic (Si3N4& ZrB2) layer for both material and examined with same limit conditions. Computing results

like deflection, von mises stress, security factor. Furthermore, absolute temperature and heat transition moreover.

The major objective chamber is analyse and dismembered the warm pressure scattering of cylinder at the certified motor condition during consuming cycle, in this cycle we applied temperature and convection as breaking point conditions and we choosing hard and fast temperature on the body, total warmth movement regards. Cfd analysis results also calculating for both ceramic and existing piston, finally conclude the results of each piston and discussing how the piston behaves in each boundary condition (static,thermal,cfd), by knowing 3 different conditions results with suitable tables and graphs project can be concluded each piston limitations and advantages &disadvantages

EXPERIMENTAL INVESTIGATIONS ON SEMI-ADIABATIC DIESEL ENGINE WITH EXHAUST GAS RECIRCULATION FUELLED WITH TAMARIND BIODIESEL

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ABSTRACT

Particulate emissions and nitrogen oxide (NO_x) levels are exhaust emissions from compression ignition (CI) engine. Once they are inhaled-in, they cause health hazards, besides environmental impact. Hence control of these emissions are important and an urgent task. In the context of depletion of fossil fuels, ever increase of fuel prices in International Market causing economic burden on developing countries and increase of pollution levels with fossil fuels the search for alternative fuels has become pertinent. Vegetable oils have high viscosity and low volatility causing combustion problems in diesel engine. Biodiesel produced from feedstock by the process of esterification are renewable in nature, biodegradable, provide energy security besides addressing environmental concerns. However, drawbacks of high viscosity, low volatility call for low heat rejection (LHR) or Semi Adiabatic diesel engine (SAD e).

Investigations are carried out to evaluate the performance with different operating conditions (normal temperature and preheated temperature) of tamarind biodiesel with low heat rejection diesel engine consisting of air gap insulated piston with stainless steel, a low thermal conductivity material and air gap insulated liner with stainless steel insert with varied injection timing and injection pressure with provision of exhaust gas recirculation (EGR) with Tamarind biodiesel with diethyl ether as additive.

Key words: Particulate Emissions, Nitrogen Oxides (NO_x), LHR engine or Semi Adiabatic engine, Exhaust Gas Recirculation (EGR), Stainless Steel. (SS).

EXPERIMENTAL INVESTIGATIONS ON EXHAUST EMISSIONS OF SEMI- ADIABATIC DIESEL ENGINE WITH EXHAUST GAS RECIRCULATION

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ABSTRACT

Particulate emissions and Nitrogen oxides (NOx) levels are exhaust emissions from compression ignition (CI) engine. Once they are inhaled, they cause health hazards, besides environmental impact. Hence control of these emissions are important and an urgent task. In the context of depletion of fossil fuels, coupled with exponential growth rate of traction power engines in automobiles and for human luxuries, energy consumption has increased by many folds. This has triggered ever increase of fuel prices in international market and due to uneven distribution of oil resources in the world, a few oil rich countries are getting benefitted and oil lacking countries are suffering from non-affordability. Alcohols and vegetable oils are important substitutes for diesel fuel, as they are renewable. However, drawbacks associated with vegetable oils (high viscosity and low volatility) and alcohols (low cetane number and calorific value of the alcohols) call for low heat rejection (LHR) diesel engine. Exhaust gas recirculation (EGR) is one of the techniques to reduce pollution levels. Investigations were carried out to determine exhaust emissions of particulate matter and oxides of nitrogen with neat diesel operation at different values of brake mean effective pressure of the engine with varied injection timing with provision of EGR and compared the data with conventional engine with neat diesel operation. LHR engine consisted of air gap insulated piston with Stainless Steel crown, a low thermal conductivity material and air gap insulated liner with Stainless Steel insert. Particulate matter and NOx emissions will reduce with optimum EGR system.

KEY WORDS : Particulate Emissions, Nitrogen Oxides (NOx), LHR engine and Exhaust Gas Recirculation (EGR)

INTRODUCTION

Energy demand (Lee *et al.*, 2014) is increasing due to ever increasing number of vehicles employing internal combustion engines (Haywood, 2013). World is presently confronted with the twin crisis of fossil fuel depletion and environmental degradation. Fossil fuels are limited resources; hence, search for renewable fuels is becoming more and more prominent for ensuring energy security

(Murali Krishna *et al.*, 2014) and environmental protection. In the context of fast depletion of fossil fuels, ever increase of fuel prices and increase of pollution levels with fossil fuels, the search for alternative techniques has become pertinent. The concept of the engine with LHR combustion chamber (Murali Krishna *et al.*, 2014a) is to reduce heat loss to the coolant, by providing thermal resistance in the path of heat flow to the coolant. Any saving in this part of the energy distribution

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A Review on Machine Learning Algorithms for Data Analytics

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Abstract

Data analytics and Machine Learning are the booming areas of research in computer science and many other industries worldwide. It has gained a great success in the areas of wide and varied application. This includes social media, economy, finance, health, agriculture, etc. Various intelligent machine learning techniques were designed and used to provide large data predictive analytics solutions. A systematic study of the literature of different machine learning techniques like Supervised and Unsupervised algorithms are provided herein. It is also a study of machine learning algorithms commonly used for large data analysis is made and presented herein. The systematic review was based on reports Preferred Items for Systematic Reviews and meta-analyzes (PRISMA) tool to review studies that have used different supervised learning algorithms and unsupervised to address different issues. The approach used in the search was such that the various articles published 2013 and 2018 on the use of machine learning algorithms and methods of data analysis were included in this article.

Keywords: Data Analytics, Machine learning algorithms, Supervised algorithms, Unsupervised algorithms

1. Introduction

The demand for advanced data analysis leading to the use of machine learning and other emerging techniques can be attributed to the appearance and subsequent development of technologies such as large volumes of data, business intelligence and applications requiring automation. As Sandhu [1] explains, machine learning, it is a subset of artificial intelligence, which uses computerized techniques to solve problems on the basis of historical data and information without unnecessary modification in the process kernel. In essence, involves creating artificial intelligence algorithms and other computational techniques that promote elegance machines. It encompasses algorithms to think, act and implement the tasks using protocols that are otherwise beyond the reach of humans.


Machine learning is a component of artificial intelligence, despite efforts to solve the problems based on historical or previous examples [2]. Unlike artificial intelligence applications, machine learning involves learning hidden patterns within the data (data mining) and subsequently using patterns to classify or predict an event related to the problem [3]. Simply depend intelligent machines knowledge to support their features and offers automatic learning and knowledge. Essentially, machine learning algorithms embedded in machines and it provides data streams to extract knowledge and information and fed into the system faster and more efficient management of processes. It is to mention that all machine learning algorithms are also artificial intelligence although not all techniques of artificial intelligence methods qualify as machine learning algorithms.

Machine learning algorithms are can be with or without supervision, but some authors also classified other algorithms as reinforcement because such techniques learn facts and identify the pattern in order to react to an environment. However, most articles recognize the machine learning algorithms are supervised learning and unsupervised algorithms. The main difference between these two classes is the existence of labels in the subset of training data. According Kotsiantis [4], supervised machine learning means output attribute also use default input attributes. The algorithms attempt to predict and classify the default attribute, and their



(6)

Heart Disease Prediction with Ensemble Learning Technique

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Abstract. Machine Learning (ML) is a field of science which is proven to be significantly effective and efficient in forecasting diseases and making predictions from analysing the enormous amounts of data produced by various healthcare industries. Several engineers across the world have developed ML algorithms for heart disease prediction in which different accuracies are obtained for the same technique for a given data set. It is in reality, contradictory to say which algorithm will be more beneficial to predicting whether the heart is healthy or unhealthy. A novel approach has been presented to predicting heart disease in which six algorithms have been developed and analyzed for predicting the heart disease efficiently. The automatic and efficient output will be derived depending on the accuracy, sensitivity, specificity, and precision. The Random Forest and Naïve Baye's classifier have proven effective in predicting heart disease from the UCI Cleveland dataset.

Keywords: Machine Learning · Classification · Heart Disease Prediction · Python

1 Introduction

Heart Disease, popularly called Cardiovascular Disease, is among the major causes of increased mortality rate globally. Predicting heart disease is not an easy task, and it involves studying several contributing factors. There are many cases and evidence that Machine Learning (ML) has proven to be very efficient in tackling real-world problems and generating optimal and efficient solutions. Several people focused on improving the accuracy of heart disease prediction and making it efficient using few ML algorithms [2–10]. An hybrid ML model of Random Forest algorithm with Linear ML model produced an output of 88% accuracy [4]. The Support Vector Machine is also significantly effective in that it could have an estimated accuracy of 85% [5]. The model developed as a comparative study on Naïve Baye's Theorem, Decision Tree, K-NN, and

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Effects of Variable Viscosity and Thermal Conductivity on MHD Convective Heat Transfer of Immiscible fluids with Heat Source

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Abstract

The magneto-fluid dynamics convective transfer of heat in two immiscible fluids with vertical channel are presented due to the effect of variable viscosity, thermal conductivity and heat source on these fluids. The heat transfer of these problems were transforming into dimensionless form by the differential equations which have been governing the flow. These governing boundary value problems so obtained were solved numerically by using Runge-Kutta 6th order method. The effects of these pertaining parameters on velocity and temperature fields are studied and their results have been presented graphically. The skin-friction and Nusselt number values have been computed and presented in a tabular form.

Keywords: Variable viscosity, thermal conductivity of variable, Heat source, magneto hydro dynamics (MHD), Free convection, Immiscible fluids, Runge-Kutta 6th order method.

I. INTRODUCTION

The two-phase fluid flow phenomena shows importance in pipe flows, fluidized beds, sedimentation process, gas purifications, transport processes and shock waves. Ramana Murthy and Srinivas [12] were analyzed in the study of heat transfer through flow of two immiscible combine stress fluid under an imposed crossways magnetic field with the laws of thermodynamics. Srinivas et al. [17] investigated the effect of radioactive heat transfer on entropy making of two immiscible fluid types which lies between two horizontal parallel plates. Mehdi-Nejad et al. [7] intended heat transfer across an interface formed between the two immiscible fluids and also Srinivas et al. [16] during his study found that effects of the heat transfer in immiscible micropolar and viscous fluids in a upright channel.

Fluids with variable viscosity and thermal conductivity have ample range of applications in many Engineering projects. For instance, these operational situations lubricants can be examined to high temperatures, pressure, shear rate etc, Myers et al. [10] concluded that these effects will influence the fluid properties. An analytical study over fluid flows and heat transfer under stretched sheet through thermal conductivity variables is reported with Subhas Abel[18]. The effect of changeable viscosity and thermal conductivities were studied by Hazarika

and Santana Hazarik[4], over stretched surface through injection with heat radiation. Surajit Dutta [19] emphasized the effects of the same on the flow in continuously moving surface by means of application in transverse magnetic field. Salawu and Dada[13] were investigated the effect of variable viscosity and thermal conductivity resting on radioactive heat transfer through inclined magnetic field along with dissipation in Darcy medium. In view of Anjali Devi and Prakash in [1], presented the problem of variable viscosity and thermal conductivity which cover the result on slander stretch sheet. Dulal Pal and Hiranmoy Mondal [3] enclosed to analyze the influence into variable viscosity and thermal conductivity going on non free convective flow of stretch sheet. Lai with Kulacki[6], Mohamed E.Ali[8], Hossain et al. [5] comprise on study which effect the same lying on flow and heat transfer and found that here be a significant outcome on the fluid flow.

Siddheshwar and Mahabaleswar[15] considered on a visco-elastic fluid in the occurrence of heat basis and also Mukhopadhyay along with Layek[9] were presented free convection flow in accordance by means of the heat transfer of fluids for changeable viscosity over a porous stretch upright surface in existence of thermal emission. An investigator Oluwole Daniel Makinde[11] abstract the effect of radiation, viscosity of variable, and suction and insertion. The result of heat basis might play a significant position in various heat

Free and Forced Convective Heat Transfer through a Nanofluid with Two Dimensions past Inclined Vertical Plate

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Abstract

Particularly in this paper discussion is about free and forced convective heat transfer in Cu – water Nano- fluid past permeable flat vertical semi-infinite moving plate due to high conductivity and occurrence in Cu-water Nanofluid with natural or forced convections. In this we consider magnetic field and also heat source. The effect on various parameters such as Reynolds number (Re), solid volume fraction (ϕ), magnetic parameter (M), inclination angle of the plate (γ), heat source parameter ($Q-h$), on linear velocity (U), vertical velocity (V) and temperature (θ) were exhibited in graphs. The profile of every governing parameter is displayed for natural as well as forced convection by considering the $Ar \gg 1$ and $Ar \ll 1$ respectively. This rate of heat transfer in forced convection is more than counterpart in free convection. Inertial force reducing the heat transfer rate in natural convection but the enhancement of Nu observed in forced convection. The composition of metal particles enhances the heat transfer rate in both convections, which emphasizes the Nano-fluid significance. Lorentz force is enhancing the heat transfer rate slightly. Heat source obviously increase the rate of heat transfer in both convections. The present paper aims to study the convective high temperature transfer of Nanofluids into which we use viscosity proposed with Einstein also with the thermal conductivity proposed by Corcione.

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Keywords: Convection, Heat source, MHD, Runge– kutta–6th order method, Thermal conductivity, Thermal slip, Viscosity.**I. INTRODUCTION**

Nano Technology is emerging due to vast applications in many fields recently. The Nanofluid usage in the convective heat and mass transfer was more significant with many fields like flow boiling, blood flows, environmental studies etc. But the detailed study about Nano particle character in convective heat and mass transfer is still needed. An attempt has been made to overcome this shortcoming for the enthusiastic researchers. The book details in the computational learn with the title “convective heat and mass transfer” include geometries such as inclined plate, stretching sheet and cylinder. These rare models in thermal conductivity proposed by Graham [1] and viscosity proposed by Jang and Choi [2] are used to describe the particle size in their mathematical forms. The scope of extension or application for real time systems is left to the intellectual researchers or readers. In this paper the discussion is about free and forced convective high temperature transfer through a nanofluid with two dimensions long-ago inclined vertical platter.

In everyday life of mankind, investigations on the ground of heat transfer challenges usage of cool with most of the system. A Nano-particle is suspended in liquid like water, ethylene glycol etc. then the heat transfer enhances enormously. This be substantiate with Das et al.[3] here their assessment paper and inside this situation he gave cool system command the extremely small heat transport rate throughout a Nanofluid in addition to heat force method similar to automobile which demand the higher temperature transport rate with Nanofluid. Kuznetsov and Nield [4] together be study the traditional way of free convective boundary layer stream with viscous as well as incompressible flowing (Newtonian fluid) long-ago a vertical smooth platter in casing of Nano-fluids. Inside this paper the author use the Nanofluid replica planned with Buongiorno [5]. Though he discovered seven slip mechanism taken put inside the convective move of Nanofluid but the Brownian diffusion plus the thermophoresis which be mostly significant while turbulent flow effect be missing.

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A STUDY OF POWER QUALITY IMPROVEMENT IN ACDC MICRO GRIDS BY USING SOLAR PV CELL: PROPOSED PI CONTROLLER

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Abstract:

At present, Power Quality is one of the key elements, which influences the economy of a nation. Due to rising of population utility supplies excess power to meet the increasing demand of the consumers. To maintain the pollution and the global warming within the particular level alternate sources of energy have used which develops the pollution less environment. To overcome those issues nonconventional energy comes into picture. The whole performance of the electrical utility can be improved by the usage of non-conventional energy resources. There are different forms of Renewable Energy Resource (RES) are available. Among them solar energy is mostly used because it is abundantly available in nature. In addition it has lot of advantages such as no air pollution, no fuel cost, noiseless and low maintenance. Integrating solar power to the grid has adverse effect on the power quality in the grid. In a few PV based framework, the inverter is a key segment which is responsible for the control of power stream between the dc source, and loads or lattice. This paper describes the difficulties and issues in the area of power quality the due to the integration of solar power in to grid

are to be analysed. In the present situation, the expanding entrance of sunlight based vitality can be huge test because of the variety of intensity generation. One of the answer for enhance the nature of intensity supply and assurance of framework security is energy storage system(ESS). In this project, an AC-DC hybrid micro grid is designed based on photovoltaic (PV), generator and vitality stockpiling framework are facilitated control is proposed to deal with the power as indicated by the heap request. The power control of the interlinked converters is empowered when the AC or DC side experience the ill effects of the dynamic power request lack. This paper shows the network associated inverter with a PI controller is suggested. At the connection of point of common coupling real and reactive power by abc to dqo transformation could be compensated under the unbalanced load condition. The proposed control strategy is utilized to enhance the voltage profile in the PV frameworks, dc voltage direction over the lattice side.

Key Words: Solar PV system, Converter, Inverter, PI controller, Power quality, Shunt active power filters.

EXPERIMENTAL INVESTIGATION ON CONCRETE CONTAINING COPPER SLAG AS A REPLACEMENT TO FINE AGGREGATE

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Abstract: This present study investigates the effect of concrete containing copper slag as a replacement. In this experimental work, M30 grade of concrete was chosen for the design mix. The physical characteristics of binding material, copper slag, fine and coarse aggregate were evaluated. The fresh and hardened state properties of concrete were evaluated in which copper slag is replaced by natural sand at various percentages such as 0%, 20%, 40%, 60%, 80%, and 100% respectively, and compared with the conventional concrete.

Index Terms – Copper Slag, Binding Material, Mechanical properties.

I. INTRODUCTION

Concrete is a versatile material that is most commonly used in all construction works. It comprises binding materials, natural fine, and coarse aggregates along with water which is mixed uniformly to obtain homogeneity. Most of the materials used in concrete are naturally available which is known as conventional concrete. Due to the increase in demand to cater to the population's needs, concrete is being used in building many structures for developing infrastructural facilities. Due to this, the available natural materials are depleting at a faster rate than expected. Many kinds of research are going on focusing on the possibility of utilizing artificial materials in concrete as a substitution to the natural materials. And few of those artificial materials can be of industrial wastes or by-products such as Fly Ash, GGBS, Copper Slag, M sand, Waste Foundry Sand, and many more. Sand is being used as a conventional material in construction activities, due to the large scale of extraction, it creates a negative impact on marine and biodiversity. FA occupies a volume of 25-40% in concrete[1]. In this present experimental study, natural river sand is replaced with copper slag and its Engineering properties were evaluated and compared with the traditional concrete.

Materials Used:

Binding Material: The binding material used for the experimental work is of OPC 43grade and the physical properties of OPC are evaluated.

Table 1 Physical Characteristics of Binding Material

Property	Value
Specific Gravity	3.06
IST	42 mins
FST	420 mins
Consistency	36%

Fine Aggregate: Natural river sand available nearby premises is chosen and its properties were evaluated as per IS:383-1987[2].

Table 2 Physical Characteristics of Fine Aggregate

Property	Value
Specific Gravity	2.51
Water Absorption	1.09%
Fineness Modulus	2.79
Grading Zone	Zone - II

Coarse Aggregate: The crushed aggregate of 20mm nominal size is used and tests are performed as per IS:383-1987[2].

Table 3 Physical Properties of Coarse Aggregate

Property	Value
Specific Gravity	2.74
Fineness Modulus	7.60
Water Absorption	0.45%

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**A STUDY ON POWER QUALITY AND RELIABILITY COMPREHENSIVE
POWER DISPENSATION OF SMALL SCALE POWER SYSTEM AND
SUBSEQUENT MICRO-GRIDS**

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ABSTRACT:

The significance of an adaptable AC dispersion framework gadget for micro-grid applications. The device intends to improve the power quality and dependability of the general power conveyance framework that the micro-grid is associated with Broadened Kalman channels are additionally contemplated for recurrence following and to extricate the symphonies spectra of the lattice voltage and the heap flows in the micro-grid. Likewise these paper high lights on DG gathering so as to orchestrate the venture of benefits, the nature of intensity supply and the participation with the current power lattice. The heritage worldview for power administration in the greater part of the jolted present reality depends on the concentrated generation transmission-circulation framework that developed under a controlled domain. In this specific situation, another worldview is developing wherein power generation is personally installed with the heap in micro-grids. Up to now, these units just infuse dynamic power depending from the accessibility of their essential source. In future from one perspective DG units need to add to framework strength, however then again DG units can give extra functionalities so as to offer a surplus incentive for the client. Hence particularly inverter-coupled frameworks are appropriate. Extra usefulness could be improvement of Power

Quality and Reliability (PQR), yet additionally crest shaving, arrangement of control vitality or receptive power remuneration is possible. And here given the future development of micro-grid and its features also given.

Key words: Distributed generation, Power system operation, Power system reliability, Electric power quality, Future Micro-grids.

1.0 INTRODUCTION:

For traditional power distribution framework, the idea of micro-grid has offered shoppers an unwavering quality and decrease in absolute vitality misfortunes and it has turned into a promising option. While associating micro-grid to the dissemination matrix, the effect of power quality (PQ) issue on the general power framework execution must be considered. These PQ issue incorporates voltage and recurrence deviation in the lattice voltage and sounds in the voltage and burden flows. To relieve these issue different types of gear, for example, dynamic channels, continuous power supplies, active voltage restorers, and UPQC are generally introduced by the purchasers to secure their heaps and framework against PQ aggravations in dissemination organize. In any case, these gadgets are introduced at the purchaser sides and the PQ issues that they are

proficient to deal with are typically

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ACTIVE POWER QUALITY IMPROVEMENT AND DISTRIBUTED CONTROL IN HYBRID AC/DC MICROGRIDS

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ABSTRACT:

Combining the DC microgrid and the dominated AC system forms the scenario hybrid AC/DC microgrid, which would be, in concept, the presence of both DC and AC microgrids with sources, storages, loads and appropriate interlinking converters (ICs) tied between them. Hybrid AC/DC microgrid has been becoming a popular concept to provide an effective solution for unlimited large-scale integration of various DGs and distributed storages (DSs) because of its higher efficiency and better compatibility. This paper proposes a distributed control strategy that considers several source characteristics to achieve reliable and efficient operation of a hybrid ac/dc micro grid. The hierarchical control scheme for standalone DC microgrids, the fully decentralized control for hybrid AC/DC microgrids, the distributed control for hybrid AC/DC/DS microgrids and power quality improvement for hybrid AC/DC microgrid have been verified. The proposed hybrid ac/dc microgrid is composed of converters and distributed generation units that include renewable energy sources (RESs) and energy storage systems (ESSs). The proposed control strategy is verified in various scenarios experimentally and by simulation.

Keywords: ac/dc hybrid microgrid, power quality, harmonic compensation, reactive power compensation

INTRODUCTION:

Alternative current (AC) has been the dominant power supply medium for over a century since the end of "the war of currents" [10] in which Thomas Edison and George Westinghouse became adversaries due to Edison's promotion of direct current (DC) for electric power distribution over AC advocated by Westinghouse. War of the currents was ultimately won by AC, and has been the platform for electrical transmission across the world since then. The key behind AC's victory was the invention of the transformers which could easily step-up the voltage levels for long distance power transfer with lower transmission losses. The points of AC being the standard choice include easier transformation into different levels for various applications, capability of long distance power transmission and inherent characteristics from the fossil energy driven rotating machine. AC power system gradually became the top engineering achievement of the 20th century. However, problems along with the development, such as high energy costs, aging of current power system infrastructure and limited funds to construct new large power plants and long distance transmission lines, constraint the meet of the growing energy demands.

On the other side, the advantage of DC transmission was re-recognized accompanied with the progress of advanced power electronics techniques. The major application is power electronics-based high voltage DC (HVDC) transmission, which integrates DC penetration inside AC-dominated transmission networks. Since the past two decades, DC grids have shown resurgence due to the development and deployment of renewable DC power sources and their inherent compatibility for various DC loads in industrial systems [1], commercial buildings [3] and residential complex [9]. Reasons of the gaining popularity for DC grids include better compatibility [5], higher efficiency [6] and robust stability [6]. The shift from AC to DC system facilitates easier control of individual load performance, increased integration of renewable energy sources (RESs) and distributed energy storages [10]. This trend calls for a re-examination of the traditional AC power system structure and its efficiency. An alternative solution might be the hybrid AC/DC power system,

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A Study on Drafting a Composed Ac and Dc Lower Electricity in a Higher Potential Power Quality

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Abstract— This review paper examines control quality contemplations for direct current (DC) electric power circulation frameworks, especially DC microgrids. Initial, four chose test DC designs are talked about to give inspiration to the thought of intensity quality in DC frameworks. Second, a concise diagram of intensity quality difficulties in customary alternating current (AC) circulation frameworks is given to build up the field of intensity quality. At long last, an overview of writing tending to control quality issues in DC frameworks is exhibited, and essential power quality contemplations in DC circulation framework plan and task are examined. Through the proposed plan of the new cross hybrid AC/DC microgrid, as another element, the activity of the system in islanded mode can be accomplished as per control quality principles even in the most exceedingly bad burden quality conditions. It ought to be noticed that in like manner crossover microgrids in islanded mode, the conveyed voltage quality is relative to the nature of the customer's heap current. Another plausibility of the proposed structure is the quick VAR remuneration of nonlinear and enlistment heaps of customers to keep the power factor of the appropriation transformer near unit esteem. Reproduction results show that there are satisfactory dimensions of pay for various sorts of intensity quality issues. Complete symphonies mutilations and all out interest bends are underneath 3% in both the framework associated and segregated methods of the cross breed AC/DC microgrid.

Keywords— Hybrid AC/DC Microgrids, DC Distribution, DC Standards, Design, Power Quality, DC Distribution, DC Microgrid.

I. Introduction

Nowadays, most renewable energy sources (RESS) and distributed generation (DG) units, including photovoltaic (PV) arrays and fuel cells, directly produce DC output power, while different sources like micro-turbines or wind turbines convey variable recurrence/voltage AC yield control. In the two modes, the association of DG to DC frameworks is generally more straightforward, increasingly effective, and progressively practical. Besides, to interface vitality stockpiling sources and electrical vehicles, there is no requirement for converters. Numerous buyers are utilizing present day family unit apparatuses and electronic burdens sustained by a power supply with an AC-to-DC converter, at last utilizing DC control. In this manner, a DC situation is an easier method to all the more productively conveys capacity to these heaps.

The advances accomplished in power hardware, which made DC voltage control a straightforward assignment, notwithstanding the expanding infiltration of DC loads and sources urged analysts to re-evaluate DC appropriation for in any event segments of the present power framework to build its general effectiveness. In this paper, the creators will exhibit a thorough writing study and diagram of the exploration endeavours led on a few issues, for example, the plan, control, activity, strength and security of DC frameworks.

The target of the paper is to give an incorporated foundation about what has just been accomplished in these regions, by giving insights concerning the points as well as direction on where to discover additional data about them. The paper likewise endeavours to build up a streamlined reasonable way to the recently specialists in the field of DC control frameworks on what the difficulties of DC frameworks are and how their friends handled them. Considering the benefits of DC microgrids, the expansion of the customary AC circulation framework can be executed utilizing a DC microgrid, demonstrative of the acknowledgment of the hybrid AC/DC microgrid. In such manner, the hybrid AC/DC microgrid is a standout amongst the most encouraging new research ventures directed in the most recent decade to improve the execution of keen lattices. In this paper, a portion of the ongoing investigations directed on hybrid AC/DC microgrids are surveyed. The distinctive structures of the hybrid AC/DC

COMPARATIVE PERFORMANCE ANALYSIS OF CANDIDATE WAVEFORM

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ABSTRACT: The utilization of versatile broadband information has seen an unstable development with the dispatch of Long Term Evolution (LTE) and LTE-Advanced organizations. An ideal waveform for 5G cell communication will give high ghostly effectiveness, low Peak-to-Average Power-Ratio (PAPR), strong against Doppler move to permit versatility, non-concurrent transmission and gathering ability. In this proposition, study has been done on three potential 5G waveform competitors specifically General Frequency Division Multiplexing (GFDM), Universal Filter Multi-Carrier (UFMC), Filter Bank Multi-Carrier (FBMC), and their benefits and disservices. Determination of an appropriate competitor waveform for 5G, recreation of the 5G frameworks dependent on the up-and-comer waveforms has been performed utilizing the MATLAB software and their exhibition is contrasted freely and the current Orthogonal Frequency Division Multiplexing (OFDM) based LTE/LTE-Advanced framework in terms of Spectral Efficiency(SE), Out-of-Band (OOB) Emissions, PAPR, and Bit Error Rate (BER) investigation. In view of the better ghasly productivity, less OOB spillage, and marginally better PAPR, FBMC waveform has been chosen as a superior decision for 5G communications. Simulation results shows because of the cyclic prefix the FBMC and CP-OFDM endure when communicating short blasts, the UFMC outperforms by 10% for any case and FBMC for the short parcels and it is like FBMC for long successions. In outline, the adaptable idea of FBMC makes this waveform an appropriate possibility for future 5G organizations.

KEYWORDS: CP OFDM, UFMC, GFDM, FBMC, LTE.

I.INTRODUCTION: The 5G (fifth generation) of WCS (wireless communication systems) and networks was researched, designed, and implemented in recent years. This establishes new standard that influence and interpret next generations of telecommunications paradigms, altering how people connect, live, and work [1,2]. With continued development of mobiles and apps, as well as improved BW(bandwidth) needs, 5G and beyond technologies which supports large amounts of data and has more efficiency in energy compared to prior generations [3]. Which results, significant KPIs (key performance indicators) comprises as spectral efficiency, data rates, transceiver complexity, power consumption, mobility, connection density, and latency are expected to increase in the 5G and beyond generations [4,5]. This may be accomplished by examining several approaches for increasing the capacity of sharing information while also improving coverage, dependability, and availability [2,6].

Enhanced Mobile Broadband (eMBB), Massive machine-type communication (mMTC), which comprises enormous Ultra-Reliable and minimum-Latency Communication and IoT (Internet of Things) are three types of services that will be presented in 5G. Peak information speeds of 10 Gb/s for uplink (UL) and 20 Gb/s for downlink (DL) are among the KPIs driven by [7], as are efficient in spectral data of UL 15 bits/Hz and DL 30 bits/Hz, system BW support up to 1 GHz, and mobility up to 500 km/h. Number of devices that linked in mMTC

Image Enhancement Techniques Using Matlab Functions

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Abstract: In image processing one of the most frequently used techniques is image enhancement. In order to obtain a good quality image, these techniques can improve the graphical appearance and image features. In real life, various images such as aerial images, medical images of different categories may suffer from the drawbacks of noises and poor contrast. To enhance the visibility of an image by removing all these drawbacks, image enhancement techniques are utilized. The improved picture results in better vision to the human eye. The image enhancement techniques are based on objective or application. In this work, to judge the effectiveness of image enhancement techniques, many techniques such as contrast enhancement, histogram equalization, and filtering, etc. have been applied on various images using Matlab.

Keywords: Image, Contrast, Matlab, Pixels

1. Introduction

By using image enhancement, images can be improved the appearance and features of graphics or provide an improved revamp image for approaching computerized image processing. The main aim of image enhancement is to increase the visibility of images to offer enhanced human visual perception. There are more than one part of the images that improve details and sharpness through the elucidation and visual analysis by using enhancement. The image picked up from the usual atmosphere with vigorous range contains mutually regions of dark and bright. Because of exceeding in the vigorous range of sensing and human eyes, human eyes are hard to recognize those types of images. The quality of image improves by using enhancement techniques so that extract the meaningful information from the image. The Image enhancement mainly recovers features of image such as contrast, edges boundaries and decreases the ringing artifacts. Apart from illumination conditions, environmental disturbances such as temperature fluctuations, ambient pressure and external noises affects the image quality

2. Techniques of Image Enhancement

Image enhancement having a great challenge for measuring the criterion for quality of image and due to this; the various techniques of image enhancement are available. By using image enhancement technique, image can be change with edge enhancement, gray level slicing, saturation transformation, hue, intensity and contrast.

3) Contrast Enhancement

Image enhancement techniques play a significant role in digital image processing applications where the image quality in terms of visual appearance and contrast is necessary by visualization of human. Essential stage of image processing is contrast enhancement. The image quality can be enhanced to raise the luminance between backgrounds and foreground by contrast enhancement. To manage the contrast for any application is the main objective

of contrast enhancement technique. Application can be such as remote sensing, television and medical image etc. If an image have poor quality than it is difficult to find information, such type of problem can be eliminate by increasing the range of pixels value using contrast enhancement. This technique helps to rise or reduction the contrast of an img consequently

2) Adaptive Histogram

In the AHE (Adaptive Histogram Equalization), the image contrast is not enhanced adequately. In adaptive histograms equalization, the contrast of each pixel is enhanced by a transformation function. This technique also eradicates the errors by linear min - max method. Thus the noise is being reduced in different areas of image. And AHE also have the capacity of restoration the contrast of gray scale and color image.

3) CLAHE

Image contrast is increased by using CLAHE. Instead of the whole image, this technique applies on sub parts of the img, called tiles. By using bilinear interpolation, the neighboring tiles are finally combined in directive to eradicate artificially tempted confines. The enhanced output is displayed in Fig. 4. by CLAHE.

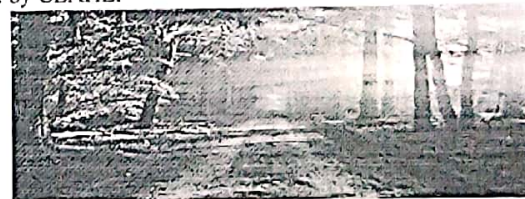


Figure 1: (a): Image

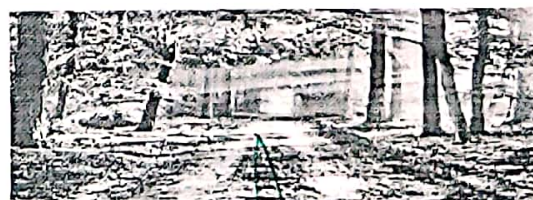


Figure 1: (b): Image enhanced by CLAHE

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DESIGN OF HARDWARE EFFICIENT PARALLEL PREFIX ADDERT.MOHAN RAO¹ASSISTANT PROFESSOR, DEPT OF ECE, ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCE'S, RANGA REDDY (DI), TELANGANA STATE¹

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ABSTRACT:

Kogge-stone adders which perform multi bit addition are one of the types of parallel prefix adders and also considered as the fastest PPA. The implementation of these adders faces difficulty due to their hardware complexity. Modified parallel prefix adders are designed for 16-bit and 32-bit parallel prefix kogge-stone adders to reduce the hardware complexity of standard 16 bit and standard 32-bit parallel prefix kogge-stone adders. In this project a modified 64 bit parallel prefix kogge-stone adder with reduced hardware complexity compared to standard 64-bit parallel prefix kogge-stone adder is designed and simulated using XILINX ISE 14.7

I.INTRODUCTION

In a prefix problem every output depends on all inputs of equal or lower magnitude, and every input influences all outputs of equal or higher magnitude graph. Due to the associative of the prefix-operator, the individual operations can be carried out in any order. In particular, sequences of operations can be grouped in order to solve the prefix problem partially and in parallel for groups of input bits, resulting in the group variables. At higher levels, sequences of group variables can again be evaluated, yielding levels of intermediate group variables, where the group variable denotes the prefix result of bits at level l . The group variables of the last level must

cover all bits from to 0 and therefore represent the results of the prefix problem.

Carry-save adders — as the most commonly used redundant arithmetic adders — play an important role in the efficient implementation of multi operand addition circuits. They are very fast due to the absence of any carry-propagation paths, their structure is very simple, but the potential for further optimization is minimal. The same holds for signed-digit adders, which use a slightly different redundant number representation. The addition results, however, usually have to be converted into an irredundant integer representation in order to be

50 ARM11 AND LINUX FOR VEHICLE ACCIDENT DETECTION AND PREVENTION

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Abstract: Everyone's biggest worry while travelling is security. This project outlines the creation of an effective alarm system that can monitor the state of an automobile, vehicle, or car while moving. This initiative is intended to tell the family members of travellers about an automobile accident. This invention employs a vibration sensor that can detect sudden vibrations in the event of an accident. A signal is sent to the microcontroller as a result of this. This project shows how to use a GPS modem to identify a car collision automatically. The system may be linked to the automobile alarm system and send an alert to the owner's phone. A GPS receiver and a microcontroller make up this detection and messaging system. The GPS receiver receives position data in the form of latitude and longitude from satellites. This data is processed by the microcontroller, and the processed data is transferred to the user/owner through IoT.

The MCU is connected to an IoT module. This refreshes the web server's information to talk about the accident. This allows accident scenarios to be monitored and the location of the accident to be quickly alerted to the police/ambulance service.

The ARM11 microcontroller is at the heart of the project. This processor is responsible for the whole alert system's operation. Although GPS only provides longitude and latitude information, we can easily get the location name from whence the message was sent by utilising an Android application on the phone.1.

INTRODUCTION

The advent of the mobile phone and Internet of Things (IoT) industries reshaped the way people communicate and brought a paradigm shift to public and private services [1]. This ever-evolving technology marked the beginning of new era affecting the lives

An Emphasis of Fluoride Effect on Human health and Treatment- Review

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ABSTRACT

Water is the major medium of fluoride intake by humans. Fluoride in drinking water can be either beneficial or detrimental to health, depending on its concentration. The presence of fluoride in drinking water within permissible limits is beneficial in the calcification of dental enamel. According to the World Health Organization (WHO), the maximum acceptable concentration of fluoride is 1.5 mg/l, South Africa's acceptable limit is 0.75 mg/l, while India's permissible limit of fluoride in drinking water is 1 mg/l. Concentrations beyond these standards have shown dental and skeletal fluorosis and lesions of the endocrine glands, thyroid and liver. Fluoride stimulates bone formation and small concentrations have beneficial effects on the teeth by hardening the enamel and reducing the incidence of caries. Fluoride is a ubiquitous element present in earth's crust and is also being added to the environment anthropogenically. It is the most electronegative of all elements. Fluorine is found in the soil and the content of Fluorine in the lithosphere varies between 100 and 1500 g/ton. Fluoride has gained importance due to its dual influences on human beings. In lower concentrations, Fluoride is an essential nutrient which aids in the formation of bones, prevents tooth decay, whereas in higher concentrations it causes fluorosis, brittling of bones, curvature of bones, dwarfishness, mental derangements, cancer and in extreme cases even death. According to WHO standards, the Fluoride in drinking water should be within a range that slightly varies above and below 1 mg/L. In temperate regions, where water intake is low, Fluoride level up to 1.5 mg/L is acceptable. The Bureau of Indian Standards, BIS (IS-10500) has prescribed a desirable limit and permissible limit of Fluoride in drinking water as 1.0 and 1.5 mg/l respectively.

Keywords: Fluorosis, WHO, Concentration, human body, lithosphere and permissible limits.

I.INTRODUCTION

Water is one of the major elements essential for sustenance of all forms of life and is available in abundance in nature covering approximately three fourths of the surface of the earth. The chemical nature of water is one of the most important criteria that determines its usefulness for a specific need and as such not all the waters are fit for drinking; hence the problems of scarcity of drinking water. Over the year's groundwater has generally been



Assessment of Ground Water Quality in Medchal-Malkajgiri District

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Abstract: Water is the most important substance in our daily life. Without water, life would not have been possible. The magnitude of water problem is increased due to poor drainage system, unplanned industries, increase of pollution, influxes of people from rural areas and other human activities. Due to rapid increase in population, urbanization and industrialization in Hyderabad have resulted the drastic increase in water pollution, which is one of the largest and smart city in India. In this study the ground water samples are collected in different seasons i.e., pre-monsoon and post-monsoon in the year 2016 for analysis from various places of Rangareddy district (Medchal) in Telangana State. The Physico-chemical parameters such as pH, total dissolved solids (TDS), chloride (Cl), fluoride (F), nitrate (NO₃), Sulphate (SO₄²⁻), hardness (CaCO₃, MgCO₃), sodium (Na), potassium (K) are analyzed with different analytical methods used by technical instruments. The results were compared with standard values given by World Health Organization (WHO). The present study revealed that the parameters of water which is too higher than the standard limits.

Keywords: Physicochemical parameters, Water pollution, Total Hardness, Fluoride and Nitrate.

I. INTRODUCTION

India is the biggest developing country having 1.3 billion population, it needs to provide more facilities in various sectors for the peoples' sustainability. It is developing in agriculture in rural level, organizations and industries at urban areas. Urbanization is more because growth rate is more at urban areas like Bengaluru, Hyderabad, Amaravati etc. Hyderabad is situated at the banks of Musi river and it has great history, it is the capital city of Telangana state and Andhra Pradesh. Hyderabad city has good climate and it provides many resources for the people to settle their career in various fields, so many are coming to Hyderabad city from various places of India mostly from Telangana and Andhra Pradesh states and the Hyderabad city is ranked as the best city in India in living standards by Mercer's Quality of Life Index ranking in 2017, thus many choose the city as permanent place as it gives multi careers. It is well developed in various sectors like IT, Pharma, educational etc. and it has major industrial areas in and around the city. Medchal is also one of the industrial area in city, which is carved out of erstwhile Ranga reddy district, now it is re-organized as a district by the Telangana government in 2016 named as Medchal-Malkajgiri district. Generally due to urbanization¹⁻⁵ and industrialization air and water gets pollution, especially water quality reduces, which becomes more dangerous⁶. Water is essential for human life and needs. Natural and ground water is more affected at such areas like Medchal.

II. MATERIALS AND METHODS

Samples were collected from various selected sites of Medchal-Malkajgiri district of Hyderabad city in both pre- monsoon and post monsoon seasons, general analytical methods were used to assess the water quality of samples such as Electrical Conductivity meter, pH meter, Ion meter, UV Spectrophotometer, Nephelo meter and Flame photometer was used to test the water quality parameters in both the seasons. While collecting the samples location of sampling area noted and numbering is given for the sampling bottles from 1 to 20, Latitude and Longitudes are also noted and mentioned below in the table-1.

Table 1: Latitude and Longitudes values of sampling sites

S. No	Name of the site	Latitude & Longitude	S. No	Name of the site	Latitude & Longitude
1	Medchal	17.6305° N, 78.4842° E	11	Kukatpally	17.4849° N, 78.3996° E
2	Jeedimetla	17.5172° N, 78.4612° E	12	Shapur	17.5394° N, 78.2675° E
3	Shamirpet	17.5895° N, 78.5706° E	13	Fathenagar	17.4573° N, 78.4517° E
4	Kapra	17.4888° N, 78.5718° E	14	Bowenpally	17.4765° N, 78.4884° E

A Review on Significant Parameters and Exhaust Emissions of Four Stroke Copper Coated SI Engine with Alcohol Blended Gasoline through Catalytic Converter

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Abstract

In this paper, the performance of four stroke single cylinder spark ignition (SI) engine with copper coated combustion chamber [copper-(thickness, 300 μ m) coated on piston crown, and inner side of cylinder head] with alcohol blended gasoline were investigated. Performance parameters like brake thermal efficiency, exhaust gas temperature and volumetric efficiency at various values of brake mean effective pressure of the engine and also investigated the combustion characteristics such as peak pressure, maximum rate of pressure rise, time of occurrence of peak pressure and maximum heat release at full load operation of the engine with alcohol blended gasoline. In this study, a comprehensive review of the four stroke copper coated spark ignition engine using alcohol blended gasoline with catalytic converter. The output power and emissions of alcohol blended engines were compared with conventional engines with pure gasoline operation.

Keywords: Spark Ignition (S.I) Engine, Conventional Engine (CE), Copper coated combustion chamber (CCCC), Copper coated engine (CCE), Catalytic converter (CC).

I. INTRODUCTION

The performance and pollution levels of four-stroke, single cylinder spark ignition (SI) engine with methanol blended gasoline (20% methanol, 80% gasoline, by volume) having copper coated engine with catalytic converter compared with conventional SI engine with gasoline operation were

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EXPERIMENTAL INVESTIGATIONS ON BOTH VERSIONS OF THE ENGINE THAT IS CONVENTIONAL ENGINE (CE) AND LOW HEAT REJECTION (LHR) DIESEL ENGINE FUELLED WITH TAMARIND BIODIESEL TO STUDY THE PERFORMANCE PARAMETERS

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Abstract: The present work was undertaken to study the performance evaluation of the CE and LHR engine with tamarind biodiesel at normal and preheated conditions with varying injection timing and injector opening pressure and was compared to that of neat diesel on conventional engine at the recommended injector opening pressure and timing. From the literature review it is understood that biodiesel increased NOx emissions. LHR engine further increased NOx emissions. Hence in order to reduce NOx emissions from LHR engine with biodiesel fuel, concept of EGR technique was used. Load test on the CE and LHR engine was conducted with different operating conditions of biodiesel in the similar manner as in the case of neat diesel operation with 100% replacement of the neat diesel. These investigations with the biodiesel established the usefulness of the hot combustion chamber of the LHR engine. The performance evaluation made in two different parts like performance parameters and combustion diagnosis were studied at different operating conditions like at the recommended injector opening pressure and timing and at the variable injection timing and pressure. Various injector opening pressures attempted in this investigations were 190 bar, 230 bar and 270 bar. Different injection timings attempted in this experimentation were 27-34°bTDC. Various operating conditions used in this experimentation were normal temperature and preheated temperature


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Dynamic Verifiable Outsourced Database with Freshness in Cloud
Computing

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Abstract

Database outsourcing is one of the significant services in cloud computing, in which the data owner (DO) delegates the database management to the cloud service provider (CSP) in order to reduce management overhead and maintenance costs of database. Despite its tremendous benefits, it suffers from some security challenges as secrecy of outsourced database and verifiability of search results. Recently, some of the research work has been done on verifiability of search results of outsourced database (ODB), which provides the correctness and completeness of search results. But it does not provide solution for freshness of search results and dynamic operations in ODB. To address these challenges, in this paper, we propose a dynamic verifiable outsourced database with freshness in cloud computing based on Merkle B^+ tree (MB-Tree), Invertible Bloom Filter (IBF) and Counting Bloom Filter (CBF) to achieve correctness, completeness and maximum degree of freshness of search result along with dynamic operations. Through security and performance analysis, we prove security and efficiency of our scheme respectively.

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Keywords: cloud computing; outsourced database; verifiability; correctness; freshness; secrecy; completeness

1. INTRODUCTION

Cloud Computing is new information technology (IT) paradigm which enables on-demand, ubiquitous network access to shared pool of configurable computing resources. One of the main services of cloud computing is database outsourcing. In which, the client can delegate database management to the CSP in order to reduce maintenance costs and management overhead of database. Despite its plenty of benefits, there are some security challenges in ODB [1].

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