3.3.1 Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

Sr.No	Year	No. of research papers published
1	Year 2022-23	11
2	Year 2021-22	11
3	Year 2020-21	04
4	Year 2019-20	05
5	Year 2018-19	NIL

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RESEARCH ARTICLE

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Research Directions for Homogenous Charge Combustion Ignition Engine

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ABSTRACT

Homogenous Charge Combustion Ignition Engine (HCCI) technology is an advanced engine technology developed in 1989. Several attempts are being made for the performance improvement and field applications of HCCI engines. Simulation models and laboratory experiments confirm that the HCCI technology is superior to the conventional Internal Combustion engines. However, the HCCI research is in nascent stage today. Focused research is required to bring this technology in commercial use. This paper aims to investigate the future directions for study of Homogenous Charge Compression Ignition engines. Review articles from last ten years were studied in detail. The conclusions and future directions suggested by all papers are critically examined, tabulated and analyzed. Common conclusions are separately presented and the specific conclusions of the papers are compared so as to develop a methodology to carry out further research in the field of Internal Combustion engines.

Keywords: Intake Manifold, CI engine, CFD Analysis.

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INTRODUCTION

Fist practical internal combustion engine was developed in 1860. This engine made use of coal-gas air mixtures as fuel. However, this engine had efficiency close to 5%. In 1867, Nicolaus Otto and Eugen Langen had developed an engine working on premixed fuel and air mixture working on 4 strokes. These engines had efficiency close to 11%. [1]. Since then, the highest thermal efficiency was close to 28%. Researches are being carried out all over the world to improve the efficiency and reduce the emissions from the engines.

The basic concept of Homogenous Charge Compression Ignition (HCCI) was proposed by Onshi et al [2] in 1989. The air and fuel are mixed external to the combustion chamber of engine and mixture is auto ignited by compression. This concept overcomes the basic drawbacks of Compression Ignition (CI) and Spark Ignition (SI) engines and produces very less emissions. This is advanced engine technology and it has got the potential to solve global emission problem. The concept is discussed in figure 1.

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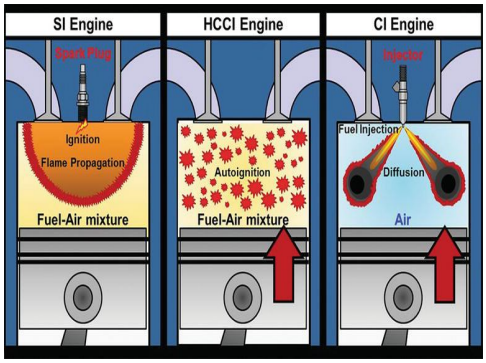
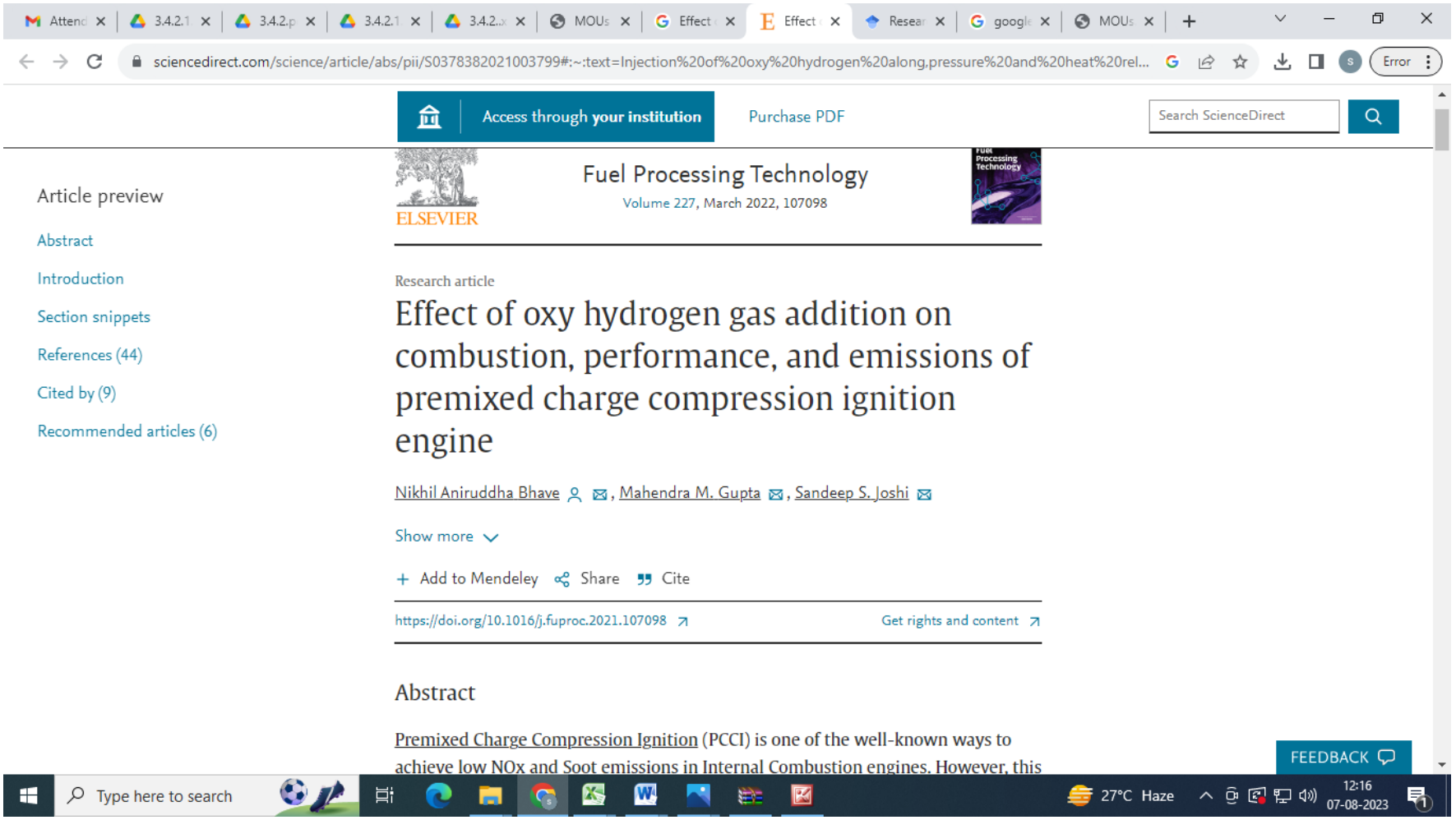


Figure 1: Comparison between the CI, SI and HCCI engine concepts [3]



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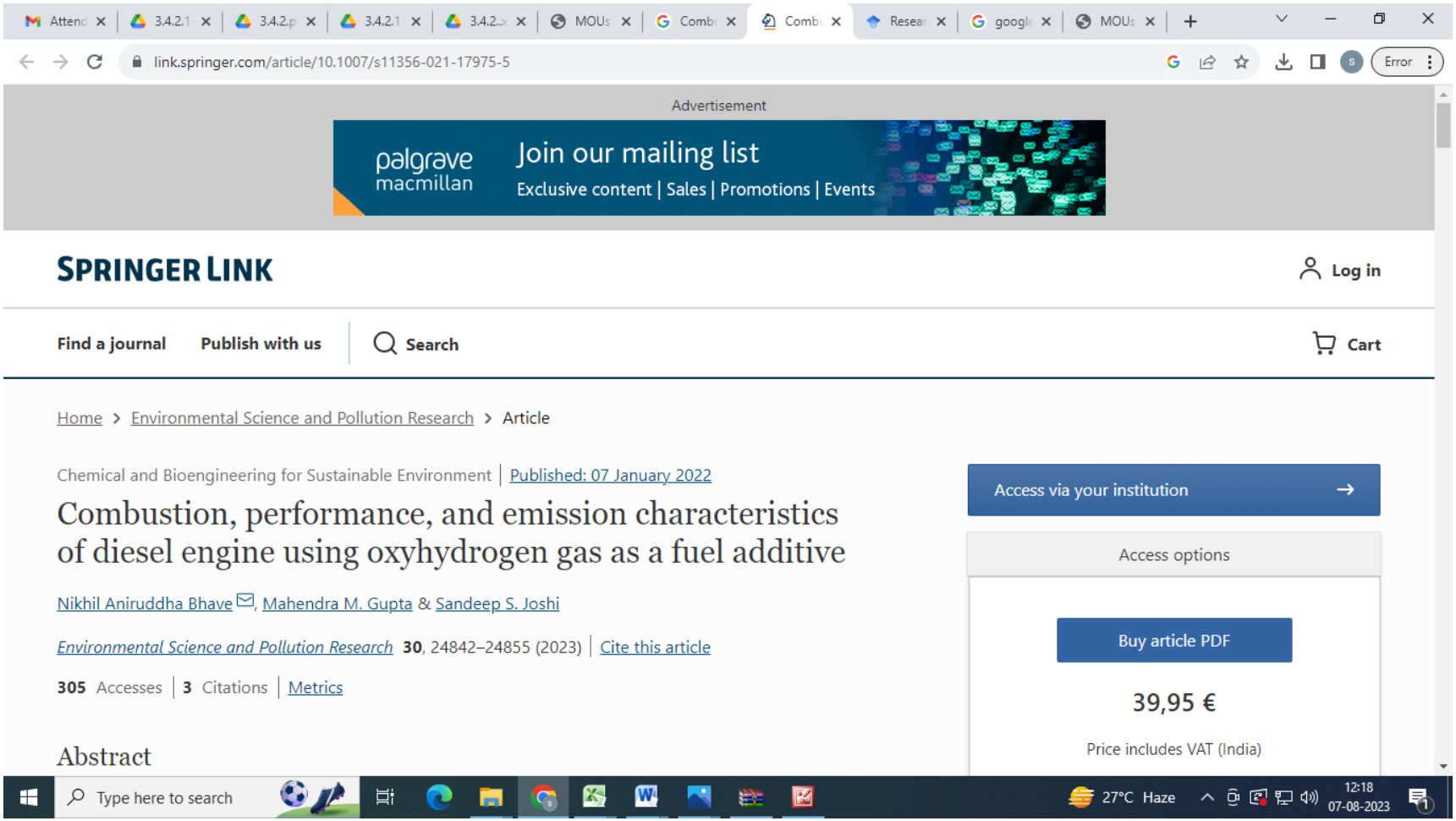

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RESEARCH ARTICLE

SAMRIDDHI Volume 14, Special Issue 1, 2022 Print ISSN : 2229-7111 Online ISSN : 2454-5767

Linkages Between Critical Success Factors and Performance Measures for Improvement in Service Quality - Life Insurance Perspective

Mahesh R. Shukla[*1], Bhavana Khapekar[2], Nikhil A Bhave[3], Yogesh Dandekar[4], Aditya Kawdaskar[5], Shailesh Khekale[6]

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ABSTRACT

The paper tries to link the Critical success factors and Performance Measures for improvement in Service Quality in Life Insurance sector. An instrument for identifying the problem through analysis of facts, in order to gain thorough, proper and clear understanding has been designed. The linkages both strong and weak were established from the empirical study. The result will help in deriving a statement in which a predicate affirms or denies something about the subject for further study and research for services to be provided in Life Insurance sector. Companies will change their style of functioning and may bring changes in their service practices.

Keywords: Service Quality, Organizational performance, Pilot study, Life Insurance sector.

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INTRODUCTION

For last 100 years, India's life insurance industry is changing rapidly. Post liberalization in the economy in 1991, gates were again thrown open for investment in this sector for the private players, both national and foreign partners (Insurance companies). In case of joint venture with Indian partner the FDI limit was set to 49% for foreign partner (IRDA, 1996). Twentynine Indian and foreign private Companies started their operations post year 2000 (IRDA, 2020). This paper examines the factors responsible for the fall in income of private companies' operating in India [1-4].

Primary investigations revealed a number of reasons behind this sharp fall of premium income. They were incomplete information of the facts, miss-selling by the agents, non-cooperation by the company staff, exorbitant policy charges, claim settlement issues, wrong promises made by the companies, attrition rate of employees, closure of branches, and technological use by the companies to address the grievances, cultural issues etc [5-7].

To find a solution to the present problem, the authors tried critical analysis of the research studies done so far in the life insurance sectors in India. Wide range of products in offerings in markets by these companies led the authors to think on the service dimension and forced them to think how improvement in quality of services to customers will help companies in their objectives [8-9]. To deal with various threats the authors tried to understand the different measures needed to allow speedy utilization of service improvement tools and technique and the predominant or critical factors that prevent them as service yields intangible and more customers contact.

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Design and Analysis of a Novel Microstrip Antenna for Implantable biomedical devices

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Abstract

Implantable Medical Devices (IMDs) are small devices designed to be safely implanted inside the human body, playing a crucial role in advancing biomedical telemetry. This article proposes the design of a miniaturized Planar Inverted-F Antenna (PIFA) suitable for operation within the Medical Implant Communications Services (MICS) band. The novel antenna design incorporates a strategically positioned shorting pin, enhancing miniaturization and resulting in a more compact yet high-performance antenna. Simulations are conducted within a rectangular model, with the tissue properties mimicking those of the human body using bio-tissue materials. Subsequently, four different substrates are employed, maintaining constant antenna dimensions, to assess additional critical antenna characteristics such as return loss and gain. The antenna's performance is then compared across these different substrates. The designed antenna boasts a compact volume of 1.492 cm3, making it well-suited for successful integration into IMDs, thereby contributing to the advancement of medical technology and patient care.

Keywords - Biomedical telemetry, implantable receiving wire, far field, biomedical implantable gadget, substrates.

1. Introduction

the field of medical care has seen amazing changes driven by progressions in innovation. Among these advancements, implantable biomedical gadgets have arisen as amazing assets in the domain of clinical diagnostics and therapy. These gadgets, going from pacemakers and neurostimulators to medicate conveyance frameworks and biosensors, are intended to be inserted inside the human body, offering persistent checking and restorative mediations. Basic to the compelling working of these gadgets is the capacity to speak with outside frameworks, giving constant information trade, programming, and control.

Headways in scaling down innovation have extraordinarily pushed the field of Wireless Medical Telemetry (WMT). This innovation considers the remote checking of actual signs, introducing a huge benefit, particularly under the watchful eye of incapacitated or old patients. For biomedical telemetry to turn out to be broadly available, two basic components should join: the accessibility of a remote correspondence medium and the improvement of gadgets that use this medium to trade data.

In biomedical telemetry, the utilization of two radio wires is normal — one inserted in the Implantable Medical Device (IMD), and the other filling in as checking hardware. These

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Latent Topic Modeling of Cancer Hallmark for Analyzing Biomedical Literature

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***Abstract*— The Cancer hallmarks represent an important impression for new information regarding cancer and to unravel the complexities of cancer. The limitations of frameworks for the analysis of clearly developed topics of cancer knowledge, study of topic modeling in cancer research remains a major challenge. The methods provided were successfully used to study the targeted semantic and contextual data in scientific texts using embedding words according to the hallmarks of cancer.**

***Index Terms*— Multi-task learning, Biomedical domain analysis, Cancer Hallmark, Topic analysis.**

I. INTRODUCTION

Cancer is the next leading source of death in 2018 and is incredibly complex [1]. The hallmarks of cancer are the qualities which are used to identify disease cells from ordinary cells [2, 3]. The cancer hallmark is a basic target for malignant cancer cell mutations and is helpful in diagnosing tumor pathogenesis. It retrieves very important information in cancer research [4-6]. There are genetic markers which can relay information regarding malignant growth and are proposed to provide a regulatory framework to determine the extent of biological processes leading to cancer [3]. These hypertensive stressors (SPS), growth retardants (EGSs), cell death resistance (RCD), replicative immortality (ERI), inducing angiogenesis (IA), active attack and metastasis (AIM)) are the hallmarks of cancer and shown in Figure 1.

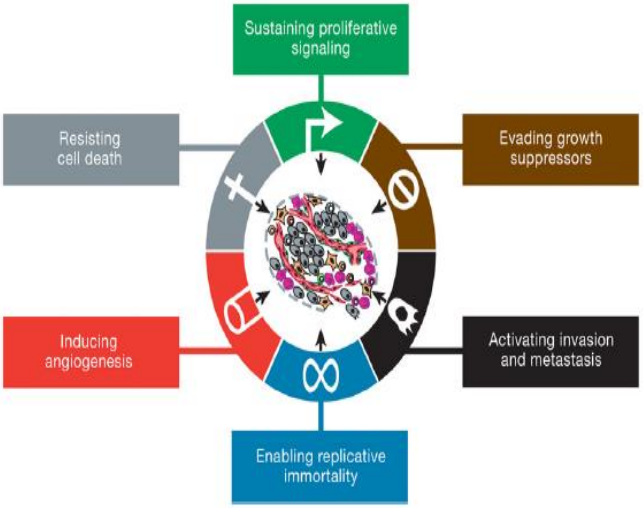

Figure 1. The Hallmark of Cancer

The biomedical literature contains the majority of cancer research findings, and the PubMed database has recognized around 30 million quotes and 4 million cancer-related literatures as of 2019. In the same field, authors have studied to gather more precise and historical data [7, 8]. That database's extensive collection of biological literature presents a fantastic chance to gather crucial data for cancer research. Researchers can retrieve relevant literature from that database by using a keyword-based search. The complexity of cancer necessitates the use of numerous keywords, synonyms, and combinations, making it time-consuming to find pertinent information using just the keyword. It's crucial to model a topic in order to retrieve data from many cancer-related papers at PubMed in a somewhat more efficient manner. Most of the cancer research results are found in the biomedical literature with the PubMed database.

II. LITERATURE REVIEW

The technique of topic modeling helps cancer researchers express biomedical knowledge more effectively. However, there aren't many experiments looking into biomedical themes and the literature that surrounds them, thus it hasn't been estimated how to use a topic model to quantify the hallmark of cancer. The topic model has been used by researchers to analyze biomedical literature on genomes, including studies of genetic research and protein-protein interactions. In order to find protein-protein interactions in biomedical literature, Andrzejewski et al. developed an automatic extraction model [9]. They measured vocabulary differences from Medline abstracts using the LDA model. In order to successfully synthesize protein interactions in biomedical literature, Wang et al. model the LDA-producing subject [10]. They claim that the topic model reflects the intricate relationships between the various procedures as well as the words that are associated with them.

Wang et al. [11] proposed a strategy to remove shared features between quality-related archives in a way that was not utilized using a point model. They used the LDA model to remove the contents of the record. They trace that points are usually logically indicated in the statistics of the currently

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Design Approaches for Real Time Tracking System for Underground Mines: A Review

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Abstract

"Mining in India is fraught with danger", By Orchie Bandyopadhyay, 07 September 2021.

One of the major concerns in the mines is to keep the track of the workers & their locations to ease rescue operations in case of emergency.

Variouscommunication techniques, tracking technologiesand the key design attributes for real-time tracking of miners, vehicles and other mining assets in an underground minehas been reviewed in this paper. The work herein is focused on suggesting a robust integrated real time tracking system with optimum accuracyfor a mission-critical strategy that should ensure the survivability of the tracking system after an accident.

Keywords:-Real Time Tracking System (RTTS), Real Time Location System (RTLS), Chirp Technology, Ultra-Wideband technology (UWB), RFID, Underground Communication Technologies

1. Introduction

The mining industry is under pressure from fluctuating mineral prices and worries about the environment and the safety of its workers.

Manual tracking is a common practice in mines to keep track of miners in underground mines. It gives information about the miners working in underground or open-cast mines and their general location. The mine foreman gives the dispatcher a list of names and locations within the mine at the beginning of each shift in manual tracking. Once inside the mine, a miner uses the dial phone there to call the dispatcher and let them know he needs to go to a different area to work. The dispatcher then updates the miners' current locations on the map.

Graduate Research in Engineering and Technology (GRET)

Volume 1
Issue 8 *Pedagogies for Higher Education.*

Article 11

September 2022

Enhancement of Concentration in studies through simple games - an innovative pedagogy methodology

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Enhancement of Concentration in studies through simple games – an innovative pedagogy methodology

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Abstract— It is often observed that the students of new generation have large number of distractions. This leads to lesser concentration on what they are studying and it effects into lesser assimilation of subject matter, lesser confidence and lesser overall performance. It is a well-known fact that assimilation increases with increase in concentration. In order to improve the performance of students in whatever they do, we planned to use some innovative methods for improving their concentration. We experimented this on the fresh batch of students that was admitted in 2018-19 to increase their concentration and built-up their confidence through a new method pedagogy involving Gaming, Micro-projects, Meditation *(Omkar Recitation)* and recitation of multiplication-tables etc. These activities were daily conducted in the specially allotted student's hour.In order to measure the outcome of our experiment, we conducted an aptitude test at the beginning and once again after doing this experimentation over a period of full semester. The outcome of this experimentation is found to be very encouraging. This paper presents the innovative methodology adopted over a group of student's improvement of for concentration and discusses the visible outcome in the better performance of the batch.

Keywords— Innovative pedagogy, Concentration Games, Yoga-in-education

INTRODUCTION

It is observed that students of current generation have large number distraction and therefore cannot concentrate for more than 20-25 minutes in a class. After that they lose their focus on the subject. Studies of Gonzalez et al [1] have shown that students can work for 11 and half minute in the same project and then switch to another. Concentration means focus of thoughts and deeds on a certain object keeping aside things, which is not related to that. Most of the students have weak ability to concentrate on the subject matter while studying. This may happen for the lessons of high

difficulty level. Concentration is nothing but the state of mind, which is activated from inside the brain. If the student loses concentration, he/she cannot pay attention and cannot assimilate or learn.

Keeping this in mind, we pla activities to pedagogical methods

Our innovative pedagogy methodology helped the batch of students to stay focused and improved their ability to absorb, assimilate and understand the information to convert it into the knowledge.

We have introduced a concept of student hour is in our college since last 5 years. The purpose of student hour is to promote nonacademic activities. The Student hour is for 40 minutes after first two lectures. So the students get a break in between. Activity other than academics like group discussion, reading newspaper article, Toast Master, any skill development activity or talk on buzz words like AI, IOT, latest technology in the remaining time. The student hour is utilized for promoting activities related Innovative Pedagogy as discussed in this paper and elaborated in following paragraphs.

THE METHOD: A fresh batch of students from first year of AY 2018-19 is selected. Total seventy students are selected for conducting this activity. All the activities are carried out on seventy students. The pre and posttest is conducted on all the students but 80% students could give both the tests. All the seventy students did Omkar recitation during student hour in the class. Micro project is done by all the seventy in a group of three in their second semester. Total five activities are carried out.

(A) Ball into Bucket (BIB) game
(B) Hand over a ball (HOB) game
(C) Meditation through *Omkar* recitation
(D) Recitation of multiplication tables
(E) Micro projects in the first year

(A) **Ball into a Bucket (BIB) game:** This is a simple game of throwing a small tennis ball into a bucket from a distance. Although, it appears to be very simple but it is an effective way of improving concentration. At the start, the student stands at a 6 feet distance from the bucket. The following instructions are given to the students

(1) Stand with balance on both legs
(2) Take a deep breath and relax
(3) Look intensely at the edge of the bucket
(4)Throw a ball into the bucket.

At a time, student is given total six chances to throw a ball perfectly inside a bucket. When perfection is achieved i.e. all six throws perfectly into the bucket, the d after a gap by increasing the feet away from the bucket and try

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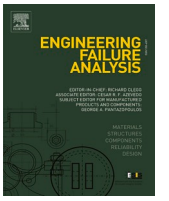

Experimental investigation of polyurethane seal failure used in hydraulic system

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A B S T R A C T

In the hydraulic system, investigation of seal failure is very important for reliable operation. The U-cup seal of thermosetting amorphous polyurethane material was tested to analyze the parameters causing the seal failure. Unlike the tribometer, the experiments were carried out in a novel pneumatically driven reciprocating shaft assembly by varying the pressure from 100 to 400 bar at a shaft velocity of 0.15 m/s. The changes in mechanical and chemical properties of the seal before and after tests were investigated using Fourier-transform infrared spectroscopy, thermogravimetric analysis, scanning electron microscopy, and deformation of seal dimensions. The maximum wear, extrusion, and deformation were observed at 400 bar pressure. It is found that the interfacial temperature developed due to frictional heat in the sealing zone was majorly responsible for seal degradation. Weakening of Hydrogen bonding, wear of sealing surface, extrusion due to rise in temperature, and deformation of seal dimensions were the phenomenon responsible for the seal failure.

1. Introduction

The hydraulic seal is an important element for channeling energy and preventing hydraulic system leakage in a hydraulic system. Most industries from automotive, oil and gas refineries, aviation, and medical consider hydraulic seals as an important component due to their efficient role in transferring fluid power into mechanical power [1,2]. Seal failure can cost to industry in terms of downtime, loss of energy, and sometimes damage to equipment. Leakages of oil due to seal failure also contaminate the environment [3,4]. Because of this, it is inevitable to investigate the seal failure for quality and reliability of operation [5]. Polyurethane is a very popular elastomer for a range of industrial applications. Hydraulic seals made up of Polyurethane are used in numerous high-pressure hydraulic applications [6]. As per synthesis and application, the mechanical and chemical properties of Polyurethane can be varied. Due to this, polyurethane has remained a topic of great interest to researchers [7,8]. Chemically Polyurethanes are usually made up of alternate networking of hard segments and soft segments. Hard segments are generally diisocyanate-based and soft segments are polyether or polyester based [9].

Researchers have focused more on property studies of the crystalline and segmented polyurethane material [10–13]. The hydraulic seal comes in different profiles like O-ring, and U-cup, and its failure is investigated tribologically by the researchers [14–17]. The impact of degradation of mechanical and chemical properties and thermal effects on polyurethane seals are reported in the literature [18–21]. In U-cup seal, sealing edges plays important role in efficient sealing. The reciprocating load acting on the sealing edges enhances the wear. The friction at the contacting surface leads to a rise in temperature and degrades the sealing surface faster [22,23]. Since the cost of the seal is less, replacement of seals is generally preferred when seal failure occurs. In case of operational breakdown

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A High Gain Circularly Polarized Antenna Array for Telemetry Application at S band frequency

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Abstract

The design, analysis, and experimental validation of a high gain circularly polarized antenna array tailored for telemetry applications at the S-band frequency. Telemetry plays a pivotal role in various fields, including aerospace, remote sensing, and medical devices, where reliable data transmission is essential. The proposed antenna array aims to address the demands of telemetry systems operating in the S-band (2-4 GHz), offering enhanced communication performance. Through meticulous design and optimization, we achieve a high gain antenna array with circular polarization characteristics, making it suitable for both transmit and receive functions in telemetry applications. The research encompasses detailed electromagnetic simulations, experimental measurements, and comparisons, demonstrating the antenna array's suitability and effectiveness. The results highlight the antenna's potential to significantly improve telemetry communication in S-band applications, paving the way for enhanced data transmission and reception capabilities in diverse fields of science and technology.

Keywords - High Gain Antenna, Antenna Array, Telemetry, S-band Frequency, Electromagnetic Simulation

Introduction

Telemetry, the wireless transmission of data over considerable distances, plays a pivotal role in various fields of science and technology, including aerospace, remote sensing, and medical devices. It serves as the backbone for collecting critical information, monitoring systems, and enabling communication with remote or inaccessible locations. Within telemetry systems, the choice of antenna design significantly influences communication performance, especially when operating in specific frequency bands. The S-band, spanning the frequency range of 2 to 4 gigahertz (GHz), is a particularly important band for telemetry applications, offering a balance between data rates and propagation characteristics. In telemetry applications, achieving high gain and circular polarization in antenna systems is often imperative. High gain ensures efficient signal transmission over extended distances, while circular polarization enhances signal reception and mitigates the effects of multipath propagation. These attributes are especially critical in scenarios where the reliability of data transmission and reception is paramount.

the challenges associated with telemetry applications at S-band frequencies by presenting the design, analysis, and experimental validation of a high gain circularly polarized antenna array. The proposed antenna array aims to provide a comprehensive solution for telemetry

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RESEARCH ARTICLE

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Analysis of the Performance of Green Pea Depoding Machine using Treadle Mechanism

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ABSTRACT

In the food industry green pea is an important material for making different food products. It is cool season crop of India and also plays major role in Indian crops. It is a rabbi season crop and it's sowing begins from October to November mid in plains. To remove the peas from pedals, more labor and time is used to be consumed. To overcome the problem of labor and time, machine is designed for maximum removal of pea seeds from pea pods without using electricity. It is operated by treadle mechanism. This machine is fabricated by keeping in view for farmers, small scale industries and for that low cost material available in market was used. Treadle mechanism, roller gears, shaft, tray, hand pulley, are the major components of this machine. Principle of this Depoding of green peas is based on the friction generated between the two rollers and pea pods.

Keywords: Depoding machine, green peas, green pea pods.

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INTRODUCTION

In India, peas are cultivated in Maharashtra, Madhya Pradesh, Utter Pradesh, Jharkhand, Punjab, Haryana and Uttarakhand. Cultivation of Peas is over an area about 4,34,000 hectares with an annual production of 38,69,000 tons[1]. Importance of fresh peas is in terms of richness of protein, amino acid, vitamin C and A, calcium, carbohydrates, iron and phosphorous.

Pea is very important ingredient consumed as green, as well as dried in the spice form and used in the vegetarian, non-vegetarian dishes. Many food products like chutneys, curry powders and many other are prepared from pea. the vegetarian, non-vegetarian dishes and pickles.

Now a day, there is increase in mechanization in terms of agricultural machinery in performing the various farm operations in more efficiently with higher speed. Scope of vegetable processing.

Green pods are shelled manually which are laborious, energy and time consuming. There is necessity to design and develop small green pea pod shelling machine.

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LITERATURE REVIEW

Khilendra Kumar Sonboier et al.[1] fabricated motor operated machine in which pea pods passes between two adjustable rollers to maintain the clearance between them for that authors have used adjusting screw. In this machine, for the Vibration of feeding tray, a tray vibrator shaft is used.

Parminder Kamboj et al. [2] designed and fabricated small scale pea depoding machine by using CAD software. This machine was based on principle of friction generated by rubbing action of blades with

RESEARCH ARTICLE

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Small Scaled Home Composting Machine and Use of Trichoderma As A Bio-Fertilizer Agent

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ABSTRACT

Organic waste composting is the leading way of recycling. By controling the microbial aerobic decomposition process of organic waste organic fertilizer can be otained. In the present paper a new design of home composter machine useful for a family of 4 to 6 people is discussed. A shredder with effective cutting angle and Trichoderma, a biofertilizer agent, are the main features af the machine. The motive behind using shedder is to cut solid waste into very small pieces and reduce the composting reaction time. Waste after cutting is decomposed by Trichoderma in the presence of required air circulation and temperature to form organic fertilizer. Trichoderma degrades organic matter and also produces nutrients and growth regulating compounds which is useful for plants. For efficient composting, other than better air circulation, frequent turning of waste, optimum level of moisture content use of some bulking agents like sawdust biochar were also taken in consideration. It resulted in the disposal of waste at the source and opening new economical avenues by producing fertilizer at home.

Keywords: Home Composting, Organic Waste, Trichoderma.

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INTRODUCTION

Composting is the natural process of decomposition of organic matter by microorganisms under controlled conditions. Composting process is necessary since the expelled biological materials contains complex chemicals which cannot be used as resource materials; hence they are converted into the simple inorganic available nutrient. If the waste is directly been put into the soil it will undergo conversion inside the soil which will take the nutrients from the crop and soil. Hence recycling plays an important role in maintaining soil quality, suppressing plant diseases and pests as well as reduces the need for chemical fertilizers. A typical composition of residential waste is given in figure 1 and it is estimated that average household waste is around 3.95 kgs per week. Hence there is a need for waste recycling [1-2].

In the present case, most of the composting machines that are available in the market are huge, expensive and require electricity, and are not suitable for recycling house waste. Hence this machine turns out to be a good option for a family of 4-6 people. The new design of the small composting machine has a shredder that cuts the kitchen waste into small pieces the shredder requires less torque to cut hence a handle is provided that rotates the shredder, where the shredder has an effective cutting angle. This designed home composting machine aims at reducing the municipal organic solid wastes generated at houses and it helps the users to make

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RESEARCH ARTICLE

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Design and Fabrication of Economical Industrial Air Filter

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ABSTRACT

The design and fabrication of an economical air filter is for an industrial cupola furnace in MIDC, Hingna. The purpose of an industrial filter is to remove unburned coal particles' hazardous fumes and reduce NOX in the environment. The filtration system consists of a filter box that comprises four filter media which are placed vertically like a cartridge. The first media is manufactured like a frame containing a steel wool scrubber. This frame traps hot gases and large particles of smoke. The second frame contains a layer of blue silica gel that absorbs moisture present in polluted air. The third filter frame consists of activated carbon which has chemical properties for the adsorption of Carbon dioxide and Nitrogen dioxide gases. The last filter is HEPA (high-efficiency particulate air) filter, which is made from element paper. It can filter 0.3µm diameter of dust particles. Finally, we get the filtered air through the exhaust. This filtration system is effective in terms of cost, cleaning, and maintenance. The filters are easy to remove when the dust gets chocked in it, also clean easily with the help of a pneumatic gun or some dust cleaning system. This will be economical and easy to maintain.

Keywords: adsorption, blue silica gel, interwoven fiberglass fibers, ultra-low particulate air, HEPA – (high-efficiency particulate air)

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INTRODUCTION

In air pollution in India or the world, there are several fine particles which are harmful to human. These fine particles enter in human body and may cause damage to parts like the nose, throat, and be captivated inside the human body part, which is dangerous and more harmful. The effect of fine particle may cause health problems such as eye irritation, nose irritation, irritation throat, and lung irritation, also others types of problems may arise like coughing, sneezing, runny nose, and asthma [1]. These types of ultra-fine particles are also called airborne particles having diameter of 2.5 µm or less. These fine dust particles can be carried by air/wind from one place to another easily in the environment. There are so many technologies are used to minimize and removal of fine particles from the environment, like cold plasma, cyclonic air filtration (venture), wet scrubbing, electrostatic precipitate and physical filters. Though, most of the technologies are not energy-efficient as well as not able to provide cost-effective filtration.

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Air quality index is one of the main parameter to study of air pollution. It is consist of different suspended and repairable particulate matter. The Repairable particulate matter in-short RPM is divided in to two sizes, one is PM10-whose size is less than 10 microns and other is PM2.5 whose size is less than 2.5 microns [2]. If Air Quality Index value is above 100 in air, then those types of air is unhealthy and dangerous for people.

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Review

Review of hydraulic seal failures due to effect of medium to high temperature

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ABSTRACT

Hydraulic seal, generally made up of elastomers, is used in hydraulic systems to prevent the leakage and facilitate the efficient transmission of fluid power into mechanical power. Most of the industries dealing with fluid power consider hydraulic seal as a one of the important components. Seal failure during the operation may cause a complete shutdown of the system, downtime in production line and affect the quality of the products. Since the cost of the seal is less, replacement of seals is generally preferred when seal failure occurs. Most of the time, engineering aspects of seal failure is not considered. Understanding of seal failure mechanisms can improve the reliability of operation, life, and design of the seal. Apart from functional failure, a thermal aging phenomenon like swelling, rapid gas decompression (RGD), change in crosslink density, chain scission reaction, and wear process worsens the mechanical and chemical properties of the seal. These mechanisms can cause seal failure and are strongly governed by temperature in the sealing region. This paper explains the failure mechanism of hydraulic seal. The objective of paper is to provide a review on influence of medium to high temperature on seal failure mechanism and provide insights to improve seal performance and reliability.

1. Introduction

Hydraulic seals are generally non-metallic and largely made up of materials like thermoplastic elastomers (TPE) and rubbers (natural and synthetic). The hydraulic seal works in static as well as in dynamic conditions. Most of the industries from automotive, oil and gas refineries, aviation, and medical consider hydraulic seal as an important component. Though hydraulic seal is a very less expensive and consumable item, its role is significant during operation. Its basic work is to provide proper sealing and does not allow contaminants to enter into the system. It allows smooth conversion of energy contained in fluid into mechanical energy in the form of linear and rotational motion [1]. In many hydraulic systems, the efficiency of transferring fluid power into mechanical power depends on sealing. In multiple fluid systems, the seal prevents mixing of fluids or gases with each other. In many applications, seal experiences a simultaneous effect of more than one system parameters like temperature, velocity, load, and chemical environment. Hydraulic seal is used in numerous applications. The working conditions of seal are different for different applications. Based on applications, normally it operates in a temperature range of – 65 °C to 260 °C, pressure up to 80 MPa, and velocity up to 15 m/s [1].

Hydraulic seal has been mentioned even before 1856 [2]. The research on the hydraulic seal has been started since 1930 with a major contribution by White and Denny. The author had developed a basic understanding of the elastomeric rod seal working used in

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Combustion, Performance and Emission Characteristics of Early Direct Injection Compression Ignition Engine with Varying Oxy Hydrogen Gas Concentration

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Abstract

Early Direct Injection Homogeneous Charge Compression Ignition is one of the clean combustion technologies which reduces the oxides of nitrogen and soot emissions significantly. However, this strategy suffered from drawbacks of fuel spray impingement on cylinder walls, excessive carbon monoxide, and unburnt hydrocarbon emissions, and lower thermal efficiency than conventional diesel combustion in CI engines. A novel attempt has been made in this experimental research work to address the above-said issues by injection of oxy hydrogen gas as a fuel additive to diesel in stationary Compression Ignition engine. This gas was injected into the intake manifold where it premixes with the incoming air. Experiments were conducted at a constant rpm of 1500 and load was varied from 0 to 75%. The diesel was injected by common rail direct injector 45 Before Top Dead Center which ensured an almost homogenous mixture of air, oxy hydrogen gas, and diesel. Due to the presence of hydrogen, the increased flame speed resulted in an increase in peak pressure and heat release rates. This enhanced the Brake Power and Brake Thermal Efficiency. CO and HC emissions were reduced due to oxy hydrogen gas addition compared to the early injection strategy. HC emissions decreased for a lower oxy hydrogen gas flow rate of 200 ml/min. However, smoke emissions were increased with oxy hydrogen gas induction due to an increase in BSFC. Oxides of Nitrogen reduced with oxy hydrogen gas addition by almost 44.13%.

Introduction

Internal Combustion (IC) engines have been in use for more than a century. IC engines make use of fossil fuels such as gasoline and diesel for the production of useful power. However, combustion of gasoline and diesel in Spark Ignition (SI) and Compression Ignition (CI) engines are responsible for a high amount of environmental pollution and hazards to living beings. Countries all over the world have applied stringent norms to control environmental pollution [1]. Despite these norms, the emissions have been drastically increasing. IC engines are responsible for the emission of CO2, CO, HC, NOx, and Smoke [2]. CI engines are robust, durable, and possess high thermal efficiency. But the emissions of NOx and smoke are substantial [3]. A study shows that the European passenger car emission regulatory body has failed when it comes to NOx emissions from diesel-fueled vehicles [4]. Another study also shows that the NOx keeps exceeding emission standard values for more transient cycles [5]. Reduction of NOx and Smoke simultaneously in a diesel engine is a difficult task [6]. Various after-treatment devices like Diesel Particulate Filter (DPF), NOx Traps, Selective Catalytic Reduction (SCR), etc are available which reduce emissions. However, looking at the present scenario, it seems to be an obligation to reduce emission in-cylinder itself [7].

To address various issues of CI engine, Homogenous Charge Compression Ignition (HCCI) strategy seems to be a suitable way. This strategy was first developed by Onishi et.al. [8] for increasing the performance of the two-stroke engine in 1979. In an HCCI engine, the air and fuel are mixed homogeneously before combustion either in the engine cylinder or in the intake manifold and then the charge is ignited by compression. The heat release is volumetric throughout the combustion chamber and combustion does not take place by flame propagation or diffusion. Using this technique, NOx and soot are drastically reduced. However, HCCI engines suffer from drawbacks of limited operating range, inability to control autoignition and combustion phasing, high peak pressure rise rates, and higher CO and HC emissions [1]. Various methods such as Early Direct Injection [8], Late Injection [9], Port Fuel Injection [10], External Mixture Preparation [11], multiple fuel injection [12], charge stratification [13], dual fuel injection [14], etc were explored by researchers to overcome the above problems.

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Experimental investigation of Al_2O_3 nanosuspension in vapor compression refrigeration system using tetrafluoroethane and isobutane refrigerants

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ABSTRACT

The indirect emissions due to energy consumption by refrigeration system has contributed potentially to global warming. The infusion of nanoparticle-based suspension (nanofluid) have shown significant improvement in heat transfer for refrigeration application with the noteworthy reduction in energy consumption. Experimental work was carried out with an aim to reduce indirect emissions from the refrigeration system. Thus, the present work consist of the performance investigation of aluminum oxide (Al2O3) nanoparticle suspension in a vapor compression refrigeration system with varying refrigerant mass charges. The refrigerants used for the experiment are tetrafluoroethane (R134a) which is high in GWP (Global Warming Potential) and isobutane (R600a) which has low GWP. Mineral oil (MO) and POE (Polyolester Oil) were used as the base fluid for the synthesis of Al2O3 based nanofluid with mass fractions of 0.02%, 0.04%,0.07%, and 0.1%.Varying mass charges of 150 gm, 180 gm, and 200 gm of R134a and R600a refrigerant were employed in the experiment to work with each mass fraction of nanofluid. The refrigeration system is designed to work within the cycle range of −6 °C to 30 °C for R134a and R600a refrigerant. Experimental results showed improvement in COP by 41.8%, reduction in power consumption 31.85%, increment in compressor discharge pressure by 12.56%, reduction in evaporator pressure by 3.94%, and reduction in pull-down time by 23.5% by using 200 gm of R600a-MO with 0.1 wt% of Al2O3 based-suspension. Also, there is a significant reduction in exergy destruction observed in a different component of the refrigeration system by using the nanosuspension compared to the pure refrigerant.

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1. Introduction

The refrigeration system is one of the biggest sectors which uses 20% of available electricity worldwide [1]. The refrigeration system worldwide has several industrial, commercial, and residential applications. More than 2 billion units are operating as domestic refrigerators [2], 120 million units for commercial refrigeration [3], 6.2 million for transportation, and over 50,000 for cold storage [4,5]. All of these statistical figures show the importance of equipment in everyday life. Many researchers have contributed significant findings to improves the refrigeration system. Specifically, almost 90% household refrigerator works on the principle of vapor compression refrigeration cycle.

The refrigeration system, along with ease and comfort to human life has also have been adversely affected the environment. Almost 37% of global warming issues are due to the direct emissions of CFCs, HCFCs, and HFCs and 63% are due to the indirect emissions sourced from the electricity production to power the refrigeration system. It is estimated that almost 7.8% of global greenhouse gases are due to refrigeration sector-related emissions [6].

For the last two decades researchers across the world have try to improve the VCRS by using innovative approaches such as the use of microchannel heat exchanger [7], integrated refrigeration techniques [8,9], cascade refrigeration [10], multi or dual evaporators [11,12], different azeotropic mixtures[13,14], use of green refrigerant [15-17], solar energy driven refrigeration [8,18], mag-

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CHEMICAL AND BIOENGINEERING FOR SUSTAINABLE ENVIRONMENT

Combustion, performance, and emission characteristics of diesel engine using oxyhydrogen gas as a fuel additive

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Abstract

A lot of research is being carried out to reduce the environmental pollution resulting from compression ignition engines. For this, various gaseous fuels are being explored as fuel additives in compression ignition engines. The purpose of this research work is to investigate rarely explored Brown's gas (oxyhydrogen gas) in CI engines to reduce environmental pollution. Brown's gas was produced by electrolysis of distilled water with potassium hydroxide as a catalyst. A common rail direct injection CI engine was used for the present investigation. Detail combustion, performance, and emission analyses were carried out, which is scarcely reported in oxyhydrogen gas fuel investigations in compression ignition engines. Oxyhydrogen was injected at varying flow rates of 200 ml/min, 400 ml/min, 600 ml/min, and 800 ml/min in the intake manifold of the CI engine equipped with an electronically controlled common rail direct injector. The peak pressure and maximum heat release rate increased with the increasing concentration of oxyhydrogen gas. The comparison was made between conventional diesel combustion and oxyhydrogen gas addition of 800 ml/min at 75% load. The reduction in CO and HC emissions was about 37.5% and 17.94% respectively. CO_2 and NOx emissions increased by 9.37% and 7.41% respectively. Very low smoke emission of 0.01 to 0.02% was recorded at 800 ml/min oxyhydrogen gas flow rate. Thus, it can be concluded that oxyhydrogen gas provides promising benefits in terms of better combustion and low emissions. However, it is recommended to carry out further research to incorporate the use of this additive in actual automobile applications.

Keywords Brown's gas · Oxyhydrogen gas · CI engine · Combustion · Performance · Emissions

Introduction

Compression ignition (CI) engines are the most widely used engines due to their durability and robust construction. However, exhaust gas emissions from the CI Engines have been a global concern for the last couple of decades. CI engines are the major contributor of oxides of nitrogen (NOx) and smoke emissions. CI engine makes use of diesel as fuel for converting the chemical energy into mechanical work. The burning of diesel produces carbon monoxide (CO), carbon dioxide (CO_2), unburnt hydrocarbons (HC), NOx, and smoke emissions.

HC and CO are produced by incomplete combustion of fuel in the crevices of the combustion chamber of the diesel engine. HC includes alkanes, aromatic hydrocarbons, and aldehydes (Heywood 1988). Alkanes are responsible for asphyxia and narcosis effects. Aromatic hydrocarbons can cause headaches, nausea, and dizziness. Some of them are even neurotoxic and cause cancer (McClellan et al. 2012). Aldehydes cause eye and skin irritations while the others may cause damage to the mucous membrane of the nose and eyes. Long-term exposure to CO reduces the oxygen-carrying capacity of blood and causes miscarriage. NOx emissions are also equally dangerous to human health which cause coughing, shortness of breath, and respiratory problems. Smoke emissions contain carbonaceous materials called soot or particulate matter (PM). PM is highly

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Hydroxy gas enriched diesel fuel investigations on homogenous charge compression ignition engine with change in injector opening pressure

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ABSTRACT

Experiments were performed on a diesel engine with varying injector opening pressure (IOP) and fuel injection timing of 45° before top dead center. Hydroxy gas was mixed with incoming air at a constant flow rate of 200 ml/min. An increase in IOP improved brake power and brake thermal efficiency (BTE) by 8.42% and 7.03%, respectively. The addition of hydroxy gas improved brake-specific fuel consumption, brake power, and BTE was 7.10%, 3.2%, and 11.48%, respectively with increment in IOP. Carbon monoxide, hydro carbons, and smoke were reduced by 29.24%, 19.84%, and 32.27%, respectively due to hydroxy gas addition at elevated IOP.

KEYWORDS

early direct injection; emissions; HCCI engine; hydroxy gas; injector opening pressure

1. Introduction

Internal combustion (IC) engines are being used in the automobile sector for a long time. IC engines make use of fossil fuels like gasoline and diesel for the production of useful power. However, the combustion of gasoline and diesel in IC engines is responsible for a high amount of environmental pollution and hazards to living beings. Extremely strict norms are being imposed by developed countries all over the world to control environmental pollution (Duan et al. 2021). Despite these norms, the emissions have been drastically increasing. IC engines are responsible for emitting carbon dioxide (CO_2), carbon monoxide (CO), hydrocarbon (HC), oxides of nitrogen (NOx), and smoke (Joy et al. 2020). CI engines are robust, durable, and possess high thermal efficiency. But the emissions of NOx and smoke are substantial (Heywood 1988). A study shows that the European passenger car emission regulatory body has failed when it comes to NOx emissions from diesel-fueled vehicles (Hooftman et al. 2018). The NOx emissions fluctuations were also significant when vehicle engine was operated in NEDC cold start condition (Guo et al. 2020). Reducing emissions

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Research article

Effect of oxy hydrogen gas addition on combustion, performance, and emissions of premixed charge compression ignition engine

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ABSTRACT

Premixed Charge Compression Ignition (PCCI) is one of the well-known ways to achieve low NOx and Soot emissions in Internal Combustion engines. However, this strategy has shown limited scope to bring down the Carbon Monoxide (CO) and Hydrocarbons (HC) emissions. To overcome this drawback, a novel attempt had been made to use oxy hydrogen gas as fuel additive in the PCCI engine. The conventional CI engine was converted into PCCI engine by Port Fuel Injection of diesel fuel and preheating of air. The comparison was made between Conventional Diesel Combustion (CDC) and PCCI mode with and without use of oxy hydrogen gas. Due to accelerated chemical reactions, Indicated Mean Effective Pressure and Indicated Thermal Efficiency improved. Due to the addition of the oxy hydrogen gas the average reduction in CO emission was 26.19% at 25% load and 18.88% at 50% load. In the case of HC, the average emission reduction was 19.27% at 25% load and 23.74% at 50% load. NOx emissions were within the range of 10 ppm even after the addition of oxy hydrogen gas. The oxy hydrogen gas addition resulted in almost negligible Smoke and oxides of nitrogen emissions even without the use of exhaust gas recirculation.

1. Introduction

Since its inception Internal Combustion Engines have transformed a lot over the years, however, controlling the engine emissions with keeping its high performance remains a challenge. Among several other ways, low temperature combustion is being explored as one of the best ways to tackle this challenge. The Low-Temperature Combustion (LTC) techniques are categorized into Homogenous Charge Compression ignition (HCCI), Premixed Charge Compression Ignition (PCCI), and Reactivity Controlled Homogenous Charge Compression Ignition (RCCI).

In HCCI strategy, the charge is mixed homogenously before combustion. The combustion takes place without actual flame front propagation and diffusion. Localized combustion takes place due to auto-ignition of charge. Thus, the high temperature and fuel concentrations are avoided which are responsible for smoke and NOx emissions. HCCI engines provides high efficiency with less emissions. In HCCI, early direct injection [3] or late injection [4] of fuel was being practiced to reduce NOx and Soot emissions [5]. However, this strategy has shown limited thermal efficiency and high HC, CO emission [6]. Various techniques like multiple fuel injection [7], charge stratification [8], dual fuel injection [9], were explored by researchers to overcome the above problems. But all these techniques couldn't go long due to several associated drawbacks. Thus, the focus was diverted to the investigation of mixture preparation external to the engine cylinder. This technique is known as Premixed Charge Compression Ignition.

In PCCI strategy, some part of fuel is injected early during compression stroke. The remaining fuel is injected by a direct injector closer to Top Dead Center. The first injection results in almost homogenous mixture before it enters into the combustion chamber which undergoes low temperature combustion. While, the second injection ensures combustion event to occur closer to Top Dead Center. The combustion, performance and emission parameters mainly depend on injection pressure, injection timing, injection angle, quantity of fuel injected, fuel used etc. Advancing first injection results in wall wetting, negative work and incomplete combustion. However, there is better mixing of fuel and air which induces longer ignition delay times resulting in lower combustion temperature and NOx emissions. HC and CO emissions increases due to the trapping of fuel in crevices of engine cylinder. Soot emissions decreases with the advance of first injection timing. Another important PCCI strategy is port fuel injection of hydrocarbon fuel in the intake system of IC engine. In Diesel PCCI strategy, due to less volatility of diesel fuel, it is needed to be preheated to achieve

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Study & Design of Effectual Communication Techniques for Wireless Sensor Network with calculation of Energy of WSN Nodes

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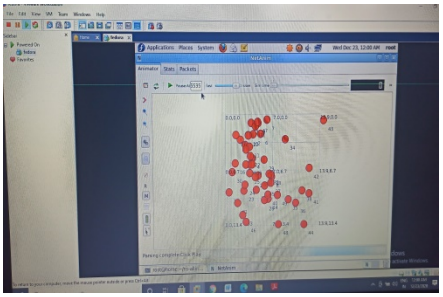
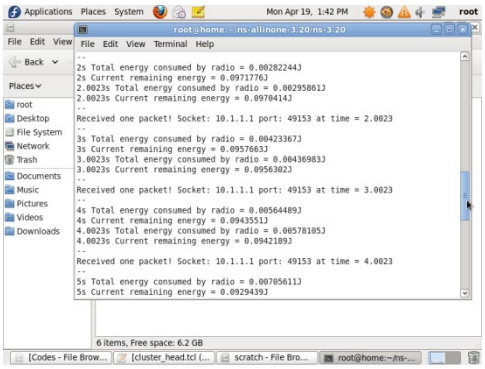
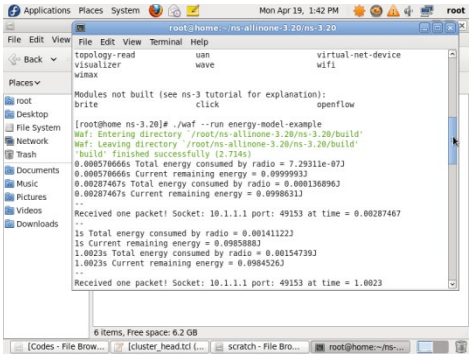
wireless sensor network .In proposed work 50 nodes generated using NS-3 and energy of each node calculated. NS-3 is used to run the .cc file and NetSim is used to run the .xml file.

RESULT:







REFERENCES

[1]. Wang, C., Li, J., Yang, Y. and Ye, F., 2017. Combining solar energy harvesting with wireless charging for hybrid wireless sensor networks. IEEE Transactions on Mobile Computing, 17(3), pp.560-576.

[2]. Zhou, Z., Xu, J., Zhang, Z., Lei, F. and Fang, W., 2017. Energy-efficient optimization for concurrent compositions of WSN services. IEEE Access, 5, pp.19994-20008.

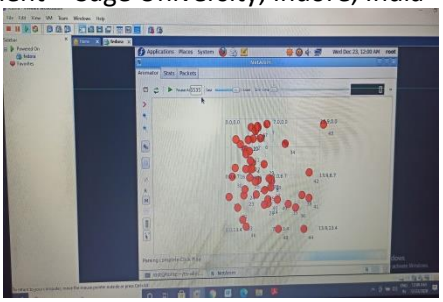
[3]. Vieira, R.G., Da Cunha, A.M., Ruiz, L.B. and De Camargo, A.P., 2017. On the design of a long range WSN for precision irrigation. IEEE Sensors Journal, 18(2), pp.773-780.

[4]. Pandey, O.J. and Hegde, R.M., 2018. Low-Latency and Energy-Balanced Data Transmission Over Cognitive Small World WSN. IEEE

Study & Design of Effectual Communication Techniques for Wireless Sensor Network with aim of Saving Energy

[1]Ms. Jaya Raut, [2]Dr. Akhilesh Upadhyay [1]Research Scholar, [2]Professor
[1,2]Electronics and Communication Department [1,2]Sage University, Indore, India

consumption or increases battery lifetime with low latency period. It means proposed system helps to increase the battery life time of a network with scalability by maintaining latency.



V.PROBABLE SOLUTION:

1. Adjusting the sleep time of every node such that it consumes less energy while maintain the proper delay and bandwidth. 2. Providing proper energy harvesting techniques to the network, so as to maintain battery life of each node in a network. 3. Reduce the transmission power of each node. 4. Each node should transmit data on basis of time division multiplexing .

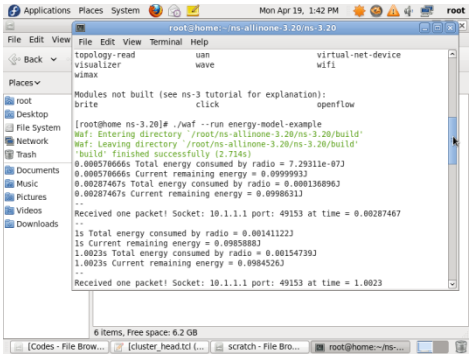
Topology and routing Method:

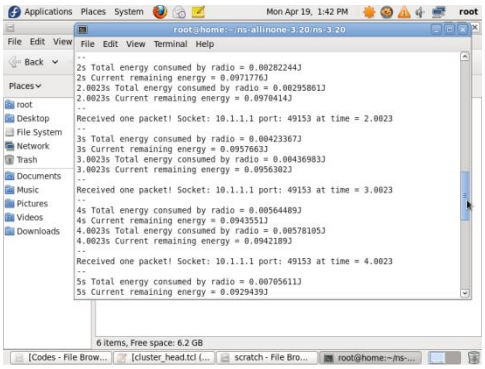
Cluster based Routing

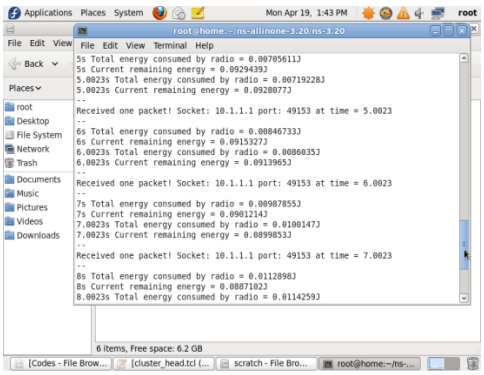
RESULTS:

Energy value of all nodes calculated.

Few of them are listed below:







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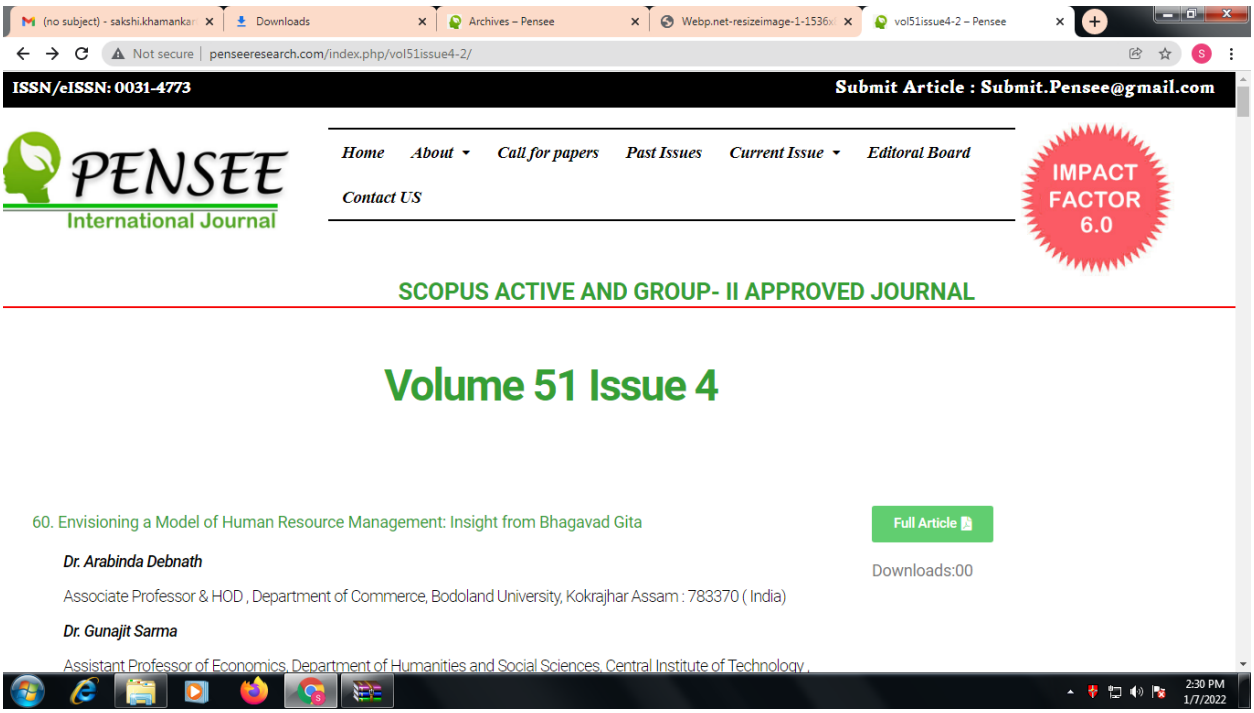

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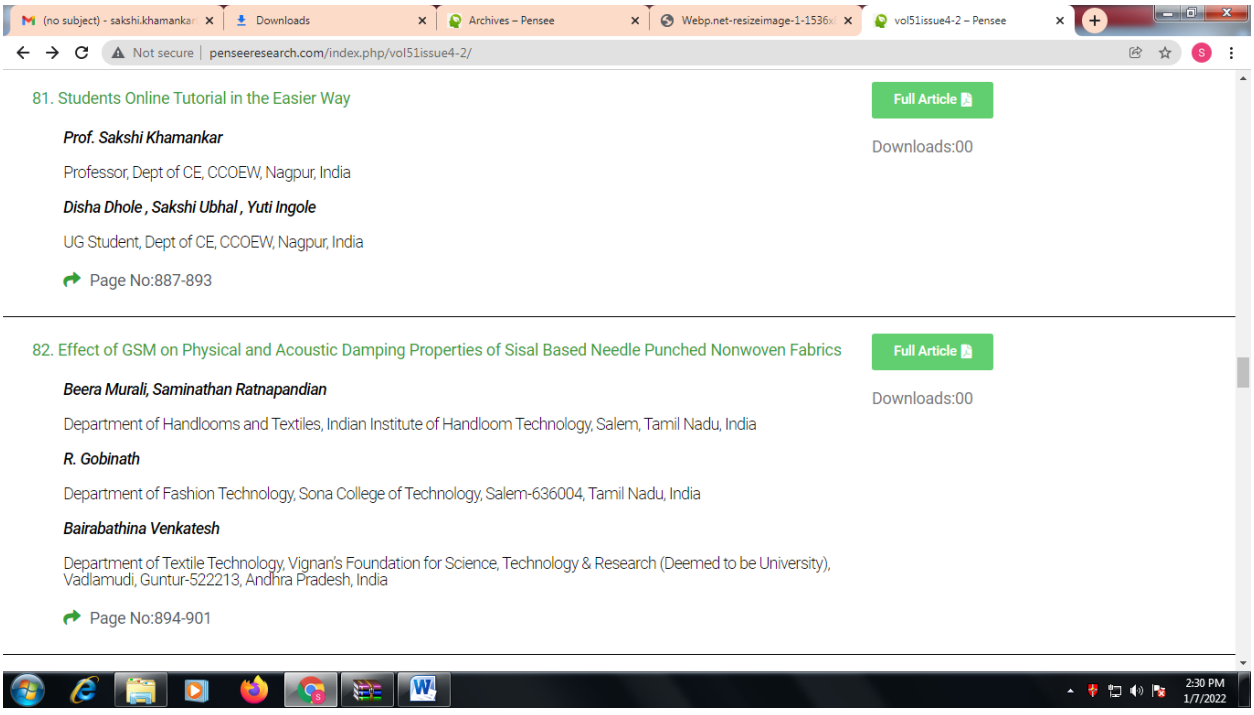

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Health Management System

Shushma Doye[1], Rutuja Pimpalkar[2], Prof. Sakshi Khamankar[3]
[1, 2]*Cummins College of Engineering for Womens, Nagpur,Maharshtra*
[3]*Guide, Department of Computer Engineering, Cummins College of Engineering for Womens, Nagpur, Maharshtra*

Abstract: ***Health system management is an Andriod based app which sets up online consulting for common health problems of the patients,Such a system can be beneficial for the people who are busy in their schedule. Such a system helps patients to monitor their health at regular intervals. With the increasing use of technology, there is a need to have such an android based integrated healthcare system that can communicate with patient, physician and pharmacist to monitor and record patient's health data. The aim is to build an Integrated Healthcare system which will provide the features like clinical management, online consulting by physician, generate QR code , maintain the patient records, suggest the nearby specialist doctor in case of emergency, online payment facility to doctor and pharmacist, feedback for receipt of home delivery service for medicines.***

Keyword: Android, Healthcare System, Digital Medicine, Doctor, Patient, Pharmacist, Portal.

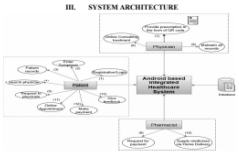
I. INTRODUCTION

This app serves the purpose of establishing an online interaction between a doctor, patient and pharmacist. Generally when doctors are not reachable to patients and vice versa, this app provide communication system to both patient and doctor . . The project aims to design and develop an android based Integrated Healthcare system for patient, pharmacist and physician for common health problems. The System will basically consist of three different users that would be interacting to provide better healthcare service through online consultation by the physician. It will provide the features like maintaining the patient records, diagnosis of health problems and generate QR code for every patient as per their updated common health problems symptoms like Fever, Cold, Cough, Body pain, Viral Infection, Headache, Wounds or Injuries, Blood pressure, Stomach infection, Throat infection, Chest pain, Eye infection, Joint pain, etc. If the patient is not feeling well in three days, he/she should be able to resend the request to the doctor for a physical appointment for further treatment. As well as the online payment facility to doctor and pharmacist is also added. Also, the feature to find the nearest physician in a locality is provided.

II. LITERATURE SURVEY

By studying some of the papers like Mobile healthcare systems design reviews of Healthcare system and android based healthcare Management system ,we got information about paper aids patients, identifies and select doctors based on the location and the specialities of the doctors. Design and implementation care system for health diagnosis based on GPS location. This type of application were developed , used android operating system environment . The modification is presented as history facility user friendly. After studied some papers we came to an conclusion, that this type of portals were good idea for Doctor, patient and pharmacists .

III. SYSTEM ARCHITECTURE



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Study & Design of Effectual Communication Techniques for Wireless Sensor Network with calculation of Energy of WSN Nodes

[1]Ms. Jaya Raut, [2]Dr. Akhilesh Upadhyay
[1]Research Scholar,[2] Professor
[1,2]Electronics and Communication Department Sage University, Indore, India

Abstract :Wireless Sensor Network (WSN) is consisting number of mobile nodes. It has the number of essential resources: Energy, Bandwidth, Scalability and low power consumption etc.All the factors are really challenging in WSN.The data aggregation and routing algorithm make use of energy saving,low power consumption maintained with scalability and Bandwidth in their working. The existing data aggregation and routing algorithms reduce energy consumption by avoiding redundancy in data but scalability and bandwidth affected.If we want low power consumption with more scalability then we need modified system with best routing algorithm for efficient energy saving nodes in WSN. The proposed INASDR (In Network Aggregation Sensor Data Routing) algorithm reduces costs and saves resource consumption by eliminating dynamic paths in case of node failure and eliminates redundant data .In proposed work the performance of INASDR compared to three other well-known routing protocols: Data Routing for Network Aggregation (DRINA), Information Fusion Based Role Assignment (INFRA) and Short Path Tree SPT algorithm.

In proposed work,Combines the proposed INASDR algorithm and its performance with the other three algorithms. The INASDR exceeds the other three, while DRINA and INFRA only surpass SPT in terms of program longevity. The INASDR technique achieves 5 to 8 percent higher energy consumption variations than current systems. The INASDR protocol is then compared to SPT, and DRNA. Simulation results indicate that INASDR can effectively find energy of each node and reduce the power consumption of each node with reduced network delay.The proposed routing algorithm will increase energy of network with low power consumption and more scalability.

Keywords:Wireless Sensor Network, Sensor routing algorithm.

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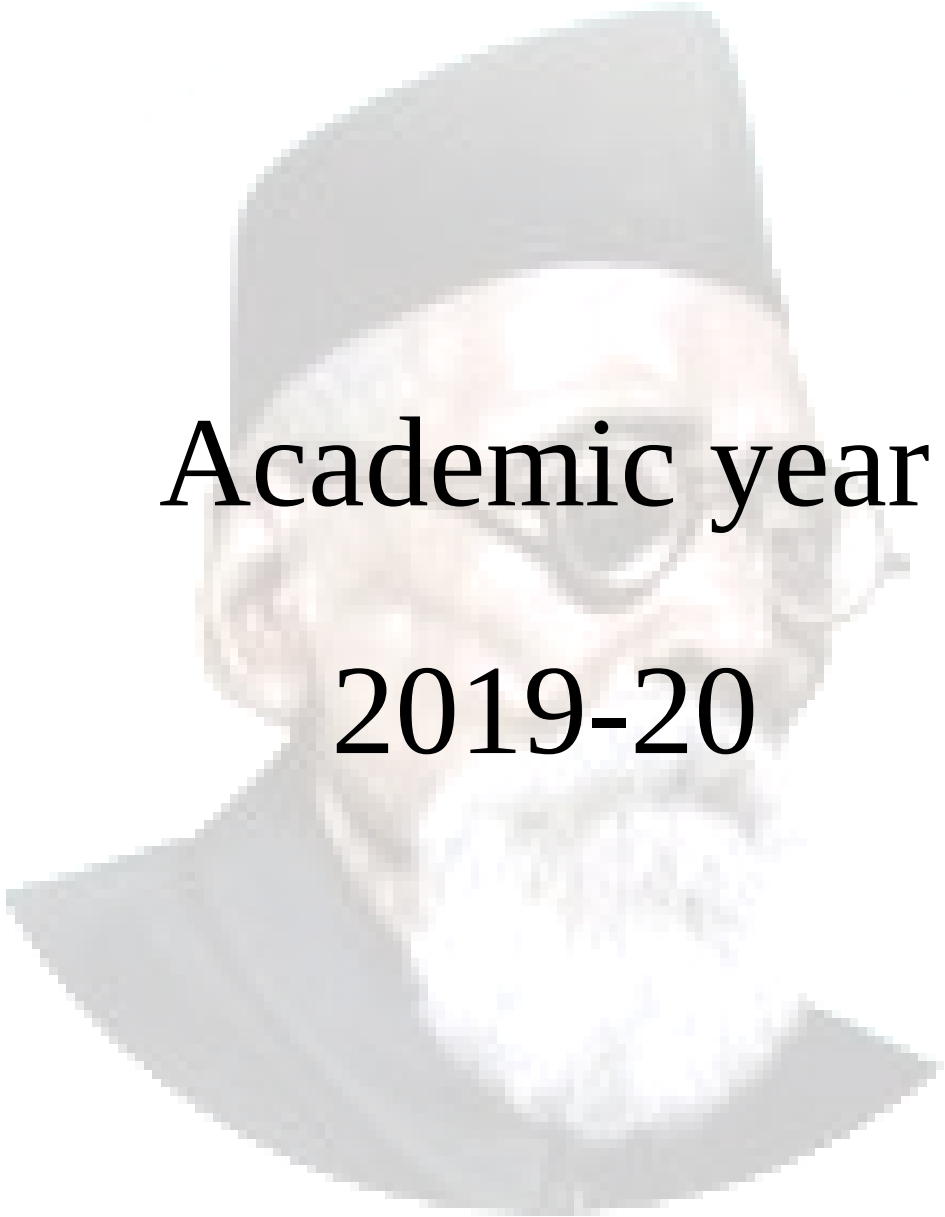

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Compressive property of newly developed composite material from Polyethylene terephthalate (PET) waste and mild steel powder

Yogesh Dandekar [a,*], R. Suresh Kumar [b], Mridul Singh Rajput [b]

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ABSTRACT

This paper deals with compressive property of a composite material developed at NIT, Raipur and Cummins College of Engineering for Women, Nagpur. The composite material being developed has two main ingredients Polyethylene terephthalate (PET) waste and Steel Wool.

In this material steel wool has been added to PET to take advantage of mechanical properties of both ingredients. The combination of PET and Steel wool has been tried and developed for the first time.

PET-Polyethylene terephthalate is a thermoplastic polymer having melting point above 250 °C. Moisture prevention of PET has resulted into its application in the field of bottle manufacturing. Steel wool powder used is a waste product of drawing operation of mild steel bars.

The newly developed composite can be preferred for various applications where high strength but with a lighter weight characteristic are required along with less cost when compared to traditional material. Results of tests found this new composite material are to be applicable for number of industrial/medical applications.

Compression moulding technique was used for sample formation. Samples were developed in the laboratory by varying the composition of Steel Wool from 0 to 5%. After compression test on all samples, the composite material with 1% steel wool content was found to be having maximum Compressive strength. The properties achieved were found to be suitable for development of various applications like manufacturing of bricks in construction sector.

Selection and Peer-review under responsibility of the scientific committee of the First International Conference on Recent Advances in Materials and Manufacturing 2019.

1. Introduction

In India, recycling of Polyethylene terephthalate (PET) bottles is not a popular practice. An initiative has been taken, in order to avoid simple dumping of these bottles by utilizing PET to form new composite materials which can be used for light weight applications in several industries. The percentage of plastic wastes may get reduced to an observable limit. Because of reuse of dumped PET an significant downfall in soil erosion, water pollution will occur [4,5].

In this material mild steel powder obtained from scrap in steel-wool manufacturing plant has been added to PET to take advantage of mechanical properties of both ingredients. The combination of PET and Steel wool has been tried and developed for the first time.

PET-Polyethylene terephthalate is a thermoplastic polymer having melting point above 250 °C. Moisture barrier tendency of PET has resulted into its application in the field of bottle manufacturing. Mild steel powder used is waste product of drawing operation of mild steel bars (Table 1).

The newly developed composite can be preferred for various applications where stronger, lighter or less expensive characteristics are required when compared to traditional material result of tests found this new composite material to be applicable for number of industrial applications.

2. Materials and experimental method

The ingredient used was mild steel powder (With and without lubrication oil) available from scrap. It was provided by Stewols India Pvt Ltd, Nagpur. The base ingredient of composite material is PET which was obtained by collecting PET bottles, then those

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A Review: Bio-fiber's as reinforcement in composites of polylactic acid (PLA)

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ABSTRACT

Due to its comparable thermo-mechanical properties to petroleum-based resins, the production of biopolymers has led to their rapid growth in recent years, especially in the automotive and construction industries. Because of its excellent mechanical properties and biodegradability, poly (lactic acid) (PLA) has achieved great commercial interest in the polymer industry among the biopolymers. Brittleness and high costs, though, hinder their use in a broad variety of applications. It is therefore a task for material scientists to change PLA by innovative technology. Reinforcement of bio-fiber or blending with other biodegradable products has proven to be an effective way to reduce the expense and fragility of PLA to produce completely biodegradable composite. Bio-fibers over synthetic fibers have low cost, low density, simple handling and equal mechanical properties. The major drawbacks of bio-fibers, though, are their hygroscopic existence and hydrophobic matrix incompatibility. Therefore, bio-fiber surface modifications are essential to enhance compatibility in order to maximize the efficiency of stress transfer between fiber and matrix.

Selection and of the scientific committee of the 10th International Conference of Materials Processing and Characterization.

1. Introduction

The growing use of polymer composites dependent on gasoline has raised the "burden" on the climate. Growing awareness of the climate has driven companies and businesses to look for more environmentally friendly ingredients for their goods. Composites based on bio-fibers with polypropylene as a matrix substance, for example, are very common these days for automotive applications [1]. Scarce work is considered to have been devoted to the analysis of composites derived from plants with recycled polymer matrices, such as PLA, cellulose esters, etc. For this cause, from both scientific and environmental viewpoints, the research and development of biopolymer-based bio-fiber composites has become a field of great interest in materials science and technology studies [2]. For instance, biodegradable polymers such as PLA, starch and poly hydroxyl alkanoates can be reinforced with bio-fibers to create composites that are environmentally friendly and biodegradable [3]. Bio-composites are biodegradable, organic and reusable, leading to the elimination of reliance on exhaustible petroleum supplies and the environmental burden [4]. PLA's good mechanical properties and exceptional barrier efficiency can be used to generate appropriate biomaterials for a range of applications [5]. PLA's drawbacks, such as its intrinsic brittleness [6], water vulnerability and low-impact strength [7], can be properly improved by incorporating fibers and/or fillers, which is a handy way to improve the overall PLA polymer properties [8,9].

2. Bio-fibers

Bio-fibers, due to their versatility, eco-friendly design, low cost, renewability, local supply compared to synthetic fibers, are potential alternative materials for the composite industry [10]. Bio-fibers are generally considered organic and sustainable, but in truth they are neither green and sustainable as the plants from which bio-fibers are derived, but not the fibers themselves [11]. In addition, polymer composites incorporating bio-fibers have also been put at the forefront of industrial industries [12]. Annual production of bio-fibers and sources is shown in Table 1 [13] (see Figs. 1 and 2).

The plant based bio-fibers (lignocellulosic fibers) can be classified into seven major groups such as bast or stem fiber (Banana,

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[1]Ms. Jaya Raut, [2]Dr. Akhilesh Upadhyay

[1]Research Scholar, [2]Professor

[1,2,],Electronics and Communication Department

[1,2]Sage University, Indore, India

Abstract : Collection techniques are used to limit the cost of communication, which in turn can increase the life of the network. In this work, an alternative is devised to solve the way of configuring routing protocols to improve information fusion. When multiple sensor nodes detect multiple events, heavy traffic occurs and nodes may fail. The proposed INASDR (In Network Aggregation Sensor Data Routing) algorithm reduces costs and saves resource consumption by eliminating dynamic paths in case of node failure and eliminates unnecessary data Is. The performance of INASDR compared to three other well-known routing protocols: Data Routing for Network Aggregation (DRINA), Information Fusion Based Role Assignment (INFRA) and Short Path Tree (S). PT) algorithm comparisons. Purpose: Combines the proposed INASDR algorithm and its performance with the other three algorithms. The INASDR exceeds the other three, while DRINA and INFRA only surpass SPT in terms of program longevity. The INASDR technique achieves 5 to 8 percent higher energy consumption variations than current systems. The INASDR protocol is then compared to SPT, and DRNA. Simulation results indicate that iNASDR can effectively and effectively reduce network delays. The proposed algorithm will beat the other three algorithms with respect to the minimum waiting time.

IndexTerms **- Routing protocol, in-network aggregation.**

I. INTRODUCTION

WSN (Wireless Sensor Network) is a wireless network consisting of spatially distributed autonomous devices using sensors to monitor physical or environmental conditions. WSNs consist of a large number of small sensing nodes that monitor their environment, process data if necessary (using microprocessors) and send/receive processed data to/from other sensing nodes. These sensing nodes, distributed in the environment, are connected to a sink node in centralized networks or to other sensing nodes via a network. In centralized networks, the sink collects sensor data to be used by the end user. Energy conservation is a primary design consideration in Wireless Sensor Networks (WSN). This is because in many practical situations, sensor node's batteries cannot be (easily) replaced, and batteries have a finite lifetime. Since every task carried out by WSN has an impact in terms of energy consumption, many solutions have been proposed in the literature to optimize energy management. Wireless sensor network consists of small, autonomous devices with RF networking capabilities. In order to increase the effectuality in real world applications, minimizing energy consumption is one of the most critical issues. Therefore accurate energy model is required for the evaluation of wireless sensor network.

In proposed research work, we shall be studying techniques and methods to reduce power consumption of WSN nodes by using WSN simulator.

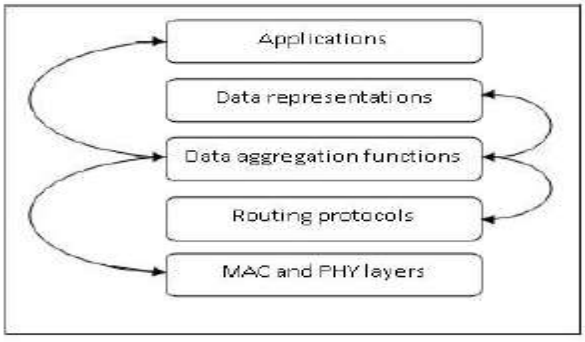

Fig.1 In-Network Aggregation Techniques and their relation..

process the data at intermediate nodes and hence lifetime of the network gets increased. Two approaches are used as follows

With Size Reduction:

The process of compressing the information at different sources with the intension of reducing the information which in turnsends towards the networks. For example, If multiple packets from multiple sources are received by a single node, then in spite of forwarding the multiple packets, it computes the average of all the multiple readings and sends a single packet

.

Without Size Reduction:

It is the process of combining the packet et. For example, If two packets can carry different physical quantities, then these t ı it can't be processed together, it can transmit it in a single packe

.

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An Analysis for the Use of Simulation Modeling in Reducing Patient Waiting Time in Emergency Departments (EDs) in Hospitals

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ABSTRACT

The emergency department (ED) plays crucial role in providing 24-hour healthcare services to the ill with speed, accuracy, and sympathy. ED faces the problem of patient waiting time, which leads to patient dissatisfaction and patient crowding. This paper presents a systematic literature review of simulation of ED in healthcare systems from 1970 to 2013. The objectives of this review are to highlight the importance and role of simulation studies to solve the problem of patient waiting time faced by the ED. It also discusses how simulation can be better applied as a tool to solve these problems. The authors found that these simulation studies focus important insights into ED problems, but they also had some limitations that should be addressed.

KEYWORDS

Emergency Department, Length of Patient Stay, Patient Waiting Time, Simulation

1. INTRODUCTION

The emergency department (ED) is a core clinical unit of a hospital. Patient satisfaction and the image of the hospital are significantly influenced by the experience of patients attending the emergency department. If the patients with serious ill health are not treated urgently, it can result in damage, permanent deformity and ultimately the death. The patients entering an ED can be saved only if they arrive at the right time, at the right place, receives the right treatment and right resources. The aspect of speed, accuracy and sympathy are important in the emergency department (HSHRC, n.d.). ED faces serious problem of patient waiting time at various stages which ultimately hampers the quality of health care and leads to patient dissatisfaction. To solve this problem of ED, simulation plays important role from last forty years. Simulation modeling helps not only to understand the present system but also to implement corrective measures and their results can be compared without disturbing the system. Simulation modeling has been used in various countries to improve the quality of health care specifically in the ED. These simulation studies are vigorously studied in this paper.

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