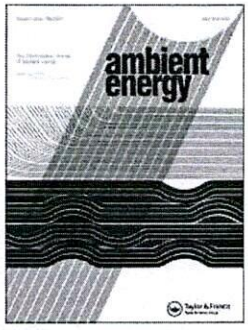

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A critical assessment of significant developments in wind turbine performance

Shankara Murthy H M, Ramakrishna N. Hegde, Ratan U. Gaonkar & Niranjana Rai

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Article

GO/CuO Nanohybrid-Based Carbon Dioxide Gas Sensors with an Arduino Detection Unit

Nagesh Bhat, Shareefraza J. Ukkund,* Momin Ashraf, Krishnaraja Acharya, Naveenkumar J. Ramegouda, Prasad Puthiyillam, Mohd Abul Hasan, Saiful Islam, Vinaya B. Koradoor, Adarsh D. Praveen, and Mohammad Amir Khan

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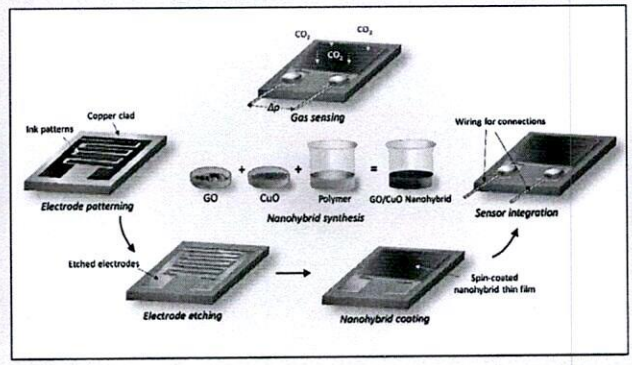
ABSTRACT: A gas sensor is a device that detects the presence of gases in a specific area. This research work demonstrates the effectiveness of gas sensors based on graphene oxide (GO) and copper oxide (CuO) semiconductor nanomaterials for the detection of carbon dioxide. GO and CuO were prepared by the modified Hummer's method and precipitation method using $CuCl_2$ as a precursor, respectively. These materials are made into a hybrid using poly(vinyl alcohol) (PVA)/poly(vinylpyrrolidone) (PVP) polymer solutions of low concentrations and are spin coated onto the pattern-etched copper-clad substrate. The sensor is tested using a source measurement unit (SMU) to obtain the change in the resistance of the sensor in open air and in a carbon dioxide environment. The fabricated sensor with an Arduino microcontroller detection unit showed a good sensing response of 60%.



1. INTRODUCTION

Sensors are a basic component in nature that can be seen anywhere in and around us. There are a number of natural sensors in nature which are made up of molecules or cells and can particularly detect the measures toward which they are sensitive. Specialized cells sensitive to light, motion, temperature, magnetic fields, gravity, humidity, moisture, vibration, pressure, electrical fields, sound, biomolecules, toxins, etc., are present in nature.[1,2] A sensor is a device, unit, or system which is designed to analyze the changes or processes happening in and around its components and direct the detected data to other devices such as electronic devices or computers.[3]

Zaaba et al.[4] demonstrated graphene oxide synthesis by the modified Hummer's method. Robinson et al.[5] experimented on graphene oxide as an active material for high-performance molecular sensors. Naik and Krishnaswamy[6] demonstrated a room-temperature humidity sensing device using graphene oxide (GO) thin films produced by chemical exfoliation. Papamatthaiou et al.[7] experimented on GO, a functionalized form of graphene, which has enhanced sensing properties as its defects further enhanced the chemical interaction with the gas molecules. Graphene-based hybrids were demonstrated by Meng et al.,[8] as chemi-resistive gas sensors with high sensitivity and selectivity. Li et al.[9] have investigated the GO for humidity sensing. Taylor and Velásquez-Garcia[10] reported their study on nanostructured GO gas sensors. Park et al.[11] have demonstrated their work on tuning of the GO synthesis process. Balashov et al.[12] worked on the kinetic characteristics of the SAW humidity sensor. Bannov et al.[13] experimented on graphite oxide for gas sensing.

Tanvir et al.[14] have published their work regarding the low temperature effects on CO_2 sensing. Kshirsagar et al.[15] demonstrated the preparation of CuO nanoparticles by the inexpensive sol−gel method and studied the development in critical heat flux. Chand et al.[16] synthesized CuO nanoparticles by the sol−gel method. Phiwdang et al.[17] prepared CuO by the precipitation method using different precursors. Mirmotallebi et al.[18] have published their work on reduced graphene oxide for hydrogen sulfide gas sensing. In this work, three-dimensional reduced graphene oxide (3D-rGO) structures decorated with CuO particles (GCu) are synthesized through an effortless and scalable method for the detection of hydrogen sulfide (H_2S) gas. Basu and Bhattacharyya[19] have reported a review paper on recent developments in gas sensors. In this work, graphene and graphene oxide sensors are studied in

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DRUG RELEASE KINETICS IN BIOCOMPATIBLE XANTHAN GUM (XG)/METHYL CELLULOSE (MC) BLEND – Γ-FE2O3 NANOCOMPOSITES

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ABSTRACT

This research investigates the drug release kinetics of biocompatible xanthan gum (XG)/methyl cellulose (MC) blend - maghemite nanocomposites. Physicochemical evaluations were conducted on metoprolol drug-infused XG, MC, their maghemite nanocomposites, and various XG/MC blend - maghemite nanocomposites. The results revealed uniform thickness and weight for the samples. The folding endurance values indicated good strength and elasticity of the thin films. The presence of maghemite nanoparticles influenced folding endurance, moisture absorption, and moisture loss. The drug release kinetics were studied using diffusion models, demonstrating sustained release behaviors for the nanocomposites. The diffusion exponent and constant confirmed Fickian kinetics. The findings suggest the potential application of these nanocomposites for controlled transdermal drug release.

Keywords: Drug Release Kinetics, Xanthan Gum, Methyl Cellulose, Maghemite Nanocomposites, Transdermal Drug Release.

1. INTRODUCTION

The field of pharmaceutical research and development has undergone significant progress in the pursuit of more efficient and targeted drug delivery systems [1]. The precise regulation of drug release kinetics has become a cornerstone in achieving optimal therapeutic outcomes while mitigating potential adverse effects [2]. Understanding drug release kinetics guides system refinement, tailoring controlled drug delivery [3, 4].

The potential for sustained drug release applications has been demonstrated by many biocompatible polymer blends [5-14]. Biocompatible materials, such as xanthan gum (XG) [15, 16] and methyl cellulose (MC) [17-19], have emerged as promising contenders with the potential to revolutionize the landscape of controlled drug delivery. The incorporation of maghemite

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DRUG RELEASE KINETICS IN BIOCOMPATIBLE GUAR GUM (GG)/HYDROXYPROPYL METHYL CELLULOSE (HPMC) BLEND - MAGHEMITE NANOCOMPOSITES

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ABSTRACT
This research study investigates the drug release kinetics of biocompatible guar gum (GG)/hydroxypropyl methyl cellulose (HPMC) blend - maghemite nanocomposites. Physicochemical evaluations were conducted on metoprolol drug-infused GG, HPMC, their maghemite nanocomposites, and various GG/HPMC blend - maghemite nanocomposites. Thickness, weight, folding endurance (FE), percentage moisture absorbance (PMA), and percentage moisture loss (PML) values were measured to assess the physical properties. The results indicated uniform thickness and weight for the samples. The presence of maghemite nanoparticles influenced the folding endurance, while the moisture absorption and moisture loss were enhanced. Drug release kinetics was studied using diffusion models such as Higuchi and Koresmeyer-Peppas, revealing sustained release behaviors for the nanocomposites. The findings suggest the potential of these nanocomposites for controlled drug release applications.
Keywords: Drug Release Kinetics, Biocompatible Nanocomposites, Physicochemical Evaluation, Sustained Drug Release, Guar Gum-HPMC Blend.

1. INTRODUCTION
In the realm of biomedical engineering sciences, the controlled release of drugs holds immense promise for optimizing therapeutic outcomes and minimizing potential side effects [1, 2]. The intricate interplay between drug carriers and their release kinetics underscores the significance of this field [3]. Our research group has been consistently engaged in investigating the combination of diverse biocompatible water-soluble polymers [4-10].
The polymers GG and HPMC, owing to their biocompatibility and drug encapsulation potential, have garnered attention as a potential drug carrier [11-17]. In tandem with this, the incorporation of maghemite (γ-Fe2O3) nanoparticles into the blend introduces a novel dimension, potentially

Section A-Research paper
ISSN 2063-5346

Investigating Drug Release Kinetics from Biocompatible Guar Gum (GG)/Methyl Cellulose (MC) Blend - γ-Fe_2O_3 Nanocomposites

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DOI: 10.48047/ecb/2023.12.si4.1769

ABSTRACT

This research explores the use of water-soluble biocompatible polymers, guar gum (GG) and methyl cellulose (MC), alongside the nanomaterial maghemite (γ-Fe_2O_3), for transdermal sustained drug release, employing metoprolol succinate as a model drug. Drug-infused thin film patches of GG, MC, their γ-Fe_2O_3 nanocomposites, and 10/90 GG/MC blend - γ-Fe_2O_3 nanocomposites were utilized for the investigation. Physicochemical parameter evaluations, including thickness, weight, folding endurance, % moisture absorbance, and % moisture loss, supported the drug release kinetics study using a hydrated cellophane sheet and diffusion tube. The results indicate that this blend-nanocomposite system releases the drug through diffusion, following Fickian kinetics. These biomaterials hold promise for developing slow, sustained release formulations in transdermal drug delivery systems.

Keywords: blend-nanocomposites, guar gum, methyl cellulose, maghemite, compatibility, biocompatibility.

1. INTRODUCTION:

Researchers are increasingly focused on developing novel drugs and dosage forms to enhance efficacy while reducing side effects. Water-soluble polymers are being extensively utilized in the pharmaceutical industry [1-7]. The irregular shifts in drug concentration in the bloodstream resulting from conventional dosing have prompted the development of

Section A-Research paper
ISSN 2063-5346

Compatibility Studies of Guar Gum (GG)/Methyl Cellulose (MC) Blend-Zinc Oxide (ZnO) Nanocomposites

Prasad P.[1*], Sudhakar Y. N.[2*], Sumana V. S. [3], Gopalakrishna Bhat N.[3], Sahana G. K. [4], Shrinivasa Mayya D.[5], Savitha M. B.[6]

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DOI: 10.48047/ecb/2023.12.si4.1768

ABSTRACT

This original research article focuses on the burgeoning significance of nanocomposites in biomedical and pharmaceutical domains due to their heightened properties. The research aims to assess the compatibility of Guar Gum (GG)/Methyl Cellulose (MC) blend-Zinc Oxide (ZnO) nanocomposites using a range of analytical techniques. ZnO nanoparticles were synthesized utilizing banana leaf extract and zinc acetate solution. To validate compatibility within the aqueous solutions, the study employed density measurement, ultrasonic velocity measurement, and adiabatic compressibility measurements. The characterization of the morphology of thin films prepared via the solution casting-solvent evaporation method was accomplished through FESEM analysis. The outcomes unveiled the compatibility and stability of GG/MC blend-ZnO nanocomposites in aqueous solutions, presenting these materials as promising candidates for diverse biomedical and pharmaceutical applications. This study significantly contributes by examining the compatibility of GG/MC blend-ZnO nanocomposites through an array of analytical methods.

Keywords: nanocomposites, guar gum, methyl cellulose, zinc oxide, compatibility, biocompatibility.

1. INTRODUCTION:

Nanocomposites refer to materials that are composed of nanoparticles embedded in a matrix material, which possess distinct properties compared to conventional materials [1-3]. Guar

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Volume 80, Part 2, 2023, Pages 517-524

A comparative analysis of exergy using dual blends of biodiesel in a DI engine

Ramakrishna N. Hegde, Gangadhara Rao, Jagadeesh Bantwal, Praveen Shenoy

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Abstract

The scarcity of petroleum fuels and pollution concerns has led to the search for alternate fuels. In this investigation, cottonseed and Simarouba oils are transesterified to produce the corresponding biodiesels. The esterification and transesterification were carried out in the presence of heterogeneous catalyst MgPO4. The various properties of biodiesel are determined in the laboratory. Vateria indica is a species endemic to India that belongs to the Dipterocarpaceae family. The oil of Vateria indica is obtained by an aqueous extraction method. This oil is transesterified to obtain the biodiesel by a two-step process of esterification followed by transesterification. This biodiesel is blended with diesel in 10% and 20% volumetric proportions. The cottonseed and Simarouba biodiesels are blended in equal proportions with diesel and tested for performance and exergy analysis along with Vateria indica blends. It is found from performance and exergy analysis that biodiesel blends performed better than diesel.

Introduction

Decreasing availability coupled with air pollution concerns resulted in newer alternatives for Petroleum products. The increasing demand for the supply of petroleum products leads to the import of crude oil by developing countries; hence humanity has embarked on alternativebut renewable energy fuel sources having higher sustainability. To cater tothe growing energy requirement, many countries import crude oil, which burdensthe economy, leading to inflation. Thus, there is a natural pressure on such countries to ease the import burden and at the same time look for petroleum-based fuel substitutes. Growing Population, energy crisis, shortage of fossil fuels and rising hazardous impact petroleum products on environment necessities some backup fuel which should offersimilar characteristics to conventional fossil fuels. Also performance and emission analysis of biodiesel and petro-diesel shows a general increase of efficiency and better emission characteristics for biodiesel. The drawbacks of neat diesel are led to the search of alternatives. Vegetable oil is currently considered an effectivesubstitute due to its characteristics, pan with

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Research Article

Mechanical characterisation and microstructure study of Al-Zn alloy processed by equal channel angular pressing combined with heat treatment

Mohan Kumar S, H K Govindaraju, Kiran M D & Lokesh K S

Accepted 19 Feb 2023, Published online: 28 Feb 2023

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ABSTRACT

In the present investigation the mechanical properties and microstructural studies of heat treated and severely plastic deformed in equal channel angular processed by route 'A' of Al-Zn alloys were studied. The alloys were heated to a temperature of 550°C for two hours to achieve solid solution temperature before Equal Channel Angular Processing (ECAP), which improved the grain refinement. The ageing treatment at a temperature of 190°C up to 20 hours improved the precipitates which will obstruct the motions of dislocation. The experimental results revealed that yield

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Analysis of design parameters of fuel injector used in liquid propellant rocket engine

Raghavendra Pai [a], Lokesh KS [b], Shrinivasa Mayya D [b], Vidyashree HG [b], Yallappa RK [b], Jayashree J [b], Neha KU [b], Sagar KK [b]

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Abstract

Performance of the liquid rocket engine is considered to be significant not only in terms of type of the fuel, fuel tank and structure used but also flow rate of the fuel takes prime importance in enhancing the engine performance. Variation in flow rate normally altered to greater extent by varying the design parameters of the fuel injectors. Keeping this in mind, the present study aims to alter the design parameters of pintle injector by changing the dimension such as diameter, impinging angle and L-open (fuel exit) by introducing orifice plate outlet of fuel injector to decrease the area and increase the velocity of fuel through designing CATIA model for fuel injector and to perform simulation using ANSYS workbench. The prime objective of the present study is to increase fuel flow rate and make it better comparable to the existing one. Implementing new design of pintle fuel injector by referring the standard value and study the fuel behaviour in the pintle injector. The present work also aims to improve the empirical design tools to get high performance of an engine and to achieve the better stability of the fuel injector through parametric design and analysis through CFD simulation.

Introduction

A pin gismo may be a sort of fuel injector for dual-fuel rocket engines like any injector. The goal is to supply the proper rate of flow and high fuel mixture into the combustion chamber for an economical and controlled combustion process. pin rocket motors will have a wider throttle vary than typical nozzle-based rocket motors and exhibit very little acoustic combustion instability as a result of needle nozzles tend to make self-stabilising flow patterns. This makes pin motors terribly appropriate for applications requiring deep, quick and safe strangulation such as B. Plug-in module. The needle gismo appeared within the mid-1950s as an early laboratory take a look at device utilized by the American state Institute of Technology'

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Available online 20 April 2023

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Impact of fibre orientation on mechanical properties of GFRP composites

H.S Sharath Chandra [a], K.S. Lokesh Mr Lokesh [b], G. Ravindra Babu Mr Ravindra [c], D. Shrinivasa Mayya Dr Shrinivasa [b], J.R. Naveen Kumar Dr Naveen [d]

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https://doi.org/10.1016/j.matpr.2023.03.754 ↗

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Abstract

Knowing the characteristics of a composite material under a given set of circumstances is essential for reliable structural member design. Understanding and being familiar with the stacking order of laminates organised to make a composite is essential since composites are used in an increasing number of applications. The goal of the current effort is to develop an E-glass fibre reinforced with epoxy composite by stacking the laminates of 0°, 45°, and 90° and integrating all three orientations. Different samples were compared experimentally with axial tensile and compressive loading. The specimen with a 0° orientation in the tensile test demonstrated outstanding resistance to tensile loading. It is observed that found the sample developed by different stacking sequence experiences the least strain of all the specimens with 9% elongation at break. Additionally, the sample made with fibre orientation of 45^0 undergo severe deformation of 20% which is considered to be largely deformed specimen compared to the rest of the combinations.

Introduction

Knowledge of fiber types and orientations is crucial for comprehending the scope of research being done on glass fiber orientation and its effect on mechanical qualities. Fiber composition works best when it is sequentially ordered to improve mechanical properties [1]. To ascertain the mechanical qualities as a result of the influence of Sisal fiber orientations such as 90°, 0°, and 45° orientations, Kumersan et al. conducted the investigation. By using compression moulding, samples of Sisal fiber reinforced in various orientations were created, and their mechanical characteristics, such as tensile strength and flexural strength, were studied. According to the findings [2], compared to 0° and 45°, the orientation 90° exhibits better mechanical qualities. The tensile, flexural, and moisture absorption characteristics of composites

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Investigative Studies on Performance Behavior on an IDI diesel engine with a Geometrically Modified Swirl Chamber using Biodiesel Blends

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ABSTRACT

In this experimental study, combustion, performance and emission characteristics of conventional swirl chamber (CSC) and geometrically modified swirl chamber (GMSC) of IDI diesel engines were studied. A GMSC was designed and fabricated in a separated engine head, for performance testing and comparison purpose. Biodiesel from chia seed oil was extracted by transesterification process and blended with diesel based on volumetric ratios of 5% to 25%, in steps of 10% increase. The performance and emission characteristics of biodiesel blends were compared with petroleum diesel using the CSC and GMSC. The result shows BTE of biodiesel blend BC05, BC15 and BC25 using the GMSC are 3.18%, 0.21% and 1.19% lesser compared to CSC 75% load. In-cylinder pressure of blends BC05, BC15 and BC25 are 66.3 bar, 59.04 bar and 54.34 bar with GMSC. BSFC of BC05, BC15 and BC25 with GMSC are 2.56%, 9.38% and 11.95% higher compared to diesel due to the low CV of biodiesel. NOx emissions for diesel, BC05, BC15 and BC25 are 9.47%, 18.41%, 6.98% and 1.67% respectively less at 75% load with GMSC compared to CSC. From the performance and emission characteristics blend B15 may be recommended as a promising substitute for petroleum diesel.

Keywords: *Swirl chamber; Biodiesel; Emission; Exergy*

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Enhancement of Brain Magnetic Resonance Images Using Cascade of Notch Filter and Linear Transformation Methods

B. J. Shivaprasad & M. Ravikumar

Pattern Recognition and Image Analysis **33**, 66–79 (2023)

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Abstract

In this work, we have proposed a cascade of notch filters with linear transformation (LT) methods to enhance MRI brain images. The proposed method is compared with the inner and inter-class of spatial, frequency and other methods. The performance is evaluated by using quantitative measures like Michelon contrast (MC), entropy, peak signal to noise ratio (PSNR), structure similarity index measurement (SSIM), and absolute mean brightness error (AMBE) as a parameter on BRATS-2019 dataset. The proposed method gives good results for entropy, PSNR, MC, RMSE and SSIM.

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Advanced Metering Infrastructure [AMI] using IoT

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Abstract:- Advanced Metering Infrastructure (AMI) is a system that enables the collection and analysis of energy consumption data in real-time. With the integration of Internet of Things (IoT) technologies, AMI has evolved into a more sophisticated and efficient solution for managing energy resources. This abstract provides an overview of AMI using IoT, highlighting its key components, benefits, and challenges. AMI using IoT leverages a network of smart meters equipped with IoT sensors to monitor and transmit energy consumption data. These smart meters are capable of measuring and recording energy usage at regular intervals, providing a granular view of consumption patterns. The collected data is then transmitted to a central server or cloud-based platform through wireless communication protocols such as Wi-Fi, cellular networks, or Low-Power Wide Area Networks (LPWAN).The integration of IoT in AMI brings numerous advantages. Firstly, it enables real-time monitoring of energy consumption, allowing utilities and consumers to gain insights into usage patterns, identify energy-saving opportunities, and make informed decisions regarding energy management. Secondly, AMI using IoT facilitates remote meter reading, eliminating the need for manual meter reading and reducing operational costs. Additionally, it enables faster detection and resolution of faults or abnormalities, improving overall system reliability and reducing downtime. However, implementing AMI using IoT also presents certain challenges. One significant challenge is the security and privacy of data transmitted over the IoT network. Measures must be in place to ensure the confidentiality, integrity, and authenticity of the data, as well as protect against unauthorized access and cyber threats. Another challenge is the scalability of the system, as large-scale deployments require robust infrastructure and network management capabilities to handle the high volume of data generated by a multitude of connected devices.In conclusion, AMI using IoT offers a promising solution for effective energy management. By leveraging IoT technologies, it enables real-time monitoring, remote meter reading, and improved fault detection. However, addressing security concerns and ensuring scalable infrastructure are critical for the successful implementation and widespread adoption of AMI using IoT in energy management systems.

Keywords:- *AMI (Advanced Metering Infrastructure) ,IoT (Internet of Things) ,Smart Grid ,Smart Meter ,Energy Management ,Real-time Monitoring ,Data Analytics ,Cloud Computing ,Wireless Communication ,Sensor Networks*

I. INTRODUCTION

AMI (Advanced Metering Infrastructure) is a two-way communication technology used to collect detailed metering data across the utility's service business. AMI is often automated, allowing for real-time, on-demand interrogations of metering endpoints.AMI is a network of sensors, Smart Meters, and software that allows end users to monitor and control utilities including water, gas, and electricity. AMI systems allow for the real-time measurement and display of time-specific data, which, when combined with remote control capabilities, can help businesses and homes reduce overhead expenses and manage resource consumption more precisely. To prevent tampering with data and control capabilities, AMI must be used in conjunction with modern security solutions. This is significant because the data provided by an AMI system frequently determines both direct billing and operational decisions.

II. OBJECTIVES

The key objectives of AMI using IoT include:

- Accurate and timely data collection: IoT-enabled smart meters can collect meter readings at regular intervals, providing accurate and up-to-date data on energy consumption, which helps utilities in billing, forecasting, and load management.
- Real-time monitoring and control: AMI using IoT allows utilities to monitor energy usage in real-time, detect anomalies or issues promptly, and remotely control meters, enabling efficient load management and response to emergencies or outages.
- Enhanced operational efficiency: IoT-enabled smart meters automate data collection, reducing the need for manual meter reading and associated operational costs. This improves the overall efficiency of utility operations, including billing, customer service, and asset management.
- Improved customer service: With real-time access to their energy consumption data, customers can make informed decisions about their energy usage, leading to potential energy savings. Additionally, IoT-enabled smart meters can enable faster fault detection and resolution, leading to improved customer satisfaction.
- Optimized energy distribution: AMI using IoT provides utilities with detailed insights into energy usage patterns, helping them optimize energy distribution and identify areas for energy conservation, load balancing, and demand response programs.

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ARTIFICIAL INTELLIGENCE IN DRUG DISCOVERY AND DEVELOPMENT-A REVIEW

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Abstract – Artificial Intelligence (AI) has recently been developed into a sizzling topic in the area of medical care industry. The biopharmaceutical industries are making efforts to approach AI to enhance drug discovery process, reduce research and development expenses, diminish failure rates in clinical trials and ultimately generate superior medicines. This article describes the use of artificial intelligence and machine learning to augment drug discovery and development to make them more efficient and accurate. This body of work supported the roles of machine learning and artificial intelligence in facilitating drug development and discovery processes, making them more cost-effective or altogether eliminating the need for clinical trials, owing to the ability to conduct simulations using these technologies

Key Words: Artificial intelligence, Machine learning, Drug discovery

1. INTRODUCTION

Every aspect of life is constantly subject to change, and one of the main aims of humans is to control these changes for our benefit; this is especially true in the field of medicine and pharmaceuticals. These disciplines focus on the creation or discovery of chemical compounds and mixtures and their use o ease physical and psychological suffering. For many decades, the manufacturing of drug products has been controlled by a regulatory framework that safeguards the quality of final products by testing of raw materials, in-process materials, end-product characteristics, batch-based operations and fixed process condition. The drug and biopharmaceutical industries have been limited source of inventive and novel technologies or machinery, and have led the development of novel principles or interpretations in general chemical and mechanical engineering. The pharmaceutical industry is in critical need of mechanical innovation, easing the creation of medications for human use

The use of artificial intelligence (AI) is increasing, and is likely to change how clinical examination and training is carried out. Doctors can participate in the development of this technology for use in the medical and pharmaceutical industries; this will ensure that the potential of AI to significantly improve medical care is fulfilled [2]. AI is currently used in the pharmaceutical industry in four main ways. The first is in the assessment of the severity of disease and the prediction of whether treatment will be successful for an individual patient, even prior to its administration. Secondly, it is used to prevent or solve complications during treatment. Its third main use is as an assistive technology to during treatment procedures or operations on patients. Lastly, it is used was created which was the first system that had overwhelming commercial success leading to a million-dollar industry

2. BACKGROUND

The use of machine learning is increasing in various avenues of the pharmaceutical industry, including drug discovery, enabling improvements in the industry as a whole. The achievements of machine learning are demonstrated by the expanding number of companies in which ML is key to their business structure. They stated that machine learning techniques has also been investigated by large pharmaceutical companies for use in drug research and development [10]. The extent of the capability of machine learning and its usefulness in the field of drug discovery; it is thus imperative that it must be incorporated in future advances in the field of drug discovery. The goal is to use high-throughput screening technologies to reduce the asset and work seriousness of medicine necessity for live animal testing [10]. These studies demonstrate that machine learning is an extremely useful tool in drug discovery. Some factors relating to chemical and biological information are needed to enhance and develop machine learning technologies for drug discovery and development. These data would help to design more advanced and accurate systems by the insights drawn from data [11]. In order to gather these data, medicinal features such as cellular toxicity, cell structure heterogeneity, animal model efficacy, on-target activity, pharmacokinetic endpoints, microsomal stability, and cytochrome P450 (CYP) inhibition values will need to be measured using assay

Fig 1 shows a simplified cycle of the events that take place during the implementation of machine learning in the pharmaceutical industry, specifically in the development and manufacturing sectors of this industry, and also shows how machine learning functions in general [12]. The data consist of different components, such as orthogonal data and applicability domain and termination data. These data are put into a previously-designed algorithm that takes into account model choices, selection functions, and orthogonal computations. The algorithm generates results as well as iterative improvements to the current methodology and procedures in order to make it more efficient and reliable. The technique is then modified, and the cycle is repeated until a final product is designed and manufactured.

One study that demonstrates the application of machine learning in the area of drug discovery was done by Margulis and colleagues [13], which looks at how intensely bitter molecules can be identified with the help of machine learning in the early stages of drug development. The aim was to determine a certain machine learning algorithm could be used

SOLAR HARVESTING MACHINE

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Abstract -- The solar energy produced by the sun is converted into electrical energy which is the cleanest and most plentiful environmentally friendly power source. Solar energy is used in significant part in rural activities like sunlight based water and air warmer, drying food items, sun powered cookers, streetlights and home machines, irrigation. In Indian homesteads, the crop cutting tasks are especially performed by hand. Nowadays the use of automated cutting instruments, controlled by petroleum product can be found in certain spots. In hand cutting, the cutting of crops takes plenty of time and workcharges, which is a drawback. In automated cutting strategies, the working and the fuel cost surpasses the financial plan of the typical rancher. To overcome from all these problem, we can utilize inexhaustible, Non-ordinary fuel source like solar energy as it is effectively accessible in nature. A useof non-regular, sustainable power source is the substitute answer for current energy interest. The machine is light weight and compact and can be effortlessly profited by the ranchers. The main aim is to decrease ranchers work and to build creation of horticultural items.

I. INTRODUCTION

A solar harvesting machine with seed sowing, digging, spraying, and cutting capabilities is a highly advanced piece of agricultural equipment that utilizes solar energy to carry out multiple farming tasks simultaneously. The machine is equipped with a solar panel that absorbsenergy from the sun and converts it into electrical power, which is used to power the machine's various functions. The seed sowing mechanism allows for precise and efficient planting of seeds, while the digging mechanism can be used to create furrows and prepare the soil for planting. In addition to seeding and digging, the machine is also capable of spraying fertilizers, pesticides, and herbicides, making it a versatile tool for crop management. The cutting mechanism can be used for pruning or harvesting crops, depending on the needs of the farmer. Overall, a solar harvesting machine with seed sowing, digging, spraying, and cutting capabilities is an innovative and eco-friendly solution for modern agriculture. It saves time and labour, reduces the environmental impact of farming, and improves crop yields and quality.

II. PROBLEM STATEMENT

The previous harvesting systems are either manual or mechanical. The mechanical harvesters are operated using fuel energy. Fuel energy is efficient in driving the system however, it is expensive and pollutant. To overcome these a solar powered harvester isproposed. Since the efficiency of solar power is low, it is necessary to think over the mechanism of existing harvesters. The current harvesters have a mechanism that has sliding cutter bar. It isobvious that sliding friction is higher than rolling friction. So that by changing the sliding to rolling cutter bar it is possible to minimize the energy needed to overcome frictional resistance. Therefore, an efficient solar harvester can be achieved using cutter bar that reciprocates on roller support.

III. METHODOLOGY

The working methodology of a solar harvesting machine with seed sowing, digging, spraying, and cutting typically involves several steps:

Solar panel collects sunlight: The solar panel mounted on the machine absorbs sunlight and converts it into electrical energy.

Electrical energy charges the battery: The electrical energy generated by the solar panel is usedto charge the battery, which provides power to the machine's components.

Control system operates the machine: The machine's control system, which is typically based on an Arduino receives input from user commands and controls the operation of the machine's various components.

Cutting: The machine's cutting mechanism uses a blade or other device to harvest crops or other plants, such as grass or weeds. A rotary blade or blades are mounted on the machine andspin rapidly to cut crops or other plants. The blades may be designed for specific types of plants, such as grass or wheat. The cutting mechanism may be mounted on the front or back ofthe machine, depending on the specific design and application. It may be controlled by the machine's central control system or by a separate control system dedicated to the cutting mechanism. Overall, the cutting mechanism is an important component of a solar harvesting machine, allowing for efficient and effective harvesting of crops and other plants.

Digging: The machine's digging mechanism uses a rotary blade or other device to dig a furrowin the ground for planting seeds or for other purposes, such as creating trenches for irrigation or drainage.The digging mechanism typically consists of a blade or set of blades that are rotated by a motor.The blades may be angled or curved to facilitate the digging process, and may be designed to cut through soil and roots with minimal resistance. The depth of the furrow can be adjusted to accommodate different types of seeds or plants, and may be controlled by the machine's centralcontrol system.

A GREENER WORLD ON THE HORIZON

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Abstract - The project aims to design and develop electric vehicles that can not only be charged from the power supply but also help reduce environmental pollution. The vehicles will be equipped with advanced power management systems that will optimize energy use and extend the range of the vehicles. The design of the electric vehicles will incorporate advanced battery technology and charging systems that will enable them to be charged from the power supply. This will reduce the dependence on traditional fuel sources and help reduce greenhouse gas emissions. The vehicles will also be designed with lightweight materials to improve energy efficiency and reduce their carbon footprint. The project will also focus on developing a charging infrastructure that will support the widespread adoption of electric vehicles. This will involve the deployment of charging stations in key locations, such as parking lots, shopping centers, and highways, to make it convenient for drivers to charge their vehicles. The Most of the vehicles are running on the gasoline fuels. These vehicles exhaust hazards gases. This increases the environmental pollution in the word. In recent years to reduce the pollution researchers have given the solution of hybrid vehicles. One of the solutions opted by many countries on environment pollution control through using electric vehicle (EV). In recent days EV's are gaining more popularity. In this paper various EMS systems are studied and proposes energy model for effective use of battery to improve the performance of EV Overall, the project aims to contribute to the transition to a more sustainable and environmentally friendly transportation system by developing electric vehicles that are efficient, reliable, and affordable, and by providing the infrastructure to support their widespread adoption.
Keywords: Electric Vehicle, solar panel, battery, on road charging, BLDC motor.

I.INTRODUCTION

Electric vehicles (EVs) are becoming an increasingly popular mode of transportation as people become more aware of the environmental impact of traditional gasoline-powered vehicles. They are powered by an electric motor instead of a gasoline engine and are charged by an external power source such as a charging station or solar panels. Electric vehicles are environmentally friendly, have lower operating costs, and offer a smoother, quieter ride than traditional vehicles. This project focuses on the development of an electric vehicle charging system that utilizes solar energy to reduce environmental pollution and make the vehicles more cost-effective and efficient. The power and charge management system is a critical component of the electric vehicle charging system. The system regulates the flow of electricity from the solar panels to the battery storage. The power and charge management system ensure that the charging station is always supplied with the required amount of electricity for charging the EVs. The project is focused on the design of an electric driven vehicle that can regenerate power using solar energy technology. If this type of vehicle became a standard commercial vehicle, the demand for fuel would decrease substantially. Designing this vehicle for practicality is the primary difficulty. The vehicle must be lightweight to minimize the size of the motor required to withstand urban transport needs. The vehicle is being designed to house one driver; practically, there would be need for additional space for other passengers and materials. Another consideration in the use of solar energy to power a vehicle is that the solar panel must be efficient enough to generate enough power for propulsion in a reasonable amount of time. This leads to a variety of decisions that must be considered during the design process. According to the EPA, transportation accounted for 26% of the total Greenhouse Gas emissions in the year 2014. For this project, the concept of a solar vehicle will be designed and fabricated. Vehicles have already been modified to run on alternative sources for fuel. Both mechanical and electrical engineering considerations must be taken into account for the project. Components will be purchased and manufactured from raw materials to suit the application. Some components will need to be machined to specifications due to the abnormal size of the vehicle. Decisions will be made based on monetary constraints and fabrication feasibility

II.LITERATURE SURVEY

A. Chinmay A. Dandekar, Prathamesh K. Patil, Rajesh R. Kubal, Prof.
Bhushan Protect: When In this essay, we covered the topic of using solar energy to power a car. The Photo Voltaic (PV) Module can be linked either inparallel or series to generate the necessary voltage, but serial connection is more expensive. Thus, power converters and batteries are being employed to keep it affordable. Low voltage (Direct Current) is created by combining the electrical charge from the PV panel and sending it to the output terminals. Thebatteries receive this power obtained from the solar panel thanks to the charge controllers. To prevent overcharging and deep discharge, the charging iscarried out in accordance with the battery's condition. By using a converter, such as an MPPT or charge controller, the voltage from the solar panels is raised up to a particular level that corresponds to the level of the load, which drives our load, such as running the motor or charging the battery, for example.The components, such as the solar panels, charge controller, battery, motor, and motor controller are chosen based on the application with regard to load.

B. K. Karthikeyan, K. T. Venkatraman:
In the future, electric vehicles dominated the transportation industry. Internal combustion engines that previously burned fuel have been replaced with EV. Due to the depletion of oil resources, there has been an increase in research, analysis, and implementation in the automotive industry. On the other hand, EVs are pollution-free, quieter, and more efficient. The information about the electric vehicle system and the necessity for it in the environment is provided in this paper. Many automotive and heavy vehicle manufactures were concentrating on the electric-based locomotive for use in the future.

Paper Agri-Innovation: Incorporating Machine Learning in Plant Disease Detection and Resource Allocation

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Abstract - This paper explores the use of machine learning in the field of agriculture to improve plant disease detection and resource allocation. The objective of the project was to develop a model that can accurately detect plant diseases and allocate resources accordingly to minimize crop damage and increase yield. To achieve this objective, a dataset was created consisting of various images of diseased and healthy plants. The dataset was used to train a deep learning model using the convolutional neural network (CNN) algorithm. The model was trained to identify the various types of diseases that commonly affect crops, including fungal infections, viral infections, and bacterial infections. Once the model was trained, it was deployed to a mobile application that can be used by farmers to take pictures of their crops and get a quick diagnosis of any diseases present. The mobile application also provides recommendations for resource allocation, such as which pesticides to use and how much water to provide based on the severity of the disease. To validate the accuracy of the model, a field test was conducted on a farm where various types of crops were grown. The model was able to accurately identify the type of disease affecting the crops, and the resource allocation recommendations provided by the mobile application were effective in minimizing crop damage.

Overall, this paper demonstrates the potential of machine learning in the field of agriculture and highlights the need for further research and development in this area. By leveraging the power of AI and other emerging technologies, we can build more sustainable and resilient agricultural systems that can help feed the growing global population.

Index Terms – Machine Learning, Disease Detection, Resource Allocation, Internet of Things, Convolutional Neural Network (CNN) algorithm, Artificial Intelligence(AI), Remote Access, Real Time Data.

I. INTRODUCTION

Agriculture is an important sector for ensuring food security and economic growth worldwide. However, plant diseases can significantly impact crop yields, leading to food shortages and economic losses. Traditional methods of disease detection and resource allocation in agriculture have been largely manual and prone to errors. In recent years, machine learning has emerged as a promising tool for improving disease detection and resource allocation in agriculture. This report provides an overview of the paper "Agri-Innovation: Incorporating machine learning in plant disease detection and resource allocation" that aims to develop a machine learning-based system for disease detection and resource allocation in agriculture. Plant diseases are caused by various factors such as environmental conditions, pests, and pathogens. These diseases can cause significant crop losses and reduce food production, leading to food shortages and economic losses. Traditional methods of disease detection in agriculture rely on visual inspection by experts, which can be time-consuming, subjective, and prone to errors. Similarly, resource allocation in agriculture, such as irrigation and fertilizer application, is often done manually without considering the individual needs of each crop. This can result in overuse or underuse of resources, leading to inefficiencies and reduced crop yields.

II. LITERATURE SURVEY

[1] Jérôme Treboux, Dominique Genoud: The study presents a comparison of an innovative machine learning method with a baseline that is typically used on vineyards and agricultural objects. The baseline uses color analysis and can distinguish interesting objects with an accuracy of 89.6%. Machine learning, an innovative approach to this type of application case, shows that the results can be improved to 94.27% accuracy.

[2] Alifia Puspaningrum, A Sumarudin, Willly Permana Putra: This paper suggested predicting irrigation using a machine learning algorithm. Classification algorithms, namely Support Vector Machine (SVM), K-Nearest Neighbor (KNN), Naive Bayes, Random Forest and Decision Tree, are studied to predict accurate irrigation. This paper calculates accuracy, precision, recall and Fl score to assess the performance of the algorithm. Experimental results show that Decision Tree outperforms other algorithms by using its performance with the same agricultural data for accuracy, recall, precision, and fl-point measurement.

[3] Hema Pallevada, Siva Parvathi Potu, Teja Venkata Kumar Munnangi, Bharath Chandhra Rayapudi, Sai Raghava Gadde, Mukesh Chinta: One solution is to allow farmers to test their land and use the fertilizer according to soil needs at affordable costs. This paper provides a report on the design of the cost-effective soil nutrient recognition with prepared capsules. Here, tests can be performed for three different types of nutrients sodium, potassium and phosphorus. Here, three test tubes are taken, each filled with a certain amount

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Comparison of Transfer Learning algorithm in predicting Alzheimer's disease

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Abstract:
Many neurogenerative diseases affect today's generation. The causes of this condition are unclear. Alzheimer's disease is one of that diseases, and elderly peoples suffer a lot from this. In this article, we applied several deep learning transfer learning approaches to categorize distinct phases of Alzheimer's disease. Different measures are used to assess each strategy, which leads to better results.

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I. Introduction

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A REVIEW OF AGILITY ENHANCEMENT FACTORS ON MICRO AND SMALL - SCALE INDUSTRIES

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Abstract
This review paper discusses various techniques and factors that can enhance the agility of micro and small scale industries (MSIs). The review highlights the importance of lean management, cross-functional teams, technology adoption, continuous improvement, customer-centricity, lean manufacturing, flexible manufacturing systems, outsourcing, information technology, supply chain management, innovation, flexibility in manufacturing processes, employee training and development, collaboration and networking, and effective human resource management. Studies have shown that the adoption of these techniques and factors can help MSIs respond more quickly to changes in the market, reduce lead times, and improve efficiency.

Keywords: Agile Manufacturing, Small-Scale industries, Lean Manufactuering

I. Introduction

Agility is a crucial factor for the success of micro and small scale industries (MSMEs) in today's rapidly changing business environment. These industries face various challenges such as competition, changing consumer preferences, and technological advancements, which require them to adapt quickly to stay relevant and competitive.

To enhance agility, MSMEs need to identify and leverage various factors that can help them become more flexible, responsive, and adaptable. Some of these factors include the use of modern technology, a skilled workforce, a supportive government policy, access to finance, efficient supply chain management, and effective collaboration with other businesses.

By adopting these agility enhancement factors, MSMEs can improve their ability to respond quickly to changing market dynamics, reduce operational costs, enhance product and service quality, and increase customer satisfaction. As a result, they can gain a competitive edge over their peers and position themselves for sustainable growth and long-term success.

This paper aims to explore the various factors that can enhance agility in MSMEs and their impact on the growth and competitiveness of these industries. The study will draw on empirical evidence from various sources to provide insights into the best practices that MSMEs can adopt to improve their agility and competitiveness. The findings of this study will be useful for policymakers, business owners, and other stakeholders interested in the development and growth of MSMEs.

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A Case Study to Determine OEE – A KPI Representing the Overall Productivity of a Machine

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Abstract

The industrial sector has experienced an exceptional degree of change in the past few decades. Also, remarkable developments have taken place in the maintenance management systems to reduce downtime and various losses associated with it. Nowadays maintenance is never treated as a profitless activity, instead it is considered as an integral part of business which improves quality of the products as well as productivity of the machines. Ensuring world-class standard of operations to meet the customer requirements is a major challenge to any manufacturing industry. The industry must be in a position to provide the best in class quality of goods and services to its customers. This research work is carried out in a small and medium scale manufacturing industry located in the southern part of Karnataka state. Initially two mechanical presses – one having 600 tonne and the other with 800 tonne capacity were selected. The previous performances of the presses were studied from their breakdown details collected from the industry. Breakdown details for the specific period were collected and analyzed to calculate monthly Overall Equipment Effectiveness (OEE) for both the mechanical presses. OEE is a Key Performance Indicator (KPI) representing the overall productivity of any machine. These monthly OEE values were then averaged and the average OEE was compared to the world-class OEE. From the study carried out, it was observed that average OEE of the 600 tonne press was very low when compared to the world-class OEE target range (60-85%). Total Productive Maintenance (TPM) is found to be an effective maintenance strategy to improve the OEE of the equipment. Hence in order to improve the OEE, it was decided to implement TPM on 600 tonne mechanical press.

Keywords: *OEE, KPI, TPM, world-class OEE, mechanical press, downtime, productivity*

1.0 Introduction

Small and Medium Enterprises (SMEs) have undergone a remarkable change in the past few years in terms of technology used, degree of automation, maintenance systems, etc. These SMEs are developing their maintenance systems in order to make the best possible use of energy and available resources. Integrated with the business of an organization, maintenance activities impart value addition to the machinery and equipment. Maintenance improves the quality of the products, increases the productivity of the machines and confirms the availability of the production equipment in the long run. Hence it is very important for any SME to adopt a proper maintenance system for its overall development. Total Productive Maintenance (TPM) is one of the Japanese modern maintenance management systems whose target is to reduce downtime, waste, defects and hazards to zero[1]. TPM combines production and maintenance

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CFD Analysis of a Diesel Generator Exhaust System to Reduce Back Pressure

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Keywords: CFD Analysis, Diesel Generator, ANSYS

Abstract

Engine exhaust back pressure is defined as the pressure of gas in the exhaust system which is generated by the engine to overcome the hydraulic resistance of the exhaust system in order to release the exhaust gases into the outside of the system. A silencer performance is mainly related on the backpressure value. A high backpressure is commonly caused by exhaust pipe diameter too small and sharp bends in the exhaust system. In this study exhaust system of a diesel generator 125 HP is selected for CFD analysis. One dimensional analysis is carried out with specified boundary conditions. Original design is modified with varying pipe diameter, length and position of expansion chamber. The result of the simulation using CFD software is displayed in the form of velocity contour, pressure contour, graphs and velocity streamline. The study has indicated that increasing bends in the system and exhaust pipe diameter will increases exhaust back pressure and also the position of expansion chamber significantly affect backpressure and thus the engine performance.

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Fabrication and characterization of bio composite fiber boards from areca leaf sheaths

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Abstract

Bio composite fiber boards were fabricated by utilizing the areca leaf sheaths. Areca leaf sheaths were obtained from areca nut tree and these leaf sheaths have fewer applications. Usually, these areca sheaths were decomposed in the soil without much utilization for practical applications. Bio composite fiber boards were fabricated by following the suitable methodology. The pulp consistency of the prepared pulp was determined by varying the different parameters. The pulp consistency of the fiber was found to be best suitable for manufacturing of bio composite medium-density fiber boards. The effect of NaOH on the fiber boards was also studied for different concentrations of NaOH and for different soaking times. The density of the Bio composite fiber boards was studied by varying the different parameters during the fabrication methodology. Surface roughness (Sa) and Profile roughness (Ra) of the fabricated fiber boards were studied using NANOVEA ST400 USA-made 3D non-contact profilometer. It was found that the Surface Roughness value and Profile Roughness value of the fabricated materials are almost similar to the commercially available fiber sheets.

Keywords: Bio composites, Natural fibers, Areca sheath, Pulp consistency, Bulk density, Surface Roughness

1. Introduction

Natural fibres are obtained from renewable sources. This material has got many positive advantages compared to artificial materials. Natural fibres generally have a less environmental impact than synthetic fibres because natural fibres do not use so many chemicals during the production process. In addition to this, burning natural fiber causes less environmental damage compared to artificial fibers [1, 2]. Also, it has low weight and abundant availability of raw materials making it low-cost and user-friendly. Bio composite materials fabricated using natural fibers have very huge applications in recent decades. These bio composites can substitute many of the harmful artificial composites. For our day-to-day applications, we depend upon artificial materials and mainly we depend upon plastic materials. These plastic materials are obtained from artificial compounds and are very harmful when disposing them [3-5]. The only possible way is to minimize the usage of plastics by substituting the place of plastics using the bio composite materials to some extent. By doing so, we can substitute the use of plastic over at least 85% in near future [6]. In this intention, we have planned to substitute the plastics by using natural reinforced bio composites for some of the substitutions of plastics. In our study, we have fabricated the bio composite fiber board materials by using the areca leaf sheath fibers. The main raw materials we have used for the fabrication of bio composite fiber board material are areca leaf sheath fibers [7].

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Role of Disruptive Technology in Tourism Industry, Leading to Life Style Transforming - A Study with Special Reference to Coorg

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ABSTRACT

Coorg is called as "Scotland of India". The district is known for its tourism activity due to which Homestays and Resorts are into getting a household income, and provide homely atmosphere The technological advancement has made the world a small place to live in. Through this study an attempt is made to analyze the transformation in the LIFE STYLE of people in Kodagu due to the adaptation of DISTRUPTIVE TECHNOLOGY this study is with special reference to home stays and resorts in coorg the process of how they overcame the challenges Depending on the disruptive technology, the paper estimates the problems faced by Homestay and Resorts and how they overcame it. Further the paper puts forward the coping strategies which are used to overcome the Obstacles and facilitate recovery.

The study focuses on measuring, analyze the role of disruptive technology in life style transformation of people in kodagu district and model the effect disruptive technology in transforming the life style of the people. In addition, the objective is to investigate the positive and negative impact of the same. The research has also set an objective to suggest the best and worst impact of disruptive technology on life style transformation. This descriptive, causal and exploratory study is conducted using primary data, which was collected from various reliable sources. The non- probability sampling design was used for the study and 115 respondents were selected based on convenience sampling method.

The researcher has set up various hypotheses to analyze and investigate the causal relationship between the role of technology in life style transformation. The primary data has been analyzed using appropriate statistical tests viz., t-test, One-way ANOVA, correlation, the factor analysis was used to determine the role of disruptive technology on life style transformation factors that are considered by home stays and resorts in Kodagu.

Through this study an attempt is made to analyze the transformation in the LIFE STYLE of people in Kodagu due to the adaptation of DISTRUPTIVE TECHNOLOGY this study is with special reference to home stays and resorts in Kodagu the process of how they overcame the challenges Depending on the disruptive technology, the paper estimates the problems faced by Homestay and Resorts and how they overcame it. Further the paper puts forward the coping strategies which are used to overcome the Obstacles and facilitate recovery.

KEYWORDS: *Coorg, Challenges, Homestay and Resorts, Obstacles, Technological advancement*

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IJTSRD52777

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I. INTRODUCTION

Tourism entails the movement of people to countries or places outside their usual environment for personal or business/professional purpose. Now a day's people prefer to stay out of their house and relax completely in a peaceful place which is good for their health and mental peace. In today's busy life every one prefers to spend their holidays in fruitfully and prefer to stay in resorts and home stays where everything is organized for them and they take little interest in the country they are visiting. Others prefer to travel around the country and to see how the people live, to get to know their customs and traditions and cuisine. In recent

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Improved Invasive Weed Social Ski-Driver Optimization-Based Deep Convolution Neural Network for Diabetic Retinopathy Classification

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The eye-related problem of diabetes is called diabetic retinopathy (DR), which is the main factor contributing to visual loss. This research develops an enhanced deep model for DR classification. Here, deep convolutional neural network (Deep CNN) is trained with the improved invasive weed social ski-driver optimization (IISSDO), which is generated by fusing improved invasive weed optimization (IIWO) and social ski-driver (SSD). The IISSDO-based Deep CNN classifies DR severity into normal, mild, non-proliferative DR (NPDR), moderate NPDR, severe NPDR, and proliferative. Initially, a type 2 fuzzy and cuckoo search (T2FCS) filter performs pre-processing and the quality of the data is improved by data augmentation. The lesion is then divided using DeepJoint segmentation. Then, the Deep CNN determines the DR. The analysis uses the Indian DR image database. The IISSDO-based Deep CNN has the highest accuracy, sensitivity, and specificity of 96.566%, 96.773%, and 96.517%, respectively.

Keywords: Diabetic retinopathy; deep convolutional neural network; type II fuzzy cuckoo search filter; DeepJoint model; data augmentation.

1. Introduction

The diabetic retinopathy (DR) affects the retinal area which caused vision loss. Hence, the earlier discovery of severity level in DR acted as a main task in the treatment. The DR destroys 80% of diabetic individuals. There exist no symptoms, which occur in the patients of DR whereas, in the primary phase, only some persons have

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An Image Encryption Model Using Hyper Chaotic Map Dependent Grey-Intelligent Optimization

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Abstract

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Abstract:
With the rapid growth of technologies and scientific innovations, information sharing was made digital, like text messages, file sharing, and pictures and audio messages especially, digital images have been found widely in economics, politics, education, and some other important fields. Methods to securely as well as secretly transmit and store digital images, particularly those that contain private information, have thus become an important concern in those domains. Image encryption technology is one to ensure the safety of image information, as it provides a pattern that is effective for people in transferring and receiving securely over a network. In this research, the Hyperchaotic map image encryption algorithm is proposed based on Grey-intelligent optimization. The optimal range of chaotic parameters in the model offers the secret image excellent security as well as with hyper-hybrid mapping, chaos encryption is used to encrypt the secret image. The proposed method achieved an improvement of 18.08% for MSE, 3.47% for PSNR, 18.55% for RMSE, and 0.33% for SSIM, demonstrating the model's efficacy and excellence of the research.

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Optimized Screening of Glaucoma using Fundus Images and Deep Learning

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Abstract— Diabetic retinopathy, glaucoma, and age-related macular degeneration are among the leading causes of global visual loss. Early detection and diagnosis of these conditions are crucial to reduce vision loss and improve patient outcomes. In recent years, deep learning algorithms have shown great potential in automating the diagnosis and categorization of eye disorders using medical photos. For this purpose, the ResNet-50 architecture is employed in a deep learning-based strategy. The approach involves fine-tuning a pre-trained ResNet-50 model using over 5,000 retinal pictures from the ODIR dataset, covering ten different ocular diseases. To enhance the model's generalization performance and avoid overfitting, various data augmentation techniques are applied to the training data. The model successfully detects glaucoma-related ocular illnesses, including cataract, diabetic retinopathy, and healthy eyes. Performance evaluation using metrics like accuracy, precision, recall, and F1-score shows that the model achieved 92.60% accuracy, 93.54% precision, 91.60% recall, and an F1-score of 91.68%. These results indicate that the proposed strategy outperforms many state-of-the-art approaches in the detection and categorization of eye disorders. This success underscores the potential of deep learning-based methods in automated ocular illness identification, facilitating early diagnosis and timely treatment to ultimately improve patient outcomes.

Keywords- Ocular diseases, Glaucoma, ResNet, Deep Learning, Fundus Images.

I. INTRODUCTION

Ocular conditions are medical problems that can impact the eyes and the surrounding structures, leading to various visual impairments, and in severe cases, even blindness. These conditions can affect different components of the eye, including the cornea, lens, retina, optic nerve, and eyelids. Common eye ailments include cataracts, glaucoma, macular degeneration, and diabetic retinopathy. These disorders can affect individuals of all age groups, with cataracts and glaucoma being more prevalent in older people, and diabetic retinopathy being more common in patients with diabetes. Cataracts cause clouding of the natural lens of the eye and are a major global cause of blindness. Glaucoma comprises a group of disorders that affect the optic nerve and can lead to irreversible visual loss if left untreated. Macular degeneration affects the central region of the retina (macula) responsible for fine vision and can result in blindness. Diabetic retinopathy is a condition affecting the blood vessels in the retina and can lead to visual loss in diabetic patients. Detecting ocular illnesses is crucial for maintaining good eyesight and overall health. Untreated eye problems can lead to vision loss or blindness. Early detection and treatment can help prevent or slow disease progression and avoid permanent visual loss [1]. Various visual disorders, including diabetic retinopathy, age-related macular degeneration, and glaucoma, may not exhibit symptoms in the early stages, underscoring the importance of regular eye exams for early detection. Early identification and treatment of eye diseases can help avoid significant healthcare costs and emotional distress associated with vision loss. Moreover, maintaining good vision is crucial for preserving quality of life and independence, especially in older individuals. In conclusion, timely detection of ocular illnesses is vital for preserving vision, overall health, preventing vision loss, and enhancing quality of life.

Figures 1 and 2 display fundus images of a normal eye and the labeling of the fundus pictures, respectively. The proposed approach employs a ResNet-50 model to detect three ocular diseases: cataract, diabetic retinopathy, and healthy eyes. The process involves data collection, pre-processing, feature extraction, and classification. For this study, the ODIR dataset, comprising over 5000 retinal photographs from diverse individuals, was used. The ResNet-50 model, known for its success in detecting various objects and patterns in photos, is employed for feature extraction. The model is trained on the pre-processed dataset to learn unique features for each image

DEVELOPING A HYBRID APPROACH FOR ENHANCEDEARLY ACUTE GLAUCOMA SCREENING BY COMBINED DEEP LEARNING APPROACH

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Abstract

Diagnosis and diagnosis of glaucoma progression remain difficult. Artificial intelligence-based techniques have the potential to improve and standardize glaucoma examination, however because of the multimodal and changeable nature of the diagnosis, developing these algorithms is difficult. Most algorithms are now focused on a single imaging modality, namely screening and diagnosis using fundus pictures or optical coherence tomography images. In our review of the literature, we found no research that evaluated the use of artificial intelligence for treatment response prediction, and no studies that conducted prospective testing of their algorithms. Another barrier to the development of artificial intelligence-based solutions is a lack of data and agreement on diagnostic criteria. Although research on the use of artificial intelligence for glaucoma is promising, more research is required to develop clinically usable tools. Current glaucoma detection convolutional neural networks (CNNs) are all based on spatial data embedded in an image. We created a hybrid CNN and recurrent neural network (RNN) that extracts not only the spatial but also the temporal characteristics encoded in a fundus image. A total of 1810 fundus photos and 295 fundus images were used to train a CNN and a CNN-LSTM-RNN combination. In differentiating glaucoma from healthy eyes, the combined CNN/RNN model achieved an average F-measure of 94.3%. A detecting system is required to aid in the early identification of glaucoma. The researchers propose employing deep learning technology to detect and forecast glaucoma before symptoms arise in this study. The results are contrasted with deep learning-based convolution neural network classification techniques. The suggested model has an accuracy of 98.21% when used for training and an accuracy of 96.34% when used for testing. According to all evaluations, the newly proposed paradigm is more effective than the one that is already in use.

KeyWords: Glaucoma, Artificial Intelligence, Deep Learning, Deep Convolution Neural Network, Recurrent Neural Network, Long Short-Term Memory.

1. INTRODUCTION

Glaucoma is a chronic, progressive optic neuropathy that causes the loss of retinal nerve fibers. Though asymptomatic in the early stages, it can lead to severe, permanent vision loss over time. As a result, early detection is critical. Glaucoma is the primary cause of irreversible blindness

Review of Security Issues in Mobile Ad Hoc Networks

Shyamily P V, Dr.Anoop B K

Keywords: MANETS, Challenges in MANETS, Attacks in MANETS, Security in MANETS, Routing, Issues, Approach and Detection

Abstract

Numerous technologies are being evolved in the everyday life. The researchers' concentration is gained increasingly by these growing modern technologies. A Mobile Ad-hoc Network (MANET) is a self-configuring along with a self-organizing network devoid of an infrastructure utilized by wireless mobile devices. Several kinds of security measures are being adopted; even then, there occur attacks often. Innovative methodologies are invented by the attacker for attacking. To guard data numerous technologies have been established whereas simultaneously, another methodology will be implemented to hack the information. All the technology is comprised of pros and cons, in the same way, MANETS are also included in that category. The MANETS' security threats, challenges, along with complications are reviewed in this paper. The various methodologies utilized in the latest literature to sort out the MANETS' security problems are significantly surveyed in this manuscript. On the regions of identification of malicious activity, malicious node detection, methodologies, performance evaluation, along with Energy Consumption (EC), the theoretical interpretation is performed.

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Articles

Make a Submission

A Survey on DR detection by Segmenting Blood Vessels and Lesions from Fundus Colour Images with Deep Learning Techniques

Padmanayana, Dr.Anoop B K

Keywords: Deep Learning, Blood Vessel Extraction, Segmentation, Neural Nets, Fundus Images, Classification.

Abstract

Visual sense is one of the most important senses among others for us humans. There are several numbers of diseases that could damage our eye permanently. One of the most common causes is due to diabetes. The condition is called Diabetic Retinopathy. It is caused because of damaging that occurs to the blood vessels of the light sensitive tissues at the back of retina. This disease can be identified from the fundus color images of the eye called retinal fundus images. These tasks although are challenging as it is symptomless. Many algorithms were deployed and analysed to check the abnormalities in the images. The ones that are going to be discussed in this paper are cluster-based methods, data mining techniques, binary filters, screening techniques and convolutional neural networks (CNN). The largest population of diabetic patients and unavailability of experienced ophthalmologists have produced the demand for computer-aided automatic DR diagnostic systems. The classification of DR is very difficult for ophthalmologists, especially in the presence of different small features. Increasing DR cases have adverse impact on ophthalmologists and require an efficient and accurate method for fundus image evaluation.

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CLOUD COMPUTING BASED IMAGE PROCESSING FOR SECURE DATA TRANSMISSION

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Abstract:
The technology of image processing provides a practical solution to the many issues related to the processing of the signal's information. The objective of this paper is to analyze the cloud computation based image processing algorithms and its design. This paper also presents cloud computation methods for processing of information in the image with a specified protocol for the data transmission. In these methods, a technique based on structure of materials and their performance is selected as an algorithm for verification. In addition, the algorithm begins with the extraction of features from the image rather than preprocessing of image, which common in traditional method of image processing. Thus based on this, a structure of processing an image in real time system using standard database and initial filtering application are used for the functional analysis. The privacy of data in the image processing and the security is enhanced by the use of cloud computation and is revealed by the literature survey. The proposed algorithm for the image processing has many advantages in exchanging the data between the sender or transmitter and the receiver using the technique among the wireless sensor network nodes.

Introduction:
Every day we go through many images from the different sources. These images are now the source of data or the information. From the image a huge amount of data is received when we carefully observe the image. Cryptography will come into picture when we want to transfer confidential images in a safe and secured manner. Encryption of images and videos has various applications in different areas such as communication in the military fields, communication using the internet, telemedicines, systems that uses multimedia, and in the field of medical images. With the advancement in the development of network and multimedia technologies, several colour images are stored and transmitted by using the wireless network and the internet. From the period of Shannon's (1949) to till today cryptography is playing a crucial part in the area of security, which is work field of many scientists and the mathematicians. There are many algorithms for the cryptography (encryption and decryption) were developed, namely IDEA, AES, RSA, DES and several others. The method of cryptography deployed in this paper is ECC – Elliptic Curve Cryptography, as the literature survey on the ECC tells that solving the

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RESEARCH ARTICLE

An Exploratory Study on Ensemble Methods used for Secure Data Transmission

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ABSTRACT

During last few decades, digital communication plays a vital role for various sectors such as healthcare departments, banking sectors, information technology companies, industries and several other fields. Nowadays, all data are transmitted over internet, which needs high protection for transmitting the original data from source to destination. Because there are countless ways to improve network security, we discuss the significance of coming up with hybrid approaches for providing high protection of data as well as resources. In order to secure digital communication, cryptography and steganography methods are used to achieve data security over insecure and the open networks like internet. We also explore various Machine Learning and Deep Learning strategies that can be used to develop secure environments. Cryptography is the method to encrypt the secret information in an unreadable structure. On the other hand, steganography is the technique to cover the secret data such as audio, image, text, and video. It can hide the message while transmitting the original information from one end to other end. Machine Learning and Deep Learning are usually applied now a days and they are used a solution to different attacks in network. In this paper, it gives an analysis based on the concept of Cryptography,

RESEARCH ARTICLE | MAY 24 2023

Prediction of health diseases using soft computing techniques : A comprehensive review

Saikumar Tara; A. Jyothsna; Mallellu Sai Prashanth; E. Susmitha; B.K. Anoop

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Soft Computing will be primarily accustomed give solutions to real-world problems, that aren't modelled or too tough to model mathematically. during this planned paper, an in-depth survey of varied procedure techniques like Genetic algorithmic rule and K Nearest Neighbors employed in the care trade Health diseases are included for prediction. The computer model moon-faced problems are known but health and also future analytical directions are given to predict and predict health conditions.

Topics

The Moon, **Computer simulation**, **Review**

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Research Article

Implementation of Deep Learning based Automated Diagnosis of Glaucoma Using Digital Retinal Fundus Images

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Abstract

Glaucoma is a prevalent chronic condition that can cause irreversible vision loss. The number of individuals suffering from permanent vision loss as a result of glaucoma is predicted to rise at an alarming rate in the near future. There is a lot of study being done on computer-aided diagnosis for glaucoma. The optic cup (OC) and optic disc (OD) are typically segmented in retinal fundus images to distinguish between glaucomatous and non-glaucomatous instances. However, the OC boundaries are quite non-distinctive; as a result, accurate OC segmentation is extremely difficult, and OD segmentation performance also needs to be improved. To address this issue, we suggest two networks for accurate glaucoma screening: CNN and RNN-LSTM. We created a CNN-RNN hybrid that extracts not only the spatial information in a fundus image but also the temporal features encoded in fundus sequential images. A CNN and a combined CNN and Long Short-Term Memory RNN were trained using 1810 fundus pictures and 295 fundus videos. In differentiating glaucoma from healthy eyes, the combined CNN/RNN model achieved an average F-measure of 95.2%. In comparison, the fundamental CNN model only achieved an average F-measure of 78.2%. Both proposed networks include a separable convolutional link to improve computational efficiency and lower network costs. The proposed architecture can provide great accuracy even with only a few trainable parameters.

Keywords: Optic cup, optic disc segmentation, Glaucoma screening, Computer-aided diagnosis, convolutional neural networks, Recurrent Neural Network (RNN).

Introduction

This Glaucoma is one of the biggest causes of blindness among eye illnesses, with an estimated 80 million individuals affected by 2020[1]. Glaucoma, unlike other eye illnesses such as cataracts and myopia, cannot be reversed. Thus, early screening is critical for early treatment in order to preserve vision and life quality. Many glaucoma patients, however, are unaware of their disease[2]. As illustrated in the bottom row of Fig. 1, glaucoma is often known as the "silent theft of sight." To screen for glaucoma, three clinical examinations are used: intraocular pressure (IOP) measurement, function-based visual field test, and optic nerve head (ONH) assessment. IOP is a significant risk factor, but it is not specific enough to be an effective screening tool for the vast majority of glaucoma patients with normal tension. Function-based visual field testing necessitates the use of specialized perimetric equipment that is not typically seen in primary care clinics. Furthermore, early glaucoma frequently lacks visual symptoms. ONH assessment is a simple approach to detect glaucoma early and is now commonly used by skilled glaucoma experts[3-5]. Glaucoma optic nerve head damage can be detected utilizing Fundoscopy, visual field assessment, optical coherence tomography, and digital

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Improved Invasive Weed Social Ski-Driver Optimization-Based Deep Convolution Neural Network for Diabetic Retinopathy Classification

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The eye-related problem of diabetes is called diabetic retinopathy (DR), which is the main factor contributing to visual loss. This research develops an enhanced deep model for DR classification. Here, deep convolutional neural network (Deep CNN) is trained with the improved invasive weed social ski-driver optimization (IISSDO), which is generated by fusing improved invasive weed optimization (IIWO) and social ski-driver (SSD). The IISSDO-based Deep CNN classifies DR severity into normal, mild, non-proliferative DR (NPDR), moderate NPDR, severe NPDR, and proliferative. Initially, a type 2 fuzzy and cuckoo search (T2FCS) filter performs pre-processing and the quality of the data is improved by data augmentation. The lesion is then divided using DeepJoint segmentation. Then, the Deep CNN determines the DR. The analysis uses the Indian DR image database. The IISSDO-based Deep CNN has the highest accuracy, sensitivity, and specificity of 96.566%, 96.773%, and 96.517%, respectively.

Keywords: Diabetic retinopathy; deep convolutional neural network; type II fuzzy cuckoo search filter; DeepJoint model; data augmentation.

1. Introduction

The diabetic retinopathy (DR) affects the retinal area which caused vision loss. Hence, the earlier discovery of severity level in DR acted as a main task in the treatment. The DR destroys 80% of diabetic individuals. There exist no symptoms, which occur in the patients of DR whereas, in the primary phase, only some persons have

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Hypervolume Sen Task Scheduilng and Multi Objective Deep Auto Encoder based Resource Allocation in Cloud

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Abstract—Cloud Computing (CC) environment has restructured the Information Age by empowering on demand dispensing of resources on a pay-per-use base. Resource Scheduling and allocation is an approach of ascertaining schedule on which tasks should be carried out. Owing to the heterogeneity nature of resources, scheduling of resources in CC environment is considered as an intricate task. Allocating best resource for a cloud request remains a complicated task and the issue of identifying the best resource – task pair according to user requirements is considered as an optimization issue. Therefore the main objective of the Cloud Server remains in scheduling the tasks and allocating the resources in an optimal manner. In this work an optimized task scheduled resource allocation model is designed to effectively address large numbers of task request arriving from cloud users, while maintaining enhanced Quality of Service (QoS). The cloud user task requests are mapped in an optimal manner to cloud resources. The optimization process is carried out using the proposed Multi-objective Auto-encoder Deep Neural Network-based (MA-DNN) method which is a combination of Sen's Multi-objective functions and Auto-encoder Deep Neural Network model. First tasks scheduling is performed by applying Hypervolume-based Sen's Multi-objective programming model. With this, multi-objective optimization (i.e., optimization of cost and time during the scheduling of tasks) is performed by means of Hypervolume-based Sen's Multi-objective programming. Second, Auto-encoder Deep Neural Network-based Resource allocation is performed with the scheduled tasks that in turn allocate the resources by utilizing Jensen–Shannon divergence function. The Jensen–Shannon divergence function has the advantage of minimizing the energy consumption that only with higher divergence results, mapping is performed, therefore improving the energy consumption to a greater extent. Finally, mapping tasks with the corresponding resources using Kronecker Delta function improves the makespan significantly. To show the efficiency of Multi-objective Auto-encoder Deep Neural Network-based (MA-DNN) cloud time scheduling and optimization between tasks and resources in the CC environment, we also perform thorough experiments on the basis of realistic traces derived from Personal Cloud Datasets. The experimental results show that compared with RAA-PI-NSGAII and DRL, MA-DNN not only significantly accelerates the task scheduling efficiency, task scheduling time but also reduces the energy usage and makespan considerably.

Keywords- Cloud Computing, Cloud Server, Multi-objective, Auto-encoder, Deep Neural Network

I. INTRODUCTION

CC climate relate virtualization instrument to divide colossal actual assets into various virtual assets. A few clients use these virtual assets on a CC climate whenever and anyplace. Most existing cloud asset assignment techniques don't support the creating mode, explaining that they are deficient in endeavor the idealness and enhancement concerning asset distribution. However, clients' support more mindfulness of the practicality and advancement. In this manner, cloud specialist co-ops or cloud servers are very restless with how to control huge assets and improve asset use. A huge asset distribution is thus urgent to show up at these targets.

A Cloud Asset Distribution Calculation in light of an Equal and Further developed Non-ruled Arranging Hereditary Calculation II (RAA-PI-NSGAII) was proposed in [1]. To begin with, asset assignment need and it were figured out to match distances. Then, the proportion of proportion to reaction by means of multi-objective streamlining strategy for distribution the asset in CC climate was planned.Here, only minimum matching and resource proportion were employed.

Multi-objective load balancing in cloud infrastructure through fuzzy based decision making and genetic algorithm based optimization

Neema George, Anoop Balakrishnan Kadan, Vinodh P. Vijayan

Abstract

Cloud computing became a popular technology which influence not only product development but also made technology business easy. The services like infrastructure, platform and software can reduce the complexity of technology requirement for any ecosystem. As the users of cloud-based services increases the complexity of back-end technologies also increased. The heterogeneous requirement of users in terms for various configurations creates different unbalancing issues related to load. Hence effective load balancing in a cloud system with reference to time and space become crucial as it adversely affect system performance. Since the user requirement and expected performance is multi-objective use of decision-making tools like fuzzy logic will yield good results as it uses human procedure knowledge in decision making. The overall system performance can be further improved by dynamic resource scheduling using optimization technique like genetic algorithm.

Keywords

Data mining and analysis; Distributed systems; Fuzzy logic; Genetic algorithm; Intelligent and knowledge-based system; Scheduling

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DRUG RELEASE KINETICS IN BIOCOMPATIBLE XANTHAN GUM (XG)/METHYL CELLULOSE (MC) BLEND – Γ-FE2O3 NANOCOMPOSITES

Prasad P.[1]*, Sudhakar Y. N.[2]*, Sumana V. S.[3], Shrinivasa Mayya D.[4], Savitha M. B.[5]

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ABSTRACT

This research investigates the drug release kinetics of biocompatible xanthan gum (XG)/methyl cellulose (MC) blend - maghemite nanocomposites. Physicochemical evaluations were conducted on metoprolol drug-infused XG, MC, their maghemite nanocomposites, and various XG/MC blend - maghemite nanocomposites. The results revealed uniform thickness and weight for the samples. The folding endurance values indicated good strength and elasticity of the thin films. The presence of maghemite nanoparticles influenced folding endurance, moisture absorption, and moisture loss. The drug release kinetics were studied using diffusion models, demonstrating sustained release behaviors for the nanocomposites. The diffusion exponent and constant confirmed Fickian kinetics. The findings suggest the potential application of these nanocomposites for controlled transdermal drug release.

Keywords: Drug Release Kinetics, Xanthan Gum, Methyl Cellulose, Maghemite Nanocomposites, Transdermal Drug Release.

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The field of pharmaceutical research and development has undergone significant progress in the pursuit of more efficient and targeted drug delivery systems [1]. The precise regulation of drug release kinetics has become a cornerstone in achieving optimal therapeutic outcomes while mitigating potential adverse effects [2]. Understanding drug release kinetics guides system refinement, tailoring controlled drug delivery [3, 4].

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DRUG RELEASE KINETICS IN BIOCOMPATIBLE GUAR GUM (GG)/HYDROXYPROPYL METHYL CELLULOSE (HPMC) BLEND - MAGHEMITE NANOCOMPOSITES

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ABSTRACT

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Keywords: Drug Release Kinetics, Biocompatible Nanocomposites, Physicochemical Evaluation, Sustained Drug Release, Guar Gum-HPMC Blend.

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In the realm of biomedical engineering sciences, the controlled release of drugs holds immense promise for optimizing therapeutic outcomes and minimizing potential side effects [1, 2]. The intricate interplay between drug carriers and their release kinetics underscores the significance of this field [3]. Our research group has been consistently engaged in investigating the combination of diverse biocompatible water-soluble polymers [4-10].

The polymers GG and HPMC, owing to their biocompatibility and drug encapsulation potential, have garnered attention as a potential drug carrier [11-17]. In tandem with this, the incorporation of maghemite (γ-Fe2O3) nanoparticles into the blend introduces a novel dimension, potentially

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Investigating Drug Release Kinetics from Biocompatible Guar Gum (GG)/Methyl Cellulose (MC) Blend - γ-Fe_2O_3 Nanocomposites

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ABSTRACT

This research explores the use of water-soluble biocompatible polymers, guar gum (GG) and methyl cellulose (MC), alongside the nanomaterial maghemite (γ-Fe_2O_3), for transdermal sustained drug release, employing metoprolol succinate as a model drug. Drug-infused thin film patches of GG, MC, their γ-Fe_2O_3 nanocomposites, and 10/90 GG/MC blend - γ-Fe_2O_3 nanocomposites were utilized for the investigation. Physicochemical parameter evaluations, including thickness, weight, folding endurance, % moisture absorbance, and % moisture loss, supported the drug release kinetics study using a hydrated cellophane sheet and diffusion tube. The results indicate that this blend-nanocomposite system releases the drug through diffusion, following Fickian kinetics. These biomaterials hold promise for developing slow, sustained release formulations in transdermal drug delivery systems.

Keywords: blend-nanocomposites, guar gum, methyl cellulose, maghemite, compatibility, biocompatibility.

1. INTRODUCTION:

Researchers are increasingly focused on developing novel drugs and dosage forms to enhance efficacy while reducing side effects. Water-soluble polymers are being extensively utilized in the pharmaceutical industry [1-7]. The irregular shifts in drug concentration in the bloodstream resulting from conventional dosing have prompted the development of

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Compatibility Studies of Guar Gum (GG)/Methyl Cellulose (MC) Blend-Zinc Oxide (ZnO) Nanocomposites

Prasad P.[1*], Sudhakar Y. N.[2*], Sumana V. S. [3], Gopalakrishna Bhat N.[3], Sahana G. K. [4], Shrinivasa Mayya D.[5], Savitha M. B.[6]

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DOI: 10.48047/ecb/2023.12.si4.1768

ABSTRACT

This original research article focuses on the burgeoning significance of nanocomposites in biomedical and pharmaceutical domains due to their heightened properties. The research aims to assess the compatibility of Guar Gum (GG)/Methyl Cellulose (MC) blend-Zinc Oxide (ZnO) nanocomposites using a range of analytical techniques. ZnO nanoparticles were synthesized utilizing banana leaf extract and zinc acetate solution. To validate compatibility within the aqueous solutions, the study employed density measurement, ultrasonic velocity measurement, and adiabatic compressibility measurements. The characterization of the morphology of thin films prepared via the solution casting-solvent evaporation method was accomplished through FESEM analysis. The outcomes unveiled the compatibility and stability of GG/MC blend-ZnO nanocomposites in aqueous solutions, presenting these materials as promising candidates for diverse biomedical and pharmaceutical applications. This study significantly contributes by examining the compatibility of GG/MC blend-ZnO nanocomposites through an array of analytical methods.

Keywords: nanocomposites, guar gum, methyl cellulose, zinc oxide, compatibility, biocompatibility.

1. INTRODUCTION:

Nanocomposites refer to materials that are composed of nanoparticles embedded in a matrix material, which possess distinct properties compared to conventional materials [1-3]. Guar

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In Press, Corrected Proof ⓘ What's this?

Analysis of design parameters of fuel injector used in liquid propellant rocket engine

Raghavendra Pai [a], Lokesh KS [b], Shrinivasa Mayya D [b], Vidyashree HG [b], Yallappa RK [b], Jayashree J [b], Neha KU [b], Sagar KK [b]

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https://doi.org/10.1016/j.matpr.2023.05.166

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Abstract

Performance of the liquid rocket engine is considered to be significant not only in terms of type of the fuel, fuel tank and structure used but also flow rate of the fuel takes prime importance in enhancing the engine performance. Variation in flow rate normally altered to greater extent by varying the design parameters of the fuel injectors. Keeping this in mind, the present study aims to alter the design parameters of pintle injector by changing the dimension such as diameter, impinging angle and L-open (fuel exit) by introducing orifice plate outlet of fuel injector to decrease the area and increase the velocity of fuel through designing CATIA model for fuel injector and to perform simulation using ANSYS workbench. The prime objective of the present study is to increase fuel flow rate and make it better comparable to the existing one. Implementing new design of pintle fuel injector by referring the standard value and study the fuel behaviour in the pintle injector. The present work also aims to improve the empirical design tools to get high performance of an engine and to achieve the better stability of the fuel injector through parametric design and analysis through CFD simulation.

Introduction

A pin gismo may be a sort of fuel injector for dual-fuel rocket engines like any injector. The goal is to supply the proper rate of flow and high fuel mixture into the combustion chamber for an economical and controlled combustion process. pin rocket motors will have a wider throttle vary than typical nozzle-based rocket motors and exhibit very little acoustic combustion instability as a result of needle nozzles tend to make self-stabilising flow patterns. This makes pin motors terribly appropriate for applications requiring deep, quick and safe strangulation such as B. Plug-in module. The needle gismo appeared within the mid-1950s as an early laboratory take a look at device utilized by the American state Institute of Technology'

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Impact of fibre orientation on mechanical properties of GFRP composites

H.S Sharath Chandra [a], K.S. Lokesh Mr Lokesh [b], G. Ravindra Babu Mr Ravindra [c], D. Shrinivasa Mayya Dr Shrinivasa [b], J.R. Naveen Kumar Dr Naveen [d]

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Abstract

Knowing the characteristics of a composite material under a given set of circumstances is essential for reliable structural member design. Understanding and being familiar with the stacking order of laminates organised to make a composite is essential since composites are used in an increasing number of applications. The goal of the current effort is to develop an E-glass fibre reinforced with epoxy composite by stacking the laminates of 0°, 45°, and 90° and integrating all three orientations. Different samples were compared experimentally with axial tensile and compressive loading. The specimen with a 0° orientation in the tensile test demonstrated outstanding resistance to tensile loading. It is observed that found the sample developed by different stacking sequence experiences the least strain of all the specimens with 9% elongation at break. Additionally, the sample made with fibre orientation of 45^0 undergo severe deformation of 20% which is considered to be largely deformed specimen compared to the rest of the combinations.

Introduction

Knowledge of fiber types and orientations is crucial for comprehending the scope of research being done on glass fiber orientation and its effect on mechanical qualities. Fiber composition works best when it is sequentially ordered to improve mechanical properties [1]. To ascertain the mechanical qualities as a result of the influence of Sisal fiber orientations such as 90°, 0°, and 45° orientations, Kumersan et al. conducted the investigation. By using compression moulding, samples of Sisal fiber reinforced in various orientations were created, and their mechanical characteristics, such as tensile strength and flexural strength, were studied. According to the findings [2], compared to 0° and 45°, the orientation 90° exhibits better mechanical qualities. The tensile, flexural, and moisture absorption characteristics of composites

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A REVIEW OF AGILITY ENHANCEMENT FACTORS ON MICRO AND SMALL - SCALE INDUSTRIES

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Dr. Shrinivasa Mayya D, Research Guide, Srinivas Institute of Technology, Mangaluru

Abstract
This review paper discusses various techniques and factors that can enhance the agility of micro and small scale industries (MSIs). The review highlights the importance of lean management, cross-functional teams, technology adoption, continuous improvement, customer-centricity, lean manufacturing, flexible manufacturing systems, outsourcing, information technology, supply chain management, innovation, flexibility in manufacturing processes, employee training and development, collaboration and networking, and effective human resource management. Studies have shown that the adoption of these techniques and factors can help MSIs respond more quickly to changes in the market, reduce lead times, and improve efficiency.

Keywords: Agile Manufacturing, Small-Scale industries, Lean Manufactuering

I. Introduction

Agility is a crucial factor for the success of micro and small scale industries (MSMEs) in today's rapidly changing business environment. These industries face various challenges such as competition, changing consumer preferences, and technological advancements, which require them to adapt quickly to stay relevant and competitive.

To enhance agility, MSMEs need to identify and leverage various factors that can help them become more flexible, responsive, and adaptable. Some of these factors include the use of modern technology, a skilled workforce, a supportive government policy, access to finance, efficient supply chain management, and effective collaboration with other businesses.

By adopting these agility enhancement factors, MSMEs can improve their ability to respond quickly to changing market dynamics, reduce operational costs, enhance product and service quality, and increase customer satisfaction. As a result, they can gain a competitive edge over their peers and position themselves for sustainable growth and long-term success.

This paper aims to explore the various factors that can enhance agility in MSMEs and their impact on the growth and competitiveness of these industries. The study will draw on empirical evidence from various sources to provide insights into the best practices that MSMEs can adopt to improve their agility and competitiveness. The findings of this study will be useful for policymakers, business owners, and other stakeholders interested in the development and growth of MSMEs.

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Prasad P.[1]*, Sudhakar Y. N.[2]*, Sumana V. S.[3], Shrinivasa Mayya D.[4], Savitha M. B.[5]

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A comparative analysis of exergy using dual blends of biodiesel in a DI engine

Ramakrishna N. Hegde, Gangadhara Rao, Jagadeesh Bantwal, Praveen Shenoy

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Abstract

The scarcity of petroleum fuels and pollution concerns has led to the search for alternate fuels. In this investigation, cottonseed and Simarouba oils are transesterified to produce the corresponding biodiesels. The esterification and transesterification were carried out in the presence of heterogeneous catalyst $MgPO_4$. The various properties of biodiesel are determined in the laboratory. Vateria indica is a species endemic to India that belongs to the Dipterocarpaceae family. The oil of Vateria indica is obtained by an aqueous extraction method. This oil is transesterified to obtain the biodiesel by a two-step process of esterification followed by transesterification. This biodiesel is blended with diesel in 10% and 20% volumetric proportions. The cottonseed and Simarouba biodiesels are blended in equal proportions with diesel and tested for performance and exergy analysis along with Vateria indica blends. It is found from performance and exergy analysis that biodiesel blends performed better than diesel.

Introduction

Decreasing availability coupled with air pollution concerns resulted in newer alternatives for Petroleum products. The increasing demand for the supply of petroleum products leads to the import of crude oil by developing countries; hence humanity has embarked on alternativebut renewable energy fuel sources having higher sustainability. To cater tothe growing energy requirement, many countries import crude oil, which burdensthe economy, leading to inflation. Thus, there is a natural pressure on such countries to ease the import burden and at the same time look for petroleum-based fuel substitutes. Growing Population, energy crisis, shortage of fossil fuels and rising hazardous impact petroleum products on environment necessities some backup fuel which should offersimilar characteristics to conventional fossil fuels. Also performance and emission analysis of biodiesel and petro-diesel shows a general increase of efficiency and better emission characteristics for biodiesel. The drawbacks of neat diesel are led to the search of alternatives. Vegetable oil is currently considered an effectivesubstitute due to its characteristics, pan with

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Abstract:
With the rapid growth of technologies and scientific innovations, information sharing was made digital, like text messages, file sharing, and pictures and audio messages especially, digital images have been found widely in economics, politics, education, and some other important fields. Methods to securely as well as secretly transmit and store digital images, particularly those that contain private information, have thus become an important concern in those domains. Image encryption technology is one to ensure the safety of image information, as it provides a pattern that is effective for people in transferring and receiving securely over a network. In this research, the Hyperchaotic map image encryption algorithm is proposed based on Grey-intelligent optimization. The optimal range of chaotic parameters in the model offers the secret image excellent security as well as with hyper-hybrid mapping, chaos encryption is used to encrypt the secret image. The proposed method achieved an improvement of 18.08% for MSE, 3.47% for PSNR, 18.55% for RMSE, and 0.33% for SSIM, demonstrating the model's efficacy and excellence of the research.

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A Survey on DR detection by Segmenting Blood Vessels and Lesions from Fundus Colour Images with Deep Learning Techniques

Padmanayana, Dr.Anoop B K

Keywords: Deep Learning, Blood Vessel Extraction, Segmentation, Neural Nets, Fundus Images, Classification.

Abstract

Visual sense is one of the most important senses among others for us humans. There are several numbers of diseases that could damage our eye permanently. One of the most common causes is due to diabetes. The condition is called Diabetic Retinopathy. It is caused because of damaging that occurs to the blood vessels of the light sensitive tissues at the back of retina. This disease can be identified from the fundus color images of the eye called retinal fundus images. These tasks although are challenging as it is symptomless. Many algorithms were deployed and analysed to check the abnormalities in the images. The ones that are going to be discussed in this paper are cluster-based methods, data mining techniques, binary filters, screening techniques and convolutional neural networks (CNN). The largest population of diabetic patients and unavailability of experienced ophthalmologists have produced the demand for computer-aided automatic DR diagnostic systems. The classification of DR is very difficult for ophthalmologists, especially in the presence of different small features. Increasing DR cases have adverse impact on ophthalmologists and require an efficient and accurate method for fundus image evaluation.

PDF

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Section
Articles

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Materials Today: Proceedings

Volume 80, Part 2, 2023, Pages 517-524

A comparative analysis of exergy using dual blends of biodiesel in a DI engine

Ramakrishna N. Hegde, Gangadhara Rao, Jagadeesh Bantwal, Praveen Shenoy

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https://doi.org/10.1016/j.matpr.2022.11.040

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Abstract

The scarcity of petroleum fuels and pollution concerns has led to the search for alternate fuels. In this investigation, cottonseed and Simarouba oils are transesterified to produce the corresponding biodiesels. The esterification and transesterification were carried out in the presence of heterogeneous catalyst MgPO4. The various properties of biodiesel are determined in the laboratory. Vateria indica is a species endemic to India that belongs to the Dipterocarpaceae family. The oil of Vateria indica is obtained by an aqueous extraction method. This oil is transesterified to obtain the biodiesel by a two-step process of esterification followed by transesterification. This biodiesel is blended with diesel in 10% and 20% volumetric proportions. The cottonseed and Simarouba biodiesels are blended in equal proportions with diesel and tested for performance and exergy analysis along with Vateria indica blends. It is found from performance and exergy analysis that biodiesel blends performed better than diesel.

Introduction

Decreasing availability coupled with air pollution concerns resulted in newer alternatives for Petroleum products. The increasing demand for the supply of petroleum products leads to the import of crude oil by developing countries; hence humanity has embarked on alternativebut renewable energy fuel sources having higher sustainability. To cater tothe growing energy requirement, many countries import crude oil, which burdensthe economy, leading to inflation. Thus, there is a natural pressure on such countries to ease the import burden and at the same time look for petroleum-based fuel substitutes. Growing Population, energy crisis, shortage of fossil fuels and rising hazardous impact petroleum products on environment necessities some backup fuel which should offersimilar characteristics to conventional fossil fuels. Also performance and emission analysis of biodiesel and petro-diesel shows a general increase of efficiency and better emission characteristics for biodiesel. The drawbacks of neat diesel are led to the search of alternatives. Vegetable oil is currently considered an effectivesubstitute due to its characteristics, pan with

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CLOUD COMPUTING BASED IMAGE PROCESSING FOR SECURE DATA TRANSMISSION

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Abstract:
The technology of image processing provides a practical solution to the many issues related to the processing of the signal's information. The objective of this paper is to analyze the cloud computation based image processing algorithms and its design. This paper also presents cloud computation methods for processing of information in the image with a specified protocol for the data transmission. In these methods, a technique based on structure of materials and their performance is selected as an algorithm for verification. In addition, the algorithm begins with the extraction of features from the image rather than preprocessing of image, which common in traditional method of image processing. Thus based on this, a structure of processing an image in real time system using standard database and initial filtering application are used for the functional analysis. The privacy of data in the image processing and the security is enhanced by the use of cloud computation and is revealed by the literature survey. The proposed algorithm for the image processing has many advantages in exchanging the data between the sender or transmitter and the receiver using the technique among the wireless sensor network nodes.

Introduction:
Every day we go through many images from the different sources. These images are now the source of data or the information. From the image a huge amount of data is received when we carefully observe the image. Cryptography will come into picture when we want to transfer confidential images in a safe and secured manner. Encryption of images and videos has various applications in different areas such as communication in the military fields, communication using the internet, telemedicines, systems that uses multimedia, and in the field of medical images. With the advancement in the development of network and multimedia technologies, several colour images are stored and transmitted by using the wireless network and the internet. From the period of Shannon's (1949) to till today cryptography is playing a crucial part in the area of security, which is work field of many scientists and the mathematicians. There are many algorithms for the cryptography (encryption and decryption) were developed, namely IDEA, AES, RSA, DES and several others. The method of cryptography deployed in this paper is ECC – Elliptic Curve Cryptography, as the literature survey on the ECC tells that solving the

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Fabrication and characterization of bio composite fiber boards from areca leaf sheaths

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Abstract

Bio composite fiber boards were fabricated by utilizing the areca leaf sheaths. Areca leaf sheaths were obtained from areca nut tree and these leaf sheaths have fewer applications. Usually, these areca sheaths were decomposed in the soil without much utilization for practical applications. Bio composite fiber boards were fabricated by following the suitable methodology. The pulp consistency of the prepared pulp was determined by varying the different parameters. The pulp consistency of the fiber was found to be best suitable for manufacturing of bio composite medium-density fiber boards. The effect of NaOH on the fiber boards was also studied for different concentrations of NaOH and for different soaking times. The density of the Bio composite fiber boards was studied by varying the different parameters during the fabrication methodology. Surface roughness (Sa) and Profile roughness (Ra) of the fabricated fiber boards were studied using NANOVEA ST400 USA-made 3D non-contact profilometer. It was found that the Surface Roughness value and Profile Roughness value of the fabricated materials are almost similar to the commercially available fiber sheets.

Keywords: Bio composites, Natural fibers, Areca sheath, Pulp consistency, Bulk density, Surface Roughness

1. Introduction

Natural fibres are obtained from renewable sources. This material has got many positive advantages compared to artificial materials. Natural fibres generally have a less environmental impact than synthetic fibres because natural fibres do not use so many chemicals during the production process. In addition to this, burning natural fiber causes less environmental damage compared to artificial fibers [1, 2]. Also, it has low weight and abundant availability of raw materials making it low-cost and user-friendly. Bio composite materials fabricated using natural fibers have very huge applications in recent decades. These bio composites can substitute many of the harmful artificial composites. For our day-to-day applications, we depend upon artificial materials and mainly we depend upon plastic materials. These plastic materials are obtained from artificial compounds and are very harmful when disposing them [3-5]. The only possible way is to minimize the usage of plastics by substituting the place of plastics using the bio composite materials to some extent. By doing so, we can substitute the use of plastic over at least 85% in near future [6]. In this intention, we have planned to substitute the plastics by using natural reinforced bio composites for some of the substitutions of plastics. In our study, we have fabricated the bio composite fiber board materials by using the areca leaf sheath fibers. The main raw materials we have used for the fabrication of bio composite fiber board material are areca leaf sheath fibers [7].

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A comparative analysis of exergy using dual blends of biodiesel in a DI engine

Ramakrishna N. Hegde, Gangadhara Rao, Jagadeesh Bantwal, Praveen Shenoy

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https://doi.org/10.1016/j.matpr.2022.11.040

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Abstract

The scarcity of petroleum fuels and pollution concerns has led to the search for alternate fuels. In this investigation, cottonseed and Simarouba oils are transesterified to produce the corresponding biodiesels. The esterification and transesterification were carried out in the presence of heterogeneous catalyst MgPO4. The various properties of biodiesel are determined in the laboratory. Vateria indica is a species endemic to India that belongs to the Dipterocarpaceae family. The oil of Vateria indica is obtained by an aqueous extraction method. This oil is transesterified to obtain the biodiesel by a two-step process of esterification followed by transesterification. This biodiesel is blended with diesel in 10% and 20% volumetric proportions. The cottonseed and Simarouba biodiesels are blended in equal proportions with diesel and tested for performance and exergy analysis along with Vateria indica blends. It is found from performance and exergy analysis that biodiesel blends performed better than diesel.

Introduction

Decreasing availability coupled with air pollution concerns resulted in newer alternatives for Petroleum products. The increasing demand for the supply of petroleum products leads to the import of crude oil by developing countries; hence humanity has embarked on alternativebut renewable energy fuel sources having higher sustainability. To cater tothe growing energy requirement, many countries import crude oil, which burdensthe economy, leading to inflation. Thus, there is a natural pressure on such countries to ease the import burden and at the same time look for petroleum-based fuel substitutes. Growing Population, energy crisis, shortage of fossil fuels and rising hazardous impact petroleum products on environment necessities some backup fuel which should offersimilar characteristics to conventional fossil fuels. Also performance and emission analysis of biodiesel and petro-diesel shows a general increase of efficiency and better emission characteristics for biodiesel. The drawbacks of neat diesel are led to the search of alternatives. Vegetable oil is currently considered an effectivesubstitute due to its characteristics, pan with

Condition monitoring of gearbox

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Keywords: Fault Diagnosis, Vibration Analysis, Rotating Machinery.

Abstract

Gears are one of the most important elements of rotating machineries and plays a key role in many industrial applications. If there is an unexpected failure in the gearbox it may lead to large economic losses. The fault diagnostic of rotating elements has drawn attention for its role in preventing disastrous accidents and beneficially assuring maintenance. Recently, fault diagnosis has paved its way in the multidisciplinary direction. Vibration analysis has always been a crucial component of preventative maintenance methods. and plays a significant role in assessing the health of the machinery and has supported decisions on machinery maintenance. An early fault identification of the gearbox is feasible by analyzing the vibration signal using various signal processing techniques since the vibration signal of a gearbox contains the signature of the defect in gear. This work aims to address fault diagnosis method based on vibrational analysis on gear box. Here an attempt has been made to use a diagnosis technique that when applied to gearbox highlights faults and these fault detection techniques are based on vibrational analysis approach.

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Make a Submission

Review on Electric Vehicle Technologies

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Keywords: IC engines, electric vehicle, Batteries, lithium-ion, lead-acid

Abstract

Society is more concern by the causes and effect of Internal Combustion (IC) engine emission on the climate and environment. The major reason due to which the automobile sector had to conceive, discover, design, build, and bring the Electric vehicle (EV) technology into existence. Electric vehicle has the potential to address greenhouse emission and also it acts as an emerging tool for reducing air pollution and providing a clean transportation system. Just in few numbers of years the rapid rise in EV technology has been observed with a huge growth and demand of public. Keeping the advantages and disadvantages in mind of EV from environmental point of view has been discussed. The most important factor for EV technology used is the batteries, hence a thorough study of battery technology- from Lithium batteries to lead acid batteries is analysed. The charging method, standards, and optimization techniques is also been discussed with the essential characteristics of EV technology used in vehicle. Further future trends, demand, supply in EV technology is provided.

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Make a Submission

Current Issue

ATOM 1.0

RSS 2.0

RSS 1.0

Information

For Readers

For Authors

Automatic Valve Operation for Bunkering

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Keywords: Bunkering, Risk factors, Automation technology, Building automation system, Marine industry

Abstract

Bunkering means refueling of the ships including the fuel filling and distributing the fuel which is being supplied to the shipboard tank. Bunkering is the most difficult procedure of operation on a ship which may lead to several accident and lead to spill of HFO into the sea. Bunkering on a ship can be of fuel oil, sludge, diesel oil, cargo etc. Bunkering of. fuel oil or diesel oil requires most care and alternate to prevent the different kind and type of accidents and oil spill. Current scenario of bunkering system is done manually. This process takes more man power and requires continuous sounding of the tank at particular time interval. So, it is necessary to find out an alternate solution which gives continuous sounding of the bunker tank automatically all the time. The proposed project aims to overcome above problems. A model is fabricated with two tanks, a submersible pump, solenoid valve, microcontroller which controls the operation of valve for bunkering operation and sensors to sense the level of the tanks such that the valves open and close at preset time. The prototype was tested based on time taken in filling a tank and the response of the sensor with respect to time was identified. It is found that the time taken for bunkering is reduced.

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Sunil Prakash Rodrigues, Prasad, Ranjith, Sampath, & Pradhan Raikar. (2023). Automatic Valve Operation for Bunkering. *JOURNAL OF ADVANCED APPLIED SCIENTIFIC RESEARCH*, *5*(3). Retrieved from http://www.joaasr.com/index.php/joaasr/article/view/635

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Current Issue

ATOM 1.0

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CFD Analysis of a Diesel Generator Exhaust System to Reduce Back Pressure

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Keywords: CFD Analysis, Diesel Generator, ANSYS

Abstract

Engine exhaust back pressure is defined as the pressure of gas in the exhaust system which is generated by the engine to overcome the hydraulic resistance of the exhaust system in order to release the exhaust gases into the outside of the system. A silencer performance is mainly related on the backpressure value. A high backpressure is commonly caused by exhaust pipe diameter too small and sharp bends in the exhaust system. In this study exhaust system of a diesel generator 125 HP is selected for CFD analysis. One dimensional analysis is carried out with specified boundary conditions. Original design is modified with varying pipe diameter, length and position of expansion chamber. The result of the simulation using CFD software is displayed in the form of velocity contour, pressure contour, graphs and velocity streamline. The study has indicated that increasing bends in the system and exhaust pipe diameter will increases exhaust back pressure and also the position of expansion chamber significantly affect backpressure and thus the engine performance.

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Make a Submission

Current Issue

Design and Fabrication of Earth Auger with trolley

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Keywords: Earth auger, Trolley, Safety measures

Abstract

The purpose of this project is to design and fabricate an earth auger to overcome limitations on the existing earth augers. The earth auger is designed by introducing the trolley system. The project will be successful in providing the earth auger which is operator friendly and can be transported from one place to another by the single operator. The simplified mechanisms are implemented in the project including the winches and pulley systems for the feed and movement of the drill bit. The clamping systems are introducing to increase the stability and to decrease the vibrations which keeps the operator to be in a distance during the operations for the purpose of safety. Therefore, this project is made to reduce the fault and to improve the safety measures as well as the usability.

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Make a Submission

Current Issue

ATOM 1.0
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RSS 1.0

Designing of voice-controlled drone using BT-voice control for Arduino

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Keywords: Drone, Bt-Voice Control, Arduino

Abstract

The hand-free drone project aims to create a drone that can be controlled through voice commands, eliminating the need for remote control or gestures. The system uses voice recognition technology to process the commands and act accordingly, using code to control the motors and achieve the desired outcome. This technology can be used in various applications, including military, surveillance, photography, gaming, and more.

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Current Issue

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Information

Optimization of Heat Treatment parameters to facilitate machining of SAE4340 steel without compromise on Mechanical properties

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Keywords: Machinability, inter-critical heat treatment

Abstract

SAE 4340 is a medium carbon low alloy steel used in many automobile and aircraft applications because of its high strength and toughness. But its machinability is very low and hence this poses difficulty in manufacturing the parts needed for such applications. Machinability of this material can be improved by adopting suitable tool material like CBN or ceramics. But these tool materials are costly and usually need high speed machines like CNC which are suitable mainly for mass production. Moreover, these inserts are brittle and chip off fast especially when intermittent cuts are involved especially in the rough machining of castings in large numbers. For this reason, it is proposed to improve machinability by adopting suitable heat treatment to the steel without considering the type of tool material being used. This will change the basic property and microstructure of the steel to facilitate machining. The inter-critical heat treatment process is suggested wherein the material is heated between the upper and lower critical temperatures followed by water quenching and suitable tempering. To begin with, the material was normalized to 850°C in order to carry out specimen preparation. The specimens were then subjected to quenching at two different temperatures of 770 and 790°C in the inter-critical range after which tempering was carried out at 580°C. Tensile strength of around 1100 N/mm^2, impact strength of around 120J and hardness in the range of 35 to 40 HRC were obtained. Machinability tests were carried out on a centre lathe with lathe tool dynamometer set up using a brazed tip tool at low and high speeds giving a depth of cut of 1mm. The cutting forces were in the range of 60 to 70 kg force indicating good machinability. Thus without compromise in mechanical properties, good machinability was attained.

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FORMULATION AND EVALUATION OF EUPATORIUM ODORATUM HERBAL OINTMENT

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ABSTRACT
The enormous surface area and permeability of the skin play a significant influence in the distribution of drugs through it. The medications like ointments, creams are used for the treatment and caring of the skin. The aim present research study is to prepare the wound healing ointment and to evaluate the medicinal property of the Eupatorium odoratum (EO) Ointment. Eupatorium odoratum is rapidly growing natural herb which have the wound healing property is used in this study for the preparation of the herbal ointment. The extract collected form Soxhlet extractor was used for the analysis of phytochemicals. EO ointment is prepared by adding coconut oil and honey wax. The prepared ointment is evaluated by pH, separability and antimicrobial activity. The positive result of Tannins and Saponins supports the wound healing property of the sample and the presence of Diterpenes supports the antimicrobial property of the plant leaves. The ointments had a good appealing appearance with green color and smooth texture, and they were all homogenous with no signs of phase separation. The pH and spreadability were found to be 6.90±0.172 and 109.20±3.17 respectively. Antimicrobial activity of the EO ointment in different assay organisms and the inhibition of EO ointments is compared with the standard positive control. The result showed that EO ointments has the good antimicrobial properties. This study shows that EO has high potential as antimicrobial agent when formulated as wound healing ointment.

KEYWORDS: Ointment, Eupatorium odoratum, Phytochemical analysis, antimicrobial activity, wound healing.

INTRODUCTION
The delivery of drug through the skin plays major role because of the large surface area and permeability conditions.[1] Ointments are viscous, unctuous, semisolid preparations containing either dissolved or suspended functional ingredients.[2] Majority of ointments consist of a base, which mainly acts as a carrier or vehicle for the medicaments. Waxes such as white wax, carnauba wax, beeswax, and Candelilla wax are the natural waxes commonly used in cosmetic and pharmaceutical products.[3] Herbal ointments are natural without any adverse effect to the skin.[4] Eupatorium odoratum (EO) is a fast-growing herb. It is a multi-stemmed shrub about 2.5 m tall.[5] In Sanskrit it is Ropani, Seekhrasarpi, in English called as Eupatorium, Eupatorium odoratum, natural floss herb and Bug, Dhoka, Tivra Gandha in Hindi.[6] Stems reach 2 cm in diameter. The plant is maintained by a system of numerous thin yellowish lateral roots. Several shoots develop from the leading of the root and the lower stem. Individual branches are long, with relatively few branches. When the leaves are crushed, they give off a sweet scent.[7]

It belongs to the following families: Asterale, genus: Cro morena, Kingdom: Plantae, scientific name: Eupatorium odoratum/Chromolaena odorata.[8] The aim present research study is to prepare the wound healing Ointment and evaluate the medicinal property of the Eupatorium odoratum Ointments.

MATERIALS AND METHODS
Materials
Eupatorium odoratum leaves, Honey wax and coconut oil obtained from local area.

Methods
Soxhlet Extraction
The thimble is filled with the sample. Typically, a thick filter paper thimble produced from a solid material containing some of the target component is fed into the Soxhlet extractor's main chamber. The extraction solvent methyl alcohol is taken into a distillation flask and the Soxhlet extractor is now placed onto this flask. The Soxhlet extractor is then equipped with a condenser. The solvent is reflux-heated. The solvent vapour travels up through a distillation arm, and floods into the chamber

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Assessing financial sustainability as a key indicator for business transformation of microfinance institutions: A study in India

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Access to financing is acknowledged to play a notable role in the development of economy by efficiently allocating resources from excess units to units in need. If microfinance institutions (MFIs) can maintain good financial performance, the positive effects they have on the financial wellbeing of those in need will continue. To promote sustainable global development, sustainable financial practices are essential. Previous studies have been motivated by the economic crisis to highlight the necessity of assessing and managing financial sustainability in business. India is the top borrower in South Asia, and hence, this study is significant for the MFIs in India. This study's goal is to look into the pattern of Indian MFIs' financial (1) success from 2014 to 2017. The result shows that women are consistently being the highest borrowers.

Keywords: financial performance, financial sustainability, India, sustainable financial practices

1. Introduction

According to Singh and Gashayie (2) microfinance institutions (MFIs) that are owned and run by their members, such as rural cooperatives for savings and loans, sustainability refers to their capacity to continue to provide financial services while maximizing member economic benefits. The main goal of these institutions is to sustainably increase the socioeconomic wellbeing of all members while using domestically generated revenue to pay for operating expenses. The significance of deposit mobilizations for establishing financial sustainability has been underlined by several authors (3). The ability of a company to generate more alternative revenue streams to sustainably provide standard services to its clients is referred to as financial sustainability, assessed using metrics like profitability, liquidity, solvency, efficiency, and effectiveness (4). Economic development and growth are greatly influenced by financial access. The main aim of microfinance units is to disseminate the resources from where it is surplus to where it is in need. Financial sustainability is the MFI's ability to meet the current as well as other costs associated with the future development activities. It is advisable to keep in mind that an organization's overall sustainability includes a variety of organizational and human capacities in addition to its financial sustainability, which is important but only one part of sustainability overall (5). About one-sixth of all people on the planet live in India. The lack of bank accounts and a formal credit for 87% of the poor have been predicted, and these MFIs have a greater role to play in financing the villagers. The banks are concerned about the borrower's capacity to pay off the loans, their erratic revenue sources, and their inability to offer collateral services (6).

2. Methodology

In order to evaluate the financial viability of MFIs in India, this study was done using the secondary sources that used a number of ratios, including the proportion of female borrowers to the total number of active borrowers, the total equity to the total asset's ratio, the proportion of deposits

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CHATBOT FOR COLLEGE CAMPUS

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Abstract: A chatbot using Python programming language for a college campus to improve communication and accessibility among students, parents, faculty, and staff. The chatbot will be trained on a dataset of frequently asked questions and information about the campus using NLP techniques. It will be deployed on the college campus's website or social media platforms using Python web frameworks. The chatbot's effectiveness will be evaluated through user feedback, and the data collected will be used to enhance its capabilities. The chatbot will provide a personalized and convenient way for students to access information, and it will reduce the workload of administrative staff.

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Index Terms **– NLP, Dataset, Deployment, Model training, Pre-processing**

I. INTRODUCTION.

In recent years, the use of chatbots in various industries has increased exponentially. With advancements in artificial intelligence and natural language processing, chatbots have become essential for businesses to enhance customer service and engagement. Chatbots have proven to be beneficial in the education sector, especially in handling student enquiries. This paper presents the development of a multilingual college inquiry chatbot using Python and Flask. The chatbot is designed to answer student enquiries related to admission, courses, fees, and other relevant information. With the integration of natural language processing techniques, the chatbot can understand and respond to queries in multiple languages. The primary objective of this chatbot is to provide an efficient and personalized experience to students while reducing the workload of college staff. The chatbot can provide 24/7 assistance to students, thereby enhancing their experience and satisfaction. The development of the chatbot involved various stages, including data collection, preprocessing, model training, and deployment. The chatbot was trained using a combination of machine learning and deep learning techniques to improve its accuracy and effectiveness. The chatbot was also designed to be scalable, allowing for the addition of new features and languages as required. The chatbot was deployed using Flask, a popular web framework for Python. The paper presents the architecture and implementation of the chatbot, including the algorithms used for natural language processing, the training process, and the deployment process. The evaluation of the chatbot's performance was carried out using various metrics such as accuracy, response time, and user satisfaction.

II. LITERATURE SURVEY

One study that investigated the application of chatbots in the field of higher education was conducted by Al-Qaysi et al. in 2021. The researchers developed an Arabic-language chatbot specifically designed to assist students with academic advising. They employed Python, a popular programming language, and TensorFlow, a widely used machine learning framework, to create the chatbot. The study aimed to evaluate the effectiveness of the chatbot in improving students' academic experiences. During the evaluation phase, students interacted with the chatbot and provided feedback on their experiences. The results indicated high levels of satisfaction among the students who utilized the chatbot for academic advising. The chatbot was praised for its ability to provide quick and accurate information, address a wide range of student queries, and offer personalized guidance based on individual needs. The students appreciated the convenience of accessing academic advice at any time, without the need for face-to-face meetings or lengthy email exchanges. Furthermore, the chatbot was found to enhance the efficiency of academic advising services. It significantly reduced the workload on human advisors by handling routine inquiries, allowing them to focus on more complex issues and providing personalized support. The study concluded that integrating chatbots into academic advising processes could improve service quality, increase accessibility, and streamline administrative tasks in higher education institutions. Another noteworthy study in the field of higher education chatbots was conducted by Sharma and Kaur in 2021. Their research focused on the development of a chatbot for a university in India. The primary objective was to create a virtual assistant that could provide

students with information about courses, faculty members, and campus events. Using Python as the primary programming language, the researchers developed the chatbot and seamlessly integrated it into the university's website. Students could access the chatbot interface and interact with it to obtain relevant information. The study evaluated user satisfaction and the impact on university staff workload. The findings of the study indicated that the chatbot was well-received by students, who reported high levels of satisfaction with its performance. The chatbot successfully provided accurate and timely information about courses, faculty details, and campus events. Students found it particularly useful for retrieving up-to-date information, such as changes in course schedules or last-minute event