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Selection of coating material for AISI 304 L SS using fuzzy AHP-PROMETHEE II for erosion corrosion applications

Resmi V. Prasad and R. Rajesh.

Published Online: August 17, 2023 · pp 225-245 · https://doi.org/10.1504/IJENM.2023.132964

ABOUT

Abstract

Fluid handling equipment such as propellers, impellers, pumps, and pumps in warships and submarines all suffer from flow-based erosion-corrosion concerns. While numerous coating materials are available to counteract erosion corrosion damage in the aforesaid components, iron-based amorphous coatings are thought to be more effective. This paper concentrates on the selection of the coating material for AISI 304L SS. In this investigation, WC-10Co-4Cr coating was deposited on stainless steel substrate using MCDM techniques to select the best alternative. Fuzzy analytic hierarchy process (FAHP) is the technique applied to calculate the weights of criteria, and preference ranking organisation method for enrichment evaluation (PROMETHEE II) is utilised for ranking the alternatives.

Keywords

corrosion, fuzzy analytic hierarchy process, analytic hierarchy process, AHP, MCDM, PROMETHEE, erosion, criteria weight, AISI 304L SS, corrosion, coating material, alternatives

< Previous Article Next Article >

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A structural equation modelling approach for analysing enablers-based knowledge management practice in manufacturing industry

D. Gopi, A. Pal Pandi and R. Rajesh

Published Online: October 30, 2023 · pp 370-393 · https://doi.org/10.1504/IJENM.2023.134596

Abstract

In today's global economical slow down, the enhancement of organisational performance plays a vital role. This paper discusses the knowledge management practice (KMP) which is an important mechanism in the present-day scenario to enhance the organisational performance. The prime objective of this paper has been coined in the above line of thought and examines the importance of the KM enablers in the implementation of KMP model in manufacturing industry through the perspective of executives. In this regard, data were collected from 200 executives from 24 different types of manufacturing industries in Tamil Nadu, India through structured, validated and standardised questionnaire. The results from one way ANOVA and Pearson product moment correlation technique clearly showed the significant role of KM enablers in the knowledge management practice. Further, the data fit of this study also has been confirmed through structural equation modelling approach.

Keywords

knowledge management practice, KMP, enablers, organisational performance, structural equation modelling, SEM

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Development of coating material for low carbon steels using MCDM

Resmi V. Prasad and R. Rajesh

Published Online: October 30, 2023 · pp 299-315 · https://doi.org/10.1504/IJENM.2023.134576

Abstract

Fluid handling equipment like propellers, impellers, pumps, and pumps in warships and submarines are all vulnerable to flow-based erosion and corrosion. While numerous coating materials are available to counteract erosion corrosion damage in the aforesaid components, iron-based amorphous coatings are thought to be more effective. This paper concentrates on the selection of the coating material for AISI 304L SS. In this investigation, WC-10Co-4Cr coating was selected on stainless steel substrate using MCDM techniques. Fuzzy analytic hierarchy process (FAHP) is the technique applied to calculate the weights of criteria and combinative distance-based assessment method (CODAS) is utilised for ranking the alternatives.

Keywords

erosion-corrosion, fuzzy analytic hierarchy process, FAHP, MCDM, CODAS, weight, AISI 304L SS, coating material, substrate

Next Article >

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NO ACCESS

Multi-objective optimisation of wear process parameters of 413/fly ash composites using grey relational analysis

J. Udaya Prakash, S. Jebarose Juliyana, R. Rajesh and A. Divya Sadhana

Published Online: October 30, 2023 · pp 334-347 · https://doi.org/10.1504/IJENM.2023.134578

ABOUT

Abstract

Composite materials are made by combining the qualities of two or more distinct materials of comparable attributes. Metal matrix composites have emerged as remarkable materials due to their superior characteristics when compared to other matrix composites. The most promising lightweight materials are composed of aluminium alloys, which are utilised in the marine, aerospace, and automotive industries, but their use is limited due to their average strength and moderate wear resistance. In terms of wear resistance, AMCs beat their monolithic counterparts that are unreinforced. Stir casting was used to produce aluminium matrix composites made of 413 aluminium alloys with particulate fly ash reinforcements weighing 3%, 6%, and 9%. Wear tests were conducted in pin-on-disc wear tester following ASTM Standard G99-05 guidelines. The goal is to explore the effects of sliding speed, load, sliding distance, and reinforcing weight percentage on coefficient of friction and specific wear rate using ANOVA and grey relational analysis. Sliding distance (18.48%), load (17.39%) are the parameters which have extreme significance on composites' GRG followed by sliding speed (10.33%) and reinforcement (4.35%). By using grey relational analysis, wear behaviour can be predicted successfully.

Keywords

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S. KAILAINATHAN[1], M. EZHILAN[1], S.V. ALAGARSAMY[2*], C. CHANAKYAN[3]

INVESTIGATIONS ON TRIBOLOGICAL BEHAVIOUR OF TITANIUM DIOXIDE PARTICLES FILLED Al-0.6Fe-0.5Si ALLOY COMPOSITE USING TOPSIS APPROACH

Aluminium metal matrix composites (AMMCs) playing a prominent part in the aerospace and automotive sectors owing to their superior mechanical and tribological properties. Hence, the aim of this work is to investigate the effect of titanium dioxide (10 wt % TiO_2) particles addition on hardness and tribological behaviour of Al-0.6Fe-0.5Si alloy (AA8011) composite manufactured by stir casting method. The surface morphology of developed composite clearly shows the inclusion of TiO_2 particles evenly distributed within the matrix alloy. Hardness of the composite was measured using Vickers micro hardness tester and the maximum hardness was obtained at 95.6 Hv. A pin-on-disc tribometer was used to carried the wear test under dry sliding conditions. The influence of wear control parameters such as applied load (L), sliding speed (S) and sliding distance (D) were taken as the input parameters and the output responses considered as the specific wear rate (SWR) and co-efficient of friction (COF). The experimental results were analyzed using Technique for Order Preference by Similarity to Ideal Preferred Solution (TOPSIS). Based on the TOPSIS approach, the less SWR and COF achieved at the optimal parametric combination were found to be L = 30 N, S = 1 m/s and D = 2000 m. ANOVA results revealed that applied load (76.01%) has the primary significant factor on SWR and COF, followed by sliding speed (20.71%) and sliding distance (3.12%) respectively. Worn surface morphology was studied using SEM image of confirmation experiment specimen to understand the wear mechanism.

Keywords: Al-Fe-Si alloy; TiO_2; Stir casting; Hardness; Tribological behaviour and TOPSIS

1. Introduction

Aluminium alloys and its matrix composites are focused with superior concern to produce light weight structures and advanced load bearing capacity which is higher strength when compared to the base metals. Generally, the blending of one or more classified materials is conventional to compile the composites with proper reinforcement and parent material [1]. In this composite, reinforcement phase and continuous phases are categorized. Next to classify the other various types like metal matrix composites, ceramic matrix and polymer matrix [2]. Aluminium matrix composites (AMCs) are widely utilized in aerospace, automotive, ship building and aircraft sectors [3]. Particularly, the AMCs have high potential strength, superior mechanical and tribological performances, produce greater stability machineries with combination of low weight and high strength ratio [4]. Similarly, AMCs also achieves the better alternate and greater life in manufacturing of brake drum, cylinder blocks, pistons, brake lining and clutches in automotive sectors. The composed AMCs enhancing the mechanical characterization with prominent ductility due to mechanical deformation are highly influenced [5]. From the last two decades, the firms fully concentrated on the high strength, resist wearing, resisting to corrosion and greater thermal stability materials are employed to generate the machinability parts [6]. Based on above the summarized statements, therefore this research selected AA8011 (Al-0.6Fe-0.5Si) as a base material. Usually, AA8011 possess major constituents of Fe-Si, these intermetallic elements which led to enhance the age hardening attributes. There is a reason for choosing AA8011 is microstructure refinement will be developed homogeneously with the influence of significant mechanical attributes and also the cost is less. Based on the desired applications, the reinforcements were utilized with different choices to base matrix of aluminium [7]. The reinforcement volume fractions and the essential properties of aluminium is a major significant role to fabricate the AMCs with superior mechanical characteristics. It is revealed that the interface bonding between the aluminium matrix and reinforcement is a vital

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Abstract

Wire electrical discharge machining (WEDM) is an cutting edge non-traditional techniques for producing complicated 3D forms in rigid materials with greater dimensional accuracy. The aim of the investigation was, to predict the WEDM characteristics of ZrO_2 ceramic addition of Al7050 alloy composite by employing Taguchi coupled Technique for order preference by similarity to ideal solution (TOPSIS) approach. The work material was manufactured by stir casting process utilizing 12 wt.% of ZrO_2 particulates in Al7050 alloy matrix. The experimental work was carried out as per the L_9 (3^3) orthogonal array design by taking input parameters like pulse current (I_p), pulse on-time (T_{on}) and pulse off-time (T_{off}), respectively. The impact of the WEDM parameters on the material removal rate (MRR) and surface roughness (SR) were determined by analysis of variance (ANOVA). Based on the TOPSIS approach, the higher MRR (0.32251 g/min) with lesser SR (3.982 µm) were achieved at the 'I_p' of 25 amps, 'T_{on}' of 115 µs and 'T_{off}' of 60 µs. ANOVA results explored that the 'T_{on}' was identified as the primary impact factor on MRR and SR, subsequently by 'I_p' and 'T_{off}' with contribution of 44.23%, 36.53%, and 12.16%, respectively. Moreover, the surface topography of the machined composite surface was analyzed through scanning electron microscopy (SEM). It was clearly revealed the formation of surface defects such as craters, micropores, cracks and also the appearance of a recast layer on the machined surface.

Revista de Metalurgia

Investigations on microstructure, hardness and tribological behaviour of AA7075-Al2O3 composites synthesized via stir casting route

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Keywords: AA7075, Al2O3, Composites, Hardness, Stir casting, TOPSIS approach, Tribological behaviour

ABSTRACT

Aluminium matrix composite (AMC) materials play an important role in the field of automobile and aerospace industries due to their excellent properties. In this research, aluminium alloy (AA7075) was reinforced with alumina (Al_2O_3) particles to improve their hardness and tribological behaviour of the base alloy. Four composites were prepared by varying the content (4, 8 and 12 wt.%) of Al_2O_3 particles through the stir casting technique. The surface morphology of the proposed composites ensured the uniform distribution of Al_2O_3 particles into the matrix alloy. The hardness of the composite was measured using a Brinell hardness

Heat treatment Effect of Mg-5Sn-3Zn-1Mn Alloy with different Silicon addition

Research Published: 10 May 2024

Volume 16, pages 4451–4460, (2024) Cite this article

Silicon

Aims and scope

Submit manuscript

R. Rethan Raj, S. Anish, K. K. Ajith Kumar & G. Sundararaju

Abstract

The Mg-5Sn-3Zn-1Mn alloy with varying silicon addition samples were casted as per the calculated weight percentage. The present work is to study and understand the solution heat treatment and ageing of Mg-5Sn-3Zn-1Mn-xSi alloys. The heat treatment procedure was framed for the duration of 18 h and 480°C as per the trial and error method. After the solution heat treatment, ageing was done at 450°C and 6 h for all the prepeared samples. The characterization tests were conducted on the samples to analyse the metallurgical changes and their results were discussed. The intermetallic formed was identified by using SEM–EDS. The modification of Mg_2Si intermetallic and refinement was observed for both the eutectic and primary phases. Similarly the hardness and tensile tests were conducted to

Dr. R. RA... PR...

Corrosion Behaviour of Cryogenic-Treated Dissimilar FSW Al Alloys

Original Article Published: 19 August 2023

Volume 77, pages 145–155, (2024) Cite this article

K. Nandakumar, K. Lenin & K. K. Ajith Kumar

Abstract

The current investigation explores the corrosion resistance of deep cryogenic-treated (DCT) dissimilar friction stir-welded (FSW) AA6066T6 - AA1060T6 aluminium alloys. The microstructures of the welded zone of FSW and DCT-FSW alloys revealed the presence of fine, dense intermetallic phases in the DCT-FSW alloy. The Rockwell hardness of the DCT-FSW alloy was higher. The corrosion resistance of this alloy was tested by immersion in a 0.6 M NaCl solution for 24, 48 and 72 hrs. The potentiodynamic polarization method measured the corrosion resistance, which indicated the highest positive corrosion potential and the lowest corrosion current density in the DCT-FSW alloy. Moreover, the surface

Mechanical, wear, and flammability properties of silanized cow dung biosilica-dispersed corn husk Fiber-reinforced epoxy composites

Original Article Published: 23 November 2023

(2023) Cite this article

Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

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Abstract

This study explores the novel ap
reinforcement agent in corn hus
dung was processed to obtain nanosilica particles, which were then silanized to enhance their compatibility with epoxy resin. Corn husk fibers were incorporated into the epoxy matrix with varying concentrations of silanized cow dung nanosilica. The resulting composites were subjected to various tests to evaluate their mechanical properties, wear resistance, and flammability behavior. The mechanical testing revealed a significant enhancement in the tensile strength, flexural strength, and compression strength and

Modelling and Characterization of Basalt/Vinyl Ester/SiC Micro- and Nano-hybrid Biocomposites Properties Using Novel ANN–GA Approach

Research Article Published: 27 February 2024

Volume 21, pages 938–952, (2024) Cite this article

Journal of Bionic Engineering

Aims and scope

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Yesudhasan Thooyavan, Lakshmi Annamali Kuma Raj, Joseph Selvi Binoj, Bright Brailson Mansingh,

Antony Sagai Francis Britto

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Abstract

Basalt fiber reinforcement in polymer matrix composites is becoming more and more popular because of its environmental friendliness and mechanical qualities that are comparable to those of synthetic fibers. Basalt fiber strengthened vinyl ester matrix polymeric composite with filler addition of nano- and micro-sized silicon carbide (SiC) element spanning from 2 weight percent to 10 weight percent was studied for its mechanical and wear properties. The application of Artificial Neural Network (ANN) to correlate the filler addition composition for optimum mechanical properties required

back

INVESTIGATION ON ENHANCED CONCRETE PERFORMANCE THROUGH THE INCORPORATION OF NANOMATERIALS AND NATURAL FIBERS

R. MAGUTEESWARAN, LAKSHMI KESHAV, A. SAGAI FRANCIS BRITTO, and D. DHAVASHANKARAN

https://doi.org/10.1142/S0218625X24500884 | **Cited by:** 0 **(Source: Crossref)**

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Abstract

This study delves into the realm of M70, high-performance concrete (HPC) with a focus on enhancing its mechanical and sustainable properties through the incorporation of nanomaterials, specifically nanosilica, and organic composites derived from abaca fibers. HPC is pivotal in contemporary construction for its superior durability, strength, and resistance to environmental factors. The integration of nanosilica aims to refine the microstructure of the concrete at the nanoscale, enhancing its strength and durability. Simultaneously, the introduction of organic composites from abaca fibers seeks to impart eco-friendly characteristics to the concrete mix, addressing sustainability concerns. The research methodology involves systematically varying the proportions of nanosilica (0%, 0.5%, 1.0%, 1.5%) as a partial replacement for cement in the concrete and additionally, abaca fibers (0%, 0.25% and 0.5%) were used to enrich the durability. Mechanical testing will be conducted to assess the impact of these additives on the concrete's structural performance, while durability testing will focus on resistance to environmental factors such as moisture and chemical exposure. The outcomes of this study enriching the concrete performance and optimization of high-performance concrete (1% of nanosilica and 0.25% of abaca fiber) is the superior quality compared to all other mixes.

Keywords: Nanosilica • abaca fiber • mechanical • durability properties

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Research Article

Smart Deep Learning Model to Recognize PCM Optimization Performance on Solar Cooling System

K. Mahesh Prasanna ✉, Sheeja V. Francis, Varuna Kumara, A. Sagai Francis Britto, G. Nageswara Rao, Tabassum Ara, ...show all

Received 17 Jun 2023, Accepted 31 Oct 2023, Published online: 24 Nov 2023

Cite this article https://doi.org/10.1080/15325008.2023.2281630 Check for updates

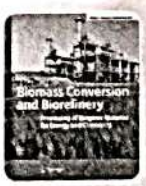
Abstract

Phase Change Materials (PCMs) offer a significant advantage by reducing the need for multiple cooling systems, potentially revolutionizing thermal comfort in buildings and optimizing thermal energy storage. The intriguing prospect of integrating PCMs into active heating and cooling systems has garnered considerable attention. Furthermore, the compatibility of PCMs with photovoltaic (PV) systems and various renewable energy sources enhances the system's efficiency. This study explores the promising application

Extraction and characterization of *Dypsis lutescens* peduncle fiber: agro-waste to probable reinforcement in biocomposites—a sustainable approach

Original Article Published: 02 October 2023

(2023) Cite this article



Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

Antony Sagai Francis Britto, Narayanan Rajesh Prabha, Bright Brailson Mansingh, Rajayyan David, Amirthaiah Amala Mithin Minther Singh & Joseph Selvi Binoj

Abstract

To include sustainability into their products, composite industries use natural resources as raw materials. This study explores the isolation and characterization of novel *Dypsis lutescens* peduncle fiber (DLPF) extracted from the peduncle of *Dypsis lutescens* an agro-waste. The thermo-mechanical and chemical characteristics of DLPF were comparable to other eco-

Machining and mechanical characterization of friction stir processed (FSP) surface hybrid composites (AA8014 + TiB2 + ZrO_2)

ORIGINAL ARTICLE Published: 26 August 2023

(2023) Cite this article

The International Journal of Advanced Manufacturing Technology

Aims and scope

Submit manuscript

Sathish Thanikodi, Antony Sagai Francis Britto, Vinjamuri Sree Naga Chidambara Dattu, Sami Al Obaid, Saleh Alfarraj & Md Abul Kalam

Abstract

In modern trends, the study on properties of hybrid composites with alloy matrix is complicated. The strength of the weld joint is depending on the strength of the weldment with the parent material. This study proposed to conduct an experimental study to maximize the strength of the hybrid composite, that is, the aluminum alloy AA8014 reinforcement

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Articles

Experimental investigations on mechanical and tribological behavior of AA7075 reinforced with ceramic particles

B. Thamaraikannan[a,*], A. Sagai Francis Britto[b], S. Senthilraja[c] and R. Rajkumar[d]

[a]KPR Institute of Engineering and Technology, Arasur, Coimbatore, Tamil Nadu, India
[b]Rohini College of Engineering & Technology, Palkulam, Tamil Nadu, India
[c]SRM Institute of Science and Technology, Kattankulathur, Trichy, Tamil Nadu, India
[d]Kongu Engineering College, Erode, Tamil Nadu, India

Abstract

Fly ash coal combustion dust from thermal power plants is one of the world's largest non-hazardous solid wastes. Effective utilization of fly ash as a secondary reinforcement in metal matrix composites significantly enhances properties and is highly appreciable for waste management systems. Present experimental scrutiny primarily spotlights on the mechanical, morphology, and wear behaviour of AA7075/Fly ash composites. The stir casting technique with regular feeding method was utilized for the fabrication of 4 wt.%, 8 wt.%, 12 wt.%, 16 wt.%, and 20 wt.% fly ash reinforced AMFAR (Aluminum matrix fly ash reinforced composites). Tensile, hardness, and low velocity impact behaviour of the samples, along with the sliding wear and morphology analysis, were carried out to study the material behaviour under different operational conditions. The results show that fly ash as a secondary reinforcement improves the mechanical performance of the samples significantly. At the same time, 20 wt.% fly ash content exhibits better mechanical, wear performance and reasonable particle distribution. The proposed hybrid composites are preferred for high-strength automobile applications as well as their industrial machine counterparts

Keywords: AA7075, Stir casting, Hardness, Sliding wear, Wear rate

This Article

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Extensive characterization of novel cellulosic biofiber from leaf sheath of *Licuala grandis* for biocomposite applications

Original Article Published: 11 July 2023

(2023) Cite this article

Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

Antony Sagai Francis Britto, Joseph Selvi Binoj, Bright Brailson Mansingh & Paulvin Navin Jass

Abstract

Composite industries focus on utilization of natural resources to imbibe sustainability in their products. This investigation details the segregation and characterization of *Licuala grandis* leaf sheath fibers (LGLSFs) extracted from leaf sheath of *Licuala grandis* tree an agro-waste for utilization as raw material in composite industries. The characteristics of LGLSF were compared with other competitive natural fibers to ensure its suitability for

Characterization of novel cellulosic plant fiber reinforced polymeric composite from *Ficus benjamina* L. stem for lightweight applications

Original Article Published: 02 June 2023

Volume 13, pages 14267–14280, (2023) Cite this article

Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

M. Sergius Joe ✉, D. Prince Sahaya Sudherson, Indran Suyambulingam, Suchart Siengchin & Guruswamy Rajeshkumar

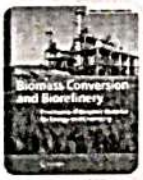
Abstract

The development of innovative reinforcement and the expansion of their potential applications will be aided by research on unique natural fibers in polymer-based composites. In this work, new cellulosic fibers were mechanically separated from the stem of *Ficus benjamina L.* and reinforced in polyester matrix. The effect of varying fiber parameters (weight percentage and length) on the tensile, flexural, hardness, impact, water absorption,

Extraction and characterization of novel biomass–based cellulosic plant fiber from *Ficus benjamina* L. stem for a potential polymeric composite reinforcement

Original Article Published: 13 January 2023

Volume 13, pages 14225–14239, (2023) Cite this article



Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

M. Sergius Joe ✉, D. Prince Sahaya Sudherson, Indran Suyambulingam & Suchart Siengchin

Abstract

This study aimed to bring a new lignocellulosic raw fiber material source to the green composite and textile industries. Lignocellulosic fibers were taken out from the stem of *Ficus benjamina* L. (FBSF) and physical, chemical, and mechanical testing was carried out to determine the fiber suitability in various industries. Fourier-transformed infrared and X-ray diffraction analyses were conducted to determine FBSF's chemical bonding and crystalline

T. Albert
D. Prince Sahaya Sudherson
K. Kalaiselvan
N. Leema

Abstract

ABSTRACT. In this work, the Copper composites Cu-x wt. % B_4C (x = 0, 5, 10, 15, 20) were fabricated for the metallurgical and mechanical property evaluation as per ASTM standards. The metallurgical characterization tests on the samples include x-ray diffraction, optical microscopy, and scanning electron microscopy with EDX. Further, pin-on-disc apparatus was used to investigate the tribological behavior of composite specimens. An SEM micrograph of the worn surface and wear debris, along with the Gwyddion software, has been used to discuss the wear mechanisms in detail. The Artificial Neural Networks (ANN) classifier model is also constructed to describe the wear behavior in more detail. The experimental results inferred that the addition of Boron carbide particles has enhanced the Copper's corrosion resistance in a 1 M HCl electrolyte solution from 30.34% to 74.2%, 75.08%, and 83.29% with B and C ions. Also, it significantly enhance the mechanical and tribological characteristics considerably.

KEY WORDS: Powder metallurgy, Cu-B_4C, Gwyddion, Wear, Artificial Neural Network

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Characterization of novel cellulosic plant fiber reinforced polymeric composite from *Ficus benjamina* L. stem for lightweight applications

Original Article Published: 02 June 2023

Volume 13, pages 14267–14280, (2023) Cite this article

Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

M. Sergius Joe, D. Prince Sahaya Sudherson, Indran Suyambulingam, Suchart Siengchin & Guruswamy Rajeshkumar

Abstract

The development of innovative reinforcement and the expansion of their potential applications will be aided by research on unique natural fibers in polymer-based composites. In this work, new cellulosic fibers were mechanically separated from the stem of *Ficus benjamina L.* and reinforced in polyester matrix. The effect of varying fiber parameters (weight percentage and length) on the tensile, flexural, hardness, impact, water absorption,

Extraction and characterization of novel biomass–based cellulosic plant fiber from *Ficus benjamina* L. stem for a potential polymeric composite reinforcement

Original Article Published: 13 January 2023

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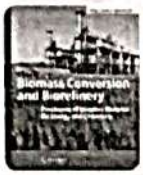

M. Sergius Joe, D. Prince Sahaya Sudherson, Indran Suyambulingam & Suchart Siengchin

Abstract

This study aimed to bring a new lignocellulosic raw fiber material source to the green composite and textile industries. Lignocellulosic fibers were taken out from the stem of *Ficus benjamina* L. (FBSF) and physical, chemical, and mechanical testing was carried out to determine the fiber suitability in various industries. Fourier-transformed infrared and X-ray diffraction analyses were conducted to determine FBSF's chemical bonding and crystalline

Isolation of Microcrystalline Cellulose from *Valoniopsis pachynema* Green Macroalgae: Physicochemical, Thermal, Morphological, and Mechanical Characterization for Biofilm Applications

Original Paper Published: 21 July 2023

Volume 15, pages 1247–1266, (2024) Cite this article

Waste and Biomass Valorization

Aims and scope

Submit manuscript

Narayana Perumal Sunesh, Indran Suyambulingam, Divya Divakaran & Suchart Siengchin

Abstract

Finding new cellulosic materials is an absolute necessity at this time since it is the way to guarantee the manufacture of quality improved materials that can be used in the bio basedfilms for food packaging applications. This study is carried out with the intention of extracting micro-sized cellulose filler that was derived from *Valoniopsis pachynema* algae

Extraction and Physico-Mechanical and Thermal Characterization of a Novel Green Bio-Plasticizer from *Pedalium murex* Plant Biomass for Biofilm Application

Original Paper Published: 10 May 2023

Volume 31, pages 4353–4368, (2023) Cite this article

Sunesh Narayana Perumal, Indran Suyambulingam ✉, Divya Divakaran & Suchart Siengchin

Abstract

Plasticizers are additives used to ensure flexibility to polymer blends and thereby to increase their processability. As the typical plastic component phthalates and other fossil-based components contribute environmental issues since such compounds are not biodegradable. To overcome these problems, researchers began to focus on biodegradable thermoplastics

RESEARCH ARTICLE | MARCH 05 2024

An S-SMILE model for achieving performance in manufacturing industry

A. Saravana Kumar ✉; R. Venkatesh Babu; K. P. Paranitharan; K. Sathish Kumar

+ Author & Article Information
AIP Conf. Proc. 2935, 020015 (2024)
https://doi.org/10.1063/5.0198916

Small and medium-sized enterprises (SMEs) deploying lean practices was lagging in the manufacturing sector. The purpose of this study is to develop an effective LM implementation model for SMEs, which serves as a practical approach for evaluating the manufacturing performance. In this regard, the authors developed a model called „System for Small and Medium Implementing Lean" (S-SMILE). Based on literature reviews and expert opinion, it consists of twelve key critical success factors (CSFs) that are derived from lean conceptual input. Based on the mean score, intended from the views of managers and stakeholders, the study revealed that leadership and management commitment play a critical role in the accomplishment of lean implementation in SMEs. The remaining eleven CSFs should be given priority to improve performance in manufacturing operations. This comprehensive model may meet the needs of managers and stakeholders in conditions of achieving cost of manufacturing, stock turnover, productivity, customer satisfaction, and timely delivery.

Topics
Industry, Review

REFERENCES

1. Singh, R.K., Garg, S.K. and Deshmukh, S.G., "Strategy development by SMEs for competitiveness: a review

RESEARCH ARTICLE | MARCH 05 2024

Fifty criteria based integrated quality healthcare system readiness assessment model in organization using scoring approach

K. Sathish Kumar ✉; R. Venkatesh Babu; K. P. Paranitharan; A. Saravana Kumar

+ Author & Article Information

AIP Conf. Proc. 2935, 020017 (2024)

https://doi.org/10.1063/5.0198918

The objective of this study the way to develop 50 criteria evaluation model and explore the practical feasibility in Indian healthcare scenario. Lean six sigma principle enable the healthcare organization to achieve the healthcare performance. In this study, 50 criteria lean six sigma healthcare model was developed. This model was tested in Indian healthcare case organization. This study indicates that the organization gap across lean criteria were identified using scoring approach. The improvement of suggested actions was implemented in the case organization based on the criteria in healthcare. These criteria were well supported with research findings of literature. This model was investigated in single healthcare organization. Further it is extended to move studies to be conducted.

Topics

Health care

REFERENCES

1. De Koning H., and Verver J.P., et al, *"Lean Six Sigma in healthcare"*. 2006; pp. 4–11.
Google Scholar

2. Vaishnavi, V., and Suresh, M. "Assessment of healthcare organizational readiness for change: A fuzzy logic approach".

RESEARCH ARTICLE | MARCH 05 2024

Lean implementation in healthcare: A systematic review

K. Sathish Kumar ✉; R. Venkatesh Babu; K. P. Paranitharan; A. Saravana Kumar

+ Author & Article Information
AIP Conf. Proc. 2935, 020011 (2024)
https://doi.org/10.1063/5.0198917

Service organizations are implementing lean more rapidly than manufacturing organizations, and healthcare organizations are embracing continuous improvement practices. However, relatively few research studies have been carry out on lean six sigma in the healthcare sector as far as motivating factors, challenges, critical success factors, and benefits are concerned. Taking advantage of this opportunity to present the key success factors, motivating factors, limitations, and benefits of implementing lean six sigma in healthcare, along with future research gaps. The author collected the secondary data from the literature from the period from 2011 to 2022 to understand the trend of the research. A total of 118 research papers were identified across the 78 referred journals recognized by the Association of Business School ranking (2021). In the healthcare sector, this SLR technique helps identify current trends, gaps, and future opportunities for lean six sigma research. This study provides directions for healthcare manager to embark the lean six sigma journey aligned with strategic objective, when rightly adapting in healthcare sector.

Topics

Schools, Health care, Review, Journal

RESEARCH ARTICLE | MARCH 05 2024

Lean implementation in manufacturing SMEs: A systematic review

A. Saravana Kumar ✉; R. Venkatesh Babu; K. P. Paranitharan; K. Sathish Kumar

+ Author & Article Information
AIP Conf. Proc. 2935, 020010 (2024)
https://doi.org/10.1063/5.0198915

Manufacturing sector is the important sector in the economic growth of developing country where role of SMEs play an important. The various challenges in manufacturing organization in improving manufacturing efficiency lacks in terms of productivity, quality and cost in developing countries. Lean manufacturing tools is a systematic implementation methodology in an organization, helps to improve the performance by reducing the waste in the process. In this study, systematic literature reviews was conducted in the manufacturing sector implementing lean in their organization. The study identified current trends in lean manufacturing, research gaps, and future research directions. The purpose of this article is to discuss the motivations, challenges, trends and state of the art of lean manufacturing in small and medium-sized (SMEs) businesses. This study provides guidelines for managers and manufacturing players so that they can embark on a lean journey with strategic objectives for their businesses. Furthermore, this study serves as a valuable tool for researchers and practitioners to learn and investigate when used appropriately.

Topics

Review

Intelligent VSM Model: a way to adopt Industry 4.0 technologies in manufacturing industry

Original Article Published: 12 October 2023

Volume 129, pages 2195–2214, (2023) Cite this article

The International Journal of Advanced Manufacturing Technology

Aims and scope

Submit manuscript

Raja Chandra Sekar Mariappan ✉, Anbumalar Veerabathiran, Paranitharan K.P & Vimal K.E.K

Abstract

In the present scenario, the industry and manufacturers find hardship in running the business profitably by enhancing the production and efficiency of the system, Multiple factors influence the industry to meet the customer's requirements and to sustain itself in this competitive environment. The purpose of this research is to develop an Intelligent VSM (IVSM) Model which integrates with Industry 4.0 and lean tools to monitor the real-time

SME 4.0: Health Monitoring of Maintenance Management Approaches in Smart Manufacturing

| Chapter | First Online: 14 September 2023

| pp 99–112 | Cite this chapter

Industry 4.0 Technologies: Sustainable Manufacturing Supply Chains

K. P. Paranitharan, K. Velmurugan, V. Balaji, P. Venkumar & R. Kumarasamy

Part of the book series: Environmental Footprints and Eco-design of Products and Processes ((EFEPP))

Abstract

Now a days Small and Medium sized Enterprises (SMEs) are also interested in lean with smart manufacturing due to the increasing demand of the product and customer satisfaction

Research Article

Developing a Delphi assisted total interpretive structural model (D-TISM) for adopting the Industry 4.0 technologies within Lean Six Sigma framework

Vimal K. E. K., Divya Rashmi, Sivakumar K., Jayakrishna Kandasmay, Paranitharan K. P. & Balaji Venkataraman

Received 01 Apr 2022, Accepted 18 Aug 2023, Published online: 29 Aug 2023

Cite this article https://doi.org/10.1080/09537287.2023.2251014 Check for updates

Abstract

Lean Six Sigma continues to be used by various industries to make their processes more efficient. The Lean Six Sigma approach is re-evaluated and possibly upgraded to enhance its suitability with Industry 4.0 technologies to provide maximum benefits for any organisation. However, the integration of Industry 4.0 within the lean six sigma framework is associated with various challenges like privacy issues and the non-

www.czasopisma.pan.pl PAN www.journals.pan.pl

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S. KAILAINATHAN[1], M. EZHILAN[1], S.V ALAGARSAMY[2*], C. CHANAKYAN[3]

INVESTIGATIONS ON TRIBOLOGICAL BEHAVIOUR OF TITANIUM DIOXIDE PARTICLES FILLED Al-0.6Fe-0.5Si ALLOY COMPOSITE USING TOPSIS APPROACH

Aluminium metal matrix composites (AMMCs) playing a prominent part in the aerospace and automotive sectors owing to their superior mechanical and tribological properties. Hence, the aim of this work is to investigate the effect of titanium dioxide (10 wt.% TiO_2) particles addition on hardness and tribological behaviour of Al-0.6Fe-0.5Si alloy (AA8011) composite manufactured by stir casting method. The surface morphology of developed composite clearly shows the inclusion of TiO_2 particles evenly distributed within the matrix alloy. Hardness of the composite was measured using Vickers micro hardness tester and the maximum hardness was obtained at 95.6 Hv. A pin-on-disc tribometer was used to carried the wear test under dry sliding conditions. The influence of wear control parameters such as applied load (L), sliding speed (S) and sliding distance (D) were taken as the input parameters and the output responses considered as the specific wear rate (SWR) and co-efficient of friction (COF). The experimental results were analyzed using Technique for Order Preference by Similarity to Ideal Preferred Solution (TOPSIS). Based on the TOPSIS approach, the less SWR and COF achieved at the optimal parametric combination were found to be L = 30 N, S = 1 m/s and D = 2000 m. ANOVA results revealed that applied load (76.01%) has the primary significant factor on SWR and COF, followed by sliding speed (20.71%) and sliding distance (3.12%) respectively. Worn surface morphology was studied using SEM image of confirmation experiment specimen to understand the wear mechanism.

Keywords: Al-Fe-Si alloy; TiO_2; Stir casting; Hardness; Tribological behaviour and TOPSIS

1. Introduction

Aluminium alloys and its matrix composites are focused with superior concern to produce light weight structures and advanced load bearing capacity which is higher strength when compared to the base metals. Generally, the blending of one or more classified materials is conventional to compile the composites with proper reinforcement and parent material [1]. In this composite, reinforcement phase and continuous phases are categorized. Next to classify the other various types like metal matrix composites, ceramic matrix and polymer matrix [2]. Aluminium matrix composites (AMCs) are widely utilized in aerospace, automotive, ship building and aircraft sectors [3]. Particularly, the AMCs have high potential strength, superior mechanical and tribological performances, produce greater stability machineries with combination of low weight and high strength ratio [4]. Similarly, AMCs also achieves the better alternate and greater life in manufacturing of brake drum, cylinder blocks, pistons, brake lining and clutches in automotive sectors. The composed AMCs enhancing the mechanical characterization with prominent ductility due to mechanical deformation are highly influenced [5]. From the last two decades, the firms fully concentrated on the high strength, resist wearing, resisting to corrosion and greater thermal stability materials are employed to generate the machinability parts [6]. Based on above the summarized statements, therefore this research selected AA8011 (Al-0.6Fe-0.5Si) as a base material. Usually, AA8011 possess major constituents of Fe-Si, these intermetallic elements which led to enhance the age hardening attributes. There is a reason for choosing AA8011 is microstructure refinement will be developed homogeneously with the influence of significant mechanical attributes and also the cost is less. Based on the desired applications, the reinforcements were utilized with different choices to base matrix of aluminium [7]. The reinforcement volume fractions and the essential properties of aluminium is a major significant role to fabricate the AMCs with superior mechanical characteristics. It is revealed that the interface bonding between the aluminium matrix and reinforcement is a vital

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Abstract

Wire electrical discharge machining (WEDM) is an cutting edge non-traditional techniques for producing complicated 3D forms in rigid materials with greater dimensional accuracy. The aim of the investigation was, to predict the WEDM characteristics of ZrO_2 ceramic addition of Al7050 alloy composite by employing Taguchi coupled Technique for order preference by similarity to ideal solution (TOPSIS) approach. The work material was manufactured by stir casting process utilizing 12 wt.% of ZrO_2 particulates in Al7050 alloy matrix. The experimental work was carried out as per the L_9 (3^3) orthogonal array design by taking input parameters like pulse current (I_p), pulse on-time (T_{on}) and pulse off-time (T_{off}), respectively. The impact of the WEDM parameters on the material removal rate (MRR) and surface roughness (SR) were determined by analysis of variance (ANOVA). Based on the TOPSIS approach, the higher MRR (0.32251 g/min) with lesser SR (3.982 µm) were achieved at the 'I_p' of 25 amps, 'T_{on}' of 115 µs and 'T_{off}' of 60 µs. ANOVA results explored that the 'T_{on}' was identified as the primary impact factor on MRR and SR, subsequently by 'I_p' and 'T_{off}' with contribution of 44.23%, 36.53%, and 12.16%, respectively. Moreover, the surface topography of the machined composite surface was analyzed through scanning electron microscopy (SEM). It was clearly revealed the formation of surface defects such as craters, micropores, cracks and also the appearance of a recast layer on the machined surface.

Characterization of novel cellulosic plant fiber reinforced polymeric composite from *Ficus benjamina* L. stem for lightweight applications

Original Article Published: 02 June 2023

Volume 13, pages 14267–14280, (2023) Cite this article

Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

M. Sergius Joe, D. Prince Sahaya Sudherson, Indran Suyambulingam, Suchart Siengchin & Guruswamy Rajeshkumar

Abstract

The development of innovative reinforcement and the expansion of their potential applications will be aided by research on unique natural fibers in polymer-based composites. In this work, new cellulosic fibers were mechanically separated from the stem of *Ficus benjamina L.* and reinforced in polyester matrix. The effect of varying fiber parameters (weight percentage and length) on the tensile, flexural, hardness, impact, water absorption,

Extraction and characterization of novel biomass-based cellulosic plant fiber from *Ficus benjamina* L. stem for a potential polymeric composite reinforcement

Original Article Published: 13 January 2023

Volume 13, pages 14225–14239, (2023) Cite this article

Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

M. Sergius Joe, D. Prince Sahaya Sudherson, Indran Suyambulingam & Suchart Siengchin

Abstract

This study aimed to bring a new lignocellulosic raw fiber material source to the green composite and textile industries. Lignocellulosic fibers were taken out from the stem of *Ficus benjamina* L. (FBSF) and physical, chemical, and mechanical testing was carried out to determine the fiber suitability in various industries. Fourier-transformed infrared and X-ray diffraction analyses were conducted to determine FBSF's chemical bonding and crystalline

Extraction and characterization of *Dypsis lutescens* peduncle fiber: agro-waste to probable reinforcement in biocomposites—a sustainable approach

Original Article Published: 02 October 2023

(2023) Cite this article

Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

Antony Sagai Francis Britto, Narayanan Rajesh Prabha, Bright Brailson Mansingh, Rajayyan David, Amirthaiah Amala Mithin Minther Singh & Joseph Selvi Binoj

Abstract

To include sustainability into their products, composite industries use natural resources as raw materials. This study explores the isolation and characterization of novel *Dypsis lutescens* peduncle fiber (DLPF) extracted from the peduncle of *Dypsis lutescens* an agro-waste. The thermo-mechanical and chemical characteristics of DLPF were comparable to other eco-

Extensive characterization of novel cellulosic biofiber from leaf sheath of *Licuala grandis* for biocomposite applications

Original Article Published: 11 July 2023

(2023) Cite this article

Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

Antony Sagai Francis Britto, Joseph Selvi Binoj, Bright Brailson Mansingh & Paulvin Navin Jass

Abstract

Composite industries focus on utilization of natural resources to imbibe sustainability in their products. This investigation details the segregation and characterization of *Licuala grandis* leaf sheath fibers (LGLSFs) extracted from leaf sheath of *Licuala grandis* tree an agro-waste for utilization as raw material in composite industries. The characteristics of LGLSF were compared with other competitive natural fibers to ensure its suitability for

Lightweight Bi-LSTM method for the prediction of mechanical properties of concrete

Published: 11 December 2023

Volume 83, pages 54863–54884, (2024) Cite this article

Multimedia Tools and Applications

Aims and scope

Submit manuscript

M. Prem Anand, M. Anand, M. Adams Joe & J. Sahaya Ruben

Abstract

Concrete is the predominant material in the construction industry, offering a wide range of mechanical attributes, including impressive compressive strength, excellent durability, robust plasticity, and a high elasticity modulus. Concrete properties prediction is crucial in designing components and also to improve their performance. High-complexity network-based baseline deep learning methods for predicting concrete may cause high computational time and high cost with the high-complexity network. To report this problem the proposed study aims to achieve better prediction of mechanical properties in the concrete using lightweight Bidirectional Long Short Term Memory (Bi-LSTM) which involves a weight pruning method and the parameters are tuned using Gridsearch Cross Validation (CV). The input variable is the grey image of the concrete microstructure, and the Representative Volume Element (RVE) provides the ground truth value to deep

Deep learning-based concrete compressive strength prediction with modified resilient backpropagation training

M. Adams Joe, J. Sahaya Ruben, M. Prem Anand and M. Anand

Published Online: July 26, 2024 · pp 276-301 · https://doi.org/10.1504/IJIEI.2024.140164

Abstract

This article proposes a novel approach for predicting concrete compressive strength using deep learning techniques. It overcomes limitations of traditional methods like memory footprint, training time, and computational requirements for predicting concrete compressive strength. Currently various filter pruning techniques are used to compress models by removing irrelevant information, but they cannot decrease memory consumption due to their large parameters. So, the entropy-based filter pruning is suggested to reduce the complexity of the model by decreasing the parameters. Then for training the CNN model, the modified resilient backpropagation technique (MRPROP) is suggested, because the previous backpropagation techniques take more time for training and also it loss the accuracy. This MRPROP improve the efficiency and convergence of CNN training and also it updates the models weight. The proposed approach demonstrated superior performance in mean squared error, root mean squared error, loss function, and regression analysis, as per the experimental results.

Keywords

machine learning, deep learning, convolutional neural network, CNN, pruning technique, backpropagation

Previous Article Next Article

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Contents

Sustainable Utilization of Wollastonite Microfibres as Internal Curing Agent in Concrete

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ABSTRACT

The present study investigates the make use of wollastonite microfibers (WM) as a cement substitute in combination with limesludge (LS) as fine aggregate alternative. In this study, the utilization of wollastonite microfibres as a cement alternative in concrete is investigated through a number of experiments to establish its internal curing effect in combination with LS aggregates. The wollastonite microfibers are used to enhance the matrix microstructure. The study also aims to address the adsorption-desorption characteristics of the wollastonite microfibres through water desorption studies and relative humidity measurements in concrete. The results show that the wollastonite microfibres functions more effectively as an internal curing agent at later ages when the concrete is exposed to drying circumstances. Interestingly, about 70% of the water in the wollastonite microfibers was released, thereby minimizing the loss of the internal concrete humidity and leading to less drying shrinkage. The internal curing ability of the wollastonite microfibres was further confirmed through better microstructure and hydration product formation as observed through TGA studies.

KEYWORDS: *Wollastonite microfibers, Internal curing, Limesludge, Concrete, Shrinkage.*

INTRODUCTION

Wollastonite microfibres (WM) has also been synthetically manufactured using industrial wastes such as quartz and marble powder and has yielded better mechanical and durability behavior [1]. Wollastonite microfibres can reduce the consumption of cement in construction. The needle like structure can enhance the physical and mechanical properties [2]. The swelling characteristics and water-releasing behavior of internal curing agents are important for utilization in concrete [3]. The usage of ICA in the form of polymers can enhance the curing of concrete by modifying the chemical or physical nature of the concrete through their polymeric cross-linked chains [4]. Though polymers have been productively employed as an ICA, their usage in concrete is highly restricted due to the multiple mechanisms involved in the production of polymers and the diversification of their quality [5, 6]. Therefore, to obtain better mechanical strength and durability, adoption of a material is required with optimal physical and chemical properties. The ICA is also found to interact with the hydration of cement and extend the working time of the concrete [7]. Past few decades also have witnessed a considerable attention in the field of research of concrete technology focusing much on the curing methods and techniques [8, 9]. In this view, a number of works use different materials to function as ICA to mitigate shrinkage and cracking in concrete [10-12]. Commercial markets have come up with a number of products that mitigate shrinkage through the internal curing effect [13]. Most of the ICA's employed

EFFECT OF WOLLASTONITE AND LIME SLUDGE ON STRENGTH, DURABILITY AND ASR OF TERNARY BLENDED CEMENT CONCRETE

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The development of unique and high volume cement replacement concrete with enhanced strength and durability properties is attempted in the present study. In this paper, fresh and hardened state properties of concrete containing wollastonite and limesludge are used as cement replacements to attain a unique composition and several experiments such as determination of compressive strength, flexural strength, split tensile strength, water absorption, sorptivity, ultrasonic pulse velocity, charge passed, alkali silica reaction, scanning electron microscope studies coupled with EDX analysis (Energy Dispersive X-Ray Analysis) were performed. The results show that the size of mineral additions has a pre-dominant role on the reduction of ASR expansion. Among all the ternary blended mixes, the mix containing wollastonite at 15% with 5% LS showed increased strength and durability at all ages. This paper also emphasized the measurement of electrical resistivity behaviour of the series of wollastonite-limesludge mixes thereby showing enhanced bulk resistance of the concrete mixes

Keywords: *wollastonite, lime sludge, durability, mechanical strength, microstructure*

1. Introduction

The high carbon foot print of the cement production increases the usage of development of alternative cement materials to reduce the cement consumption. Ordinary Portland Cement (OPC) can be blended with various supplementary cementitious materials and industrial by-products to enhance the strength behaviour for use in special applications. The blended cement concretes are inexpensive and exhibit better mechanical and strength properties. Wollastonite as a cement replacement material has been focused by several researchers to reduce cement consumption and production [1]. Besides, the strength and hydration behaviour of cement has also shown positive inclination due to wollastonite substitution [2]. The worldwide production of wollastonite is abundant [3] and hence commonly is used in ceramics, paints, plastics and other commercial applications [4]. In addition, the synthetic production of wollastonite using calcium and silicate sources has extended the boundary of usage of wollastonite [5]. The concrete mixes were made by replacing Portland cement with wollastonite at diverse replacement levels ranging from 0–25 percent at various w/b ratios of 0.45, 0.50, and 0.55. The use of wollastonite instead of 10–15 percent cement improved the strength and durability of concrete. The results of SEM and MIP showed that replacing cement with wollastonite reduced porosity and densified the concrete microstructure by up to 15% [6].Concrete and cement applications have recently attempted the utilization of with phosphoric acid [7] and carbonation treatment [8]. Wollastonite in concrete managed to improve early point compressive strength and endorsed pore discontinuity, according to Soliman and Nehdi 2014 [9], way that results in less drying shrinkage of extremely high performance concrete. Ransinchung et al. 2008 [10] studied the microstructure of pavement quality concrete incorporating wollastonite and silica fume. When wollastonite or wollastonite–silica fume were employed instead of cement, the voids and microcracks that were visible in the control concrete with only cement as a binding ingredient were filled with C–S–H gel and CH crystals. Kalla et al. 2013 [11] found that concrete containing a wollastonite–fly ash combination improved in strength, impermeability, resistance to chloride transfer, carbonation, shrinkage, and corrosion.

Wollastonite is needle like calcium silicate minerals that occur naturally due to interaction between silica and limestone at high temperature. Wollastonite as an ingredient in OPC systems were attempted in a number of studies and the significant variation in the strength results were reported [12]. Sand replacement by wollastonite showed improved mechanical strength of the mortar at 20% replacement ratio, beyond which a detrimental effect in the strength was observed [13]. A similar study by Kalla et al., 2015 [6] showed that the strength properties were optimum when 10-15% of cement was replaced by wollastonite with minimal chloride penetration and reduced permeability. The wollastonite micro fibres have a profound effect on the flexural strength of the concrete with improved ductile behaviour and dense microstructure [2]. A study by Soliman and Nehdi 2014 [9] reported reduced shrinkage behaviour of the ultra high performance concrete with wollastonite addition. The needle like structure of wollastonite has been explored and has been reported as the main reason for improving the toughness of the mortar and

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RESEARCH ARTICLE | MAY 04 2023

Concrete with glass powder as a partial replacement for cement

Dasarathy ✉; Tamil Selvi; Ponkumar Illango

+ Author & Article Information

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https://doi.org/10.1063/5.0144526

The cement companies manufacture a substantial amount of carbon dioxide, aninfluential greenhouse-gas that contributes to global warming. Cement manufacturing generates greenhouse gases both intrinsically and extrinsically: direct CO2 emissions occur during heating from limestone, while indirect CO2 emissions occur during the burning of fossil fuels used to heat the kiln. The cement business contributes around 8% of worldwide co2 Emissions, making this a key industry in terms of determine the precise reduction efforts. This research examines the feasibility of utilizing glass powder as a partial substitute for cement in compositions (10 %, 20 percent%, 30 percent%, 40 % and 50 %). The compressive split tensile strength among these compositions were determined after 7, 14, and twenty-eight days of complete curing, and findings of the same were associated to those of normal concrete. We discovered that replacing 20% of the glass powder with cement resulted in a 23 percent increase in strength, whereas replacing 30% and 40% of the component resulted in the same strength as M25. The composition usage of glass powder in the concrete reduces the cement consumption which inturn reduces the global warming effect and is also environmentally friendly.

REFERENCES

1. IS 3812 2003 Pulvarised fuel ash-Specification Bureau of Indian Standards.

2. IS 383 1970 (reaffirmed 2002) Indian standard code of practice for specification for coarse and fine aggregate from

Green Technology Implementation for Environmental Sustainability: Applications and Challenges

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DESIGNING PARAMETER AGNOSTIC FRAMEWORK FOR PREDICTING DISEASE ONSET USING DEEP LEARNING METHODS Jain Deemed University

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Date Written: September 23, 2023

Abstract

Green technology implementation plays a pivotal role in the pursuit of environmental sustainability by aligning human activities with the preservation of our planet. It encompasses a spectrum of innovative approaches aimed at minimizing the ecological footprint of industries, infrastructure, and everyday life. By focusing on resource efficiency, pollution reduction, and the utilization of renewable energy sources, green technology contributes to mitigating the adverse impacts of human actions on the environment. Energy-efficient practices and smart infrastructure promote responsible energy consumption, minimizing waste and conserving natural resources. Moreover, green technology's influence extends to waste management, sustainable agriculture, and transportation, fostering practices that reduce pollution, promote circular economies, and minimize the depletion of finite resources. While challenges exist, including initial costs and technological maturity, the implementation of green technology signifies a collective commitment to fostering a harmonious coexistence between human progress and environmental health. It holds the potential to reshape industries, economies, and societies, steering them towards a more sustainable and ecologically conscious future.

Keywords: Green Technology, Environmental Sustainability; Technological development, Radical innovation, Applications and Challenges

JEL Classification: J24, M12

PAPER • OPEN ACCESS

Effect of cement kiln dust and lignosulfonate on cement paste: a rheology and hydration kinetics study

Suthan Kumar N, Thanka Jebarsan V and Chandran Masi[4]

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Abstract

This research provides a comprehensive analysis of the influence of cement kiln dust (CKD) and lignosulfonate (LS) on the rheology and hydration kinetics of cement paste. The interaction effect, dispersion potential, and adsorption kinetics of LS on the cement/CKD paste were obtained using UV spectroscopy and zeta potential measurements. The results indicate that the

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Research Article Open Access

Sustainable Use of Gum Acacia as a Biopolymeric Additive in Ultra-High Performance Concrete

Suthan Kumar N., Sahaya Ruben J., Ibsa Neme M.

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Abstract

The main objective of this research is to analyze whether biopolymer (gum acacia) can be used as an admixture for ultra-high performance concrete (UHPC) and to elucidate the strength, durability, microstructure, and transport properties of biopolymer (gum acacia) incorporated UHPC mixes in combination with the shrinkage reducing agent (SRA). The mechanical, thermal, and durability aspects of UHPC were studied at different ages and curing conditions by adding gum acacia in combination with the SRA. After 28 days under hybrid curing, the compressive strength increased by 22.19% and the flexural strength increased by 41.59% for 1% biopolymer addition. The highest strength and durability were obtained using the hybrid curing procedure using superplasticizer and gum acacia biopolymer at a water-binder ratio of 0.35. With an improved microstructure, the results revealed improved hydration and durability as revealed through the scanning electron microscopic (SEM) images. The SEM photographs of the concrete showed more polymorphic patterns and crystals overall relative to the UHPC with SRA, while exhibiting little to no microfractures. Through adjustment of the biopolymer proportion and adoption of a suitable curing method, this research presents a new strategy for addressing the negative impact produced by the usage of SRA in UHPC.

1. Introduction

Sustainability in the construction industry establishes certain principles for using natural additives in the sector without causing environmental damage [1]. Cement is the world's foremost emitter of CO_2 and to mitigate this problem, the use of a different bio-based admixtures has been suggested in a number of studies [2, 3]. Bio-based additives in the cement industry have been observed noticeably in the past few decades due to the adverse impacts of cement production on the environment and are also economical [4]. However, the use of bio-based admixtures in cement and concrete has faced severe criticism due to

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Research Article

Mechanical Characterization of Curaua Fiber/Babool Wood Particle Reinforced Polyester Hybrid Composite

Author(s): R. Suthan, A. Padma Rao, P.Babu Aurtherson, Sujin Jose Arul*, K. Ajan and D.S. Jenaris

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Abstract

Background: The researchers are in the situation to satisfy the demand for engineering materials by developing novel eco-friendly materials. The natural fiber composites are the substitutes for the synthetic material.

Introduction: The mechanical properties of curaua fiber-reinforced polyester (CFRP) composites were investigated, as well as the effects of curaua fibre infusion with Babool Wood particles (BWP).

Methods: The composite specimens were fabricated using a hand lay-up approach using varying amounts of curaua fibres (CF) and babool wood particles in a 1:1 ratio in order to test the tensile strength and flexural strength.

Results: The results demonstrated that before weakening, the tensile strength and flexural strength of the composite samples rose by up to 40% for hybrid reinforcements. Comparing samples made of pure resin to those made of the composite at 40 weight percent (CF20/BWP20), the tensile and bending strengths of the composite are improved by 93.42% and 86.4%, respectively.

Conclusion: The tensile and flexural modulus values of the hybrid composites increased by up to 50% fiber, but less successfully (CF25 and BWP25). The fracture mechanism of the shattered composite samples was examined using scanning electron microscopy.

Microaneurysms detection in fundus images using local Fourier transform and neighbourhood analysis

Regular Paper Published: 10 October 2023

Volume 66, pages 1403–1423, (2024) Cite this article

Knowledge and Information Systems

Aims and scope

Submit manuscript

T. Sudarson Rama Perumal, A. Jayachandran & S. Ratheesh Kumar

Abstract

Microaneurysms, tiny, circular red dots that occur in retinal fundus images, are one of the earliest symptoms of diabetic retinopathy. Because microaneurysms are small and delicate, detecting them can be difficult. Their small size and cunning character make automatic detection of them difficult. The automatic detection of microaneurysms in retinal fundus images is proposed in this research using a local Fourier transform and neighbourhood analysis-based multi-scale approach technique. The suggested method is broken down into three stages: image preprocessing, the detection of retinal vessels and microaneurysm candidates, and labelling of the candidates. A multi-scale framework is used to develop every stage of the algorithm, with the exception of the initial image

An intrusion detection system based on hybrid machine learning classifier

Article type: Research Article

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Correspondence: [*] Corresponding author. M. Reji, Associate Professor, Department of Electronics and Communication Engineering, Rohini College of Engineering and Technology, Kanyakumari, Tamilnadu, India. E-mail: rejieceped@gmail.com (mailto:rejieceped@gmail.com).

Abstract: Intrusion detection systems (IDS) can be used to detect irregularities in network traffic to improve network security and protect data and systems. From 2.4 times in 2018 to three times in 2023, the number of devices linked to IP networks is predicted to outnumber the total population of the world. In 2020, approximately 1.5 billion cyber-attacks on Internet of Things (IoT) devices have been reported. Classification of these attacks in the IoT network is the major objective of this research. This research proposes a hybrid machine learning model using Seagull Optimization Algorithm (SOA) and Extreme Learning Machine (ELM) classifier to classify and detect attacks in IoT networks. The CIC-IDS-2018 dataset is used in this work to evaluate the proposed model. The SOA is implemented for feature selection from the dataset, and the ELM is used to classify attacks from the selected features. The dataset has 80 features, in the proposed model used only 22 features with higher scores than the original dataset. The dataset is divided into 80% for training and 20% for testing. The proposed SOA-ELM model obtained 94.22% accuracy, 92.95% precision, 93.45% detection rate, and 91.26% f1-score.

Keywords: Intrusion detection, IoT, SOA, ELM, feature selection, attack classification, machine learning

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A highly consistent and proficient class of multiport dc-dc converter based sustainable energy sources

T.V.V. Pavan Kumar [a], Shafqat Nabi Mughal [b], Radhika Gautamkumar Deshmukh [c], S. Gopa Kumar [d], Yogendra Kumar [e], D. Stalin David [f]

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Abstract

ThePhotovoltaicsystem(PV) systems are reliable Renewable Energy Sources (RES) because to their efficiency under high irradiation conditions, low maintenance, and low pollution. Effective processes generate steady power. This new programme determines the dynamic performance of this technology's application to conduct a thorough feasibility utility grid is determined under different operational circumstances. However, integrating renewable energy into the alternating current system has challenges including voltage increases, synchronisation, and protection. With the DCDC converter, the power distribution system will be more reliable. The RES voltage level and storage needed by the static power DCDC converter must be maintained to preserve grid synchronisation. Because static converters are simple, they need a separate converter for stabilisation, increasing the circuit size. Compact size, centralised control, and energyefficient energy management are important features of Multiport Converters (MPC). The microgrid needs a backup battery to offset the intermittent nature of renewable energy sources. To ensure safety, isolation between the source and the load is required. Storage devices need a twoway power channel. An independent multiport

RESEARCH ARTICLE | OCTOBER 20 2023

Neural network based predictive control of DC motor position by Newton - Raphson method

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+ Author & Article Information

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DC motor operation with accurate position control marks a positive impact for the functioning of the motor driven system in the electric sector. Rotor position control aspect favours the necessity of precise movement of the connected load. In this paper, model predictive control algorithm drives the positioning control of DC motor and neural network using Newton-Raphson method trains the data in an orderly fashion to achieve desired output. Model predictive control tests the functioning of required position enabling DC motor operation through MATLAB program codings. The test results pose the necessity of position control in the system when compared to its absence. Plant model is designed using MATLAB/Simulink and the necessary training and testing is carried out using codings. Results picturize the need of stated algorithms for the accurate positioning of rotor and precise application of motor in an electric circuit.

Topics

MATLAB, DC motors, Electrical circuits, Artificial neural networks, Control theory, Newton Raphson method

REFERENCES

1. Mahanijah Md Kamal and Nasirah Mamat. "Controller design for servomotor". *IEEE IEA*, 2009.
Google Scholar

2. Duman, S. Maden, D., Guvenc, U. (2011) 'Determination of PID controller parameters forspeed and position control of DC motor using Gravitational Search Algorithm' *ELECO-2011*,

FOE NET: Segmentation of Fetal in Ultrasound Images Using V-NET

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Keywords: Ultrasound images, Adaptive Gaussian Filter, Adaptive Bilateral Filter, CLAHE, Multi-scale retinex, V-net

Abstract

Ultrasound is a non-invasive method to diagnose and treat medical conditions. It is becoming increasingly popular to use portable ultrasound scanning devices to reduce patient wait times and make healthcare more convenient for patients. By using ultrasound imaging, you will be able to obtain images with better quality and also gain information about soft tissues. The interference caused by tissues reflected in ultrasound waves resulted in intensified speckle sound, complicating imaging. In this paper, a novel Foe-Net has been proposed for segmenting the fetal in ultrasound images. Initially, the input US images are noise removal phase using two different filters Adaptive Gaussian Filter (AGF) and Adaptive Bilateral Filter (ABF) used to reduce the noise artifacts. Then, the US images are enhanced using CLAHE and MSR for smoothing to enhance the image quality. Finally, the denoised images are input to the V-net is used to segment the fetal in the US images. The experimental outcomes of the proposed Multi-Scale Retinex (MSR) is an image enhancement technique that improves image quality by adjusting its illumination and enhancing details. Foe-Net was measured by specific parameters such as specificity, precision, and accuracy. The proposed Foe-Net achieves an overall accuracy of 99.48%, specificity of 98.56 %, and precision of 96.82 % for

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(RESEARCH ARTICLE)

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Dual Stage Bionic Spatial Convolutional Restoration Model for Image De-noising and De-mosaicking

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Abstract

The first two important steps in the pipeline for processing picture signals are de-noising and de-mosaicking. The joint solution of the highly uncertain inverse problem of de-noising and de-mosaicking has garnered increased attention in research today. It is difficult to restore high-quality images from raw data in low light because of a variety of disturbances brought on by a low photon count and a complex image signal processing scheme. Even if some restoration and improvement techniques have been used, they might not work in harsh situations, including raw data imaging with brief exposure. Therefore, this research focuses on developing a de-mosaicking and de-noising model with effective end to end manner outcomes. Initially, the pre-processing is conducted using Gaussian filtering to eliminate artifacts from the input image, thereby enhancing the image quality. Then, the proposed method incorporates an Enhanced Spatial Convolutional Residual Net (EnConvResNet) for image de-mosaicking and an Adaptive U-net restoration model for image de-noising. An enhanced gazelle optimization (EnGa) algorithm is used to fine-tune the hyper-parameters of the model in order to maximize its performance and improve its generalization capacity. The proposed method accomplished peak signal to noise ratio (PSNR) and structural similarity index measure (SSIM) of 46.65 and 98.89, respectively.

Keywords: Enhanced Gazelle optimization; De-mosaicking; De-noising; Gaussian filtering; Adaptive U-Net; Enhanced Spatial Convolutional Residual Net

1. Introduction

De-mosaicking aims to combine four spatially sparse color channels to produce a full-color image. Actually, color information per pixel can only be captured by digital cameras with monochrome sensors; most of these cameras achieve this by utilizing color filter arrays (CFA), like the Bayer pattern [1]. Two of the four pixels are measured to be green, red, and blue. De-mosaicking is the process of creating a whole color image from the output of partial color samples [2]. In general image processing, the pipeline is assumed to contain the raw data first de-noised and then de-mosaicked. Because de-noising algorithms are usually built on statistical priors, once the raw data is removed, these priors could be seriously disrupted. Additionally, the majority of well-performing common de-mosaicking techniques are created using the essential noise-free condition as their foundation [3].

The main problem with the segmentation de-noising and de-mosaicking processes is that they can conflict with one another. De-mosaicking increases the difficulty of the noise removal process by substituting the interpolation process for the noise distribution. The color models in the raw photos are altered if de-noising is done before, making full color

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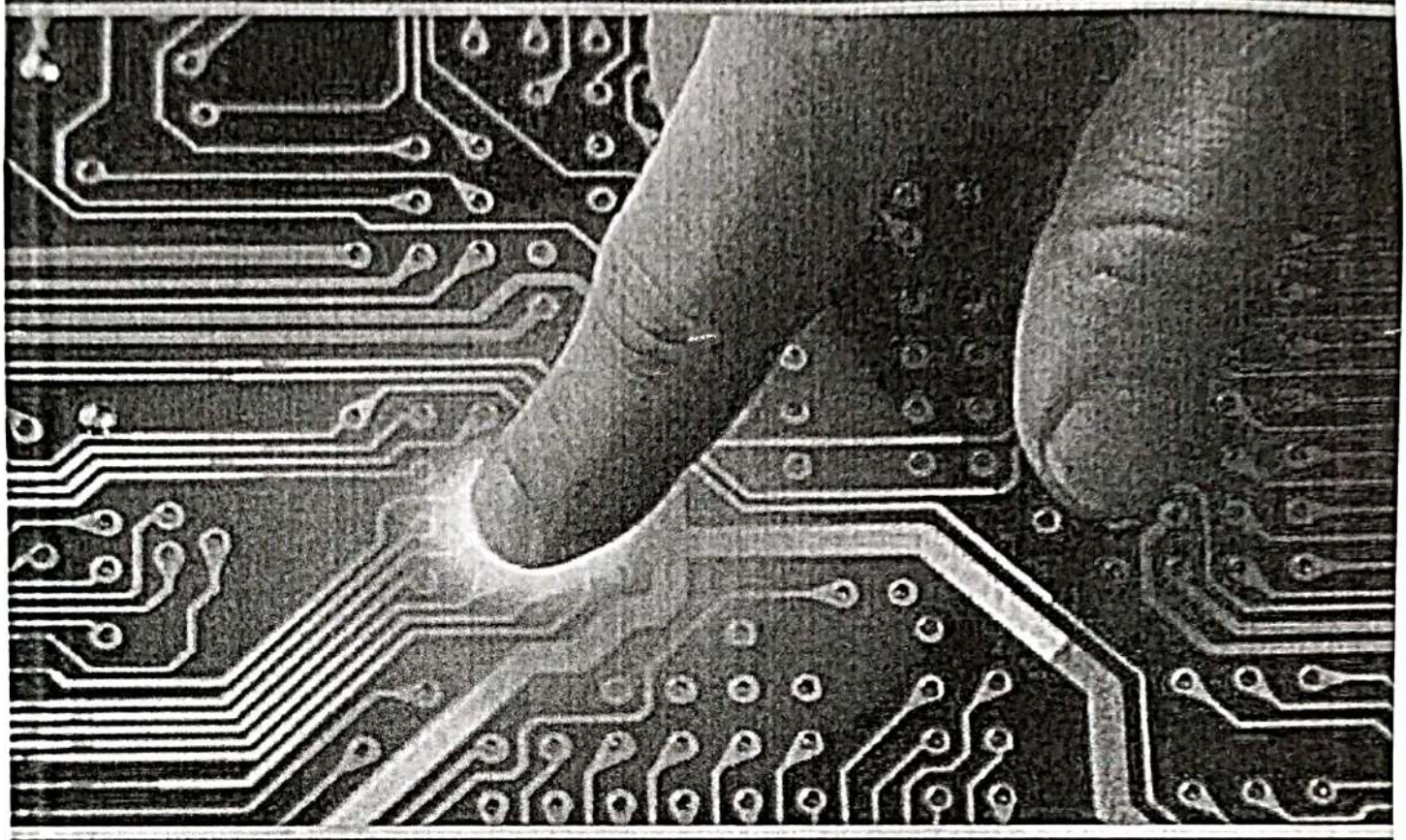

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Detection of Tampered Region in Color Filter Image Using Multiple Channel Approach

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Abstract — *Gadgets equipped for catching pictures should be visible in places as normal as jam-packed stores, workplaces, schools, or even at home, looking like reconnaissance cameras, cell phones, robots, and expert and activity cameras. A Colour Filter Array (CFA) is included in the majority of devices that can take pictures. Pictures produced by these gadgets can be investigated to distinguish the so known CFA antiques left by demosaicing strategies. These relics are significant in advanced picture criminology since they demonstrate helpful for deciding the realness of a picture. In existing work, examination of the green band of the Bayer channel, ignoring the data in the leftover groups. In this undertaking a cycle to gauge the example left by CFA curios no matter what their setup is proposed, which can be utilized no matter what the size or varieties utilized by the channel, or even in various variety spaces, getting in this way new wellsprings of data for legal examination. The awareness of these proposition to post-handling techniques, for example, pressure and separating will likewise be audited. JPEG pressure is a lossy pressure strategy ordinarily used to diminish the document size of pictures by disposing of some picture information. This interaction can present antiques and debase picture quality, making it trying to identify any altering or adjustments that could have been made to the picture. The proposed strategy has the capacity to distinguish controls notwithstanding the difficulties presented by elevated degrees of JPEG pressure. It proposes that the technique has a more elevated level of vigor or aversion to recognize irregularities, relics, or examples that might show altering, no matter what the pressure prompted mutilations in the picture.*

Key Words : JPEG Compression, Color Filter Array, Demosaicig, image manipulation

1. INTRODUCTION

Image tampering location is an advanced field that breaks down the legitimacy of a suspect picture. The intention of picture altering is to make bogus ideas about a picture according to the watcher's viewpoint. In the present advanced world, such altered pictures can be made, circulated and sent without any problem. The goal behind the altering could be noxious, for example, in the photos of political social affairs, war fields, logical diaries articles and so on., or on the other hand could be innocuous as on account of nature photos, photos of landmarks, and so forth. Picture with innocuous duplicate move altering. Messing with innocuous aim adds some photograph impacts and does changes like obscuring, contrast improvement, splendor modification and variety. In some cases, modification in a picture is finished to work on the visual nature of the picture through activities, for example, contrast change, brilliance change, extending, low pass/high pass sifting, and so on. Be that as it may, change in a picture should likewise be possible with a malignant goal which might have bearing on legitimate cases, proof in court, police examination, criticism and misrepresentation cases, copyright issues, legislative issues, photojournalism, big names ways of life, style explanations, excellence and wellness items, diversion area, promotions, wrongdoing against teenagers, clinical science, biometric pictures and scientific cases. [1]

Alatawi et.al. [2] proposed Computerized picture steganography review and examination. These days, steganography articles, particularly overviews, seldom expressly characterize steganography in view of its objectives. Thus, this overview adds to characterizing steganographic research in view of objectives and its appraisals. This paper likewise audits the utilization of evaluation devices inside and out on the grounds that it is firmly connected with the objective of steganography.

Armas Vega et.al. [3] proposed Duplicate move falsification recognition strategy in light of discrete cosine change blocks highlights. They performs identification of duplicate move changes inside a picture, utilizing the discrete cosine change. The qualities got from these coefficients permit us to acquire move vectors, which are gathered together.

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RGB Image for Underwater Clear Image Acquisition by Using Multiscale Decomposition Method

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ABSTRACT: Images captured underwater generally degrade due to scattering and absorption. Low contrast, color distortion and poor visual appearance are the major issues that an underwater image has to undergo. Such problems were caused by dispersion and refraction of light as they penetrate from rarer to denser media. The scattering of light reduces color contrast. Here introduces an improved method for underwater image enhancement based on the fusion method that is capable to restore accurately underwater images. The proposed work takes a single image as the input and a sequence of operations such as white balancing, sharpening, manipulating weight maps are performed on the input image. Finally multiscale decomposition of the inputs is done to obtain the resultant output. In the initial stage, color distorted input image is white balanced to remove the color casts maintaining a realistic subsea image. In the second stage, CLAHE is performed on the gamma corrected image. CLAHE plays a significant role in luminance enhancement of underwater images. At the same time, histogram equalization is performed on the sharpened image. The weight maps analyze image characteristics that properly specify the spatial pixel relationship. Finally in the last stage, multiscale decomposition of input and weight map are performed. Result analysis the performance of underwater images using proposed method.

KEYWORDS: underwater image enhancement based on the fusion method that is capable to restore accurately underwater images, multiscale decomposition of the inputs is done to obtain the resultant output.

I. INTRODUCTION

Digital image processing is the use of computer algorithms to perform image processing on digital images. As a subcategory or field of digital signal processing, the digital image processing has many advantages over analog image processing. It allows a much wider range of algorithms to be applied to the input data and we can avoid problems such as the build-up of noise and signal distortion during processing. Since images are defined over two dimensions digital image processing may be modeled in the form of multidimensional systems.

Image research is the descent of important info coming from photos; chiefly coming from electronic digital graphics with a digital picture control strategies. Photograph investigation tasks is usually as easy because meter reading pub coded tag cloud or even as innovative since determining a person via the encounter. Pcs are generally indispensable for that examination of huge numbers of data, pertaining to duties that requirement intricate computation, or for this removal of quantitative information.

Then again, we can establish the human being visual area is a great graphic examination apparatus, particularly for extracting higher-degree selective information, and for many applications including practice of medicine, safety measures, as well as rural realizing people analysts nevertheless cannot be changed simply by computer systems. This is why, quite a few important image analysis equipment for example side alarms in addition to neuronal communities are usually inspired through homo beholding designs.

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Retinal Vessels Segmentation Based on Colon SeNet

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ABSTRACT: The morphology of blood vessels in retinal fundus images is an important indicator of diseases like glaucoma, hypertension and diabetic retinopathy. The accuracy of retinal blood vessels segmentation affects the quality of retinal image analysis which is used in diagnosis methods in modern ophthalmology. Existing diagnostic systems are not only prone to inaccurate judgments, but are also difficult and require a longer time from experts. Artificial intelligence (AI) based on deep learning (DL) has attracted global interest recently because of its effectiveness and accuracy in detecting eye disease. There are several challenges in diagnosing eye diseases based on retinal fundus imaging. Most of the previous models in the literature targeted these challenges and tried to improve the evaluation metrics, whereas very little attention has been given to reducing the computational complexity of the developed model. This project proposes a work in which any general lightweight DNN model could be used for vessel segmentation in retinal images as a proof of concept. Then applied a light weight DNN model for retinal vessel segmentation, based on the Colon SegNet model. Then retrained the Colon SegNet model using retinal vessel datasets. These results outperform several light weight and computationally heavy methods. The reduced number of parameters, computational complexity, and improved segmentation performance support its use in automated diagnostic systems for retinal vessel segmentation.

KEYWORDS: DNN model, Colon SegNet model, Artificial intelligence (AI), deep learning (DL).

I. INTRODUCTION

Due to the rapid progress in computing hardware, especially graphical processing units (GPUs), and their cheap availability in the last two decades, efficient deep learning (DL) frameworks have been explored for solving different problems in various fields of science. Artificial intelligence (AI), based on DL, has attracted global interest in recent years. Medicine and healthcare are not exceptions, where DL has been applied to medical imaging analysis, which has shown robust diagnostic ability in detecting different medical diseases. In ophthalmology, DL achieves robust classification performance in detecting and diagnosing various eye diseases, for instance, diabetic retinopathy (DR), age-related macular degeneration (AMD), and glaucoma. Retinal vessel segmentation is an essential pre-step for further geometrical and topological analysis on retinal vessel structures. An automatic and accurate vessel segmentation method can largely reduce the workload of manually labeling by experts and improve the efficiency of diagnosis in particular to large-scale screening programs.ML algorithms are categorized as supervised, un supervised and reinforcement learning. In supervised learning, the input and output data are labeled whereas in un supervised learning, the data are not labeled, and it is learned without supervision. Supervised methods are learned based on the features of the input images that are manually marked. In contrast, un supervised methods discover hidden features and do not require manually segmented images. In reinforcement learning, there is no input data, and it depends on the action soft the algorithm. Reinforcement learning seeks long- term cumulative rewards to achieve an optimal solution. On the other hand, supervised and unsupervised learning typically look for instant rewards.

II. REVIEW OF LITERATURE

R. Ju, Y. Chen, L. Zhang, (2019) proposed a Retinopathy of prematurity(ROP) is the leading cause of childhood blindness worldwide. Automated ROP detection system is urgent and it appears to be a safe, reliable, and cost-effective complement to human experts. An automated ROP detection system called Deep ROP was developed by using Deep Neural Networks (DNNs). ROP detection was divided into ROP identification and grading tasks. Two specific DNN models, i.e., Id-Net and Gr-Net, were designed for identification and grading tasks, respectively. To develop the DNNs,

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Deep Learning Based Image Enhancement for Exposure Restoration

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ABSTRACT: Images and videos capture a vast amount of rich and detailed information about the scene. Intelligent systems use these captured images for various computer vision tasks, such as image enhancement, object detection, classification and recognition, segmentation, 3-D scene understanding, and modeling. Image restoration techniques process degraded images to highlight obscure details or enhance the scene with good contrast and vivid color for the best possible visibility. Poor illumination condition causes issues, such as high-level noise, unlikely color or texture distortions, nonuniform exposure, halo artifacts, and lack of sharpness in the images. This article presents a novel end-to-end trainable deep convolutional neural network called the deep perceptual image enhancement network (DPIENet) to address these challenges. The novel contributions of the proposed work are: 1) a framework to synthesize multiple exposures from a single image and utilizing the exposure variation to restore the image and 2) a loss function based on the approximation of the logarithmic response of the human eye. Extensive computer simulations on the benchmark MIT-Adobe FiveK and user studies performed using Google high dynamic range, DIV2K, and low light image datasets show that DPIENet has clear advantages over state-of-the-art techniques.

KEYWORDS: Deep Perceptual Image Enhancement Network(DPIENet), MIT-Adobe FiveK, Convolutional Neural Network, Logarithmic Exposure Transformation.

I. INTRODUCTION

The growing importance of digital image processing systems from two principal application areas and they are (i) Improvement of pictorial information for human interpretation and (ii) Processing of scene data for autonomous machine perception. Digital image processing techniques are now used to solve a variety of problems. One such important problem in image processing is restoration. The goal of the restoration approach is to improve the given image, so that it is suitable for further processing. Restoration is a technique used to reconstruct or recover an image that has been degraded by using a prior knowledge of the degradation phenomenon. Removal of degradation is becoming increasingly important as image analysis and acquisition system finds more application in society. There are a variety of reasons that could cause degradation of an image, and image restoration is one of the key fields in today's Digital Image Processing due to its wide area of applications. Because of the imperfection of the physical imaging system and due to various physical limitations on every application a recorded image will always be a degraded version of an original image.

Blurring can be caused when an object in the image is outside the cameras depth of field during the exposure. Motion blur can be caused when an object moves relative to the camera during an exposure. Photographic defocusing is also a problem in many different imaging situations. This type o blurring is due to effects at the camera aperture, which spreads a point of incoming light across a circle of confusion. Noise is generally a distortion due to the imaging system rather than the scene recorded. Noise results in random variations to pixels in the image. Whatever be the degrading process, image distortions can fall into two categories, spatially invariant and spatially variant. In a space invariant distortion, all pixels have suffered the same form of distortion. This is generally due to the problems with the imaging system such as distortions in the optical system, global lack of focus or camera motion. In a space variant distortion, the degradation suffered by a pixel in the image depends upon its location in the image. This can be caused by internal factors such as distortions in the optical system or by external factors such as object, motion etc.

RESEARCH ARTICLE | MARCH 25 2024

High performance packet classification algorithm for network security systems using modified grid-of-tries

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T. Sudarson Rama Perumal; J. Sushmitha

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In order to enhance the functionality of network applications including traffic engineering and intrusion detection, the packet classification problem has received extensive research during the past decade. Software-based packet classification algorithms are gaining significant attention due to their extremely high flexibility in satisfying various industrial requirements for security and network systems, which has coincided with the general improvement of hardware architectures and the rising popularity of multi-core multi-threaded processors over the past few years. These methods require extremely big tables internally to achieve fast classification, and the size of the tables could possibly grow along with the size of the rule set. They cannot be utilised with a big rule set as a result. To solve this issue, we present a novel software-based packet classification algorithm dubbed the grid-of-tries approach that combines the partition decision trees in a search table to support both high scalability and quick classification performance. Our proposed algorithm exhibits a very high categorization speed, regardless of the quantity of rules, with smaller tables and shorter table building time, while the majority of generic partitioning-based packet classification algorithms demonstrate acceptable scalability at the expense of reduced classification speed. In this study, we suggest the Grid-of-tries approach, a novel packet classification algorithm to bridge the theoretical and practical gap. In terms of classification speed, memory utilisation, and preprocessing time, our technique outperforms other well-known algorithms. The results of our tests

An improved K-means clustering and optimal random forest for scheduling workloads in virtual servers

Original Paper Published: 21 May 2024

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Evolving Systems

Aims and scope

Submit manuscript

Lourdes Mary Amulu ✉, M. Manjusha & J. Ashok

Abstract

The utilization of cloud computing systems has increased recently in many organizations and applications due to on-demand service as well as the quick response capabilities of cloud-based services. However, the dynamic load conditions on cloud infrastructure cause system failures. Therefore, it is essential to balance the load on the cloud server to efficiently process the tasks. Proper balancing of workloads on the cloud computing system optimizes response time, resource utilization, and system stability. To accomplish this goal, this paper proposes a novel energy-efficient load balancing technique named 'improved k-means levy flight white shark optimization based random forest (IK-LWS-RF) algorithm'. This proposed algorithm performs two distinct operations namely clustering and scheduling to balance the workloads among the virtual servers. At first, the

Implementation of A Deep Learning Algorithm for Fraud Detection Based on Credit Transactions

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Author(s) :

R. Sahila Devi

Article Name :

Implementation of A Deep Learning Algorithm for Fraud Detection Based on Credit Transactions

Abstract :

Online transactions using credit cards are being more reliable and efficient method followed by most of the users. In the same way, the fake transaction and scam occurring during the credit card transactions are increasing day by day. This scam not only steal user's money but also misuse their personal details. Manual detection of these scam may be a tedious process, so this detection must be a deep learning method for the fastest and effective method of detection. This paper proposes a methodology of deep learning algorithm involving Multi Layer Perceptron (MLP) to prevent the users from fraud transaction. The data which is trained form a neural network and the test data is evaluated to define the classification, whether the data is fraud or verified data. This work involves data processing, data cleaning and data visualization of the data transaction. At the end of the process, the detected results undergo validation and model evaluation. Data visualization uses libraries from Matlab to learn the data, which is used in the data classification.

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Article Title: CNN Classification based on the MobileNet for Malware Detection

CNN Classification based on the MobileNet for Malware Detection

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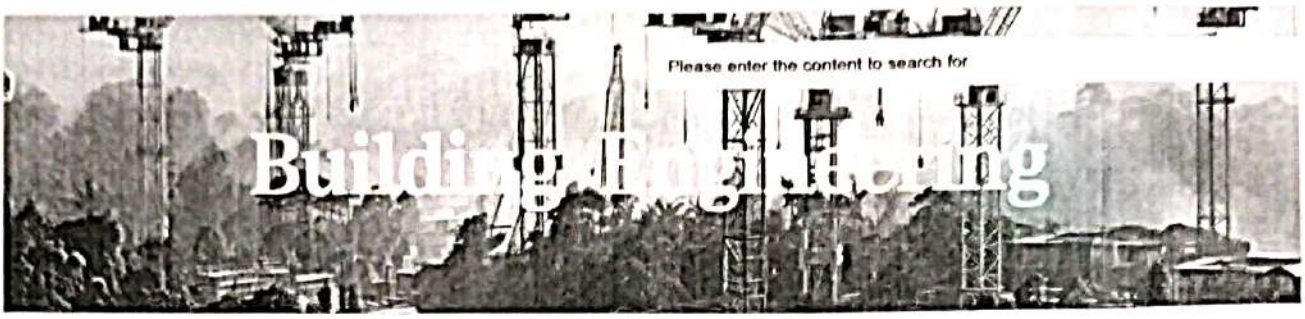
ABSTRACT

The occurrence of harmful software, also known as malware is on the rise with certain types of malware becoming adept at camouflaging themselves within a system through sophisticated techniques. It is crucial to detect malware early on to prevent widespread damage to computer systems and the Internet. Numerous techniques for identifying malware have been created in recent times. Despite this, detecting malware remains a difficult task so this paper proposes the utilization of MobileNet-based CNN classification for malware detection. The initial dataset undergoes pre-processing to simplify the subsequent processes. Data preprocessing is a crucial step in data preparation where raw data undergoes various processing techniques to make it suitable for further processing. Data visualization involves transforming data into visual representations, such as charts or diagrams, to enhance comprehension and extract valuable insights for humans. These visualizations aid in understanding the data structure and detecting any anomalies present. MobileNet is specifically designed to reduce the parameter count, enhance training speed and provide accurate predictions. MobileNet is a convolutional neural network (CNN) design created specifically for the tasks of image classification and mobile vision applications. This makes it ideal for running on mobile devices or for implementing transfer learning techniques. To evaluate the model's performance, the confusion matrix is generated and this technology is well-suited for mobile devices, embedded systems and low-power computers that maintain a high accuracy without sacrificing computational efficiency. This work is implemented in python software.

Keywords: Malware, data pre-processing, data visualization, MobileNet based CNN classification, Confusion matrix.

1 Introduction

Malware, often known as malicious software which is a type of compiled binary file that disrupts networks or computer systems with the intent to encrypt, change or remove sensitive data, steal information or take over essential computer operations and some of the examples of malware are Ransomware, spyware, trojans and worms. There has been a significant surge in malware development recently, with an average of 588 cyber threats each minute [1]. Malware



Net zero energy analysis and energy conversion of sustainable residential build Muscat, Oman

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Keywords: sustainable buildings; energy conservation; ecohouse; energy demand; Net Zero energy

Abstract

The building sector is the predominant consumer of primary energy globally. The building sector accounts for around 40% of glol production. Net Zero Energy Buildings (NZEBs) are highly suggested by energy experts as an effective option to alleviate the strain on prim sources caused by the building sector. The disparity between energy performance predictions provided during the design phase and energy performance of residential buildings is mostly attributed to a limited comprehension of the components that influence energy co and the constraints of whole building simulation software. The objective of this research was to perform a comparison analysis of the ex actual energy consumption of a prototype net-zero energy house built at the University of Technology and Applied Sciences in Muscat. Analysis Programme (HAP V4.2) was utilised to forecast the energy consumption of a Net Zero Energy Building (NZEB) at HCT, taking into a availability of an Energy Recovery Ventilator (ERV) and the absence of an ERV. The newly built house underwent a one-month testing ph many duties according to competition regulations. One of the main goals was to generate on-site energy through photovoltaic panels, pr amount proportional to the energy consumed by the house. Upon comparing the actual energy consumption data with the simulated re noticed that the actual energy demand of the house was around 20% lower than the prediction made by the simulation tool.

References

[1]Kamal MA. Design Concepts and Architectural Interventions. Acta Technica Napocensis: Journal of Civil Engineering & Architecture. 2022;
[2]International Energy Agency. Updating building energy codes to ensure the sustainability of our global energy future. Availal https://www.iea.org/publications-freepublications/publication/PolicyPathwaysModernisingBuildingEnergyCodes.pdf. (accessed on 12 Januar
[3]Torcellini P, Pless S, Deru M, et al. An Examination of the Definition of Zero Energy Buildings- A Classification System Based on Renewa Supply Options. U.S. Department of Energy Office of Scientific and Technical Information, 2010. doi: 10.2172/983417
[4]Garde F, Lenoir A, Scognamiglio A, et al. Design of Net Zero Energy Buildings: Feedback from International Projects. Energy Procedia. 201 998. doi: 10.1016/j.egypro.2014.11.1011. hal-01153038
[5]International Energy Agency. Oman's electricity and heat production data for the year 2018. Available https://www.iea.org/statistics/statisticssearch/report/?country=Oman&product=electricityandheat (accessed on 12 January 2024).
[6]Baldwin C, Cruickshank CA. An evaluation of solar cooling solutions for residential use in Canada. Journal Energy Procedia. 2022; 30. 49 10.1016/j.egypro.2022.11.059
[7]DOE. Energy-efficient home that produces as much energy as it consumes, known as a Zero Energy Ready Home. Availal https://energy.gov/eere/buildings/zero-energy-ready-home (accessed on 12 January 2024).

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Analyze the Effects of Implementing a Solar Thermal Hot Water System on Oman's Economy and Environmental Factors

Muthuraman Subbiah (articles?searchcode=Muthuraman++Subbiah&searchfield=authors&page=1)[1*], Saravanan Natarajan (articles?searchcode=Saravanan++Natarajan&searchfield=authors&page=1)[1], Sivaraj Murugan (articles?searchcode=Sivaraj++Murugan&searchfield=authors&page=1)[2]

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Abstract

An analysis is conducted on eleven governorates in Oman to assess the environmental and financial advantages of implementing a solar hot water system. The conservation of natural gas is measured by comparing it to the absorption of solar energy on a daily, monthly, and yearly basis. The study considers the monetary value of natural gas and the duration required to recover the initial investment in order to evaluate the environmental and economic benefits. Muscat realises its maximum capabilities. The examined solution enables annual savings of up to 106.03 USD and 927.01 kilogrammes of CO_2 in Muscat, and a minimum of 74.74 USD and 653.48 kilogrammes of CO_2 in Dhofar.

Keywords

Solar Energy (articles?searchcode=Solar+Energy&searchfield=keyword&page=1), Solar Thermal System (articles?searchcode=+Solar+Thermal+System&searchfield=keyword&page=1), Payback Period (articles?searchcode=+Payback+Period&searchfield=keyword&page=1)

Subbiah, M. , Natarajan, S. and Murugan, S. (2024) Analyze the Effects of Implementing a Solar Thermal Hot Water System on Oman's Economy and Environmental Factors. *Open Access Library Journal*, **11**, 1-17. doi: 10.4236/oalib.1111127 (https://doi.org/10.4236/oalib.1111127).

1. Introduction

The use of solar energy has both monetary and ecological advantages. Using the right solar energy technologies, it is feasible to generate electricity, heat water and steam, and heat and cool buildings. By eliminating the need for fossil fuels, greenhouse gas emissions can be lowered through the implementation of these technologies.

The biggest potential for solar energy usage is in the Oman region. About 1527 kilowatt hours per square meter per year of solar energy hits Oman. It is estimated that Oman receives an average of 2741 hours of sunshine per year [1] .

The solar thermal industry is boosted by this possibility. When it comes to sales of flat plate solar collectors, Oman ranks third globally [2] . More than 12 GWth [3] of flat plate solar collectors have been built so far. Flat-plate solar collectors are commonly used in Oman's thermosiphon solar hot water systems. The promise of solar energy and the ever-increasing cost of fossil fuels both contribute to the system's rising appeal. Numerous manufacturers can be found in every state. As a result, many households are switching to solar hot water systems instead of using traditional fuels like electricity or natural gas.

Journal of Nuclear Engineering & Technology

Role of Energy Audit in optimizing the energy consumption cost of educational institution for energy conservation

N. Amutha Priya, G. Abitha, A. Aswi, J. P. Harishma Jai, S. Raja Rajeswari

Abstract

Regular electricity use at educational institutions has led to unintentional and intentional energy wastage. In view of reducing this wastage, energy audit is used as a tool to identify the possibility of energy conservation. The audit procedures are planned to get executed for Sir Isaac Newton Block (Mechanical Engineering, Electrical and Electronics Engineering) and Kalpana Chawla Block (Electronics and Communication Engineering and Computer Science and Engineering) at Rohini College of Engineering and Technology, Kanyakumari, Tamilnadu. Audit process is segregated as pre-audit for data collection to carry out optimum cost analysis and post-audit for suggesting improvements to achieve the set goals. In this paper, the initial pre-audit phase survey report is discussed. Energy auditors make recommendations for energy-saving strategies based on the audit's results. These could include installing programmable thermostats, upgrading energy-efficient equipment, installing smart building controls, upgrading to energy-efficient lighting, and enhancing insulation.

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Assessing the Effectiveness of Industrial Energy Audits: A Literature Review

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By Amutha Priya N.,* Vinoth J.,* Thivakar V.,* Sheserao B.,* Jude Makvin T.,

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Abstract

Indian economy plans to conserve the energy which is consumed by the industrial sector. Government to conduct periodic energy audits in the industrial sector which is to be followed up with a prac conservation (ECON) measures as suggested by the energy audit team. Energy audit has been condu audit and post audit phase. During pre-audit phase, initially, power ratings of machines, appliances, ligh

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Chemical synthesis of NiO nanoparticles from Solanum trilobatum leaf extract for antibacterial and cytotoxic properties

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ABSTRACT

The chemical precipitation approach was employed to synthesize Nickel oxide nanoparticles (NiONPs) using Solanum trilobatum leaf extract as the stimulant and Nickel nitrate as the precursor. The Nickel oxide is examined using a range of characterization methods including X-ray diffraction, Fourier Transform Infrared spectroscopy, High-Resolution Transmission Electron Microscopy, High-Resolution Scanning Electron Microscopy, X-ray photoelectron spectroscopy, Thermo gravimetric Analysis/Derivative Thermo gravimetric Analysis, Diffuse Reflectance Spectroscopy, cytotoxicity and antimicrobial investigations The X-ray diffraction examination determined that the average size of the crystals increases as the quantities of leaf extract in the NiO_2 composites rise. The decrease in line broadening (β) value and the increase in leaf extract concentrations may be the cause of this phenomenon. The FTIR spectrum confirms that the as-synthesized NiO-NPs are of great purity and match well with the XRD pattern. The thermal stability of the synthesized samples was determined using TGA/DTG analysis. The analysis was conducted in an air atmosphere, with the temperature increasing at a rate of 10°C per minute. The temperature range for the analysis was from room temperature to 750 C. The optical properties are determined by the use of Diffuse Reflectance Spectroscopy, which examines the coordinated movement of electrons in the conduction band when exposed to electromagnetic waves. Rat skeletal muscle cell line and SKMEL cancer cells were cultured on 96-well plates and incubated at 37°C and 5 % CO_2 for 24 hours to allow them to adapt to the culture conditions. An investigation was conducted to assess the antibacterial properties of synthesized nanocomposites against two types of bacteria: gram-positive *Staphylococcus aureus* (MTCC No: 87) and gram-negative *Escherichia coli* (MTCC No: 443), In order to explore their potential for biological applications.

1. Introduction

Nickes oxide, an inorganic substance with a chemical formula, is in "black solid" (NiO) [1]. This chemical formulation (NiO) is an insoluble and base and acid have the ability to attract it. Given its extensive range of applications in various industries, this material is attracting significant interest. Applications encompassed within this category include catalytic and electro chromic films, fuel cell electrodes and gas sensors, smart windows, electrochemical supercapacitors, battery cathodes, magnetic materials, and photovoltaic systems. NiO is a P-type semiconductor with a wide band gap ranging from 3.6 to 4.0 eV. NiO nanoparticles exhibit distinct optical, catalytic, electrical, and magnetic properties compared to bulk NiO particles due to quantum size and surface effects. Nanoparticles' size, form, and ubiquitous nature allow them to enhance physical, chemical, or biological characteristics. The non-toxic approach that focuses on using plant extract to synthesize nanoparticles is known as Green Synthesis. It is considered to be fast, eco-friendly and low cost [2,3]. The modern research presents that "semiconductive heterogeneous" photo catalysis is the assuring substitute for the removal of organic contaminants [4]. The synthesis of

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To Study on Optimizing Resource Use and Reducing Waste by Using a Pioneering Analytical Method

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Abstract

This study explores innovative analytical methods to optimize resource utilization and minimize waste, addressing the critical environment and economic challenges faced by hotel industries. By blending advanced data analytics and analytical techniques, this study aims to establish a sustainable operational framework for hotels. Through the examination of case studies from a range of food hotels, the study showcases how predictive analytics can help predict demand, streamline inventory management, decrease food wastage.

The main objective of the project is to get the full knowledge of the optimizing resource through daily sales tracking, daily purchase and inventory management, daily wastage monitoring in the hotel. By integrating these components, this project seeks to provide actionable insights and findings of solutions for restaurants. This approach was validated and data gathered by online survey from one restaurant and got 119 responds from 120 employee. The data was collected and processed using SPSS tool for analysis like (ANOVA, Chi-Square, Regression Analysis, Correlation Analysis) and Power bi for creating dashboard that provide value for restaurants. By this analysis it empowers restaurant managers with real-time data and insights, quick decision-making about resource management that will helps to reduce waste and optimize resource use to enhances operational efficiency, reduces costs, and improves overall profitability.

Keywords: Reducing Wastage, Optimizing Resources, Inventory Management, Online Survey, Power bi for Sashboard, Operational Efficiency, Advanced Data Analytical Techniques.

Introduction

Optimizing resource use and Reducing waste are essential for both economic viability and environmental sustainability. The sector faces significant challenges due to the high volume of perishable goods, fluctuating customer demand, and stringent regulatory requirements. Effective resource management not only reduces costs but also minimizes environmental impact, aligning with global sustainability goals.

Daily Purchases Management: Keeping track of daily purchases is vital for maintaining adequate inventory levels and controlling costs. Our project includes features to log daily purchases of food items and ingredients, ensuring that restaurants have the necessary supplies

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To Study on "Assessing the Impact of Hybrid Work Versus On-site Work Mode" with Respect to Employees

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Abstract

During the covid and after the covid, the emerge of remote work and hybrid model, changed most of the employee's interest. Now, recent years the employers want their employees back to office, the switching towards hybrid work and traditional office-based work seriously impacted employees in different ways. This study to assess the impact of hybrid work versus On-site work, within a single IT company employee. By focusing on the company employees, this study tries to find in-depth comprehension, of how well these models of work affect the productivity of employees, work-life balance, Job Satisfaction, Mental health and collaboration and communication. This study collects the quantitative data through structured surveys from 100 employees. The collected data was processed using SPSS tool for analysis such as ANOVA, Regression and Correlation). This study also inspects the demographics variables such as age, experience, gender etc. to distinguish and distinct impacts among the various employee groups. Through data analysis, the study aims to provide actionable understanding for employers seeking to optimize work arrangements. These understanding helps the employers to make informed decisions to enhance the employee productivity, satisfaction and well-being, collaboration and communication, eventually contributes to the company's overall success in the evolving work landscape.

Keywords: Employees Productivity, Work-life Balance, Mental Health, Collaboration and Communication, On-site Work, Hybrid Work.

Introduction

The concept of hybrid work, which involves employees working in both remote work as well as the physically present in the office. Hybrid work offers flexibility and the potential for improved work-life balance but also presents challenges in maintaining productivity, ensuring effective communication, and preserving company culture.

The Shift in Work Paradigm

Generally, work was Synonymous with a physical office where representatives congregated to perform their obligations beneath coordinate supervision. This demonstrates given structure, encouraged real-time communication and collaboration The appearance of advanced

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A Study on "Lending Strategies and Technological Advancements of Financial Sector" with Special Reference to Kanyakumari District Central Cooperative Bank Limited

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Abstract

Banking is essential for the economy because it makes money easier to move and makes economic activity possible. The primary functions of a bank include taking deposits, making loans, assisting with transactions, and providing a range of financial goods, such as credit cards, loans and savings accounts. Here, the lending strategies adopted and the different technologies used by the bank for the growth of the bank and for the welfare of the people. The different lending policies adopted by the bank makes the people to take more loan. The main purpose of this study is to evaluate the degree of technologies used in lending, the internet banking services and its impacts on customer engagement and to know about the innovative strategies used by the bank. The research methodology used here is descriptive analysis. The data is collected by preparing questionnaire and convenience sampling method is used. 120 responses had taken for the analysis and the tools used for the analysis were percentage analysis, one way ANOVA and correlation. Finally the analysis help to find out to give some more innovative strategies and few more technological innovation in the lending process to complete the loan process faster. Some more updations were made in the online banking services to make it more easier for the people and get to know more about their account activities in an easier way.

Keywords: Lending Policies, Technologies, Internet Banking Services, Innovative Strategies Updations.

Introduction

Banking

Because banking facilitates the movement of money and allows for economic activity, it is vital to the economy. Banking is the network of financial organizations, such as credit unions and banks, that provide a variety of financial services to individuals, businesses, and governmental entities. A bank's main duties include receiving deposits, disbursing loans, helping with transactions, and offering a variety of financial products such savings accounts, credit cards,

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Short communication

Highly efficient fluorescence sensing of Al^{3+} ions using a sensitive carbazole based Schiff base

G. Suganthi [a,b], R. Ajitha [a], A. Anish Babu [c,*], S. Kamalesu [d,*], R. Subramanian [d], T Arun [d], A. Godlyn [e], Karuppiah Nagaraj [f]

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ABSTRACT

A new carbazole based fluorescent turn-on probe, 2-((E)-(9-ethyl-9H-carbazol-6-ylimino)methyl)-4,6-diiodophenol (CS) was designed and synthesized through the condensation of 3-amino-9-ethyl carbazole and 3,5-diiodo salicylaldehyde. The new CS probe is highly sensitive towards selective detection of Al^{3+} ions, even in various other metal ions in 90 % aqueous acetonitrile. The binding efficiency of the probe towards metal ion is investigated through absorption and fluorescence spectral techniques. The Fluorescence intensity of CS enhances together with a blue shift of 16 nm was observed only in the presence of Al^{3+} ion and also forms a ground state complex with Al^{3+} in 1:1 stoichiometry with association constant, $K_a = 5.44 \times 10^4$ L/mol and binding constant $K_b = 4.99 \times 10^4\ M^{-1}$. The Gibb's free energy change (ΔG) value for the complex formation process (-2.701×10^4 J K^{-1} mol^{-1}) indicates its spontaneity. The detection limit of the probe ions was calculated to be as low as 0.403 mg/μL from the titration curve.

1. Introduction

The design and synthesis of molecular fluorescent probes having high selectivity towards metal ions are intriguing for their diverse applications because of their ease of use, high sensitivity, and quick response in the environment and in biology. Aluminium is one of the most prevalent metals in the earth's crust. Excessive exposure to aluminium in the human body is recognized to be harmful to one's health [1–5]. Parkinson's disease, Alzheimer's disease, kidney damage, chronic renal failure and bone softening are all possible side effects. Pharmaceutical medications containing aluminum, such as antiseptic treatments, antiperspirants and adjuvants in vaccines for human health, are extensively used. As a result, accurate Al^{3+} detection has become critical for regulating its presence in the environment and preventing its extant influence on human health [6–8]. Additionally, large levels of Al^{3+} are hazardous to plant's growth and aquatic life. Given the detrimental effects of Al^{3+} on human health and the environment, it is critical to develop effective Al^{3+} detection methods with high selectivity and sensitivity. To date, atomic absorption spectroscopy, atomic emission spectrometry, mass spectrometry, and voltammetry have all been employed to detect Al^{3+} ions [9–12]. Schiff base derivatives have been widely used in the construction of fluorescent chemo sensors for metal ion sensing due to their unique photo physical properties and high binding capacities to diverse metal ions [29–32]. Most of the Schiff base containing fluorescence chemo sensors, to our knowledge, is tiny organic derivatives that do not soluble in water and must be used a mixed aqueous solution-organic co-solvent for metal ion detection. The metal aluminum is the abundant metals and element in our earth's crust and used in home food additives and some industries such as packing and manufacturing of paper and computer etc., However, many literature reported based on its concentrations highly toxic towards living organisms. According to the World Health Organization, daily aluminium intake should be 3–10 mg/day, and the maximum Al^{3+} content in drinking water should be 7.41 mM. Al^{3+} has lower coordination ability than transition metals, and it is difficult to identify spectroscopically due to its lack of photophysical characteristics. Schiff base

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