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3.3.3 BOOKS/CHAPTERS AND PUBLISHED PAPERS IN CONFERENCE

Academic Year	No:of Books	No:of Papers in conference	International/National
2023-2024	5	73	78




Co-ordinator





Principal



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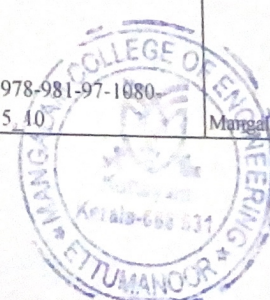
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MANGALAM COLLEGE OF ENGINEERING

3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during year

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	Dr. K Arun Kumar	NA	Utilization of Waste Byproduct in the Production of Green Geopolymer Concrete	Lecture Notes in Civil Engineering	International Conference on Interdisciplinary Approaches in Civil Engineering and Sustainable Development. IACESD 2023.	International	2023	978-981-97-0910-6_26	Mangalam College of Engineering	Springer
2	Dr. K Arun Kumar	NA	Utilization of silica fume for the production of self compacting GGBS based geopolymer concrete.	AIP Conference Proceedings	INTERNATIONAL CONFERENCE ON RECENT INNOVATIONS IN SCIENCE AND TECHNOLOGY (RIST2022)	International	2024	1551-7616	Mangalam College of Engineering	AIP Publishers
3	Dr. K Arun Kumar	NA	Effect of silica fume on rheological, mechanical and durability properties of ground granulated blast furnace slag based geopolymer concrete	AIP Conference Proceedings	INTERNATIONAL CONFERENCE ON RECENT INNOVATIONS IN SCIENCE AND TECHNOLOGY (RIST2022)	International	2024	1551-7616	Mangalam College of Engineering	AIP Publishers
4	Dr. K Arun Kumar	NA	Parametric Study on Strength Performance of Geopolymer Concrete Using Industrial By-Products. Recent Advances in Mechanical Engineering	Lecture Notes in Mechanical Engineering.	Recent Advances in Mechanical Engineering. ICRAMERD 2023	International	2023	978-981-97-1080-5_10	Mangalam College of Engineering	Springer

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Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
5	Dr. K Arun Kumar	NA	Experimental investigations on fresh and mechanical properties of fly ash and ground granulated blast furnace slag self-compacting geopolymer concrete	Materials Today Proceedings	INTERNATIONAL CONFERENCE ON RECENT INNOVATIONS IN SCIENCE AND TECHNOLOGY (RIST2022)	International	2024	2214-7853	Mangalam College of Engineering	Elsevier
6	Gokul P V	NA	An Experimental Study on Performance of Two-Part Geopolymer Concrete Using Natural Binders and Activators.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
7	Dr. D RameshKumar	NA	Correlation of Mechanical and Durability Properties of Binary and Ternary Blended High-performance Concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
8	Sankar B	NA	Correlation of Mechanical and Durability Properties of Binary and Ternary Blended High-performance Concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences



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9	Dr. K Arun Kumar	NA	Comparative study on the performance of one part and two part geopolymers concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
10	Gokul P V	NA	Comparative study on the performance of one part and two part geopolymers concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
11	Dr. D Ramesh Kumar	NA	Comparative study on the performance of one part and two part geopolymers concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
12	Reni Kuruvilla	NA	Experimental study on partial replacement of fine aggregate in concrete by waste tyre rubber and cement by fly ash,	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
13	Salini Theres N Kurian	NA	Experimental Study on Rubberized Geopolymer Concrete with Sugarcane Bagasse Ash	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences



Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
14	Aswathy Soman	NA	Experimental study on steel fiber reinforced concrete modified with egg shell powder and nano silica	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
15	Dr. D RameshKumar	NA	A Novel Perspective in Construction: Analysing the Effects of 3-D Printing Innovation	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
16	Sankar B	NA	Review of Mechanical, Durability, and Thermal properties of Light weight concrete containing cenosphere	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
17	Dr. D RameshKumar	NA	Advancements in Concrete Performance by Using Waste materials in the Mixture,	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
18	Abhijith Kumar A N	NA	Use of plastic waste as recycled material in the concret	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences



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19	Dr.Swaminathan P.	NA	replacement of cement in the	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
20	Aksharamol G Raj	NA	Partially Replacing Cement by	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
21	Nimisha Annie Abraham	NA	reinforced geopolymer concrete	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
22	Asha Jose	NA	Alternatives for Industrial Waste	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
23	Dr K Arun Kumar	NA	Utilizing Coffee-Husk Ash as an	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
24	Gokul P V	NA	Utilizing Coffee-Husk Ash as an	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
25		NA	Hybrid Fiber-Reinforced Low	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
26	Dr. K Arun Kumar	NA	Hybrid Fiber-Reinforced Low	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
27	Gokul P V	NA	Behavior of One Part Geopolymer	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
28	Silpa Caroline James	NA	Cockle Shell Ash, Sea sand and	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
29	Mita Ann Zachariah	NA	Gum, Gellan Gum Biopolymer	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
30	Haritha M R	NA	Energy Development in India	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
31	Karthika S Nair	NA	and Implementing into Effective	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
32	Rakhi Sugunan	NA	and Watershed health for	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
33	Dr Radhakrishnan R	NA	Single Effect Absorption System	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
34	Geethu Lal	NA	Disaster Analysis Using Image	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
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38	Sreerench Raghavu	NA	Materials From Conventional to	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
39	Neema George		regressive neural federated	Conf. 529	Conference on	International	2024	2267-1242	Mangalam College of Engineering	Web of
40	Jinu P Sainudeen		based skin cancer detection	Innovations in Engineering	Conference on Innovation in	International	2023	979-8-3503-1000-9	Hindustan Institute of Technology & Science, Chennai	IEEE
41	Roja Thomas		pituitary tumor using an optimal	Intelligence, ry Approaches	Conference on	International	2023	979-8-3503-1380-2	Mangalam College of Engineering	IEEE
42	Roja Thomas		Prostate Cancer Identification	Conf. 529	Conference on	International	2024	979-8-3503-6053-0	Mangalam College of Engineering	IEEE
43	Vinodh P Vijayan		regressive neural federated	Conf. 529	Conference on	International	2024	2267-1242	Mangalam College of Engineering	Web of
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46	Jinu P Sainudeen		Segmentation and Self Improved Tuna Swarm	Intelligence For Internet of	Conference on Artificial	International	2024	979-8-3503-7213-7	Hindustan Institute of Technology & Science, Chennai	IEEE
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49	Lijosh Mathew	NA	Biomaterials for Tissue	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	Web of
50	Dr. Abraham C G,	NA	assistive device for non-expertise	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	Web of
51	Shiney M Abraham	NA	Energy Generation	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	Web of
52	Jaleel P K	NA	Seaweed in Renewable Energy	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	Web of
53	Abraham	NA	in IoT: A Review of Tailored	International	Conference on	International	2023	979-8-3503-4167-6	Mangalam College of Engineering	IEEE
54	Dr Deepthy Mary Alex	Intelligenc	NA	NA	NA	International	2024	978-81-975192-7-7	Mangalam College of Engineering	INTERNATIO
55	Aparna Jose	NA	Purifier with Air Quality	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	Web of



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56	Dr. Abraham C.G.	NA	Purifier with Air Quality	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	Web of
57	Mariya Stephen	NA	Initiatives for Sustainable	Conferences	Conference on	International	2024	2267-1242	Mangalam College of Engineering	Web of
58	Dr. P.P George	g	-	-	-	National	2023	978-93-92321-07-8	Mangalam College of Engineering	Kerala
59	Ms Mariam Grace Saji	NA	Participation in the Hospitality	NA	Conference on	International	2024	NA	NA	Web of
60	Ms Amala Lovely James	NA	Handling Release of Carbon for	Conferences	Conference on	International	2024	eISSN: 2267-1242	Mangalam College of Engineering	Web of
61	Reshma Raveendranath	NA	Data Analytics in Geotechnical	Conferences	Conference on	International	2024	eISSN: 2267-1242	Mangalam College of Engineering	Publishers
62	Dr. Tomy Mathew	ary	Indian Stock Market	NA	NA	NA	2023	ISBN: 9789391355791	Mangalam College of Engineering	Perspectives in
63	Dr. Prima Anne George	Perspective	Awareness in Digital Marketing	NA	NA	International	2023	5	Mangalam College of Engineering	Culture Society
64	Dr. Reshma Gopi		Axis Wind Turbine from Highway	conference on	conference on	International	2024	9789392504587	Mangalam College of Engineering	Culture Society
65	Ms. Shoma Mani		for two wheeled electric cycle",	conference on	conference on	International	2024	9789392504587	Mangalam College of Engineering	Culture Society
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76	Ms Lekshmi Nair J		Change Control Strategy of	conference on	conference on	International	2024	9789392504587	Mangalam College of Engineering	Culture Society
77	Dr. Rabi J	-	An Algorithm for Extracting	2023 3rd		International	2023	979-8-3503-9927-1	Mangalam College Of Engineering	IEEE
78	Dr. K. Pratheesh, Dr.	2nd	-	-	ICAMET 2023	International	2023	978-93-5915-521-0	Mangalam College Of Engineering	Santhu



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Utilization of Waste Byproducts in the Production of Green Geopolymer Concrete

Conference paper | First Online: 13 April 2024

pp 313–323 | Cite this conference paper



**Environmental Engineering for
Ecosystem Restoration**
(IACESD 2023)

S. Arathi, Kadarkarai Arunkumar , Anila Mary Jacob, A. Suresh Kumar & S. Pream Kumar

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Abstract

The demand for green building materials has increased due to the global warming scenario of the world. In this study, industrial waste named GGBS along with metakaolin has been utilized as the binders for the production of geopolymer concrete at varying proportions ranging from 0 to 100%. Another crisis that the world faces is the scarcity of river sand. To overcome the scarcity, the river sand is substituted with M-sand and Silica fume in various proportions. The optimum ratio of M-sand and SF was found to be 60:40, due to the performance in mechanical properties. The results show that the geopolymer concrete mix with 70% GGBS and 30% metakaolin has attained good mechanical properties when compared with conventional geopolymer concrete. The addition of metakaolin resulted in the acceleration in fresh concrete properties at a rate of 0.5% and 1% in workability and initial setting time, respectively.


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ARTICLE NAVIGATION

RESEARCH ARTICLE | APRIL 02 2024

Utilization of silica fume for the production of self compacting GGBS based geopolymer concrete

K. Arunkumar ; A. Suresh kumar; M. Mohan Murali;
B. Gowtham Lohith; B. Aruna Jyothi; B. Sravani

+ Author & Article Information

AIP Conf. Proc. 3037, 020049 (2024)

<https://doi.org/10.1063/5.0196041>

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Tools 

Geopolymer concrete (GPC) is the most predominant alternate for cement concrete in construction industry which can highly reduce the CO_2 emission by the cement production. Self-Compacting Concrete (SCC) is also the growing technology that can help to pour the concrete in congested reinforcement sections. The effort is

Effect of Silica Fume on Rheological, Mechanical and Durability Properties of Ground Granulated Blast Furnace Slag Based Geopolymer Concrete

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Mukilan Karuppasamy^{4, d)}, Prem Kumar Vagestan^{5, e)}, Dhanush Pradeep^{6, f)},
Sai Sri Karthikeya Sakhamuri^{7, g)}

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Abstract. The need for concrete is growing rapidly every day and cement is utilized to satisfy the requirement for development of infrastructure. The manufacturing of cement products generates a massive concentration of carbon dioxide (CO₂) that impacts the ecosystem and surroundings, creates pollution as well as hazardous to human beings. In an effort to minimize the demand for cement and CO₂ emissions, in this study, alternating cementitious ingredients such as Ground granulated blast furnace slag (GGBFS) and silica fume (SF) were utilized. In this study, NaOH and Na₂SiO₃ were used to generate ground granulated blast furnace slag based geopolymer concretes that contained various proportions of silica fume, which were then cured at room temperature. Rheological, hardened, and durability properties were investigated. NaOH (14M) and Na₂SiO₃ were utilized as alkaline solutions to activate the geopolymerization. The findings indicate that the incorporation of SF increased the compressive, splitting tensile and flexural strength of geopolymer concrete. The geopolymer concrete has been observed highly reliable in the existence of 2 percent of sulphuric acid, 5 percent of sodium sulphate and 5 percent of sodium chloride.

Keywords: Fresh Properties, GGBFS, Durability Characteristics, Hardened Properties, Aggressive Environment.

INTRODUCTION

The worldwide usage of concrete is next to the water. In accordance with the increase in the need for concrete as a building material, Portland Cement consumption further increases. The production of cement uses a lot of energy and releases around a ton of CO₂, a greenhouse gas that contributes to global warming [1-4]. Therefore, in addition to making the cement sector quite environmentally friendly and sustainable, it is urgently necessary to manufacture a substitute for cement that is strong and durable enough.

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021044-1

Davidovits originally proposed a novel binding material called "geopolymer" in 1978 [5]. Geopolymers are created when highly alkaline solutions (hydroxides, silicates) are combined with aluminosilicate materials such as fly ash [6-10], metakaolin [11-14], silica fume [15,16], GGBFS [17-19], waste wood ash [20-24], bio-medical waste ash [25-29], waste glass powder [30-32], rice-husk ash [33], red mud [34], etc. Geopolymer Concrete (GPC) employs fly ash that has been triggered with an alkaline solution as the binder, among other aluminosilicate precursors [35-37]. Moreover, the requirement to heat these geopolymers at high temperatures to accelerate the dissolving of the monomer, there is a direct correlation between the amount of energy used and the amount of greenhouse gases emitted [38-40]. Also, the necessity for the high curing for such geopolymers limits their utilisation since it is unfeasible for many applications. Thus, to enhance and achieve the maximum economic viability of Geopolymer concrete when increasing its implementations, hence there is a necessity for discovering strategies for healing the Geopolymer concrete under atmospheric circumstances.

Lower early strength results from longer setting times for FA-based geopolymers that are cured in ambient circumstances [41,42]. By substituting different precursors, including ground granulated blast furnace slag, FA-based geopolymers' early strength and setting may be enhanced. Furthermore, it also necessitated the use of GGBFS at a greater substitution of fly ash in order to attain the desired characteristics. According to Provis [43] and Nath and Sarker [41], enhancing the GGBFS in geopolymers led to stronger bonds and quicker setting times since more gels were produced. Additionally, by integrating waste materials like silica fume, more silicate may be added to the geopolymer system [44-47]. The strength of the resultant composites has been observed to rise when the SiO₂ to Al₂O₃ ratio in geopolymers increases [48-51].

In view of this, the major goal of this research is to evaluate the characteristics of rheological as well as hardened GPC cured at room temperature by using silica fume as a lower substitute for GGBFS. In this investigation, silica fume replaced GGBFS to an extent of 40%. The characteristics of the geopolymer concrete mixture integrating SF as a substitute for GGBFS were explored, and the precursors utilized (i.e., GGBFS and SF) were described. Microstructural analyses of the geopolymer concrete containing the optimum amount of SF were also performed.

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Parametric Study on Strength Performance of Geopolymer Concrete Using Industrial By-Products


Conference paper | First Online: 15 May 2024

pp 113–124 | [Cite this conference paper](#)

Recent Advances in Mechanical Engineering
(ICRAMERD 2023)


[M. Maheswaran](#) , [C. Freeda Christy](#), [M. Muthukannan](#), [K. Arunkumar](#) Part of the book series: [Lecture Notes in Mechanical Engineering](#) Included in the following conference series:
[International Conference on Recent Advances in Mechanical Engineering Research and Development](#)**K. Arunkumar**

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Abstract

Green building materials are being developed around the world to limit the demand for rapidly depleting environmental assets, including greenhouse gas emissions. Geopolymers are significant in this environment, and various studies have considered a range of substances as suitable binder materials. In this dissertation, the workability and mechanical properties of geopolymer concrete mixes made using industrial by-products such as fly ash (FA) and Ground Granulated Blast Furnace Slag (GGBS) was determined by varying the FA and GGBS proportions (0–100%) with an interval of 10%, Molarity (8–14 M) and alkaline binder (A/B) ratios (0.40, 0.45, 0.50, 0.55, 0.60 and 0.61). For all mixes, the binder content (550 kg/m³) and alkaline activator ratio (1:2.5) were kept constant. Variations in the sodium hydroxide (NaOH) concentration and alkaline activator-binder ratio were used to determine how efficiently the compressive and tensile strengths were performed at ambient temperature. The experimental results shows that the increase in slag content improved the strength but reduced the workability, and the analysis for 28 days shows that the 70:30 proportion of FA and GGBS, the sodium hydroxide concentration of 13 M, and the 0.55 alkaline binder ratio has given the optimum compressive and split strengths with better workability.


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Experimental investigations on fresh and mechanical properties of fly ash and ground granulated blast furnace slag self-compacting geopolymer concrete

Vigneshkumar A^a , C. Freeda Christy^a, M. Muthukannan^b, M. Maheswaran^a, K. Arunkumar^c, R. Kanniga Devi^d

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Abstract

Concrete is typical utilized material that requires a lot of cement and energy to produce and emit carbon dioxide (CO₂), need to find an alternative. Self-Compacting Geopolymer Concrete (SCGC) is a sustainable engineering method in industrial ecosystems which do not need shaking and cement. In this study, the effects of fly ash (FA) and Ground Granulated Blast Furnace Slag (GGBS) based SCGC with sodium silicate and sodium hydroxide solutions as activator on fresh and mechanical properties was investigated. The constant binder concentration of 0.45 and binder weight of 450 kg/m³ are used. GGBS replacement with FA was 0%, 25%, 50%, 75%, and 100% weight percentage in each SCGC. The fresh properties were investigated by using tests such as slump flow, T_{50cm}, V-funnel, and L-box. The mechanical properties of SCGC were evaluated by compressive, split tensile, and flexural tests at 7 and 28 days. The GGBS and FA dosage is optimized, and results show that 50% treatment of the GGBS and FA has enhanced hardening qualities in SCGC 3 mix. Superplasticizers (2%) was used to maintain fluidity of the SCGC. This study shows the designed SCGC is cost-effective building material for precast and cast in situ constructions under ambient conditions.

Introduction

Global warming has become a universal problem today, and cement is the second most material for response to carbon dioxide (CO₂) emissions which emit 7% of total greenhouse gas in the atmosphere. So, to find a remedy for global warming, it needs to replace cement with an alternative solution to meet the requirements [1]. In this context, it is the better choice to use fly ash (FA), and slag has cementitious properties to perform well when used as an alternative to cement [2].

In addition, Geopolymer Concrete (GC) has sparked widespread interest because of CO₂ reduction and maintaining sustainability. The raw materials used in geopolymer that require less energy. The CO₂ emissions from geopolymer binder are 5–6 times lower than those from cement. The disadvantage of GC is the parent material that comes from anywhere but must be high in alumina and silica oxides. Industrial byproducts particularly FA, Ground Granulated Blast Furnace Slag (GGBS), rice husk ash, and metakaolin, uses in production of GC [3], [4]. The primary constituents of geopolymer materials are an aluminosilicate base and liquid alkaline constituents [5], [6]. Among them, FA has significant potential because high in silica, and GGBS contains calcium and magnesium silicates and aluminosilicates [7]. On the other hand, GC had a minor response to carbonation and alkali-aggregate reaction than ordinary Portland cement concrete [8], [9].

Self-Compacting Concrete (SCC) is self-consolidating behavior that compacts under its weight and first progressed from Japan in the 1980s. Three properties define SCC workability: resistance segregation, filling ability, and passing ability [10]. Despite the SCC benefits, expensive than traditional concrete because more cement and chemical admixtures use to maintain the flow ability [11], [12]. Moreover, It is necessary to improve workability and hardened cementitious and mineral materials properties with lower construction costs [13].



An Experimental Study on Performance of Two-Part Geopolymer Concrete Using Natural Binders and Activators.

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Abstract. The study investigates the characteristics of geopolymer concrete, employing sodium silicate and sodium hydroxide as activators instead of cement. In conventional construction practices, binders like fly ash, ground granulated blast furnace slag (GGBS) are commonly combined with alkali solutions. The manufacturing process of geopolymer relies on various alkaline activators. In this research, GGBS is replaced with sodium hydroxide and sodium silicate as activators. GGBS is recognized for its ability to enhance the workability and strength of geopolymer concrete, exhibiting favorable mechanical properties, resistance to chemicals, minimal shrinkage, environmental friendliness and exceptional durability. Furthermore, there are still certain drawbacks to geopolymer concrete, such as the fact that alkaline solutions are difficult to handle and apply because they are viscous, corrosive, difficult to transport, as well as challenging to store in huge quantities. A two part geopolymer concrete consists of two main components. An activator solution and a binder solution. The activator solution typically contains alkali metal hydroxides or silicates, while the binder solution contains aluminosilicate material such as fly ash or metakaolin. When mixed together, these solutions undergo a chemical reaction that forms a solid and durable geopolymer material.

Keywords. Geopolymer Concrete, One part geopolymer, GGBS, Sodium Carbonate

1 Introduction

This study addresses the environmental concerns associated with traditional cement production, highlighting its significant impacts on land use, water contamination, and air pollution, as well as its non-recyclable and non-renewable raw materials [1-6]. Kamal Neupane is described about the environmental study of two part geopolymer concrete [7]. In response to these issues, an eco-friendly construction material known as geopolymer concrete is introduced. In this research, GGBS is utilized as a binder material, while sodium hydroxide and sodium silicate serve as activators. Gaurav Thakur and et al, aimed that partially replacing OPC with fly ash. GGBS and silica fume are reported [8]. The alkaline

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Correlation of Mechanical and Durability Properties of Binary and Ternary Blended High – performance Concrete

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Abstract: High-performance concrete is a specialized type of concrete renowned for its exceptional strength, durability, and resilience to various environmental stresses. Typically it's crafted using a combination of two or three supplementary cementitious materials (SCMs) in precise proportions to achieve specific performance attributes. Ternary blended concrete, for instance, incorporates three different SCMs alongside Portland cement. This study delved into the relationship between mechanical and durability aspects of high-performance concrete. Durability measures including electrical resistivity, water absorption, porosity, chloride penetration, and carbonation were analyzed alongside the compressive strength of various concrete mixes. The findings indicate that ternary blended concrete displays superior electrical resistivity, lower water absorption, reduced critical pore size, decreased chloride diffusion coefficient, and slower corrosion rate compared to binary mixes. Power correlations were conducted on these durability parameters, revealing a positive correlation between compressive strength and durability properties.

Keywords: Correlation studies, mechanical properties, Durability properties, Ternary blended concrete, High -performance concrete

1 Introduction

Over the previous few decades the materials that are used excessively in the construction business include concrete and cement composites[1]. The natural resources that are the main components of the cement industry are continuously being depleted as a result of the rising demand[2]. The production of Portland cement is energy-intensive and requires natural raw resources, mainly limestone and clay, which is bad for the environment. Additionally, producing this cement releases a significant amount of CO₂, a key greenhouse gas. According to reports, one ton of Portland cement equals to one ton of CO₂. As a result, the mechanism is increasingly implicated in global warming[3,4,5].

There are legitimate and substantial worries about how traditional concrete and cement production affect the environment. The creation of substitute cementitious materials using certain industrial byproducts is a viable strategy that can either totally or partially

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Comparative study on the performance of one part and two part geopolymer concrete

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Abstract. As cement is the primary cause of CO₂ emission, an attempt is made to replace the cement and it is done by replacing the cement with GGBS and silica fume along with activators such as sodium silicate and sodium hydroxide. By enrolling such materials in concrete, it will ensure the reduction of environmental consequences. This research is done by replacing of the cement with GGBS and silica fume without involving any type of admixtures. And it is done for M 30 grade with varying GGBS i.e., 90%, 80%, 70% and 60%. And to accelerate the pozzolanic effect, silica fume is added in diverse proportions i.e., 10%, 20%, 30% and 40%. Sodium hydroxide is kept constant throughout. Specimens were prepared for testing and ambient curing of 7 & 28 days has done. Tests such as compressive, split-tensile and flexural strength test are performed to obtain the mechanical behaviour of the concrete.

Keywords. Ground Granulated Blast- Furnace Slag, Silica Fume, Compressive Strength, Split- Tensile Strength, Flexural Strength

1 Introduction

For development, sustainability is the most important thing that has to be considered. Sustainable development should meet the requirements of the present without compromising the ability of future generations to come over their requirements [1]. There are many things in the world which will be a threat to the environmental sustainability. Out of these, cement is considered as the primary reason. Cement concrete is considered as one of the most versatile materials used in the construction field. This cement has a greater binding property which in turn helps to increase the strength of concrete buildings but the industry of cement is responsible for the emission of CO₂ into the atmosphere. Due to the increased production in concrete, [2] the emission of CO₂ has also been increased tremendously which in turn causes many health issues to all living things existing in the earth. In the case of global warming, 65% of global warming is by one of the greenhouse agents which is CO₂. And this CO₂ will increase the effect of global warming. As the use of cement causes many such environmental related problems, GGBS and Silica Fume are introduced instead of the harmful material cement into the concrete. As the expulsion of toxic waste materials develops serious issues to the whole world, one attempt is done here to enhance the sustainability by utilizing those waste materials in the concrete. And it can be considered as an approach that is sustainable. As cement gives better strength, resistance to fire and fair durability,

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Experimental study on partial replacement of fine aggregate in concrete by waste tyre rubber and cement by fly ash

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Abstract. Waste tyre disposal is one of the biggest environmental problems the world is currently experiencing. Because of its non-bio degradable character, it is very difficult to dispose them without making much harm to the environment. So, there is a big need of finding out a new way to dispose the tyre waste safely. Use of tyre rubber in place of fine aggregate in construction field was one of the alternatives put forth. An investigation in the compressive strength of concrete having shredded tyres in place of sand was conducted through an experimental program. For this investigation, several cubes, beams, and cylinders of M30 grade were cast. The fine aggregate in concrete mix were replaced with 20%, 25%, 30% of tyre rubber. As we all know that, there are numerous thermal power plants across the world, each plant produces different kinds of waste materials like fly ash, its disposal also needs some serious supervision. Due to the presence of some chemical's like calcium oxide, fly ash can be used as a cementing material. This experiment studies the characteristics of tyre rubber induced concrete and check the feasibility of replacing cement with 25% of fly ash in that rubberized concrete mix.

Keywords: Tyre rubber, Fly ash, Compressive strength

1 Introduction

One of the most important problems facing the entire planet is the disposal of waste. Tyre trash disposal is a serious issue since a long time ago. Even after a lengthy period of usage, this material is extremely difficult to decompose. Rubber waste is also utilized as a raw material to make rubber products [1]. However, such recycle process is expensive and time consuming. Concrete plays a major role in every construction field. Its production requires large quantities of natural raw materials. As a result, our natural resources are declining day by day. So, it's important to bring suitable materials to reduce the usage of our natural raw materials. Waste tyre rubber is such a material that can be used as fine aggregate in concrete. After the life span of tyres, it is better to convert them into suitable sizes to use them as fine aggregate or coarse aggregate partially or whole in concrete [1]. However, the utilization of tyre crumb in concrete has only been the subject of a small number of studies yet. In the

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Experimental Study on Rubberized Geopolymer Concrete with Sugarcane Bagasse Ash

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Abstract. The purpose of this experimental investigation is to determine whether it is feasible and effective to use sugarcane bagasse ash (SCBA) in place of some of the cement in rubberized geopolymer concrete. Rubber particles are added to the concrete to improve its ductility and energy absorption capability, while SBA is added as an additional cementitious material to lessen its environmental impact. Sugarcane bagasse ash, a byproduct of the sugarcane industry, has the potential to be utilized as an extra cementitious element due to its pozzolanic properties. To improve the concrete mix's ductility and ability to absorb energy, waste rubber particles are added. Rubberized geopolymer concrete is evaluated in numerous curing circumstances through extensive laboratory testing, which includes compressive strength, flexural strength, and split tensile strength. The study's findings shed light on whether using SCBA in rubberized geopolymer concrete is feasible and present environmentally friendly options for building applications. The study helps to promote circular economy concepts and environmental sustainability in the building industry by lowering cement usage and utilizing waste rubber resources. The design and optimization of rubberized geopolymer concrete mixes for improved mechanical qualities and durability are among the practical implications that may be applied to promote the use of environmentally friendly building materials. The mechanical characteristics of rubberized geopolymer concrete were assessed through experimental research. This paper is a scientific approach for complying the performance evaluation of strength studies such as Flexural strength, Compressive strength, Split tensile Strength, effect of NaOH molarities and the effect of curing method in rubberized geopolymer concrete that contains SCBA.

Keywords: Fly Ash, Sugarcane bagasse Ash, Rubberized Geopolymer Concrete, Alkaline Activator Solution

1 Introduction

The demand for concrete is rising as a result of the increased infrastructure and building development worldwide. Portland cement, a vital component of conventional concrete, is a major contributor to atmospheric carbon dioxide emissions. The majority of the energy and carbon dioxide emissions related to ordinary ready-mixed concrete are caused by Portland cement [1, 2]. The environmental impact of cement production and the high demand for

Experimental study on steel fiber reinforced concrete modified with egg shell powder and nano silica

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Abstract This work presents the mechanical characteristics of concrete enhanced with egg shell powder (ESP) and nano-silica (NS) along with steel fibres. Steel fibre reinforced concrete (SFRC) offers several benefits, including prevention of macro cracks, improving ductility and residual strength and increasing toughness. These benefits make SFRC a valuable choice for structural applications requiring enhanced durability, crack resistance, and resilience to mechanical stresses. To develop the modified concrete mixture the Ordinary Portland Cement (OPC 53 grade) was partially replaced with varying percentage such as 0%, 5%, 10%, and 15% of ESP and NS by weight of the total binder content. Steel fibers were merged into the concrete at a volume fraction of 1.5% by weight of concrete to boost the engineering characteristics of concrete. The effect of ESP and NS were observed on compressive, flexural and split tensiles strength of the concrete. The test was conducted after 7 and 28 days of curing period. The inclusion of 10% and 15% percentage of ESP and NS gives high mechanical properties. The findings validated the suitability and efficacy of employing ESP and NS as partial substitutes for OPC, leading to substantial enhancements in the engineering characteristics of SFRC.

Keywords : Concrete, Steel Fibre, Egg shell powder, Nano silica

1. Introduction

Cement-based materials (CBMs) are in high demand to meet the growing needs of the construction industry. CBMs primarily consist of aggregates, cement, and water. Cement production is energy-intensive and releases substantial amounts of carbon dioxide, a major greenhouse gas. As a result, the production of building materials, particularly CBMs, has a significant impact on the natural environment. The reliance on cement as a key ingredient in construction materials underlines the importance of exploring sustainable alternatives and adopting practices that reduce environmental harm while meeting construction demands. Industrial leftovers and agricultural trash are two types of solid waste materials that can be transformed into cement substitutes, reducing cement consumption and mitigating

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environmental harm from open trash disposal [1]. Eggshells are currently disposed of in landfills worldwide in significant quantities, and by 2030, global egg production is expected to increase by about 90 million tons. It is crucial to explore alternative technologies for converting eggshells into components for other applications. Due to the similar chemical composition of cement, the eggshell powder (ESP) is employed as a fractional alternative for Ordinary Portland Cement (OPC) in concrete [3].

One of the most widely used type of alternative of cement in concrete industry is nano silica (NS). Nano silica particles are used in concrete to enhance its mechanical properties.



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A Novel Perspective in Construction: Analysing the Effects of 3-D Printing Innovation

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Abstract. The sector of production has witnessed a transformative shift with the combination of 3-D printing technologies, providing novel strategies to design, production, and constructing practices. This investigation explores three primary 3D printing techniques: Extrusion-type techniques, Powder Bonding, and Spray Methodologies, each contributing uniquely to the sustainable development of the construction industry. We delve into the usage of revolutionary materials, including gelatin-based composites and geopolymers, and verify their effect on performance, sustainability, and structural integrity. The research underscores the importance of each approach's technique to diminishing material waste, improving durability, and facilitating complex architectural designs. Although by analysing latest improvements and experimental findings, the study gives insights into the evolving perspectives of construction methodologies, highlighting the potential for advanced environmental compatibility, cost-effectiveness, and architectural flexibility.

Keyword:- Construction industry, 3D printing, extrusion, spray, powder bonding, environmentally friendly.



1 Introduction

With yearly sales of around 10 trillion USD, the construction sector is a major contributor to the world economy and has experienced tremendous growth in recent years. However, the

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Review of Mechanical, Durability, and Thermal properties of Light weight concrete containing cenosphere

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Abstract. Compared to conventional concrete, lightweight concrete offers a reduced unit weight, making it easier to handle and transport. Its popularity has surged globally in numerous countries and has proven beneficial for construction purposes. Lightweight concrete often exhibits better thermal insulation properties compared to traditional concrete, contributing to energy efficiency in buildings. Recently, the inclusion of cenospheres in lightweight aggregates is being heavily researched around the world. Cenosphere addition increases the volume of the concrete mixture because of their smaller size and hollow nature of the particle. This research paper showcases the various applications and advantages of lightweight concrete (LWC) containing cenosphere, along with highlighting the role of different supplementary cementitious materials characteristics and manufacturing methods. Furthermore, the current study examines previous researches on sustainable lightweight concretes and showcases the improvements and advancements in mechanical, durability, and thermal properties obtained when cenospheres were added.

Keywords: Light weight concrete, Mechanical properties, Durability properties, Thermal properties, Supplementary cementitious material

1 Introduction

The production of concrete relies heavily on natural resources, positioning it as the second most utilized material globally following water. This extensive usage has adverse environmental consequences, particularly due to the heightened demand spurred by the expanding construction sector [1], [2]. The increased consumption and production of concrete and its key component, cement, contribute significantly to environmental harm, including escalated greenhouse gas emissions. The cement industry, like many others, grapples with challenges related to carbon dioxide emissions, energy sourcing, material utilization, and resource management. Carbon dioxide is emitted at various stages of cement manufacturing, encompassing fuel consumption, transportation, and production processes. Consequently, there has been a push for the introduction of alternative raw materials in concrete manufacturing to mitigate the overall environmental impact of the construction industry and foster sustainability. This review focuses on investigating the substitution of cementitious materials with lightweight alternatives to produce lightweight concrete, aiming to address these environmental concerns [3], [4], [5].

Research in the field of lightweight and durable concrete materials encompasses the utilization of various additives and aggregates to optimize performance and sustainability in construction applications. Lightweight concrete is a flexible and easily transportable construction material. Its affordability, particularly for larger construction projects, stems from the reduced need for steel reinforcement or additional concrete. The reduced density of lightweight concrete offers several advantages, including improved thermal insulation properties, reduced dead load on structures, and enhanced workability during construction [6], [7], [8]. There are a number of byproducts created during the burning of coal in power plants, including fly ash, cenosphere and bottom ash. The usage of cenosphere in LWC are recently being researched. Also, the coal plant also provides aggregates such as bottom ash which are

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Advancements in Concrete Performance by Using Waste materials in the Mixture

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Abstract. There have been serious research advancements in concrete materials to make construction more sustainable. Specifically, this is true with regard to alternative ingredients used for self-compacting concrete (SCC) production. To improve its sustainability, this study is aimed at adding Fine Recycled Concrete Aggregate (FRCA) and Recycled Concrete Aggregate (RCA) into SCC. Crushed and reclaimed asphalt (RCA), on the other hand, has many benefits including lower environmental impact and cost-effectiveness. Nevertheless, there are several issues associated with contractors' knowledge among others being variations in their properties. It's also known that FRCA can imbibe water faster; hence, mineral admixtures may be introduced to further enhance mechanical behaviour of the concrete. Fly ash and geopolymer synthesis are examples of waste products from industry as well as by-products of coal combustion which are useful in making green concretes. The best results would be achieved if fly ash, a popular Supplementary Cementitious Material (SCM) that reduces Ordinary Portland Cement's (OPC's) need is divided according to its oxide content. In order for geopolymers to become an alternative for cement making materials such as aluminosilicate source or alkali reactants are applied. Engineered Cementitious Composite (ECC) enhances performance of concrete even more with strain-hardening properties, especially in terms of durability and tensile capacity. On the whole, manufacturing concrete from recycled and industrial waste products is cost effective and environmentally beneficial. These materials can be maximized if proper

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Use of plastic waste as recycled material in the concrete

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Abstract. In this study, we examined the effect of adding recycled plastics to concrete. The waste plastics were collected from a local market. The disposal of plastics is a major issue with many negative consequences. Plastic, being inorganic, does not change the chemical characteristics of concrete and has no effect on its quality or consistency, making it an ideal material for use in the construction industry, where it may help reduce plastic waste. Plastic has dual uses in concrete as a filler ingredient and as an additive to enhance the mechanical properties of the material. The concrete was prepared using five different amounts of aggregate substitution by volume: 10%, 20%, 30%, 40%, and 50%. Cubes and beams were cast, cured, and tested using a universal testing machine. A mixed proportion was made using the different ingredients used in the concrete. At 7, 21, and 28 d, the results showed that the compressive and flexural strengths increased as the percentage of plastic waste increased. Also, flexural strength improved with an increase in the proportion of plastic waste, reaching a maximum at 30%. These results highlight that, as plastic fiber decreases the quantity of industrial fibers needed in concrete, it is also proven to be more inexpensive.

Keyword:- Plastic waste, recycled material, concrete, compressive strength, flexural strength, performance, properties.

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Use of silica fume as a replacement of cement in the concrete

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Abstract. Over the past 30 years, significant advancements have been made in enhancing the capabilities of concrete as a construction material, with a focus on high-strength concrete applications using Silica Fume (SF). Global interest in SF as a pozzolanic admixture has surged owing to its ability to enhance concrete properties when used at specific percentages. This study examined the effect of addition of SF in concrete mixes. The performance of concrete in corrosive environment is most important and it can be enhanced by the addition of SF. For strength and longevity, high strength concrete is required. In this study, concrete was prepared with varying proportions of silica fume (5, 10, and 15% by aggregate volume). The specimens were tested to evaluate their strength. The cubes and beams were casted, cured and tested on universal testing machine. The findings showed that both the compressive and flexural strengths were improved by the addition of silica fume. The mechanical and durability properties of concrete are significantly enhanced by the incorporation of silica fume. The findings of this study are helpful for construction industry in the use of silica fume as an economical choice for the enhancement of strength.

Keyword:- Silica Fume, Concrete, Industrial Waste, Pozzolanic Properties, Compressive Strength, Flexural Strength

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Advancement of Concrete by Partially Replacing Cement by Zeolite & Fine Aggregate by Glass Powder

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Abstract. Using glass powder for partially replacing of fine aggregate in concrete helps to reduce the demand for natural resources like sand, promote recycling of glass waste and enhance the overall strength and durability of concrete, it can also improve the thermal and sound insulation properties of concrete. Zeolite is a naturally occurring mineral that can enhance the properties of concrete, and increase its strength and durability. It can also help with reducing the carbon footprint of concrete production. By partially replacing cement with zeolite, we can reduce the amount of cement needed, which in turn reduces the carbon emissions associated with cement production. Zeolite is a type of porous mineral that has unique properties, making it a potential substitute for cement in concrete production. When zeolite is used as supplementary cementitious material, it improves strength and durability of the concrete while reducing its environmental impact. This property helps to improve the workability of the mix and enhance the hydration process of cement. Additionally, zeolite can contribute to the formation of additional cementitious materials, which can further enhance the durability and strength of the concrete. By partially replacing cement with zeolite, we can reduce the overall amount of cement used in concrete production. Manufacturing of cement is a main source of CO₂ emissions, this reduction can help to mitigate the environmental impact of concrete manufacturing.

Keywords: Zeolite, Glass powder, carbon footprint, carbon emissions, environmental impact, cementitious materials

1 Introduction

Despite these limitations, the durability and strength of concrete make it a popular choice in construction. This substitution offers several benefits, such as reducing the environmental impact and improving specific properties of the concrete. Use of glass powder as alternative material for partially replacing for fine aggregate in concrete helps to reduce the demand for natural resources like sand, promote recycling of glass waste and enhance the overall strength

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Rubber fibre reinforced geopolymer concrete with silica fumes as a replacement for fine aggregate

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Abstract: This experimental study deals with the upgrading of rubber fibre reinforced geopolymer concrete with silica fumes as replacement of fine aggregate. Researches are experimenting with replacing ordinary portland cement with GGBS as binder. GGBS has several positive environmental impacts. It reduces the carbon footprints of concrete producing by completely or partially replacing a portion of cement, which is a significant source of CO₂ emission. In this experiment fine aggregate also partially replaced with silica fume by 10%, 20%, 30%, 40% and 50%. Silica fumes are extremely fine particles, with high surface area and reactivity, make it an excellent material for enhancing the properties of concrete. When adding to concrete mixture silica fumes filled the voids between cement particles leading to denser and stronger concrete. Cube and cylinder are the specimens cured at 7 and 28 days for determining the mechanical properties like compressive strength and split tensile strength. Sodium silicate and sodium hydroxide were the alkali solution used as an admixture for the concrete grade-M30. The rubber fibres are added at 0.5%, 1%, 1.5% and 2% to the obtained optimum value. From 10%-50%, 30% of silica fumes in geopolymer shows the optimum mix when compared to conventional Portland cement concrete mix. Our project point to emphasize an advanced concrete mix that is sustainable, durable and ecofriendly for the construction field.

Keywords: Geopolymer concrete, Ground Granulated Blast Furnace Slag, Silica Fumes, Rubber Fibres.

1 Introduction

One of the most adaptable materials that is frequently used in the construction field is concrete, which is regarded as solid and sturdy. Every person on the earth produces more than a ton of concrete annually. Ordinary Portland Cement's contribution to the early strength achievement of concrete accelerates the use of OPC. Because heating calcium carbonate releases greenhouse gases both directly and indirectly through the use of fuel, the production of cement accounts for 5% of all carbon dioxide emissions produced by humans worldwide [1].

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Understanding Sustainable Alternatives for Industrial Waste Apart from Landfills

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Abstract. This study explores innovative methods and technologies that promote efficiency and environmental stewardship in the handling of industrial waste, providing sustainable alternatives to disposal solutions. Waste from various manufacturing techniques, both commercial and municipal, creates very demanding conditions due to its volume and impact on the environment. This study looks at recycling techniques, bio-electrochemical systems, smart waste monitoring systems helped by IoT and advanced computing, and sustainable waste management practices in addition to the 3R concept (reduce, reuse, recycle). The paper also identifies the detrimental effects of conventional disposal methods. The studies demonstrate how sustainable-practice integration can lead to significant waste reduction, resource conservation, and environmental safety in many global contexts and industries. This review promotes the implementation of sustainable waste control techniques across all sectors to lessen the negative effects of commercial waste by analyzing different techniques and their results. It does this by highlighting the scalability and value of these strategies.

Keyword-: Sustainable waste management, landfills, Industrial Symbiosis, advance techniques, classifiers.

1 Introduction

Modern societies develop industrial and municipal solid wastes as a result of industry, mining, and demands from customers. Industries across the 19th century focused on eliminating waste and leftovers to produce high-quality products. Waste materials have been processed, disposed

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INVESTIGATION ON FEASIBILITY OF UTILIZING COFFEE- HUSK ASH AS AN ALKALINE ACTIVATOR IN GEOPOLYMER CONCRETE

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Abstract. Cement production is the major source of global warming which induces 7% of total greenhouse gas emissions. Reducing the use of cement in construction industry needs to be adopted by any of the alternates. One of the best alternates to reduce the impact caused by the cement production process is geopolymer concrete which can completely replace the usage of cement. Geopolymer is trending technology which possess numerous advantages than ordinary Portland cement concrete technology. Geopolymer is produced by the mixing of solid precursor and monomer. Most widely used solid precursors are waste industrial byproducts such as fly ash, GGBS, metakaolin etc., and monomers are alkaline activators like sodium hydroxide and Na_2SiO_3 . Meanwhile, the properties of geopolymer concrete are decided by the various parameters such as quantity of aluminosilicate source in precursor, ratio of NaO/SiO_2 , $\text{SiO}_2/\text{Al}_2\text{O}_3$, $\text{NaOH}/\text{NaSiO}_3$, solution to binder ratio, concentration of NaOH etc., The alkaline activators mostly used are chemical activators which is harmful to humans. Hence, there is a need of finding an alternate for chemical activators in the geopolymer concrete. In this proposed methodology, the chemical alkaline activators have been completely replaced by the waste residue product named coffee husk. Coffee husk is a residue produced from the coffee powder production industry. A total of 18.29 MMT of coffee husk ash has been produced every year. Coffee husk has an inbuilt composition of potassium which is one of the alkaline activators. However, the coffee husk ash needs to be calcinated by the use of oven before to use. In this research, an attempt has been made to utilize the Coffee husk ash (CA), as an alkaline activator and efficient activation mechanism of CA will be examined.

Keywords. Alkaline activator, Mechanical properties, Geopolymer concrete, Flyash, Coffee husk ash.

1. Introduction

Sustainability-related issues have been receiving more and more attention presently. An additional indication of this concern is the rise in research aimed at enhancing sustainability across several domains. This explains why a wide range of studies carried out especially in

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EXPERIMENTAL BEHAVIOUR OF HYBRID FIBER REINFORCED LOW CALCIUM FERRO-GEOPOLYMER PAVER BLOCK

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Abstract. The environment friendly and creative material in the construction field is the Geopolymer concrete. The two main constituents of Geopolymer are the source material and the alkaline liquids. In previous studies, alternate for alumino silicate source material as wood ash in geopolymer concrete was found and optimized with fly ash. Moreover, from the previous literatures it could be noted that, GPC had a less brittleness and energy absorbent. To improve the brittleness and energy absorption capacity polypropylene fibre and rubber fibre were added by 0, 0.25, 0.5, 0.75, and 1 % of volume fraction at different ratios. Further, effects on addition of polypropylene and rubber fibres of the optimized wood ash-fly ash based low calcium geopolymer were studied. In the previous study, hybridization of fibres was found out. On other hand, concrete paver block has major disadvantages of less skid resistance, less strength, less energy absorbent, less slip resistance. Hence, the research on finding an alternative to the cement paver block is needed. Ferro-cement was a wonderful technology in the construction industry which have tendency to give more strength to the structure. In this study, the low calcium ferro-geopolymer paver block for an alternate of cement paver block was proposed. Meanwhile, the ferro-geopolymer technology was used by varying the different type of meshes and different layout patterns of meshes. The optimized ferro-geopolymer paver block is going to be produced by varying the shape and size of paver block, surface texture of the paver block. The compressive behaviour, split tensile behaviour, and flexural behaviour is going to be studied for the optimization of low calcium ferro-geopolymer paver block. Micro-structural characterization is also going to be studied for the detailed understanding of inside reaction of low calcium ferro-geopolymer paver block by SEM and EDX.

Keywords. Hybrid fibers, Mechanical properties, Low calcium ferro-cement, Geopolymer Concrete, Paver block, Water absorption.

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Experimental Study on the Behavior of One Part Geopolymer Concrete Using Natural Binders and Activators

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Abstract. The cement industry is one of the primary factors contributing to the process of global warming with a large carbon footprint. Approximately 8% of global CO₂ emissions are attributed to cement. The development of cement substitute materials has advanced with the discovery of geopolymer concrete. The conventional geopolymers are two-part mixes made up of an activator-containing liquid phase and an aluminum-silicate material-containing solid phase. Among the many benefits of geopolymers are their increased environmental friendliness, better workability, greater compressive strength, increased resistance to sulfate and acids, increased temperature resistance, and decreased drying shrinkage and creep. However, geopolymerization is a difficult procedure. Furthermore, there are still certain drawbacks to geopolymer concrete, such as the fact that alkaline solutions are difficult to handle and apply because they are viscous, corrosive, difficult to transport, as well as challenging to store in huge quantities. As a result, the creation of one-part geopolymer concrete gained more advantages over the traditional two-part geopolymer. Solid aluminosilicate and solid alkali activator combine to form one part geopolymer concrete. The creation of one-part geopolymer concrete with natural binders is the primary goal of this research. It should be highlighted that GGBS based geopolymer concrete is challenging to make and has poor workability. As a result, various proportions of GGBS and silica fume are utilized as binders in this experiment. Powdered NaOH is utilized as alkaline activator. The mechanical properties are established by conducting necessary experiments for finding the best concrete mixture for this present work. The concrete mix with 80%, GGBS, 10% silica fume and 10% NaOH exhibits the expected quality of fresh properties and mechanical characteristics.

Keywords: Carbon footprints, one part geopolymer concrete,

1 Introduction

In order to reduce CO₂ emissions, it is now vital to identify environmentally acceptable building materials as a substitute to regular Portland cement (OPC). The manufacturing of

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Utilization Of Cockle Shell Ash, Sea sand And Plastic Waste In The Manufacture Of Paver Blocks

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Abstract. The cockle shell is categorized as industrial waste and often disposed of in open dumping zones, especially in coastal areas. Therefore, an eco-friendly solution to this disposal issue is crucial, as it can transform waste into a high-value product, such as a partial cement replacement. Also, as there is a growing interest in using alternatives to sand as a replacement for fine aggregate in concrete, in this study we used plastic coated sea sand as a partial replacement for fine aggregate. The design mix is formulated for a non-traffic application, with varying percentages of cockle shell ash and plastic-coated sea sand replacing cement and fine aggregate, respectively. Two curing methods, normal water curing and accelerated curing, are applied. The samples are then tested for compression strength and water absorption after 28 days of curing. The findings indicate that compressive strength value increased with increase in both cockle shell ash content as well as plastic coated sea sand content. The water absorption value increased with increase in cockle shell ash content and decreased with increase in plastic coated sea sand content. Hence, this composite material is suitable for use in paver blocks.

Keywords: Cockle shell ash, Multi-layered plastic waste, Sea sand, Paver block, Compressive strength, Water Absorption

1 Introduction

The use of waste materials in concrete production for sustainability is gaining traction. Studies on concrete made with alternative materials indicate that strengths comparable to conventional materials can be achieved [1]. There is a growing importance in finding an environmentally friendly solution for disposing of cockle shell ash. Therefore, an attempt has been made to utilize this material in paver blocks. Recycling plastic waste is considered an alternative approach to mitigate the environmental impact, despite the implementation of numerous control measures worldwide. The presence of chloride in sea sand restricts its usage in the construction industry. To address this constraint, sea sand is coated with a layer of plastic before being utilized as a construction material. Considering all factors, this study aims to use cockle shell as a partial cement replacement and plastic-coated sea sand as a partial replacement for sand in producing paver blocks.

Paver blocks are typically made from concrete, clay, or natural stone materials in between to provide stability and drainage. They offer advantages such as easy installation, low maintenance and the ability to withstand heavy loads and harsh weather conditions. Cockle is one of the main species in the aquaculture industry. The inclusion of cockle shell ash may positively influence the workability of the concrete, streamlining the mixing, placing and finishing processes. The shells content of calcium carbonate is noteworthy, offering the potential to reduce the alkalinity of the concrete and enhances its resistance to certain chemical attacks. It not only repurposes a seafood industry by-product but also addresses environmental concerns, reduces costs and has the potential to

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GUAR GUM, GELLAN GUM BIOPOLYMER SOILSTABILIZATION

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Abstract. In civil engineering and construction, soil stabilization is an important aspect. There are diverse conventional techniques to improve soil properties and for soil stabilization. This study explores the viability of two types of biopolymers, Guar gum and Gellan gum, as sustainable and ecofriendly additives for clayey soil stabilization. Compaction, unconfined compression test, permeability, consistency limit, consolidation tests were performed in the study. The sample for the test has been prepared that biopolymer has been mixed with soil in different proportions. These biopolymers form hydrogels when they get activated, and it enhances the bonding between soil particles thereby increasing the strength. Treating soil with biopolymer increases dry unit weight and decreases optimum moisture content (OMC). Addition of gum solution reduces friction between soil particles, leading to marginal increase in dry unit weight. Higher the biopolymer content lower is the OMC content and soil becomes more stiff. The compressive strength and load bearing capacity is found increasing soil biopolymer specimen upon different days of curing. For every tested percentage of treatment the percentage reduction factor rises with biopolymer concentration due to drop in void ratio that results in a drop in the soil's permeability. Guar Gum and Gellan Gum are used as stabilizers in soil treatment, increasing liquid and plastic limits, shrinkage limit, and viscosity. They activate hydrogels, strengthen bonding activity, and increase shrinkage limit. The addition of Guar Gum and Gellan Gum improves soil biopolymer mix viscosity and adhesion. The findings of this study positively imply that adding this material to weak soil would improve the soil's characteristics.

1 Introduction

In geotechnical engineering, enhancement of soil property is a venerable attempt. Many research exhibits the use of different soil improvement techniques, basically mechanical and chemical soil stabilization techniques. Chemical soil stabilization involves physically changing of the property of soil. Compaction stabilization uses the mechanical means to eliminate air voids and to obtain dense soil mass resulting in soil to bear load without further immediate consolidation or compaction. Chemical soil stabilization is done using binders or by-products like lime, fly ash, bitumen, and cement, basically they are calcium based. Most adopted ground improvement technique is use of admixtures and additives;

India Analysis of Scope of Wind-Energy Development in India

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Abstract. Energy is essential to the nation's economic growth and to raising the standard of living for its citizens. Following its independence, India invested a great deal of resources in expanding its energy potential. As a result, the nation's capacity for generation has grown significantly. Everyone is aware of the environmental risks associated with traditional energy generating. India has thus been planning the development of environmentally friendly renewable-energy generation via solar, hydroelectric, and wind-energy sources. Renewable-energy has received particular attention, even though the nation primarily generates its energy from natural gas and coal. India ranks fourth among the nations that produce wind power this essay has honestly attempted to provide a brief synopsis of the global and Indian developments in wind-energy from the late 20th century to the present. It also examines the results of some global studies conducted on a range of topics related to this industry. One can get a sense of the current state of the wind-energy development project after reading this document.

Keywords: Wind Power, Renewable Energy, MNES, DNES, MNRE.

1 Introduction

It is impossible to overstate the significance of electricity in the modern world. The amount of energy produced in a nation has a significant impact on both the standard of living and the expansion of industry. Coal and oil are the main sources of power production, but their long-term reserves are finite. In addition, the release of greenhouse gases and other pollutants from these fuels pollutes the atmosphere. Around the world, efforts are being undertaken to lessen this issue and to focus more on generating energy from renewable sources [1-3]. Nowadays, wind-energy is widely regarded as a financially feasible way to boost energy production while lowering air pollution and global warming. The technology has advanced significantly over the past 20 years, and energy conversion systems now function dependably and affordably.

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Improving the Quality of the Air and Implementing into Effective Pollution Mitigation Methods

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Abstract. This review paper explores the impact of air pollution on human health, focusing on indoor and outdoor air quality. It highlights the importance of pollutants like particulate matter, nitrogen dioxide, sulfur dioxide, and volatile organic compounds, which contribute to diseases like lung cancer, heart disease, and respiratory issues. The paper also examines sources and types of air pollutants, including industrial activities, transportation, and natural events. It presents a comparative analysis of air quality issues across different regions, highlighting the complexities and severity of pollution. The paper examines pollution control technologies for industry and transport, innovative approaches like hydrogen fuel utilization and intelligent transportation systems. It also discusses the influence of regulatory standards on indoor environmental quality and the challenges posed by regional differences. The paper aims to contribute to the ongoing discourse on air quality management and encourages the development of more robust pollution control measures.

Keyword-: Air Quality, Pollution, Strategies, Prediction, Control, Monitoring.



1 Introduction

Since 90% of individuals spend their time indoors, interior settings have a substantial impact on the health of humans. Every year, indoors pollution of the air (IAP), which is caused by

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Integrating forest management and Watershed health for Sustainable Water sources

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Abstract. This paper explores the complex relationship among forest management practices and watershed health, emphasizing the crucial function of forests in sustaining freshwater sources. It critiques various factors impacting watershed fitness, including land use changes, deforestation, and urbanization. The study conducted here highlights the importance of sustainable forest management practices, such as environment-based techniques and carbon sequestration, in retaining water quality and quantity. Additionally, it discusses the impact of forest composition on watershed health and the subsequent results on soil approaches, water quality, and biodiversity. The paper additionally addresses the challenges and strategies in handling watersheds, considering the socio-economic, environmental, and political aspects. The findings recommend that an incorporated technique regarding community participation, cross-sectorial coverage integration, and advanced management strategies can improve watershed health and make a contribution to global water security.

Keyword:- Forest management, watershed, sustainability, water sources, Deforestation.

1. Introduction

Water scarcity and contamination are major risks to the world's water resources, affecting ecosystem health as well as social and economic well-being. These problems are exacerbated by improper land use management, which calls for better land management,

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Investigation of Solar Powered Single Effect Absorption System

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Abstract. Cooling processes like refrigeration and air conditioning are known for their high energy consumption. Since most Indian states experience abundant sunshine year-round, solar refrigeration is a suitable technology for the country. Solar-powered absorption refrigeration systems offer a viable alternative to traditional refrigeration, providing not only cooling and ice-making capabilities but also energy savings and environmental benefits. However, further research is necessary to enable widespread industrial adoption and the replacement of conventional refrigeration systems with solar powered absorption system. Using solar energy for an air-conditioning system is typically more cost-effective, when it can fulfil both heating and cooling needs. This research focuses on the thermodynamic modelling of a system, specifically the effect of various temperature on COP. Thermodynamic modelling was done with the help of first law of thermodynamics. Using engineering equation solver software, study simulated the cycle and equations were developed for energy and mass flow for each component. Further, before proceeding to analysis some assumptions were also made. We then analysed how the Coefficient of Performance (COP) changed when varying the temperatures across each component. Our findings show that COP increases with increase in condenser, evaporator, and absorber temperatures, but it is declined with decrease in generator temperature.

Keyword:- single effect absorption system, generator, condenser, evaporator and absorber temperature, COP, thermodynamic modelling.

1 Introduction

The sun is the primary source of energy supplied by water, fossil fuels and wind. Solar energy is mortal energy and does not disappear. Both refrigerators and space cooling are high-energy products. The demand for spatial cooling is greater during the day, when the

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A Comparative Analysis of Post-Disaster Analysis Using Image Processing Techniques

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Abstract. Post-disaster recovery is a multifaceted system essential for rebuilding communities and infrastructure. Despite its importance, many limitations obstruct powerful recuperation, main to tremendous loss of life and monetary assets. This paper synthesizes varied approaches in the direction of sustainable restoration, highlighting the increasing reliance on technology for disaster management. Image processing strategies, pivotal in addressing these demanding situations, are reviewed across studies. Those strategies range from SLIC segmentation and Random forest classification to advanced deep learning models together with U-net and YOLOv8, machine learning algorithms like SVM, and image category methodologies along with bi-temporal analysis. Comparative evaluation reveals that those strategies presents promising consequences, with accuracies starting from 75% to over 94%. The paper gives a framework for understanding the role of various image processing strategies in improving disaster control strategies, emphasizing their implications for future studies and application.

Keyword:- Disasters, post-disasters, recovery, machine learning techniques, classifications.

1. Introduction

The process of rebuilding public services, accommodation, and infrastructure following a

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PREDICTION OF STREAMFLOW IN RIVER BASIN -USING ANN

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Abstract. In addition to the flood level predictions, our system provides valuable insights into future rainfall patterns. With the data set we have gathered, we can determine the expected amount of rainfall in the upcoming months. By combining the flood level predictions with the rainfall data, we can better understand the overall flood risk and take proactive measures to mitigate its impact. Our system equips us with the necessary information to make informed decisions and enhance flood preparedness strategies. The main difference is that we focus on predicting flood levels using a combination of current water level data and real-time weather data. This allows us to have a more accurate understanding of potential flood events. Additionally, our paper also incorporates rainfall data to assess the risk of flooding in the coming months. By considering multiple factors, we aim to provide a more holistic understanding of flood risks and enhance preparedness strategies. By combining the flood level predictions with rainfall forecasts, we can assess the flood risk in the coming months and take preventive actions, such as implementing early warning systems or strengthening infrastructure, to minimize the impact of potential flood events.

Keywords: Daily streamflow, Forecasting hydrological modelling, ANN, Flood forecasting

1 Introduction

Stream flow prediction plays a crucial role in water resource management and flood forecasting. In this study, we explore the application of Artificial Neural Networks (ANN) software in combination with Visual Studio Code (VS Code) as a powerful tool for stream flow prediction. By leveraging the computational capabilities of ANN and the flexibility of VS Code, we develop a robust model that incorporates various hydrological variables to accurately forecast stream flow. Our results demonstrate the effectiveness of this approach in improving stream flow prediction accuracy, offering valuable insights for water resource planning and management [1]. Seasonal rainfall and stream flow forecasting play a vital role

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INVESTIGATION OF ENHANCED LANDFILL LINERS USING KUTTANAD CLAY

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Abstract: Landfill liners are layers of materials used to protect soil and groundwater from contaminants. A study aims to improve the performance and effectiveness of these liners by using bentonite and fly ash as amending materials. The research aims to contribute to the sustainable waste management practices by offering cost-effective and environmentally friendly alternatives for landfill liner construction. By using locally available materials, the proposed amended liners can reduce dependency on imported materials and minimize the environmental footprint associated with conventional liner systems. The study investigates the synergistic effect of bentonite and fly ash as amending materials for improving the mechanical and hydraulic characteristics of Kuttanad clayey soil. In economic view, to maximize the usage of fly ash, bentonite can be replaced up to 30%. This mix is found to be suitable amended soil liner with a coefficient of permeability value which satisfies the permeability criteria of landfill liner.

Keywords: Landfill liner, bentonite, fly ash, environment sustainability

1. INTRODUCTION

Landfills are an important part of modern waste management systems and serve as final storage facilities for large quantities of domestic, industrial and hazardous waste. However, improper landfill containment poses significant environmental risks, especially when groundwater and soil are contaminated [7]. To reduce these risks, effective landfill liners are needed to prevent leachate, a highly toxic liquid produced by the decomposition of waste, from seeping into the surrounding environment [6].

A landfill usually consists of several separate parts, such as a liner, waste chambers, compacted waste, cover material, gas collection system, leachate collection system, and final cover, each of which serves a specific purpose in waste management. The most important part of a landfill is the bottom liner, which acts as the primary barrier between the waste in the landfill and the underlying soil and groundwater [8]. The defining factor of the liner is its impermeability, which prevents the migration of pollutants such as leachate into the soil and groundwater surrounding the landfill. Landfills are constructed from synthetic materials such as geomembranes and clay liners. Although these materials have proven effective in containing runoff, their production, transportation and installation often involve significant financial and environmental costs. Furthermore, their dependence on

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Unscrambling traffic congestion and increasing sustainability in special urban intersection

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Abstract: Traffic congestion in India's densely populated urban centres is a major challenge exacerbated by rapid urbanization and a surge in vehicles surpassing infrastructure growth. Gridlocks and slow-moving vehicles are common due to inadequate road networks and poorly planned intersections, leading to longer commutes, productivity loss, and heightened pollution and safety concerns. Mitigation efforts include infrastructure upgrades and sustainable transportation promotion, implementing Indian Road Congress (IRC) signal design guidelines for intersection optimization and traffic flow management. Pedestrian safety remains critical, requiring comprehensive strategies integrating public transportation enhancement, road infrastructure optimization, and alternative travel modes promotion. Utilizing advanced technology for traffic monitoring, alongside urban planning initiatives prioritizing efficient land use and mixed-use developments, is crucial. Furthermore, policies promoting telecommuting and flexible work schedules can help alleviate the burden of peak-hour traffic. Flyovers offer relief by allowing vehicles to bypass congested areas, improving traffic flow. Congestion indirectly contributes to pollution, emphasizing the importance of catalytic converters in reducing harmful emissions from vehicle exhaust. This comprehensive approach aims to create smoother and more sustainable transportation systems while addressing congestion and pollution issues effectively.

Keywords: Traffic volume, pollutions, IRC, PCU Values



1 Introduction

Traffic congestion in India presents a significant challenge, especially in densely populated urban areas. Rapid urbanization and economic growth have led to a surge in the number of vehicles on Indian roads [2], surpassing the expansion of infrastructure. The result is chaotic traffic scenarios marked by gridlocks, slow-moving vehicles, and frayed nerves [3]. In many cities, inadequate road networks, poorly planned intersections, and a lack of proper traffic management exacerbate the problem. Moreover, the proliferation of motor vehicles, including cars, motorcycles, and auto-rickshaws, coupled with limited public transportation options, further compounds the issue. This congestion not only leads to longer commute times and decreased productivity but also contributes to heightened air pollution levels and

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The Development of Composites Materials: From Conventional to Innovative Uses

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Abstract. This paper explores the evolution, development, and application of composite substances from conventional methodologies to their innovative uses throughout numerous sectors. Composite materials, known for their strength, versatility, and resilience, have seen substantial advances, especially with the incorporation of nanotechnologies and hybrid fiber reinforcements. By means of analyzing exclusive matrix substances, reinforcement sorts, and fabrication techniques, this study highlights the transition from traditional composites to advanced metallic matrix nanocomposites (MMNCS) and fiber-reinforced polymers (FRPS). Special interest is given to the demanding situations associated with manufacturing, together with uniform dispersion of nanoparticles and damage-free machining of fiber composites. Moreover, the paper discusses the environmental impact that specialize in sustainable options like natural fiber reinforcements. Through comprehensive critiques and case studies, this research objectives to offer a holistic information of the cutting-edge state and future potential of composite materials in improving industrial purposes even as addressing environmental concerns.

Keyword : Composite material, natural fibre, metal matrix, nano-composites, fabrication technique, classification.

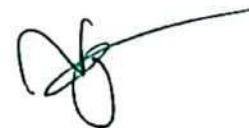
1 Introduction

The strength, resilience to breakdown, and versatility of composite materials make them

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3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during year

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	Dr. K Arun Kumar	NA	Utilization of Waste Byproduct in the Production of Green Geopolymer Concrete	Lecture Notes in Civil Engineering	International Conference on Interdisciplinary Approaches in Civil Engineering and Sustainable Development. IACESD 2023.	International	2023	978-981-97-0910-6_26	Mangalam College of Engineering	Springer
2	Dr. K Arun Kumar	NA	Utilization of silica fume for the production of self compacting GGBS based geopolymer concrete.	AIP Conference Proceedings	INTERNATIONAL CONFERENCE ON RECENT INNOVATIONS IN SCIENCE AND TECHNOLOGY (RIST2022)	International	2024	1551-7616	Mangalam College of Engineering	AIP Publishers
3	Dr. K Arun Kumar	NA	Effect of silica fume on rheological, mechanical and durability properties of ground granulated blast furnace slag based geopolymer concrete	AIP Conference Proceedings	INTERNATIONAL CONFERENCE ON RECENT INNOVATIONS IN SCIENCE AND TECHNOLOGY (RIST2022)	International	2024	1551-7616	Mangalam College of Engineering	AIP Publishers



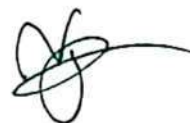
4	Dr. K Arun Kumar	NA	Parametric Study on Strength Performance of Geopolymer Concrete Using Industrial By-Products. Recent Advances in Mechanical Engineering	Lecture Notes in Mechanical Engineering.	Recent Advances in Mechanical Engineering. ICRAMERD 2023	International	2023	978-981-97-1080-5_10	Mangalam College of Engineering	Springer
5	Dr. K Arun Kumar	NA	Experimental investigations on fresh and mechanical properties of fly ash and ground granulated blast furnace slag self-compacting geopolymer concrete	Materials Today Proceedings	INTERNATIONAL CONFERENCE ON RECENT INNOVATIONS IN SCIENCE AND TECHNOLOGY (RIST2022)	International	2024	2214-7853	Mangalam College of Engineering	Elsevier
6	Gokul P V	NA	An Experimental Study on Performance of Two-Part Geopolymer Concrete Using Natural Binders and Activators.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
7	Dr. D Rameshkumar	NA	Correlation of Mechanical and Durability Properties of Binary and Ternary Blended High-performance Concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences

8	Sankar B	NA	Correlation of Mechanical and Durability Properties of Binary and Ternary Blended High-performance Concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
9	Dr. K Arun Kumar	NA	Comparative study on the performance of one part and two part geopolymers concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
10	Gokul P V	NA	Comparative study on the performance of one part and two part geopolymers concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
11	Dr. D Ramesh Kumar	NA	Comparative study on the performance of one part and two part geopolymers concrete.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
12	Reni Kuruvilla	NA	Experimental study on partial replacement of fine aggregate in concrete by waste tyre rubber and cement by fly ash.	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences

13	Salini Theres N Kurian	NA	Experimental Study on Rubberized Geopolymer Concrete with Sugarcane Bagasse Ash	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
14	Aswathy Soman	NA	Experimental study on steel fiber reinforced concrete modified with egg shell powder and nano silica	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
15	Dr. D RameshKumar	NA	A Novel Perspective in Constructive: Analysing the Effects of 3-D Printing Innovation	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
16	Sankar B	NA	Review of Mechanical, Durability, and Thermal properties of Light weight concrete containing cenosphere	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
17	Dr. D RameshKumar	NA	Advancements in Concrete Performance by Using Waste materials in the Mixture,	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences

18	Abhijith Kumar A N	NA	Use of plastic waste as recycled material In the concret	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
19	Dr.Swaminathan P.	NA	Use of silica fume as a replacement of cement in the concrete	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
20	Aksharamol G Raj	NA	Advancement of Concrete by Partially Replacing Cement by Zeolite & Fine Aggregate by Glass Powder	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
21	Nimisha Annie Abraham	NA	Rubber fibre reinforced geopolymer concrete with silica fumes as a replacement for fine aggregate	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
22	Asha Jose	NA	Understanding Sustainable Alternatives for Industrial Waste Apart from Landfills	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences

23	Dr. K Arun Kumar	NA	Investigation on Feasibility of Utilizing Coffee-Husk Ash as an Alkaline Activator in Geopolymer Concrete	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
24	Gokul P V	NA	Investigation on Feasibility of Utilizing Coffee-Husk Ash as an Alkaline Activator in Geopolymer Concrete	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
25	Dr.Swaminathan P.	NA	Experimental Behaviour of Hybrid Fiber-Reinforced Low Calcium Ferro Geopolymer Paver Block	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
26	Dr. K Arun Kumar	NA	Experimental Behaviour of Hybrid Fiber-Reinforced Low Calcium Ferro Geopolymer Paver Block	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
27	Gokul P V	NA	Experimental Study on the Behavior of One Part Geopolymer Concrete Using Natural Binders and Activators	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences



28	Silpa Caroline James	NA	Utilization of Cockle Shell Ash, Sea sand and Plastic Waste in the Manufacture of Paver Blocks	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
29	Mita Ann Zachariah	NA	Guar Gum, Gellan Gum Biopolymer Soil Stabilization	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
30	Haritha M R	NA	India Analysis of Scope of Wind-Energy Development in India https://doi.org/10.1051/e3sconf/202452902012	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
31	Karthika S Nair	NA	Improving the Quality of the Air and Implementing into Effective Pollution Mitigation Methods	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
32	Rakhi Sugunan	NA	Integrating forest management and Watershed health for Sustainable Water sources	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences



33	Dr. Radhakrishnan R	NA	Investigation of Solar Powered Single Effect Absorption System	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
34	Geethu Lal	NA	A Comparative Analysis of Post-Disaster Analysis Using Image Processing Techniques	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
35	Reni Kuruvilla	NA	Prediction of Streamflow in River Basin-Using ANN	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
36	Lt. Abhijith Kumar A N	NA	Investigation of Enhanced Landfill Liners Using Kuttanad Clay	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
37	Dr. Radhakrishnan R	NA	Unscrambling traffic congestion and increasing sustainability in special urban intersection	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences

38	Sreerench Raghavu	NA	The Development of Composites Materials: From Conventional to Innovative Uses	E3S Web of Conferences	International Conference on Sustainable Goals in Materials, Energy and Environment (ICSMEE'24)	International	2024	2267-1242	Mangalam College of Engineering	EDP Sciences
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A Novel Approach to Identify Pituitary Tumor Using an Optimal CNN Model with Deep Learning

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Abstract— The technical paper introduces a novel approach to identifying pituitary tumors using an Optimized Convolutional Neural Network (OCNN) model with deep learning. Pituitary tumors rank among the most prevalent variety of brain tumors, and accurate identification is critical for proper diagnosis and treatment. The suggested method makes use of a deep learning framework that combines an ideal feature extraction method with a pre-trained CNN model. The pulled out features are then used to train the CNN model to classify pituitary tumors accurately. The effectiveness of the suggested method is assessed using a publicly accessible dataset, revealing that it surpasses the performance of current leading techniques. The suggested method possesses the capacity to act as a valuable asset for making clinical decisions in the field of neuroimaging, particularly for the accurate identification of pituitary tumors. The results of the experiment indicate that our suggested model successfully detects and classifies tumors with high accuracy, sensitivity, and specificity. Our model specifically achieves a 99.55% overall accuracy, 99% sensitivity, 99% specificity and 99% F1 score. These outcomes show that our suggested CNN design for brain tumor identification and classification performs better than several state-of-the-art techniques.

Keywords— OCNN, Pituitary Tumor, Deep Learning, CNN

I. INTRODUCTION

A pituitary neoplasm is an atypical expansion or accumulation that forms within the pituitary gland, a diminutive gland situated at the lower part of the brain. The pituitary gland holds significance within the endocrine system, generating numerous hormones that oversee diverse bodily processes including growth, metabolism, reproduction, and reaction to stress. These tumors in the pituitary can either be benign, lacking cancerous properties, or malignant, possessing cancerous attributes. The symptoms they trigger vary based on their dimensions and position. Some common symptoms of pituitary tumors include headaches, vision problems, hormonal imbalances, and fatigue [1]. The customary management of pituitary tumors generally encompasses surgical intervention, radiation therapy, and pharmaceutical intervention aimed at symptom management and regulation of hormone levels.

Up to 25% of the population can have a pituitary tumor, which is a benign (non-cancerous) growth of the normal pituitary cells. Most pituitary tumors remain small and do not cause any indications for several years or even in a lifetime. Abnormal growth of the pituitary gland can lead to

over or underproduction of the different hormones [2]. However, hormone levels may also remain normal. If the pituitary tumor becomes large enough, it can press on the optic nerve or other nerves that manage eye movements and sensation of the face. Patients may complain of decreased peripheral vision in both eyes, double vision, and/or numbness of the face.



Fig. 1. an MRI with contrast from a patient with a large pituitary tumor

Several methods exist for detecting pituitary tumors, such as Magnetic Resonance Imaging (MRI), Computed Tomography (CT) scans, blood and urine analyses, visual field tests, and neurological evaluations. If a pituitary tumor is identified, additional assessments might be conducted to ascertain its classification and whether it is malignant or benign [3]. The selection of treatment alternatives will rely on factors such as tumor dimensions, type, and placement, alongside the patient's general well-being and individual preferences.

Deep learning and computer science have been utilized more and more recently to point out and categories pituitary tumors. Here are some of the current methods and existing works. CNNs have been used to accurately identify and classify pituitary tumors from MRI images. CNN will help to acquire and extract the available attributes from the images and the researchers can create a valid comparison with conventional machine learning techniques. There is another method called transfer learning which helps to improve the training and testing accuracy. The pre- trained architecture helps to achieve the high accuracy like VGG or Inception. MRI images helps to train the CNN network and provides good results. Segmentation algorithms are the other possibility to detect the brain tumor from MRI. Computer science field can contribute more in medical field research and helps to detect diseases from MRI scan. The

Multicriteria generalized regressive neural federated learning for cloud computing task scheduling and resource allocation

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Abstract. Cloud computing has arisen as a shrewd and well known worldview for people and associations to work with the entrance and use of registering assets through the web. With the rapid growth of cloud computing technology, efficiently running big data applications within minimal time has become a significant challenge. In this dynamic and scalable environment, effective resource allocation and task scheduling of big data applications play pivotal roles in optimizing performance, enhancing efficiency, and ensuring cost-effectiveness. In environments involving remote computing, task scheduling is a crucial consideration. In order to effectively accomplish resource-optimal task scheduling and minimize overall task execution time, a novel technique called Multicriteria Generalized Regressive Neural Federated Learning (MGRNFL) is developed to address the particular issues in cloud systems. Tasks from several users arrive at the cloud server at the start of the procedure. The cloud server's job scheduler then uses Multicriteria Federated Learning to carry out resource-optimal task scheduling. A decentralized machine learning technique called federated learning (FL) enables model training across several tasks that are gathered from cloud computing customers. This decentralized approach primarily focuses on learning from datasets to obtain a global model by aggregating the results of local models. The proposed techniques involve two different steps: local training models and global aggregation models. In the local training model, the task scheduler determines the resource-optimal virtual machine in the cloud server using a Generalized Regression Neural Network (GRNN) based on multicriteria functions of the virtual machine, such as energy, memory, CPU, and bandwidth. Based on these objective functions, resource-efficient virtual machines are determined to schedule multiple user tasks. The locally updated models are then combined and fed into the global aggregation model. Calculated within the global aggregation model is the weighted total of locally updated findings. The algorithm iterates through this process till the maximum number of times. In order to schedule incoming tasks, the resource-optimal virtual machine is found. Various quantitative criteria are used for the experimental evaluation, including makespan, throughput in relation to the number of tasks, and task scheduling efficiency.

Keywords. Cloud computing, resource allocation; task scheduling, Generalized Regression Neural Network (GRNN), Multicriteria Federated Learning.

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A Breakthrough Approach for Prostate Cancer Identification Utilizing VGG-16 CNN Model with Migration Learning

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Abstract— In the realm of medical visual scrutiny, the accurate identification of prostate cancer holds paramount significance for early diagnosis and effective treatment. This work presents a pioneering method for prostate cancer identification, harnessing the power of deep learning and Migration Learning strategies. Leveraging the VGG-16 Convolutional Neural Network (CNN) framework as the cornerstone, the proposed approach capitalizes on its ability to extract intricate features from medical images. By incorporating Migration Learning, the model is enriched with knowledge gleaned from diverse datasets, enabling it to achieve exceptional performance even with limited medical image data. The methodology entails meticulous dataset curation and preprocessing, ensuring the quality and representativeness of the images. The VGG-16 model undergoes a meticulous fine-tuning process, accommodating the unique characteristics of prostate cancer images. Performance evaluation is conducted rigorously, utilizing established metrics to gauge the approach's effectiveness. Comparative analysis with contemporary methods showcases the breakthrough potential of the proposed approach. The model gave 93.97% testing accuracy.

Keywords— VGG16, Prostate Cancer, Migration Learning, CNN

I. INTRODUCTION

Prostate cancer initiates when the cells of the prostate gland commence an uncontrolled growth process. This form of cancer is both highly risky and pervasive, causing significant harm. Among male cancer-related deaths globally, prostate cancer ranks as the second leading cause following leukemia [1]. Statistics suggest that one out of every six men in the United States is likely to receive a prostate cancer diagnosis, as indicated by [2]. The timely identification of prostate cancer plays a crucial role in enabling effective treatment strategies. One approach to early detection involves analyzing the levels of prostate-specific antigen (PSA) in a man's bloodstream. Additionally, the digital rectal exam (DRE) offers another means of early prostate cancer detection [3]. When anomalies arise in either the PSA or DRE results, a prostate biopsy becomes necessary to assess the prognosis of prostate cancer. This biopsy assigns a Gleason score (GS) to the prostate cancer based on the two most prevalent Gleason patterns (GP) observed within it [4].

A huge number of high-resolution diagnostic pictures, such as computed tomography (CT) scans, ultrasounds, and magnetic resonance imaging (MRI), are utilized for cancer diagnosis, and it is difficult for a person to properly assess them and come to an unbiased and consistent judgement. Because various individuals might analyses the same image in different ways based on their understanding and experience, this leads to disagreement and misunderstanding. As a result, for reliable and unbiased data analysis, machine learning (ML) is advised. ML approaches were also extensively utilized with CAD systems for early identification. Feature extraction is one of the most critical elements in the usage of machine learning, and a number of feature extraction approaches are being evaluated on various types of imaging modalities and cancer types. The early study focuses on generating relevant feature descriptors for context learning utilizing various machine learning approaches. Deep learning techniques have been employed to help in the learning of picture data with hierarchical features. The researchers want to attain high accuracy and efficiency in identifying prostate cancer signs by using the migration learning approach. We hope to equip clinical practitioners and doctors with a new technique to detecting prostate cancer on time. If validated, the method could serve as an advanced tool for radiologists and medical professionals to enhance their diagnostic capabilities, potentially aiding in earlier detection and intervention for prostate cancer patients. The following Figure.1 shows the MRI depiction of prostate cancer.



Fig.1. MRI depiction of prostate cancer

Analysis on Automatic International Classification of Disease Coding with Medical Records

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Abstract. The clinical concepts in the information gathered from the healthcare services are categorized and standardized using medical coding. The International Classification of Diseases (ICD) includes codes for various diseases that have an impact on financing, reporting, and research. In order to provide patient care and billing, medical coding allocates a subset of ICD codes to each patient visit. Medical personnel must spend a lot of time and effort on manual medical coding, which can lead to missed revenue and claim denials. Different studies on machine learning achieved promising performance for automated medical coding. Many researchers carried out their research on ICD. But, heterogeneous mode of operations by doctors and diagnosis methods makes the medical coding as more complex one. Furthermore, the current ICD approaches did not reduce computational complexity or increase accuracy. To address these problems, a range of deep learning and machine learning approaches are tested for ICD.

Keywords. Medical coding, healthcare service, International Classification of Diseases, automatic ICD coding, machine learning, medical professionals.

1 Introduction

The World Health Organization created the International Classification of Diseases (ICD), which is crucial for classifying diseases globally. ICDs are coded using a variety of characters and digits. ICD coding was crucial for hospital statistics, scholarly collaboration across geographical boundaries, and health insurance payout. To achieve artificial intelligence health based on artificial ICD coding, electronic medical records (EMR) were used. Clinic notes were labeled and the contents of the ICD codes were committed to memory using ICD coders. ICD was an expensive, time-consuming, and labor-intensive task. ICD coders were prone to errors when working for extended periods of time.

The structure of this document is as follows: The shortcomings of the current worldwide categorization of illnesses are reviewed in Section 2. The investigation and analysis of the current worldwide categorization of illnesses methodologies are explained in Section 3. The probable comparison between them is explained in Section 4. The shortcomings of the

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Expanding Bioenergy: A Comparison of Waste-to-Energy Techniques

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Abstract. The paper explores the ability of biomass as a renewable energy source globally and analysis of waste generation and bioenergy abilities. It highlights the significance of sustainable waste control and the performance of numerous biomass conversion technology in producing bioenergy, biofuels, and bio-chemical compounds. The study highlights worldwide initiatives and challenges confronted in maximizing biomass capability, specially inside the bioenergy sector. It emphasizes the need for improved waste management strategies, technological improvements, and political guidance to enhance the contribution of bioenergy to worldwide energy demands.

Keyword:- Biomass, waste to energy conversion, renewable energy, bioenergy, sustainability.

↑ Introduction

Turkey and Malaysia are large biomass generators, with Turkey generating a total of thirty million tons of waste per year, the equivalent of 1.5 million tonnes of biodiesel, over three million tons of bioethanol, and approximately 4.0 billion m³ of biogas. By the year 2030 Turkey's biomass production is expected to exceed 52.5 Mtoe [1]. the Malaysian yearly biomass output is 168,000,000 tons, which includes wood, oil palm trash, the husks of rice, coconut trunk fibers, and municipal garbage. The US has the ability to create 15 billion m³ of biogas per year, however only 773 Megawatts were utilized until the year 2011 [2]. Throughout history, biomass has been utilized for heating, food preparation, and lighting purposes. The Biomass Initiative 2020 proposes to employ twenty million tons of biomass

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Multicriteria generalized regressive neural federated learning for cloud computing task scheduling and resource allocation

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Abstract. Cloud computing has arisen as a shrewd and well known worldview for people and associations to work with the entrance and use of registering assets through the web. With the rapid growth of cloud computing technology, efficiently running big data applications within minimal time has become a significant challenge. In this dynamic and scalable environment, effective resource allocation and task scheduling of big data applications play pivotal roles in optimizing performance, enhancing efficiency, and ensuring cost-effectiveness. In environments involving remote computing, task scheduling is a crucial consideration. In order to effectively accomplish resource-optimal task scheduling and minimize overall task execution time, a novel technique called Multicriteria Generalized Regressive Neural Federated Learning (MGRNFL) is developed to address the particular issues in cloud systems. Tasks from several users arrive at the cloud server at the start of the procedure. The cloud server's job scheduler then uses Multicriteria Federated Learning to carry out resource-optimal task scheduling. A decentralized machine learning technique called federated learning (FL) enables model training across several tasks that are gathered from cloud computing customers. This decentralized approach primarily focuses on learning from datasets to obtain a global model by aggregating the results of local models. The proposed techniques involve two different steps: local training models and global aggregation models. In the local training model, the task scheduler determines the resource-optimal virtual machine in the cloud server using a Generalized Regression Neural Network (GRNN) based on multicriteria functions of the virtual machine, such as energy, memory, CPU, and bandwidth. Based on these objective functions, resource-efficient virtual machines are determined to schedule multiple user tasks. The locally updated models are then combined and fed into the global aggregation model. Calculated within the global aggregation model is the weighted total of locally updated findings. The algorithm iterates through this process till the maximum number of times. In order to schedule incoming tasks, the resource-optimal virtual machine is found. Various quantitative criteria are used for the experimental evaluation, including makespan, throughput in relation to the number of tasks, and task scheduling efficiency.

Keywords. Cloud computing, resource allocation; task scheduling, Generalized Regression Neural Network (GRNN), Multicriteria Federated Learning.

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Improved FCM based Segmentation and Self Improved Tuna Swarm Optimized Hybrid Classifier for Skin Cancer Detection

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Abstract—One of the deadliest forms of cancer and a major global cause of mortality is skin cancer. Detecting skin cancer at primary stages can help lower the eventual death. The prevalent method of diagnosing skin cancer is the visual examination that is less precise. Deep learning-based techniques are suggested to help physicians on diagnosing skin malignancies accurately and precisely. This article presents novel skin cancer detection (SCD) method that uses the median filter (MF) to pre-process the input image. Then, the image is subjected for segmentation by means of improved Fuzzy C Means (FCM). Further, GLCM, LGXP and LBP features are extracted. Finally, detection is done using the hybrid model combining CNN and Bi-GRU models. For weight optimization in CNN and Bi-GRU, we develop a new SI-TSA (Self Improved Tuna Swarm) algorithm. This enhances the detection performance and it is validated in terms of different performance measures.

Keywords— Skin Cancer, Median Filter, GLCM, Bi-GRU, SI-TSA algorithm.

Nomenclature

Abbreviation	Description
AI	Artificial Intelligence
ASM	Angular Second Moment
Bi-GRU	Bidirectional Gated Recurrent Unit
BC	Bayesian classifiers
CNN	Convolutional Neural Network
DT	Decision Tree
DHO	Deer Hunting Optimization
DL	Deep Learning
FCM	Fuzzy C Means
FC	Fully Connected
FCN	Fully Convolutional Network
GLCM	Gray-Level Co-Occurrence Matrix
IMC	Information Measures of Correlation
JFO	Jelly Fish Optimization
LGXP	Local Gabor XOR Pattern
LBP	Local Binary Pattern
ML	Machine Learning
SI-TSA	Self-Improved Tuna Swarm Algorithm
SCD	skin cancer detection
SVM	Support Vector Machine
TOA	Teamwork Optimization
TSO	Tuna swarm Optimization

I. INTRODUCTION

Around 200 different forms of cancer may trigger an uncontrollably large number of cells to invade organs and tissues. Eventually, these cells may proliferate and become tumorous in other organs [1] [2][3]. One among the most common forms of tumours in the present decade is skin cancer.

Skin cancer is often divided into two main categories: melanoma and non melanoma. One dangerous, uncommon, and fatal kind of skin cancer is melanoma [4] [5] [6]. Melanoma often begins as pigmented cells, or melanocytes, and results in a dark lesion. On the other hand, the lesion may occasionally be white, pink or brown. [7].

Recently, varied DL techniques are utilized to screen skin cancers. Popular techniques for classifying images include the use of SVM, BC, DT algorithms, and a range of AI based techniques. Nonetheless, it is believed that only the experts in the fields of software engineering and computers could handle these techniques in a proper way. In this way, this work intends to propose a skin cancer detection model with the following contribution:

- Proposes improved FCM for better segmentation of image.
- Deploys hybrid CNN and Bi-GRU classifiers, where the weights are tuned optimally via SI-TSA optimization.

Section II shows reviews on skin lesion. Short explanation on skin cancer detection is section III. Extraction of LGXP, GLCM and LBP features is given in section IV. SI-TSA based hybrid classifiers is given in Section V. The results are explained in Section VI.

II. LITERATURE REVIEW

A. Related works

In 2023, Yang *et al.* [8] introduced a unique approach to the classification of skin tumours in diagnostic skin imaging. There were four blocks in this strategy.

In 2023, Mridhaet *et al.* [9] developed Trustworthy DL model for forecasting skin cancer. These models are addressed a common severe class imbalance issue, which occurred when the class of skin affected patients was considerably less than the class of healthy patients.

Pacheco and Krohling [10] in 2021 proposed the MetaBlock, a unique approach that employed metadata to help in classifying data. Two different combination techniques, one of them employing feature chain and other employed MetaNet, were compared with the suggested method.

Wei *et al.* [11] in 2020 proposed a SCD model with feature differentiation utilizing a precise classification concept. First, the recognition model's light weighted CNN feature extraction module received 2 sets of samples: negative and positive.



Deep learning architecture based skin cancer detection using Deep belief network and Grey wolf optimization

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Abstract-Skin cancer is becoming more common every year, and this trend is seen in various nations. As a result of lifestyle modifications and sun-seeking behavior, skin cancer cases are increasing. Melanoma can be successfully treated when skin cancer is discovered early; as a result, curing and surviving melanoma directly depend on eliminating it when it is in its early stages. Unfortunately, traditional procedures for detecting skin cancer can be imprecise and frequently result in more testing. In this work, artificial intelligence (AI) techniques are used to create a special deep learning model that combines deep belief networks and grey wolf optimization. By integrating the advantages of two reliable methods, this network achieves maximum accuracy. The suggested method's performance is evaluated against current state-of-the-art methods and a DBN. The effectiveness of the proposed technique is evaluated using the Human Against Machine (HAM10000) dataset. The proposed technology's accuracy and effectiveness allow for the early clinical detection of skin cancer by doctors and dermatologists.

Keywords -Deep learning, Skin cancer prediction, deep belief network, Artificial intelligence

1. INTRODUCTION

Skin color-producing cells that proliferate and divide improperly can lead to skin cancer [1]. Every year, skin cancer affects between 2 to 3 million people worldwide [2]. Tumors that develop outside the skin are called skin cancers. They are caused by the growth of abnormal cells and may spread to specific areas of the human body. Melanoma, squamous cell carcinoma (SCC), and basal cell carcinoma (BCC) are the three types of skin cancer that may be distinguished [3].

SCC and BCC are less severe skin diseases. Melanoma is the most perilous kind. Moles that have changed in size, shape, colour, borders, or number of shades, as well as those that itch or bleed, are all signs of this condition. Globally, there were 287,723 new cases of melanoma in 2018, and there were 60,712 fatalities from the disease. Approximately 96,480 melanomas were recorded in the US in 2019, and 7230 persons (nearly 4740 men and 2490 women) lost their lives to the disease [4].

UV radiation from exposure to the sun is the primary environmental cause of skin cancer. A malignant

melanoma begins to invade its surroundings. Despite the high risk of melanoma occurrence, a good diagnosis in the disease's early stages greatly increases the likelihood of survival. Melanoma detection and categorization in its early stages are not only a difficult area of research, but they are also very important [4].

Skin cancer has high healing possibilities due to its enormous frequency, it is still considered to be a big issue for people. Melanoma can occasionally travel to the farthest parts of the body via the lymphatic or circulatory systems. Among the numerous types of skin cancer, this one has the highest probability[5]. Studies have demonstrated that melanoma early identification considerably lowers the mortality rate of melanoma cancer. Even for experts, it can be challenging to make an early diagnosis of melanoma. This is a major problem. The usage of image processing and artificial intelligence for diverse medical imaging applications has increased significantly during the last ten years [6]. By using these methods, you may speed up the diagnosing process and reduce human error. Additionally, it can enhance the accuracy and practicality of radiologists' and doctors' melanoma diagnoses.

Deep Belief Network method classifies medical Data with high accuracy [7-10]. The learning rate is utilized as a hyper-parameter which is used to manage the network's weights adjustment w.r.t. the loss gradient. If the value is small, traveling alongside the downward slope will be slower. It defines the context of optimization and minimizing the loss function. Learning Rate Decay formalizes the cost function, which provides greater efficiency in classification tasks than regular learning rate, and limits the number of free parameters to resolve the overfitting problem.

On the same dataset, traditional DI models are also assessed in order to compare our proposed model, and eventually, our proposed model provides the best classification accuracy.

Our suggested model is compared with classic DI models using the same dataset, and our proposed model eventually has the highest classification accuracy.

MEMS Technology in the Evolution of Structural Control Strategies

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Abstract. The integration of Micro-Electro-Mechanical Systems (MEMS) into structural control strategies represents a transformative step towards more efficient, precise, and resilient engineering applications. This paper reviews the evolution and current state of MEMS technology in the context of structural control, highlighting key fabrication techniques such as wet and dry etching, sacrificial layer technology, and advanced additive manufacturing (AM). We delve into the unique properties and advantages brought by MEMS in various domains, including drug delivery systems, industrial automation, and tissue engineering. Special attention is given to the comparison of traditional and modern MEMS fabrication methods, examining their impact on device performance, cost-efficiency, and application breadth. The emerging synergy between MEMS and nanotechnology, particularly in enhancing sensor capabilities and fostering new biomedical and environmental applications, is also explored. Through a detailed analysis, this paper underscores the significant role of MEMS in advancing structural control mechanisms and outlines future directions for research and application.

Keyword:- MEMS, nano-technology, structural control, materials, CMOS.

1 Introduction

Several processing methods, such as wet and dry etching, sacrificial layer technology, bonding, and SOI with cavities, are used in the fabrication of MEMS devices. These procedures, which differ in etching depth, anisotropic wet etching, and pattern

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Electro-Chemical Energy Conversion and Storage Systems- Analytical Review

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Abstract. This study emphasises how crucial it is to implement clean energy technology, especially electro-chemical systems, in order to reduce the emission of green-house and fulfil the world's growing energy needs. The study highlights the significance of sustainable resources such as wind and solar electricity. It also examines the difficulties associated with their intermittent nature and proposes changes to consumer behaviour and power producing practices. It talks about current research on candidate materials at the fundamental level and emphasises the crucial role customised materials play in electro-chemical systems. The paper explores the several uses of electro-chemical energy technology, explaining the classifications and operation of fuel cells, batteries, and capacitors, among other devices. The paper concludes by arguing that further advancements in materials and technology are essential to securing a reliable and efficient energy supply in the future.

Keyword:- Electro-chemical Energy, Fuel Cells, Energy Storage Systems, Batteries.

1 Introduction

It is impossible to overestimate the significance of implementing clean and environmentally friendly energy technology, especially in light of the world's rising energy demands and rising the emission of green-house. Renewable-energy sources like solar and wind power will increase the stability of home electrical systems [1]. The future energy landscape will be significantly shaped by the integration of Renewable-energy. A greater understanding of the consequences of nature's sporadic nature follows when increasing volumes of sustainable energy are incorporated into national electrical networks [2]. Improvements to electricity production and smart metres increase the effectiveness of energy use. Customers are being urged to change their habits of energy usage by grid providers and customised generators. This shift highlights costs and increases the demand for energy storage [3-5]. In the years to come, electro-chemical energy systems will play a pivotal role in advancing sustainability by providing increased productivity and less total pollution.

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Biodegradable Polymer Biomaterials for Tissue Engineering Applications: A Critical Review

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Abstract. This critical review explores the application of biodegradable polymer biomaterials in tissue engineering, highlighting their potential to revolutionize regenerative medicine and tissue substitute. Biodegradable polymers, due to their ability to mimic the extracellular matrix, offer a sustainable alternative for the development of tissue scaffolds that degrade at a rate matching new tissue formation. This review systematically covers the evolution, types, and applications of those materials, addressing both natural and synthetic polymers. Special attention is given to the fabrication techniques, along with 3-d bioprinting and nano-fabrication, that allow the introduction of scaffolds tailored for unique tissue engineering packages. The evaluation discusses the contemporary demanding situations, together with the balance among mechanical properties and biodegradability, and the mixing of scaffolds with host tissues. furthermore, it delves into future directions, including the development of hybrid biomaterials and the incorporation of bioactive molecules to enhance tissue regeneration. The advancements in biodegradable polymer biomaterials constitute a massive step in the direction of the development of more effective and personalised processes to tissue engineering.

Keyword-: Biopolymers, tissue-engineering, regenerative medicine, 3D-printing, application, fabrication.

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Design of auto adjustable CPR assistive device for non- expertise usability scenarios

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Abstract: The proposal introduces a frugal device designed to optimize cardiopulmonary resuscitation (CPR) procedures, offering a promising solution to enhance emergency medical care. In CPR, maintaining adequate chest compressions is crucial for sustaining blood circulation and oxygen supply to vital organs until professional medical help arrives. The proposed device addresses this challenge by continuously monitoring the pressure of chest compressions. When the pressure exceeds a preset threshold, the device automatically triggers the deflation of an airbag, thereby damping excess pressure and ensuring compression levels remain within the optimal range. This innovative approach not only improves the effectiveness of CPR delivery but also mitigates the risk of injury to the patient, as excessive compression force can cause rib fractures or other complications. By providing real-time feedback and assistance during CPR, the device has the potential to enhance the quality of care delivered by both trained professionals and lay rescuers, ultimately improving patient outcomes in emergency situations. Overall, the development of this frugal device represents a significant advancement in emergency medical technology, offering a cost- effective and accessible solution to optimize CPR procedures and save lives.

Keywords: CPR, dampening, Threshold

1 INTRODUCTION

Cardiopulmonary resuscitation (CPR) is an emergency life-saving procedure that can help keep oxygenated blood flowing to the brain and other vital organs until definitive medical treatment is available. CPR is important because it can double or triple a person's chances of survival after a heart attack arrest. When someone's heart stops beating, blood stops flowing to the brain and other vital organs. Brain damage can begin within minutes and death can occur within 10 minutes.

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From Flames to Fuels: A Review of Combustion in Energy Generation

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Abstract. This review paper delves into the nuanced world of combustion in energy generation, exploring the different kinds and their respective influences and utilization. It spans from complete type to explosive combustion, each imparting specific features, environmental implications, and technological advancements. Complete-type combustion, renowned for its cleanliness, contrasts sharply with the hazardous incomplete combustion. Whereas, rapid combustion is extremely good for enhancing engine performance, and spontaneous combustion is marked by its natural incidence without outside triggers. Explosive combustion, prominent by its rapid response rates, underscores the complexity and risks inherent in certain combustion techniques. The paper similarly investigates catalysts, fuel enhancements, and technological innovations aimed toward optimizing combustion performance and reducing environmental detriments. This complete review presents a deep dive into the combustion mechanisms, their utilization, and the ongoing research aimed at mitigating their environmental affects while enhancing efficiency in energy generation systems.

Keyword:- Combustion, types, application, control strategies, Conventional Power Plant.

1 Introduction

The majority of the discussion on the sustainability of energy revolves around clean-energy technologies such as solar power, wind power, and thermal. But along with fossil fuels accounting for nearly 80% of total energy consumption in the USA, combustion maintains the primary mode of energy conversion for power production as shown in Fig.1, electricity.

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Algal Biofuels: Unveiling the Potential of Seaweed in Renewable Energy Production

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Abstract. This study examines the numerous pre-processing techniques used to convert biomass into greater sustainable biofuels and commodities, highlighting the boom in productivity and the supply of a greater uniform, dry, and suitable feedstock. by using addressing the demanding situations associated with biomass size, layout, moisture content, and variability, this study delves into mechanical procedures, drying, torrefaction, palletization, hydrolysis, hydrothermal, and microwave-primarily based strategies as possible solutions. It explores the utilization of various biomass types, which include wood, woody biomass, herbaceous streams, and agricultural streams, and assesses their impact on bioenergy production and environmental sustainability. The study also considers the position of algae, specially microalgae, in offering bioactive materials with substantial health advantages and their ability in overcoming land-use concerns associated with traditional biomass. moreover, the paper evaluates the environmental affects and sustainability of biomass usage, advocating for microalgae as a promising feedstock for 1/3-technology biofuels. The research is grounded in the context of the increasing need to reduce reliance on fossil fuels due to urbanization and population enlargement, which make contributions to environmental degradation.

Keyword: Biofuels, renewable fuels, algae, seaweed, biomass, energy production

Pioneering Efficient Blockchain in IoT: A Review of Tailored Protocols for Modern Devices

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Abstract

Abstract:

The dawn of the digital age has transformed our world, with the Internet of Things (IoT) at its heart, where billions of devices are seamlessly connected. Essential to the vision of smart cities, these devices deliver convenience, though not without drawbacks, and also pose a serious security risk. This paper dives deeper into the potential of blockchain - a decentralized ledger system - as a solution to these challenges, specifically focusing on its adaptability to IoT constraints. Through detailed analysis, we conduct four key experiments to map the landscape that blockchain protocols are optimized for IoT and we discuss their features and shortcomings. These reviews cover policies from managing secure transactions to verifying payments, approving channels, and more. Despite the promise these protocols show, the use of blockchain in the IoT is fraught with challenges, mainly due to the limited features of many IoT devices, and while blockchain promises security communicatively, it does not protect against all possible threats such as physical changes. The purpose of the paper is to compare these protocols and give the readers a panoramic view on the convergence of IoT and blockchain. Looking ahead, the research will focus on how to adapt to the ever-evolving world of IoT

blockchain. Looking ahead, the research will focus on how to adapt to the ever-evolving world of IoT and address existing challenges, ensuring a future where our devices are better connected and it is safe.

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HyporChain: A Dynamic Stake Sharding Protocol Supporting Smart Contracts to Achieve Low Cross-Shard and Scalability
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INFINITE INTELLIGENCE

A PRACTICAL APPROACH TO DEEP LEARNING

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IoT based solar powered air purifier with air quality monitoring system

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Abstract. The cornerstone of combating indoor air pollution sustainably lies in integrating solar electricity into air purification systems. This not only addresses airborne pollutants but also reduces reliance on traditional power sources, promoting environmental preservation and cost savings. The system's effectiveness hinges on real-time AQM and advanced filtering techniques, powered by solar energy. By leveraging solar power, it operates eco-consciously while maximizing indoor air quality impact. Its design emphasizes energy efficiency without compromising purification efficacy, effectively eliminating allergens, pollutants, and Real-time monitoring empowers users to make informed environmental adjustments by tracking various metrics simultaneously. This comprehensive approach fosters sustainability, efficiency, and real-time control, crucial for enhancing indoor air quality. Additionally, its reliance on solar energy aligns with global efforts towards renewable energy adoption, reducing its ecological footprint. In summary, this solar-powered air filtration system signifies a paradigm shift in combating indoor air pollution, embodying the fusion of sustainability, innovation, and health-conscious design for a healthier indoor environment.

Keywords: Internet of Things, Air Monitoring System, Particulate Matter, Volatile Organic Compounds, Air quality index, Wireless Sensor Network, Global positioning system, Air quality monitoring, Revolutions per minute, Cubic feet per minute, Parts per million.

1. Introduction

The urgent issue of air pollution, particularly in regions with unreliable power sources, demands an innovative approach to continuous air quality monitoring and purification. The aim is to develop a sustainable system that not only cleanses the air but also provides real-time information on key metrics such as temperature, humidity, gases, and particulate matter. This endeavour requires leveraging solar power as the primary energy source to ensure the system's autonomy [1]. Combining advanced air quality monitoring features with solar energy presents a significant challenge, but it's crucial for creating a solution that operates independently of conventional power grids. By enabling users to access vital information about their environment, we empower them to make informed decisions for healthier living spaces. Ultimately, the goal is to establish a novel, self-sufficient air purification system that contributes to both environmental and economic sustainability while addressing the pressing

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Biomass and Operational Initiatives for Sustainable Bioenergy Generation

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Abstract. The global shift towards sustainable energy resources highlights the importance of biomass as a promising path for generating green, renewable energy. This study synthesizes modern research and technological improvements in biomass feedstocks, bioenergy conversion approaches, and integrated biorefinery systems. It explores the multifaceted position of biomass in addressing power safety, mitigating climate change, and fostering financial improvement, in particular in emerging economies. The paper evaluates diverse biomass resources, along with lignocellulosic materials, dairy waste, and microalgae, and discusses their conversion into biofuels and biochemicals via tactics including fermentation, anaerobic digestion, and biochemical conversion. It similarly delves into the environmental and monetary implications of biomass usage, highlighting the challenges and opportunities in enhancing efficiency, reducing fees, and making sure sustainability. By supplying a comprehensive evaluate of the modern country and future instructions of bioenergy research, this paper pursuit to make contributions to the development of low-carbon, renewable fuel options and advance the global transition towards a more sustainable and varied energy portfolio.

Keyword-: Renewable Energy, biomass, feedstock, biofuels, energy generation.

1 Introduction

Bioenergy, a kind of energy from renewable sources derived from biomass as shown in Fig.1, is a major international contributor to the generation of clean energy mainly because of its cheap power infrastructure needs and high effectiveness [1]. It covers substances that are

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Efficiency Analysis of Gear Change Control Strategy of Clutchless Automatic Manual Transmission of an Electric Vehicle

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Abstract: Conventional automatic-manual transmission for vehicle powered by IC engine requires an electronically controlled clutch to isolate and engage the engine power for smooth gear changes because of the high inertia of the internal-combustion engine. This makes the system complicated and, therefore, more expensive. A Clutchless Automatic Manual Transmission (CLAMT) employed for electric vehicles is analysed in this paper. It has the benefits of high efficiency, low cost, and simple structure. To increase speed and make the speed controller useful for the CLAMT system, a synchronisation speed control technique based on the sliding-mode method is used. By utilizing the electronic control unit (ECU) of CLAMT system, it can achieve the smooth gear-shifting process, with regard to the efficiency of the drive train. The ECU, employs two 32-bit floating-point digital signal processors, TI TMS320LF240⁷ and TMS320F2801.

Keywords: CLAMT, Electric vehicle, ECU.

Introduction:

Automatic transmissions (AT) were once regarded as a high-end alternative to manual gearboxes in the automotive industry because they provide automated gear shifting, saving the driver from having to manually shift into gear [1]. The benefit of an automatic gear schedule has become more significant, though, as energy efficiency of automobiles has been one of the primary goals of automobile manufacturers [2]. It is feasible to let the engine or powered motor operate in areas with low energy consumption by delegating the responsibility of choosing an appropriate gear for engine-powered motor operation from the driver to the gearbox. Pure electric vehicles have gained international attention as a result of advancements in power electronics technology and electric components. The driving motor of a pure electric car is typically equipped with a decelerator or a transmission device to increase the efficiency of an electric driving system while still meeting the standards of vehicle drivability [3]. It is inappropriate to utilise an AT or continuous-variable transmission (CVT) when building the EV because an AT suffers from significant power losses and a CVT can only be used for small-sized passenger cars at the moment [4]. Using a standard multispeed manual gearbox plus electric, pneumatic, or hydraulic power, the AMT can be deployed with ease.

Materials:

Table I.I shows the specification of Gear Ratio in MT Gearbox. Due to the high inertia of the ICE, conventional AMT for ICE-powered vehicles requires an electronic controlled clutch to separate and engage engine power for smooth gear changes. This adds complexity to the system and raises costs. This paper proposes an AMT system for electric vehicles (EVs) without the clutch apparatus. Shift quality is one of the most important factors in transmission control. Shift quality is determined by torque hole and

An Intelligent Vacuum Based Grass Cutter for Agricultural Application

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Abstract: A robot's control system plays a critical role in its ability to assist humans with everyday tasks. Robotic technology for lawn maintenance has been done in an effort to reduce the possibility of potential risks while also taking time, money, and energy efficiency into account. But in certain situations, human supervision has not entirely replaced robotic assistance in work. Therefore, even if this lawn mower robot's application has been thoroughly researched, there are still areas that need to be developed to increase its effectiveness and performance. The lawn mower model has an inbuilt vacuum cleaner. Basically, the robot operates in two automatic modes based on the situation. With regard to the creation of the overall system, including the hardware and software components, microcontrollers play a significant role. It is designed to take commands in order to detect objects in its environment and steer the robot away from collisions. The battery powers the entire circuitry.

Keywords- Robotic technology, Bluetooth controlling, Microcontroller, Rechargeable battery, Motor drivers, Control system.

Introduction:

Due of their efficacy in supporting people in cleaning applications, robotic cleaners have received significant interest in recent years in robotic research. Cleaning is the process of eliminating undesirable elements from a space or thing, such as dust, pathogens, and other contaminants. Cleaning takes place in a variety of settings and with a variety of techniques. One of the procedures that takes more time is the typical cleaning techniques used by humans. Vacuum cleaners were a huge advance in the cleaning procedure that came about many years ago. Our nation must maintain its cleanliness in order to attract foreign investment and give people better facilities. In many ways, intelligent machines will replace or improve human talents. Research into artificial intelligence research has spawned the fast-expanding field of expertise system. Vibration caused by the transit causes the iron ore to slide off the conveyor. Around the conveyor, the iron ore that has been dropped builds up. Recently, the dirt pile has been cleaned up using a hoover car. This cleaning technique was known as hoover work. The use of a hose linked to a hoover car to remove and collect the dirt pile is known as hoover work. However, the conveyor must be stopped in order to avoid having workers collide with falling iron ore while performing hoover work. Steelworks productivity suffers as a result. Additionally, employees spend a lot of time vacuuming in a dusty environment. As a result, employees have health issues like Pneumoconiosis and shortness of breath. Due to these issues, a robot that performs hoover work instead of humans must be created. An automated mapping system for the domestic environment as well as a method for cleaning the entire map's region were created.

Objective:

To achieve this, you would need to carefully design the product with two separate modes of operation.

Efficient Dual Motor Power Train For Two-wheeled Electric-Cycle

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Abstract: In this paper, as the market of two-wheeled Electric Vehicle is growing and it is to improve the efficiency of the electric power train. Most of the two-wheeled Electric Vehicles are either motor mounted in the wheel-hub or connected to the rear wheel through a transmission. In-wheel motor has a limited torque capacity whereas the other configuration the transmission reduces the system efficiency. So here this paper proposes a Dual- motor power-train topology which aims to combine the best of both configurations. To evaluate and compare the configurations, the energy consumption of the Single-motor and the Dual- motor topologies is calculated over a driving cycle. Here It is shown that Dual-motor topology is efficiently utilizes the available energy compared to Single-motor topology

Introduction:

India is the largest manufacturing country and market for two wheelers. This presents a great opportunity to have a greater impact on reducing emissions by replacing internal combustion engines in two-wheelers with electric power-trains. According to the unions of concerned scientists, the current cost of manufacturing a lithium-ion battery pack is around \$200/kwh. Improve system efficiency in electric vehicles. In this topology the in-wheel motors are connected to the front wheels. The chassis mounted engine is linked via a two-speed fixed gearbox. The main goal is to combine the two topologies to maximize battery usage. Bicycles have long been popular among people of all ages because they are lightweight, and require no maintenance or fuel costs. Cycling, like any other physical activity, contributes to health benefits. All normal bicycles are driven by people, so people tends to get tired and nervous when riding for long times. The advantage of the bicycle is that is combined with the additional engine power of the e- bike. An e-bike is an electric bicycle with an integrated electric motor that must be used for propulsion. A chassis-mounted motor is connected through a two- stage fixed transmission. The aim is to combine the best of the two topologies to maximize battery utilization. Unlike traditional trail usage, electric-assist modes enable users to reach higher speeds, cover longer distances, and transport more gear or equipment. These features can pose safety issues for hikers, conventional bicyclists, and horseback riders, who typically travel at slower speeds, cover shorter distances, and carry less equipment. This paper explores the development and implementation of an efficient dual motor power train for two-wheeled electric cycles. The dual motor configuration offers several advantages over traditional single motor systems, including improved torque distribution, better handling, and increased overall efficiency. By distributing the load between two motors, this approach can potentially reduce wear and tear on individual components, leading to a longer lifespan and lower maintenance costs. Our research focuses on the design, optimization, and testing of a dual motor powertrain system tailored for e-cycles. We aim to address key challenges such as energy management, motor synchronization, and control strategies to ensure a seamless and efficient riding experience. The findings of this study will provide valuable insights for manufacturers and designers in the e-cycle industry, contributing to the advancement of electric mobility solutions.

Modeling And Simulation:

The model provides the charging and discharging curves based on the Shepherd's equations as given below.

Third Eye for Blind

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Abstract: Over the last few decades, the development in the field of navigation and routing devices has become a hindering task for the researchers to develop smart and intelligent guiding mechanism at indoor and outdoor locations for blind and visually impaired people (BVIPs). The existing research need to be analysed from a historical perception including early research on the first electronic travel aids to the use of modern artificial vision models for the navigation of BVIPs. Diverse approaches such as: e-cane or guide dog, infrared-based cane, laser-based walker and many others are proposed for the navigation of BVIPs. But most of these techniques have limitations such as: infrared and ultrasonic based assistance has short range capacities for object detection. While laser-based assistance can harm other people if it directly hit them on their eyes or any other part of the body. These trade-offs are critical to bring this technology in practice. to systematically assess, analyse, and identify the primary studies in this specialized field and provide an overview of the trends and empirical evidence in the proposed field. This systematic research work is performed by defining a set of relevant keywords, formulating four research questions, defining selection criteria for the articles, and synthesizing the empirical evidence in this area. Our pool of studies include 191 most relevant articles to the proposed field reported between 2011 and 2020 (a portion of 2020 is included). This systematic mapping will help the researchers, engineers, and practitioners to make more authentic decisions for finding gaps in the available navigation assistants and suggest a new and enhanced smart assistant application accordingly to ensure safety and accurate guidance of the BVIPs. This research work has several implications in particular the impact of reducing fatalities and major injuries of BVIPs.

Key Words: Navigation, Travel aids, Assistive Technology, Blind and Visually impaired



Power Quality Enhancement in Electrical System by Incorporating Renewable Energy Resources With UPQC

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Abstract: The integration of renewable energy resources, such as solar into the electrical grid presents challenges related to power quality due to their intermittent nature. This speculative approach suggests a solution for enhancing power quality by incorporating Flexible AC Transmission System (FACTS) devices like Unified Power Quality Conditioner (UPQC) into the system which can eliminate numerous power quality events comprises voltage sags, swells, harmonics, and power factor correction and integrating with RES, the consistency and permanency of the grid can be significantly improved. It discusses the principles of operation, benefits and challenges associated with the integration of RES and FACT devices like UPQC for power quality enhancement. Through simulation studies and real-world examples, the proposed approach is demonstrated in modern power systems aiming for high quality and reliable while embracing renewable energy.

Key Words: Renewable Energy System, FACTS, Power Quality, Unified Power Quality Conditioner.



Grid - Tied Solar Panel Companion Inverter

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Abstract: A Solar panel companion inverter (SPCI) is a single-stage DC-AC power converter, installed behind each solar panel and is topologically similar to a cascaded H-Bridge inverter. Six solar panels and their corresponding SPCIs are taken into consideration. Each H-Bridge consists of four power electronics devices preferably Metal Oxide Semiconductor Field Effect Transistors (MOSFETs), one DC link capacitor, and a parasitic power supply harvesting energy from the solar panel itself. DC voltage output of a photo-voltaic solar panel is converted to quasi-square wave voltages with variable pulse width, which when aggregated realize a superior quality multilevel waveform that can be directly interfaced with the power grid. A Maximum Power Point Tracking (MPPT) using the control algorithm extracts the maximum power at the panel level. In the initial step, six DC inputs are provided to six H-Bridges and a 13-level output voltage is obtained. A general study on a Phase Locked Loop (PLL) is also going to be conducted as the control of grid-connected inverters needs the phase information of the source. Closed loop current control of the SPCI needs to be done and the regulation of the grid current to be studied.

Key Words: Photovoltaic Inverter, Cascaded H-bridge Inverter, Multilevel Inverter, Control Strategies, Photo Voltaic Power Conversion, Maximum Power Point Tracking, MPPT



Energy Harvesting Using Vertical Axis Wind Turbine from Highway Traffic Vehicles Movement

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Abstract: *This paper describes the electric energy harvesting method using Vertical Axis Wind Turbines to harness the wind energy generated by the turbulence created by the movement of automobiles along our National Highways. The electric power generated from the wind is presumed to supply power to the National Highway streetlights and electric car charging. There are several alternative renewable sources that we may employ in place of existing non-renewable sources. Further testing with diverse sources, is required to ensure that the alternatives chosen have no problems in the long term. Wind energy is effective and renewable. Electricity production can be facilitated through the aerodynamic losses incurred by vehicles in motion on highways. This energy would be beneficial in a variety of applications, including ship power systems, hybrid electric vehicles, the telecommunications industry, rural electrification, etc. The escalating expenses of traditional energy sources have led to a growing interest in the environmental advantages of these technologies, which may contribute to their broad adoption and approval.*

Keywords: *Wind Turbines, wind energy harvesting, hybrid electric vehicles, Energy management*

Introduction:

Renewable energy is regarded as a sustainable and environmentally friendly source of power. Currently, it stands as one of the most crucial subjects. The depletion of fossil fuel reserves is occurring at a rapid pace, with no new reserves being discovered [1]. Furthermore, the production of energy through the utilisation of fossil fuels has the potential to give rise to a plethora of environmental issues, such as the discharge of greenhouse gases, the escalation of global temperatures, and the occurrence of acid precipitation. Renewable energy sources are significant contributors in such circumstances. Renewable sources of energy encompass a variety of natural resources such as wind, solar radiation, geothermal heat, hydro power, tidal energy, biomass, and other similar sources. The conversion of energy from various sources, regardless of whether they are depletable or non-depletable, into a usable form, results in environmental consequences. The utilisation of analytical techniques to evaluate sustainability with regards to energy and environmental aspects, followed by a comparative analysis of various alternatives, can provide guidance for future energy strategies and governmental regulations.

Wind energy (or wind power) describes the process by which wind is used to generate electricity. The process of converting the kinetic energy present in the wind into mechanical power is accomplished by wind turbines. The transformation of mechanical power into electrical power can be accomplished using a generator. Direct utilisation of mechanical power can be employed for particular purposes, such as water pumping. The phenomenon of wind can be attributed to the non-uniform heating of the atmosphere by solar radiation, irregularities in the topography of the earth's surface, and the rotational motion of the planet. The patterns of wind flow are influenced by various natural elements such as mountains, bodies of water, and vegetation. The process of generating electricity from wind involves the utilisation of wind turbines, which operate by rotating rotor blades in a propeller-like manner to harness the kinetic energy of wind. The rotational motion of the rotor is responsible for driving the drive shaft, which in turn drives an electric generator. The amount of energy that a turbine can harness from the wind is influenced by three primary factors, namely wind speed, air density, and swept area.

A Comparative Study of the Recent High Gain Boost Converters Topology for Renewable Energy Applications

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Abstract: Maximizing energy from renewable sources requires power electronics. High gain converters are where most power electronics advances take place. By generating enough power output, high gain DC-DC converters help renewable energy sources (RES) like fuel cells and photovoltaics meet high load demands. The many high-gain DC-DC converter topologies are examined and discussed in this paper. These consist of non-isolated, non-coupled inductor-based high gain DC to DC converters, non-isolated quadratic DC-DC boost converters, and switching the inductor and capacitor divider network-based high gain boost converters. Through a combination of study, simulation, and topology comparison, the optimal topology for a photovoltaic system was developed. The voltage gain and component count are examples of performance parameters.

Key Words: Renewable Energy Sources, DC-DC Converters

DC-DC Converter with Single Input and Dual Output for Electric Vehicle

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Abstract: Multiport converters are important for applications involving electric vehicles (EVs). The only converter that can be utilized for both the production and consumption is the DC-DC converter. The converters can be multi input or multi output in different configurations. The majority of single input multi output (SIMO) converters generate outputs with limitations on the duty ratio and inductor charging. One ongoing challenge in the design of SIMO converters is the cross regulation issue. In order to successfully avoid cross regulation while controlling the loads, this study presents a DC-DC converter with single input dual output (SIDO), which provides independent outputs without affecting the other loads during operation. Because there are fewer components in the proposed converter, the circuit is simple and cost-effective. The usefulness of an auxiliary power module for EV application is analysed using simulation results.

Key Words: Single Input Multi Output Converters

An Algorithm for Extracting Image Features Using a Random Deep Neural Network

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Abstract: In this paper, a random deep convolutional neural network-based technique for extracting image features is devised and put into practice. The image features are also richer following the image preprocessing procedure described in this article. Additionally, more consistent feature points are recognized, duplicate local features are deleted, and this prevents the feature matching from encountering too many unmatched pairs. Since the self-encoder can successfully rebuild the training data set, data that is close to the training set, and the data itself, this work offers some original ideas for constructing the model. The study's findings have demonstrated the successful outcomes.

Keywords: Learning, Neural Networks, Image Analysis, Image Feature, Feature Extraction, Random Model

1. INTRODUCTION

The goal of picture fusion is to combine different source images to create a new image by utilizing the complementary nature of the image information. Currently, optical devices can typically just focus on a small portion of a scene and are thus unable to capture photos that clearly show all of the targets [1-3]. Initial, picture denoising employs filter like average filter and average filtering that lack adaptive capabilities. This same edge info there in picture would be blurred as a result of this filtering technique [4-5, 7-9]. Slowly, these techniques are being dropped. Basic spatial domain interpolation & change detection denoising are two categories into which later denoising techniques can be loosely divided [6].

This same spatial domain denoising technique weights spare pixels blocks to substitute the targeted pixel block that has been tainted by noise by looking for spare pixels blocks just on entire image that have similar properties to the targeted pixel blocks. Only after source picture has

undergone multi-scale modification, the multi-scale picture fusion method merges the equations with in transform domain. Most traditional of them all is the wavelet, which is founded here on Fourier analytic theory. The feature extension neural network - based systems model is suggested in light of the latest advancements in neural networks. Scientists will lower the net configuration as the key study way of such compression optimized method since the factors with in deep neural networks model influence how complex



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Development of Fuzzy Logic Controller in Automatic Vehicle Navigation using IoT



Journal of
Electrical
Systems

Abstract: - The integration of fuzzy logic controllers in automatic vehicle navigation systems represents a significant advancement in intelligent transportation systems, especially when paired with Internet of Things (IoT) functionalities and optimized through genetic algorithms. This innovative fusion harnesses the precision of fuzzy logic, the connectivity of IoT, and the optimization capabilities of genetic algorithms to transform automatic vehicle navigation. Fuzzy logic controllers excel in managing uncertainty and imprecision, providing decision-making capabilities akin to human reasoning. By simultaneously assessing multiple inputs and determining actions based on degrees of truth, fuzzy logic enables safe and efficient navigation in dynamic driving environments with fluctuating variables like obstacle proximity and traffic flow. IoT integration enhances navigation systems by enabling real-time data collection and sharing among vehicles and infrastructure, fostering adaptive route planning and improving the overall navigation experience. Genetic algorithms further optimize system performance by iteratively adjusting fuzzy logic controller parameters, ensuring efficient decision-making tailored to specific performance criteria such as travel time and fuel consumption. This collaborative integration of fuzzy logic controllers, IoT, and genetic algorithms offers a holistic solution to the challenges of automatic vehicle navigation, enhancing safety, efficiency, and adaptability in complex driving scenarios. Beyond enhancing individual vehicle performance, this approach contributes to overall transportation system efficiency and safety by mitigating traffic congestion, reducing emissions, and minimizing accidents. Consequently, these integrated systems address crucial societal challenges and pave the way for widespread adoption of autonomous vehicles in the future.

Keywords: Fuzzy logic controllers, Automatic vehicles, Internet of things, Genetic algorithm.

I. INTRODUCTION

Automatic vehicle navigation, also known as autonomous or self-driving vehicle technology, stands at the forefront of transformative innovation in road transportation. It represents a paradigm shift aimed at enhancing safety, efficiency, and accessibility in transportation systems worldwide. This technology relies on a sophisticated array of sensors, cameras, and radar systems, coupled with advanced algorithms and artificial intelligence (AI), to perceive and interpret the surrounding environment in real-time. By comprehending complex traffic scenarios, including the behavior of other vehicles, pedestrians, and various obstacles, autonomous vehicles navigate roads with precision, aiming to revolutionize the concept of mobility [1]-[3].

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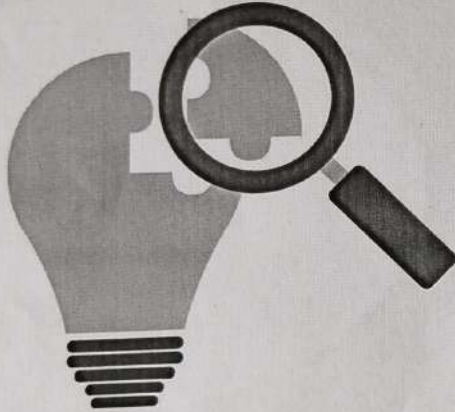
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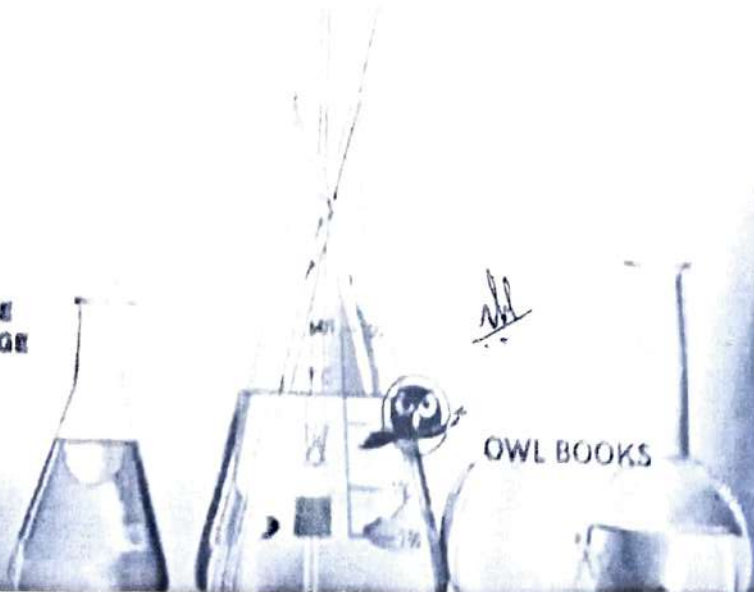
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