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Centre for Industrial Relation and Research Projects (IRRP)

Date ... 23.05.2022

FACULTY INCENTIVE FORM

Staff Name	Dr. K. TAMILARASI			
Designation/Department	ASP|ECE			
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published ✓	Applicant (First) (Rs.5,000)	Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)	Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—
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Participation	IITs/NITs/up to NIRF Top 100 colleges		Registration Fee - Actual (Max.Rs.5,000)	—
Additional details (Attach supporting documents)	Impact Factor —	DOI / Patent No./ Scheme 2022A1026586		NIRF Ranking —
Approved amount in Rs.	RS. 5000/- (Rupees Five thousand only)			

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Investigator / Coordinator

K·a~ 27|5|22
Dept. IRRP Coordinator

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23/5/2022
Director - IRRP

23/5/22
Director (Admin.) / Principal

May be approved
Executive Director
24/05/22

Amount Received
Already - NIL
(K) 23/5/22

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241026586 A

(19) INDIA

(22) Date of filing of Application :08/05/2022

(43) Publication Date : 20/05/2022

(54) Title of the invention : PERFORMANCE AND ACCURACY ANALYSIS OF SIGNATURE VERIFICATION USING INTEGER WAVELET TRANSFORM AND BACK PROPAGATION NEURAL NETWORK

(51) International classification	:G06K0009000000, G06N0003080000, G06T0001000000, G07C0009350000, H04L0009320000
(86) International Application No Filing Date	:PCT// :01/01/1900
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

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(57) Abstract :
The biometric system is an accurate, reliable and rugged tools with traditional identification techniques for various applications. A person uses signature verification to avoid automatic entries of forgers. The proposed handwritten signature verification system is initially pre-processed for the reduction of unwanted noise and the features like angle, pressure, input vector and sequence of impulses are extracted using Integer Wavelet Transform (IWT)finally the obtained values are evaluated with the proposed Back Propagation Neural Network (BPNN)classifier for the identify of genuine and forgery signature. The IWT with BPNN approach will produces the error ratio of the signature verification system at 0.0882 for SVC 2004 and 0.0921 for GPDS data set.

No. of Pages : 10 No. of Claims : 1

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Tran Date	Chq No	Particulars	Debit	Credit	Balance	Init. Br
		OPENING BALANCE			3019.24	
06-06-2022		Dr Card Charges ANNUAL 6522XXXXXXXXX1374	236.00		2783.24	170
07-06-2022		SRI RENGASWAMY /Excel Bill Payment		5000.00	7783.24	170
09-06-2022		INB/894871355/RELIANCE JIO INFOCOM(BILLDESK)/NA	666.00		7117.24	170
09-06-2022		SRI RENGASWAMY /EXCEL SALARYMAY 22		27657.00	34774.24	170
		TRANSACTION TOTAL	902.00	32657.00		
		CLOSING BALANCE			34774.24	

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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Rank
	—	202241013634 A		—
Approved amount in Rs.	2,500/-			

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	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
	—	202241029669 A		—
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Amount Received
Already - NIL

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(21) Application No.202241029669 A

(22) Date of filing of Application :24/05/2022

(43) Publication Date : 03/06/2022

(54) Title of the invention : MACHINE LEARNING AND IOT BASED APPROACH MONITORING AND PREDICTION OF AIR QUALITY POLLUTION

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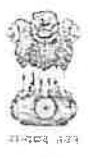 12)DR. N. VENKATACHALAM
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(51) International classification : G06N0020000000, C01N0010000000, C06N0003080000, G06K0009620000, C05B0013040000

(86) International Application No : PCT//
    Filing Date : 01/01/1900

(87) International Publication No : NA

(61) Patent of Addition to Application Number : NA
    Filing Date : NA

(62) Divisional to Application Number : NA
    Filing Date : NA

(57) Abstract :
Machine learning and IOT based approach monitoring and prediction of Air Quality Pollution is the proposed invention. The invention focuses on implementing the algorithm of machine learning to analyze the quality of air. The IOT unit is integrated to monitor the air pollution and its impact on the particular geographical location.

No. of Pages : 11 No. of Claims : 4

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Application Details	
APPLICATION NUMBER	202241039699
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	24/05/2022
APPLICANT NAME	1 . Dr. SAI VENU PRATHAP KATARI
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	10 . SATAM SACHIN BAJIRAO
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	12 . DR. M. VENKATACHALAM
TITLE OF INVENTION	MACHINE LEARNING AND IOT BASED APPROACH MONITORING AND PREDICTION OF AIR QUALITY POLLUTION
FIELD OF INVENTION	COMPUTER SCIENCE
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E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	--
PUBLICATION DATE (U/S 11A)	03/06/2022

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	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—
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Participation	IITs/NITs/up to NIRF Top 100 colleges		Registration Fee - Actual (Max.Rs.5,000)	—
Additional details (Attach supporting documents)	Impact Factor 0.6	DOI / Patent No./ Scheme https://doi.org/10.1007/978 -3-030-96305- 7-8		NIRF Ranking
Approved amount in Rs.	Rs.1,500/= One Thousand Five hundred only			

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An Optimized Data Replication Algorithm in Mobile Edge Computing Systems to Reduce Latency in Internet o. Things

N. Saranya, K. Geetha & C. Rajan

Abstract

The actual amount of data that was created applying the actuators, the sensors, and some other devices for the Internet of Things (IoT) has been showing a substantial level of increase in recent years. The data of IoT are handled using the cloud utilizing computing resources that are located in the data canters at a distance. As a result, the bandwidth of the network and the latency of communication have become major bottlenecks. The technology is known as Mobile Edge Computing (MEC) primarily seeks at

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An Optimized Data Replication Algorithm in Mobile Edge Computing Systems to Reduce Latency in Internet of Things

Resource allocation based on

scheduling in mobile edge

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Centre for Industrial Relation and Research Projects (IRRP)
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	Scopus/AU Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)	Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)	Inventor (Rs.10,000)	
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
	—	20.18001.GSJ.2022.V9u .22.39154		
Approved amount in Rs.	Rs. 2,500/—			

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The details were checked and updated. The above mentioned incentive amount is recommended for approval.

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(65)

HEAT TRANSFER ENHANCEMENT IN SPIRAL TYPE HEAT EXCHANGER USING NON-NEWTONIAN NANOFLUIDS

*Dr.TAMILSELVAN N. [1], RANJITH KUMAR P [2], RAM KUMAR S [3], SIVAKUMAR S [4], RAJ KUMAR S [5]

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ABSTRACT

Nanofluids with their improved thermal conductivity are held to be a promising coolant in heat transfer applications. Heat transfer by nanofluids gained incredible interest among researchers due to its enhanced thermal conductivity. The efficiency of nanofluids such as alumina dispersed in sodium alginate (SA) non-newtonian fluid in spiral type heat exchanger resulting in enhancement of turbulent heat transfer was investigated. The experiment was carried out for various flow rates and for various Reynolds number. Results show that heat transfer enhancement is promoted due to the presence of alumina but enhancement is minimized due to increase in concentration of Sodium Alginate (SA).

KEYWORDS - Nanofluids, non-Newtonian, heat transfer, turbulent flow, spiral type heat exchanger.

I. INTRODUCTION

Efficient energy transfer is vital to render processes economically viable. More efficient heat exchangers is essential to make this possible. Various engineering techniques have been proposed since 1950's to reduce the size and cost of the equipment, to enhance the heat transfer rate thus saving up energy. One of the innovative techniques recently proposed is the use of 'nanofluids'. The concept that thermal conductivity for solids is higher than liquids, it is expected that thermal performance will be enlarged significantly by addition of nanoparticles to heat transfer fluids. Such fluids containing well dispersed nanoparticles into the base fluid is termed as 'nanofluids'. Main reason for higher thermal conductivity of nanofluids is due to Brownian motion and better effective mixing. It should be noted that the size of nanoparticles plays an important role in the enhancement of thermal conductivity of nano fluid. Nanofluid is prepared by adding metals, metal oxides, carbon nanotubes or any other solid nanomaterials to a base fluid like water, ethylene glycol or engine oil. Solid nanoparticles can be directly produced in a base fluid through chemical techniques [1 –5].

Enhancement characteristics for various nanoparticles have been studied by various researchers. Amirhossein Zamzamian et al investicated the forced convective heat transfer coefficient in nanofluids of Al2O3/EG and CuO/EG in a double pipe and plate heat exchangers under turbulent flow and also calculated the forced convective heat transfer coefficient of the nanofluids using theoretical correlations in order to compare the results with the experimental data [6]. Kamali.R, and A.R. Binesh, Numerically studied the convective heat transfer of multi-wall carbon nanotube (MWCNT)-based nanofluids in a straight tube under constant wall heat flux condition [7]. Wen and Ding [8] have experimented Al2O3/water nanofluid heat transfer in laminar flow under constant wall heat flux and found an increase in nanofluid heat transfer coefficient with Reynolds number and nano articles concentration particularly at the entrance region. They expressed that thermal developing length for nanofluid was greater than pure water. The reason for heat transfer enhancement for nanofluids is the decreased thermal boundary layer thickness due to non-uniform distribution of thermal conductivity and viscosity resulting from Brownian motion of nanoparticles. Palm et al. [9] numerically investigated the laminar flow heat transfer of Al2O3/ethylene glycol (EG) and Al2O3/water nanofluids in a radial flow system and reported

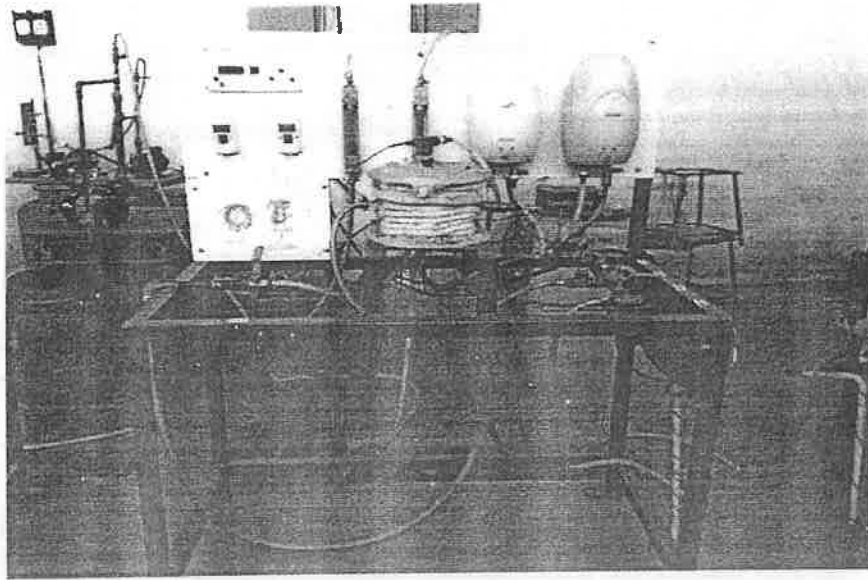Heat Transfer Enhancement in Spiral Type Heat Exchanger Using Non-Newtonian NanoFluids

Fig. 1 : Spiral Type Heat Exchanger Experimental Set up

Cold fluid (Sodium Alginate) is pumped at a inlet temperature of $31 \pm 3°C$ and hot fluid (Water) is pumped at a inlet temperature of $60 \pm 3°C$. Constant hot water flow rate of 4LPM is maintained throughout the experiment. Flow of rate of cold fluid is varied from 2 LPM to 8 LPM and corresponding inlet and outlet temperatures are noted. Times taken for filling definite volume are noted at the exit to reduce uncertainty in flow measurements. The system is allowed to reach steady state condition before the temperatures are noted. For each test fluids, the experiments are repeated for few readings to minimize the uncertainty in measured experimental parameters and reproducibility were found to be within $\pm 2\%$.

V. DATA ANALYSIS

Thermo-physical properties of test fluids are assumed to be constant along the length of the spiral and evaluated at the average temperature. Physical properties of non-newtonian fluids such as density, thermal conductivity and specific heat were taken to be same as that of water, as taken by Rajasekharan et. al.[14]

All nanofluids used exhibit shear thinning behavior. Physical Properties of nanofluids at average bulk temperatures are calculated from base fluids and nanofluids properties by following correlation [15]

$$\rho_{nf} = \phi\rho_p + (1 - \phi)\rho_{bf}$$

$$(\rho C_p)_{nf} = \phi(\rho C_p)_p + (1 - \phi)(\rho C_p)_{bf}$$

Their base fluids follow power law model. The base fluids and all nanofluids employed in this study exhibiting the power-law rheological behavior expressed as

$$\tau = K\gamma^n$$

For purely non-newtonian fluid (pseudoplastic) , dimensionless numbers are defined as follows:

$$Re = \frac{\rho \, u^{2-n} \, D^n}{K}$$

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Publisher: Wichmann Verlag

ISSN: 1869-9391

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S. No.	Name of the Faculty	Dept	Name of the Scheme	Journal Name/SCI/SCOPUS/WOS	Title of the proposal	Fund Received	Remaining Eligibility
1	Dr.S.Balakrishnan	MECH	Journal Publication		Development of a new improved structural integrity assessment correlation for throughwall axially cracked 90° shape imperfect pipe bends under in-plane opening bending moment	5000	5000
2	Dr.A.Vasantharaj	ECE	Patent Publication		Novel Architecture For Design And Evaluation Of Asynchronous System On Chip For Vlsi Technology	2500	7500
3	Dr.A.Vasantharaj	ECE	Journal Publication		Automated Brain Imaging Diagnosis and Classification Model using Rat Swarm Optimization with Deep Learning based Capsule Network	5000	2500
4	Dr.S.Sreethar	CSE	Journal Publication		SARC: Search and rescue optimization-based coding scheme for channel fault tolerance in wireless networks	5000	5000
5	Dr. N.Nandhagopal	ECE	Journal Publication		RE-PUPIL: resource efficient pupil detection system using the technique of average black pixel density	3500	6500
6	Dr. N.Nandhagopal	ECE	Journal Publication		Trust Management-Based Service Recovery and Attack Prevention in MANET	3500	3000
7	Mr.V.Karthikeyan	MECH	Journal Publication		Design and Performance Analysis of Air Pre heater for Water Tube Boiler to improve its Efficiency	5000	5000
8	Dr.A.Vasantharaj	ECE	Journal Publication		IOT Smart sensing device for sensitive Nanoclusters Modification in sensing properties	2500	NIL
9	Ms.R.Preethi	ECE	4 week induction Programme		College:	1950	8050

27	Dr.K.Tamilarasi	ECE	Patent Publication	Inventor	Performance And Accuracy Analysis Of Signature Verification Using Integ... Wavelet Transform And Back Propagation Neural Network	5000	5000
28	Mr.M.Sambath Kumar	Mech	Patent Publication	Inventor	Machine Learning and IOT based Approach Monitoring and Prediction of Air Quality Pollution	2500	7500
29	Ms.R.Preethi	ECE	Journal Publication	WoS	Improve Safety and Bioavialability of Meicinesin Pharmaceuticals	3500	Rejected Du... of Speci...
30	Dr.N .TamilsELVAN	Mech	Journal Publication	Scopus	Heat Transfer Enhancement In Spiral Type Heat Exchanger Using Non- Newtonian Nanofluids	2500	7500
31	Dr.K.Geetha	CSE	Journal Publication	scopus	An Optimized Data Replication Algorithm in Mobile Edg	1500	8500

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Total Amount Given - 104900/-

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S. No.	Name of the Faculty	Dept	Name of the Scheme	Title of the proposal	Fund Received	Remaining Eligibility	Status
1	Dr.S.Balakrishnan	MECH	Journal Publication	Development of a new improved structural integrity assessment correlation for throughwall axially cracked 90° shape imperfect pipe bends under in-plane opening bending moment	5000	5000	
2	Dr.A.Vasantharaj	ECE	Patent Publication	Novel Architecture For Design And Evaluation Of Asynchronous System On Chip For Vlsi Technology	2500	7500	
3	Dr.A.Vasantharaj	ECE	Journal Publication	Automated Brain Imaging Diagnosis and Classification Model using Rat Swarm Optimization with Deep Learning based Capsule Network	5000	2500	
4	Dr.S.Sreethar	CSE	Journal Publication	SARC: Search and rescue optimization-based coding scheme for channel fault tolerance in wireless networks	5000	5000	
5	Dr. N.Nandhagopal	ECE	Journal Publication	RE-PUPIL: resource efficient pupil detection system using the technique of average black pixel density	3500	6500	
6	Dr. N.Nandhagopal	ECE	Journal Publication	Trust Management-Based Service Recovery and Attack Prevention in MANET	3500	3000	
7	Mr.V.Karthikeyan	MECH	Journal Publication	Design and Performance Analysis of Air Pre heater for Water Tube Boiler to improve its Efficiency	5000	5000	
8	Dr.A.Vasantharaj	ECE	Journal Publication	IOT Smart sensing device for sensitive Nanoclusters Modification in sensing properties	2500	NIL	Completed
9	Ms.R.Preethi	ECE	4 week induction Programme	College:	1950	8050	
10	Dr.S.Sreethar	CSE	Journal Publication	A Group Teaching Optimization Algorithm for Priority Based Resource Allocation in Wireless Networks	5000	NIL	Completed

No	Name	Dept	Type	Title			
11	Sankarananth	EEE	Book Chapter indexed in scopus	Challenges and Opportunities of big data integration in Patient centric Health care analytics using Mobile Networks	1500	8500	
12	Dr.Arulmurugan	EEE	Patent Publication	Sustainable Tree Based Smart Power Generation System	5000	5000	
13	V.Arun Antony	ECE	Patent Publication	New Digital software Technology to Indentify the Variety of Dangerous	5000	5000	
14	V.Ramya	CSE	Patent Publication	Analysis and Monitoring of Network Traffic using Deep Learning	5000	5000	
15	Ms.R.Preethi	ECE	Patent Publication	An Image Processing Based Technique to help HR Predict the Pulse of Working Environment	5000	3050	
16	Dr.R.Vinoth	MECH	Journal Publication	Study on the Heat Transfer characteristic of Al2O3-CUO/Water hybrid Nanofluids in a shell and rotating wavy tube heat exchanges	2500	7500	
17	Dr.R.Vinoth	MECH	Journal Publication	Environment impact on the use of diesel waste plastic oil nano additive blends in a DI Diesel Engine	3500	4000	
18	Mrs.A.Anitha Rani	ECE	Patent Publication	Precision Analysis of Digital Agriculture	5000	5000	
19	Dr.N.Venkatachallam	Mech	Journal Publication	Application of Analytical Hierarchy Process(AHP) for assessment of collection and Transportation of solid Waste :An Empirical Study	1500	8500	
20	Dr.Arulmurugan	EEE	Patent Publication	Smart Health Monitoring System Enabled Smar Grid Using Machine Learning AI	5000	NIL	Completed
21	Dr.S.Anbukaruppusamy	ECE	Journal Publication	Forest Fire Prediction using IOT and Deep Learning	1000	9000	
22	Dr.S.Anbukaruppusamy	ECE	Journal Publication	Greedy Weight Matrix Topological Adaptive Ad -Hoc On demand Multipath Distance Vector Protocol for Qos Improvement in Manet	3500	5500	
23	Dr.M.P Murugesan	FT	Journal Publication	Toxic Metal Recovery from waste Printed Circuit Boards :A Review of Advanced Approaches for sustinable Treatment Methodology	5000	5000	
24	Dr.M.P Murugesan	FT	Journal Publication	A comparitive Review on recovery of heavy metals from printed circuit boards (PCB'S)by chemical and bio leaching	5000	NIL	Completed
25	Mrs .M.Ramya	ECE	Patent Publication	Machine Learning based Approach to identify the postive traits of a Successful Entrepreneur	5000	5000	
26	V.Arun Antony	ECE	Patent Publication	New Technology To Prevent CPU Overheating	2500	2500	Submitted
27	Dr.K.Tamilarasi	ECE	Patent Publication	Performance And Accuracy Analysis Of Signature Verification Using Integer Wavelet Transform And Back Propagation Neural Network	5000	5000	Submitted

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Centre for Industrial Relation and Research Projects (IRRP)

Date : 16-07-2022

FACULTY INCENTIVE FORM

Staff Name	Dr. N.NATARAJAN				
Designation / Department	Professor & Head / Mech. Engg				
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)	
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000) ✓	
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %		
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %		
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management		
Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)			
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking	
		doi.org/10.1016/j.matpr.2022.04.012			
Approved amount in Rs.	1,000/-				

N.Nataraj 16/7/22
Investigator / Coordinator

6.07.22
Dept. IRRP Coordinator

N.Nataraj 16/7/22
HOD

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

R&D Coordinator

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Director (Admin.) / Principal

Executive Director

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Journal
16/7/22
Added in Google Scholar
38 - Rejected

Exploration of mechanical properties of jute fiber and copper wire reinforced hybrid polymer composites

V. Vadivel Vivek [a,*], C. Boopathi [a], N. Natarajan [b], E L. Pradeesh [a], MC. Pravin [a]

[a] Bannari Amman Institute of Technology, Sathyamangalam, Erode-638401, Tamil Nadu, India
[b] Excel Engineering college, Namakkal-637303, Tamil Nadu, India

ARTICLE INFO

ABSTRACT

Fibers like coir, jute, sisal and hemp are used for thousands of years, but fiber-resin composites have only recently been investigated. The superior sustainability properties of these materials when compared to traditional building materials are a major motivator for such applications. Nonetheless, there has been a huge in interest in composite materials reinforced with natural fibers in recent years. Natural fibers are a better alternative to glass or carbon fiber reinforced composites due to their ease of fabrication and low cost of raw materials, as well as the possibility of recycling, decomposability, and safe production and processing. Natural composites usage as construction materials is limited, however, due to their poorer mechanical qualities. While there is a lot of information available about natural fiber composites materials, few studies have looked into their structural applications. The main aim of this work to study the mechanical performance of jute fiber and copper wire reinforced composites in polyester matrix. The mechanical characteristics of composite specimens were investigated using a hand layup approach and various tests such as compression, impact, flexural, and tensile. According to the findings, jute fiber with 5% copper wire reinforced polyester composites produce 15.38 % high compression strength, 66.67 % better flexural strength and 34.50 % higher tensile strength than pure jute fiber composites. The impact test values of jute with copper is 0.7 J where as that of jute without copper is 0.4 J.

1. Introduction

A composite is a material with superior properties obtained by combining two or more dissimilar materials. Fiber-reinforced composites are widely used in a variety of fields due to their superior properties, including defence, aerospace, engineering applications, sports goods, and so on.

The characteristics of composites in polymer matrix were investigated by Asheesh Kumar et al [1]. Composites with natural fiber reinforcement are gaining importance than synthetic fiber reinforcements due to their environmental friendliness, biodegradability, and sustainability. Milanese et al [2] examined the mechanical performance and the tensile behaviour of four composites in their work. The influence of moisture content on sisal fiber physicomechanical characteristics was examined. They discovered that the tensile strength at yield of castor oil-based polyurethane is 2.5 MPa, with a corresponding elongation of 29 % indicating ductile behaviour. Milanese et al [3] looked into the mechanical prop-

erties of polyester composites reinforced with coconut fibers. Chemical treatment of coconut fibers modified the surface of the fiber and they are used in polyester matrix. A 1 percent wt/v sodium hydroxide solution was applied to coconut fibers for 1 h. The properties of hybrid glass fiber-sisal/jute reinforced epoxy composites were examined by M. Ramesh et al [4]. In a range of engineering and technology disciplines, natural fibers such as sisal/jute are increasingly being employed in glass fiber composites. Rana et al [5] demonstrated that using a compatibilizer improves the mechanical properties of jute fibers. At 60 percent by weight of fiber load, the compatibilizer increased flexural strength to 100 percent, tensile strength to 120 percent, and impact strength to 175 percent. The mechanical characteristics of jute-reinforced fibers and glass-reinforced fibers are compared by Shah and Lakkad et al [6]. The findings reveal that adding jute fibers as reinforcement to the resin matrix improves mechanical characteristics significantly. Vivek Mishra et al examined the Physico-Mechanical of Bi-directional Jute Polymer Composites [7] There has been an increase in interest to employing partial fiber as lighter reinforcement in recent years. M.S. Sreekala Sahu examined the properties of oil palm fiber

* Corresponding author.
E-mail address: ...@...com (V. Vadivel Vivek)

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Exploration of mechanical properties of jute fiber and copper wire reinforced hybrid polymer composites

V. Vadivel Vivek [a] � ✉, C. Boopathi [a], N. Natarajan [b], E L.Pradeesh [a], MC. Pravin [a]

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Abstract

Fibers like coir, jute, sisal and hemp are used for thousands of years, but fiber-resin composites have only recently been investigated. The superior sustainability properties of these materials when compared to traditional building materials are a major motivator for such applications. Nonetheless, there has been a huge in interest in composite materials reinforced with natural fibers in recent years. Natural fibers are a better alternative to glass or carbon fiber reinforced composites due to their ease of fabrication and low cost of raw materials, as well as the possibility of recycling, decomposability, and safe production and processing. Natural composites usage as construction materials is limited, however, due to their poorer mechanical qualities. While there is a lot of information available about natural fiber composites materials, few studies have looked into their structural applications. The main aim of this work to study the mechanical performance of jute fiber and copper wire reinforced composites in polyester matrix. The mechanical characteristics of composite specimens were investigated using a hand layup approach and various tests such as compression, impact, flexural, and tensile. According to the findings, jute fiber with 5% copper wire reinforced polyester composites produce 15.38 % high compression strength, 66.67 % better flexural strength and 34.50 % higher tensile strength than pure jute fiber composites. The impact test values of jute with copper is 0.7 J where as that of jute without copper is 0.4 J.

Keywords

Structural applications; Natural fiber; Composites; Polymer matrix; Jute fiber; Mechanical properties

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(3)

FACULTY INCENTIVE FORM

Staff Name	Dr. N. NATARAJAN			
Designation / Department	Professor & Head /Mech. Engg.			
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500) ✓	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	
Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)		
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
		doi.org/10.1016/j.matpr.2022.05.214		
Approved amount in Rs.	1,500/-			

Investigator / Coordinator 16/7/22   Dept. IRRP Coordinator 16.07.22   HOD 16/7/22

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

R&D Coordinator 16/7/2022   IRRP Chief-Coordinator

Added in Google Scholar

Director - IRRP   Director (Admin.) / Principal   Executive Director 04/08/22

Amount Received already - NIL (2021-22)

(47)

Experimental analysis on evaporative emission from ceramic coated fuel tank

B. Saravanan [a] & ✉, N. Natarajan [b], S. Deepankumar [a], S. Dhayaneethi [a], S.M. Praveen [c], S. Neha [a]

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Abstract

Variations in the ambient temperature cause a type of emission called Diurnal emissions. When the fuel in a vehicle fuel tank vaporizes, they give rise to these emissions. To control the fuel evaporation at the most possible level, this research work deals with the coating of the fuel tank at its exterior with low heat-conducting ceramic materials which in turn lead to controlled evaporation due to external heat sources. Modeling of the coated fuel tank is done using modeling software, SOLIDWORKS, and the model is subjected to thermal analysis so as to choose a better material for the ceramic coating. Hence, the research work aims in determining the effects of ceramic coating over the fuel tank and compare the emission test results such as permeability test and break out fuel test with conventional fuel tank.

Keywords

Evaporative emission; Ceramic coating; Transient thermal analysis; Fuel evaporation

Recommended articles

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Scopus Preview

Source details

Materials Today: Proceedings

Scopus coverage years: 2005, from 2014 to Present

Publisher: Elsevier

E-ISSN: 2214-7853

Subject area: (Materials Science: General Materials Science)

Source type: Conference Proceeding

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Category	Rank	Percentile
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09 Sep 2022	ATM-CASH-AXIS/TWAW1450/808/090922/SAKTHI	- Rs.2000.00
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07 Sep 2022	ATM-CASH-AXIS/SWCW17009/6782/070922/NAMA	- Rs.500.00
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7-S   (31)

M RAMESH
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EXCEL ENGINEERING COLLEGE NH 47 NEW SALEM
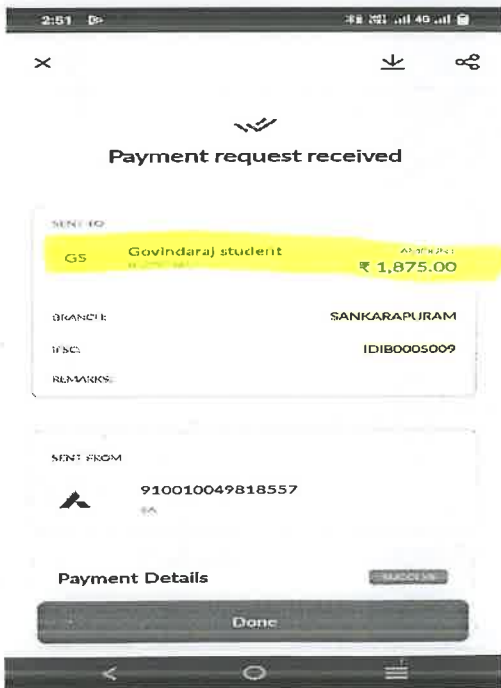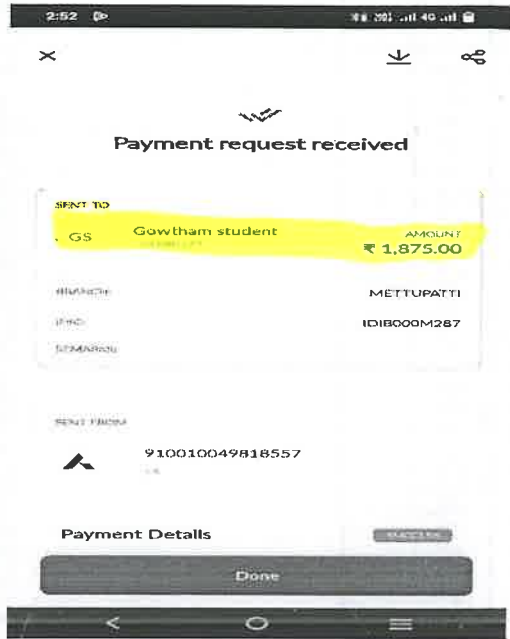MAIN RD PALLAKKAPALAYAM,SANKARI W
NAMAKKAL
TAMIL NADU-INDIA
637303

Customer No :849744754
Scheme :LIBERTY SALARY ACCOUNT
Currency :INR

Statement of Axis Account No :913010034960220 for the period (From : 16-08-2022 To : 20-08-2022)

Tran Date	Chq No	Particulars	Debit	Credit	Balance	Init. Br
		OPENING BALANCE			11633.30	
16-08-2022		NEFT/IOBAN22228199121/CHIEF CON/INDIAN OV//REF/		2000.00	13633.30	248
16-08-2022		SRI RENGASWAMY /Excel Tnscst payemnt		7500.00	21133.30	170
18-08-2022		ATM-CASH/MUNIAPPAN KOVIL/Kumarapalayam/180822	500.00		20633.30	170
18-08-2022		IMPS/P2A/223020524850/RAMACH/INDIANO/X036529/	3005.90		14621.50	170
18-08-2022		INB/903765263/INDIAN INSTITUTE OF TECHNOLOGY(BILL	1117.70		13504.30	170
18-08-2022		INB/903767539/INDIAN INSTITUTE OF TECHNOLOGY(BILL	1117.70		12386.60	170
18-08-2022		IMPS/P2A/223021958809/ISMAIL/KARNATA/X953101/	4505.90		7880.70	170
20-08-2022		UPI/P2A/223246881588/GAYATHRI /Bank of B/marriag	3000.00		4880.70	170
		TRANSACTION TOTAL	13247	9500.00		
		CLOSING BALANCE			4880.70	

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VMT-ICON	-	Visa Money Transfer through Internet Banking
AUTOSWEEP	-	Transfer to linked fixed deposit
REV SWEEP	-	Interest on Linked fixed Deposit
SWEEP TRF	-	Transfer from Linked Fixed Deposit / Account
VMT	-	Visa Money Transfer through ATM

9:37 ○ 🗎 🖼 •   ⏰ LTE1 Vo)) 4G+ ⬇ ⬆ .ıl 42%🔋

✕   ⬇   ⦵ₒ

Payment Complete

SENT TO

IS   ismail
      0742560...

AMOUNT
₹ 4,500.00

BRANCH   BELLARY

IFSC: KARB0000074

REMARKS:

SENT FROM

913010034960220

Payment Details   SUCCESS

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8-S   (33)

AXIS BANK

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NAMAKKAL
TAMIL NADU-INDIA
638183

Customer No :837194766
Scheme :PRIME SALARY ACCOUNT
Currency :INR

Statement of Axis Account No :910010049818557 for the period (From : 15-08-2022 To : 24-08-2022)

Tran Date	Chq No	Particulars	Debit	Credit	Balance	Init. Br
		OPENING BALANCE			**34426.09**	
15-08-2022		UPI/P2M/222777274630/Chatraram/Paytm Pay/Slepers	1050.00		33376.09	170
15-08-2022		UPI/P2A/222702746326/P. AUGUS/State Ban/Belt	550.00		32826.09	170
15-08-2022		UPI/P2M/222758145141/ANTHONYSA/Paytm Pay/Lunch b	400.00		32426.09	170
15-08-2022		UPI/P2M/222751581356/ANTHONYSA/Paytm Pay/Travel	700.00		31726.09	170
15-08-2022		UPI/P2M/222765717899/RAVINDRAN/Paytm Pay/Juice	210.00		31516.09	170
15-08-2022		UPI/P2M/222711182797/V ANAND/Paytm Pay/Lunch	146.00		31370.09	170
15-08-2022		ATM-CASH/RN PUDUR NEW/Rn Pudur New/150822	1000.00		30370.09	170
15-08-2022		UPI/P2A/222725204732/SINIVASAN/State Ban/Tea	33.00		30337.09	170
16-08-2022		UPI/P2M/222802528352/PhonePe/Axis Bank/Payment	481.00		29856.09	170
16-08-2022		ATM-CASH-AXIS/LWCW17024/5519/160822/NAMAKKAL	3800.00		26056.09	170
16-08-2022		SRI RENGASWAMY /Excel Tnscst payemnt		7500.00	33556.09	170
17-08-2022		UPI/P2A/222970444128/Sathyadev/State Ban/UPI	8000.00		25556.09	170
17-08-2022		UPI/P2A/222955584308/SELVARAJU/Tamilnad /Soup	80.00		25476.09	170
17-08-2022		UPI/P2A/222984763482/SEKH SAJ/State Ban/Briyani	180.00		25296.09	170
18-08-2022		ATM-CASH/KON THEATRE/Kumarapalayam/180822	1000.00		24296.09	170
21-08-2022		POS/K C P AGENCIES/ERODE/210822/08:24	450.00		23846.09	170
21-08-2022		ATM-CASH-AXIS/TWCW14493/8555/210822/ERODE	1000.00		22846.09	170
21-08-2022		ATM-CASH-AXIS/TWCW14493/8557/210822/ERODE	500.00		22346.09	170
21-08-2022		UPI/P2M/223325862140/SAKTHE KR/Paytm Pay/Wife sa	1300.00		21046.09	170
21-08-2022		ATM-CASH/RN PUDUR NEW/Rn Pudur New/210822	500.00		20546.09	170
21-08-2022		ATM-CASH/R N PUDUR ERODE/Erode/210822	500.00		20046.09	170
22-08-2022		NEFT/MB/AXMB222345036804/JAGAN R/BANK OF/	1.00		20045.09	170
22-08-2022		NEFT/MB/AXMB222345116070/JAGAN R/BANK OF/	1875.00		18170.09	170
22-08-2022		NEFT/MB/AXMB222345119834/GOWTHAM /INDIAN /	1875.00		16295.09	170
22-08-2022		NEFT/MB/AXMB222345119285/GOVINDAR/I NDIAN /	1875.00		14420.09	170
23-08-2022		PTLSCG/21.08.22/K C P AGENCIES	2.12		14417.97	00
23-08-2022		NEFT/MB/AXMB222355656866/DINESH K/UNION B/	1875.00		12542.97	70

Screenshot 1

4:30

Payment request received

SENT TO

DK Dinesh Kumar stu...   AMOUNT
₹ 1,875.00

BRANCH: AYILPATTY

IFSC: UBIN0918393

REMARKS:

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910010049818557
SA

Payment Details   SUCCESS

Done

Screenshot 2

2:52

Payment request received

SENT TO

GS Gowtham student   AMOUNT
₹ 1,875.00

BRANCH: METTUPATTI

IFSC: IDIB000M287

REMARKS:

SENT FROM
910010049818557

Payment Details   SUCCESS

Done

Screenshot 3

2:51

Payment request received

SENT TO

GS Govindaraj student   AMOUNT
₹ 1,875.00

BRANCH: SANKARAPURAM

IFSC: IDIB000S009

REMARKS:

SENT FROM
910010049818557
SA

Payment Details   SUCCESS

Done

Screenshot 4

2:49

Payment request received

SENT TO

JR jagan student   AMOUNT
₹ 1,875.00

BRANCH: BRANCH

IFSC: BARBOPALLIP

REMARKS:

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910010049818557
SS

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Komarapalayam - 637303

Centre for Industrial Relation and Research Projects (IRRP)
Date : 30/7/22

FACULTY INCENTIVE FORM

Staff Name	Dr. M. P. MURUGESAN				
Designation / Department	ASSOCIATE PROFESSOR / FOOD TECHNOLOGY				
Publication Category	SCI/SCIE/WoS ✓	1st Author (Rs.5,000)	2nd Author (Rs.3,500)		3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)		3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %		
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %		
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management		
Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)			
Additional details (Attach supporting documents)	Impact Factor 3.38	DOI / Patent No./ Scheme https://doi.org/10.1155/2022/4833913		NIRF Ranking	
Approved amount in Rs.	5000/-				

Investigator / Coordinator   Dept. IRRP Coordinator   HOD

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

1/8/22 Added in google Scholar.

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Director - IRRP   Director (Admin.) / Principal   Executive Director

may be approved

amount Received already (2022-23) - NIL - 1/8/22

5:08 PM

City Union Bank

JM-CUBANK

Savings No XXXXXXXX04 credited with INR 5000.00 towards BY NEFT TRF:SRI RENGASWAMY E AXISP00313170051: on 20-AUG-2022.Avl Bal 11037.22

Received Rs.5000/-

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ASP/Food Tech

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Research Article

Treatment of Municipal Wastewater in a Fixed Aerated Bed: Use of Natural Fibrous Materials

Murugesan Manikkampatti Palanisamy [1] Minar Mohamed Lebbai,[2] and M. Venkata Ratnam [3]

[1]*Department of Food Technology, Excel Engineering College, Namakkal, Tamil Nadu, India*
[2]*Department of Chemical Engineering, Erode Sengunthar Engineering College, Erode, Tamil Nadu, India*
[3]*Department of Chemical Engineering, Mettu University, Mettu Zuria, Ethiopia*

Correspondence should be addressed to M. Venkata Ratnam; mvratnam81@gmail.com

The municipal wastewater may be treated using a number of different types of fixed beds that have a larger surface area. Since the fibrous materials have such a large specific surface area, they are frequently considered to be the best option for greater microbiological support and treatment efficacy. In this research, natural fibre materials such as coir fibre and areca husk were investigated for their potential to function as fixed aerated beds for the treatment of municipal wastewater. During the experiment, variations in the chemical oxygen demand (COD), biological oxygen demand (BOD), total dissolved solids (TDS), and total suspended solids (TSS) of the effluent were used to determine how well the aerated fixed bed work in treating the wastewater. The most efficient operating parameters for the successful treatment of wastewater were determined to be a contact period of 72 hrs, a filter medium depth of 5 cm, and a packing density of 10 kg/m^3. The reductions in BOD, COD, TDS, and TSS for coir fibre are 55%, 58.8%, 57.8%, and 51.89%, respectively, whereas the reductions for areca husk are 38.3%, 37.78%, 31.76%, and 30.56%, respectively. In the course of this experiment, the coir fibre was discovered to be marginally more effective in comparison to the areca husk.

1. Introduction

Water is an essential component of the planet and is one of its most vital substances. Water is essential to the survival of all living things, including plants and animals. The availability of clean water for drinking and several other uses is a major concern for people all around the world. Many people believe that the growth of modern industry and the destruction of the natural environment are two sides of the same coin, which highlights the need of having stricter rules for the management of pollutants [1, 2]. The quality of the water is being put in jeopardy by a number of different variables, some of which include recurrent droughts, seasonal and geographical changes in precipitation, excessive use of groundwater, and an absence of uniform distribution of groundwater [2]. The water that is used for drinking must

not include any microbes or contaminants. Monitoring the quality of the water is essential in order to maintain a sanitary and risk-free atmosphere [3, 4]. Wastewater is a word that is used to represent liquid waste that is disposed of by a variety of sources, including households, companies, industries, and agriculture, and which frequently contains toxins as a result of the mixing of wastewater from multiple sources [5]. Wastewater is a word that is used to represent liquid waste that is disposed of by a variety of sources, including households, companies, industries, and agriculture.

It is imperative that the wastewater collected from a variety of sources be thoroughly cleaned and disinfected before being released back into the environment. A problematic situation will develop in the event that adequate plans for the collection, treatment, and disposal of all of the

AXIS BANK

SREENIVASARAJA·
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NAMAKKAL
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637001

Customer No :837318162
Scheme :PRIME SALARY ACCOUNT
Currency :INR

Statement of Axis Account No :911010000462398 for the period (From : 27-08-2022 To : 10-09-2022)

Tran Date	Chq No	Particulars	Debit	Credit	Balance	Init. Br
		OPENING BALANCE			87642.84	
27-08-2022		POS/SRI M R S PETROL/TIRUCHENGODE/270822/12:45	500.00		87142.84	170
27-08-2022		INB/NEFT/AXIR222397348189/HARIHARA/CANARA /TNSCST	1875.00		85267.84	170
27-08-2022		INB/NEFT/AXIR222397348620/ARJUN PR/CANARA /TNSCST	1875.00		83392.84	170
27-08-2022		INB/NEFT/AXIR222397348424/ASHIR AZ/STATE B/TNSCST	1875.00		81517.84	170
27-08-2022		INB/NEFT/AXIR222397348823/AJITH M/CANARA /TNSCST	1875.00		79642.84	170
28-08-2022		UPI/P2M/224023854432/PhonePe/Axis Bank/Payment	255.00		79387.84	170
28-08-2022		UPI/P2A/224006497665/Bank Acco/EQUITAS S/Payment	400.00		78987.84	170
29-08-2022		POS/AARTHI AGENCIES I/SALEM/280822/23:18	500.00		78487.84	170
29-08-2022		POS/BALAJI TRADERS/SALEM/290822/08:29	500.00		77987.84	170
30-08-2022		UPI/P2A/224255247487/Bank Acco/State Ban/Payment	1750.00		76237.84	170
30-08-2022		UPI/P2M/224234303349/Bharti Ai/Yes Bank /Payment	267.00		75970.84	170
30-08-2022		UPI/P2M/224279672639/Aruljothi/Paytm Pay/Payment	1300.00		74670.84	170
30-08-2022		UPI/P2M/224225181827/CAUVERY S/HDFC BANK/Payment	92.00		74578.84	170
31-08-2022		POS/ANANYA FUELS/NAMAKKAL/310822/12:52	150.00		74428.84	170
01-09-2022		UPI/P2A/224428753804/Mr NAGARA/Indian Ba/Payment		10000.00	84428.84	170
01-09-2022		UPI/P2M/224441768414/NANDHAKUM/Paytm Pay/Payment	280.00		84148.84	170
02-09-2022		UPI/P2M/224537275656/SRI MRS P/Yes Bank /Payment	100.00		84048.84	170
03-09-2022		UPI/P2M/224606557227/SRI MRS P/Yes Bank /Payment	100.00		83948.84	170
03-09-2022		UPI/P2M/224645482497/Aruljothi/Paytm Pay/Payment	307.00		83641.84	170
03-09-2022		UPI/P2A/224641756020/MEENASHI /Indian Ov/Payment	500.00		83141.84	170
04-09-2022		UPI/P2A/224772394859/Bank Acco/Karur Vys/Payment	15000.00		68141.84	170
04-09-2022		UPI/P2M/224718495786/Flipkart /Axis Bank/Payment	299.00		67842.84	170
05-09-2022		UPI/P2A/224881196925/SANJAY MU/Axis Bank/UPI		7500.00	75342.84	170
05-09-2022		UPI/P2M/224803140760/SRI MRS P/Yes Bank /Payment	100.00		75242.84	170
05-09-2022		SRI RENGASWAMY /Excel Salary Aug 22		26025.00	101267.84	170
07-09-2022		UPI/P2M/225039229173/SRI MRS P/Yes Bank /Payment	100.00		101167.84	170

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Centre for Industrial Relation and Research Projects (IRRP)

Date : 08-09-2021

FACULTY INCENTIVE FORM

Staff Name	Dr. S. BALAKRISHNAN				
Designation/Department	Assistant Professor / Mechanical / EEC				
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000) ✓	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)	
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	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—	
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—	
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—	
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking	
	2.028	doi.org/10.1016/j.ijPVP.2021.104526			
Approved amount in Rs.	Rs.5000/- [Rupees Five thousand only]				

Investigator / Coordinator 08/9/21

Dept. IRRP Coordinator

N. Natar...
HOD

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The details were checked and updated. The above mentioned incentive amount is recommended for approval.

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IRRP Chief-Coordinator

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Director (Admin.) / Principal

Executive Director
15/09/21

18/9/21
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International Journal of Pressure Vessels and Piping

Development of a new improved structural integrity assessment correlation for throughwall axially cracked 90° shape imperfect pipe bends under in-plane opening bending moment

S. Balakrishnan [a,*], AR. Veerappan [b], S. Shanmugam [b]

[a] Department of Mechanical Engineering, Excel Engineering College, Komarapalayam, Tamil Nadu, 637 303, India
[b] Department of Mechanical Engineering, National Institute of Technology, Tiruchirappalli, 620 015, Tamil Nadu, India

ARTICLE INFO

ABSTRACT

In the present work, a systematic and detailed investigation on the plastic collapse load of 90° structurally defected pipe bends under in-plane opening bending was performed using three-dimensional finite element (FE) analyses. The analysis considers the material behavior as elastic-perfectly plastic (EPP) with a large strain formulation option. The structural defects in the pipe bend models included were ovality at mid-portion and throughwall axial crack (TAC) at the crown portion. Ovality varied from 0 to 20 % with 5 % increment at each step while the normalized throughwall axial crack (TAC) parameter length a/D from 0 to 1 with an increment of 0.2 in each step. As per the recommendation of clause NB-3213.25 in Section III of ASME B&PV code, Twice-elastic slope (TES) technique was extensively used to determine the plastic collapse moment (PCM) for all simulated pipe bend models from their corresponding reaction moment versus angular rotation curve. The analysis illustrated that both ovality and throughwall axial crack (TAC) significantly affected PCM load of pipe bends and when combined, the effect was almost double. In pipe bend models with thin walls and short bend radius, both ovality and TAC were found to be more vulnerable and the effect decreased with an increase in bend radius and thickness. The experimental results for pipe bend's plastic collapse moment available in open literature were used to validate the present finite element (FE) procedure and a new improved structural assessment correlation proposed for pipe bends with ovality and TAC defects.

1. Introduction

Right-angled (90°) pipe bends or elbows are commonly employed in a variety of technical applications such as petroleum refineries, chemical processing plants, pharmaceuticals, food processing plants, conventional and nuclear power plants [1]. Elbows are most vulnerable to failure among other piping components due to the complexities of loading and geometric structure. Mourad and Younan [2] proved that elbows and pipe bends have nearly 5-20 times more flexibility than straight pipes with identical geometry and material properties. Hence pipe bends offer necessary flexibility (cushion-like effects) to the piping system and protect the pipeline by reducing reaction forces and moments caused within the pipeline by local deformation [3]. Plastic collapse occurs in the structure when the pipe bend deformation exceeds the elastic limit and should be avoided. To establish the allowable limit

of plastic loads on structures, the concepts of plastic limit load analysis are used [4]. Maximum load carrying capacities are estimated for structures with respect to failure and therefore knowledge on plastic limit loads is essential. Crack like defects occur not only during the manufacturing and installation stages but also as a result of prolonged normal continuous operation with cyclic loading and material degradation. These are the major causes for crack or flaw initiation and propagation that greatly reduce the pipe bend's failure load [5]. Hence in a pressurized piping system, assessment of structural integrity of pipe bends with crack is a primary safeguard task and the measurement of plastic loads for cracked pipe bends plays an important role in integrity assessment technology. Further, accidents in power plants can occur due to complex loads and weak parts in pipe bends resulting in significant losses. The leak-before-break (LBB) concept employs the analysis of throughwall cracks on the principal heat transport piping systems of pressurized reactors in nuclear industries [6]. The presence of large

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Centre for Industrial Relation and Research Projects (IRRP)

Date: 30.07.22

FACULTY INCENTIVE FORM

Staff Name	S. Sankaranath			
Designation / Department	AP/EEE			
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs 3,500)	3rd Author (Rs 1,500)
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	Patent-Published ✓	Applicant (First) (Rs 5,000)		Inventor (Rs 2,500)
	Patent-Granted	Applicant (Rs 15,000)		Inventor (Rs 10,000)
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Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No / Scheme		NIRF Ranking
	—	202241030229A		—
Approved amount in Rs	₹ 5000/₨ (Five thousand only)			

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Director (Admin) / Principal   Executive Director

Amount Received
Already - NIL

(22) Date of filing of Application :26/05/2022   (43) Publication Date : 03/06/2022

(54) Title of the invention : AUTO-CONTROLLED ANTI-GLARE VISOR IMPLEMENTATION FOR VEHICLES

(51) International classification	:B60J0003020000, B60R0001080000, B60J0003040000, B60K0037000000, B60R0011000000
(86) International Application No Filing Date	:NA :NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

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(57) Abstract :
For the driver's benefit, the present invention incorporates an anti-glare coat sheet visor into the front glass. In order to enhance driving safety and reduce glare, the anti-glare thin coat visor filters the quantity of incident light entering the vehicle. The primary goal of this idea is to improve the driver's field of vision by incorporating an anti-reflective thin film into the front glass. It becomes opaqu when this thin film is exposed to sunshine or the opposing vehicle's light and remains so during the remainder of the time. Using the size of the front window as a guide, the system was designed to fit any car.

No. of Pages : 12 No. of Claims : 4

TITLE
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Publication Number	22/2022
Publication Date	03/06/2022
Publication Type	INA
Application Number	202241030229
Application Filing Date	26/05/2022
Priority Number	
Priority Country	
Priority Date	
Field of Invention	MECHANICAL ENGINEERING
Classification (IPC)	B60J0003020000, B60R0001080000, B60J0003040000, B60K0037000000, B60R0011000000

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Abstract:

For the driver's benefit, the present invention incorporates an anti-glare coat sheet visor into the front glass. In order to enhance driving safety and reduce glare, the anti-glare thin coat visor filters the quantity of incident light entering the vehicle. The primary goal of this idea is to improve the driver's field of vision by incorporating an anti-reflect film into the front glass. It becomes opaque when this thin film is exposed to sunshine or the opposing vehicle's light and remains so during the remainder of the time. Using size of the front window as a guide, the system was designed to fit any car.

Complete Specification

TITLE
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FACULTY INCENTIVE FORM

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Designation / Department	AP/EEE			
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500) ✓	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
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Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—
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Participation	IITs/NITs/up to NIRF Top 100 colleges		Registration Fee- Actual (Max.Rs.5,000)	—
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
		10.52549/ijeei.v10i2.3677		
Approved amount in Rs.	Rs. 2500 Two thousand five hundred			

Investigator/Coordinator   Dept. IRRP Coordinator   HOD

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The details were checked and updated. The above mentioned incentive amount is recommended for approval.

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PV Systems based High Gain Converter using CI and SCC Techniques

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Article Info	ABSTRACT
Article history: Received Jan 23, 2022 Revised Mar 7, 2022 Accepted May 28, 2022	In this paper, new techniques for a CI (coupled inductor) and SCC (Switched Clamp Capacitor)-based stepup higher-level voltage DC-DC converter were implemented. The CI and SC, charge and discharge the energy, respectively, to attain higher gains. Using the clamp circuitry, the stress on the switching volt level and inductance leakage are removed. The reversed retrieval problem in the diode was eradicated with the help of a coupled inductor (CI). The new topology is to get more gain from the voltage and improve efficacy. The steadystateexamination of novel DC-DC converteroperation procedures arediscoursed here. The proposed model has an inputvoltage of 24V and an outputvoltage of 410V. Pmax of 150Wwas given to get a maximum of 96.4%.
Keyword: Switched capacitor Converter Coupled Inductor Clamp Circuit Efficiency	

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1. INTRODUCTION

Our country is deeply concerned about the energy crisis and environmental issues [1]. In this concern, the global warming problem will occur, and this will in turn increase the level of the sea by about 2 meters. This has a greater impact on the lives of all human beings. Non-conventional energy sources are used to resolve the air pollution and energy crises and global warming problems. Non-conventional Energy causes like sun_energy, energy from the wind, and wave_energyis widely used. [2], [3], [4]. Non-conventional energy sources produce a lower voltage level and it must be increased by using a converter named stepper-up boost DC-DC. This higher voltage output is transferred through the inverter to convert DC into AC [5] [6] [7] [8]. The stepper-up boost DCDC converter ratio disturbs entire system efficacy. The existing convertercircuit topology is not suitable for Steper-Up Boost dc-to-dc converter ratio applications. In existing Stepper-Up Boost dc-to-dc converter circuit, the duty cycle is increased to 1. During ideal conditions, the Stepper-Up boosting conversion ratio should reach its maximum value. The Stepper-Up Boost DC-DC Converter circuits EMI and Converse retrieval problems are issued to limit the high voltage gain by using the C, L, R, and switches. The leakage of the transformer affects the huge amount of power dissipation and a large amount of voltage spike problems occur on switch.

Selection of power switches with highvoltage stress is the main consideration because of redundant cost and more space problems. To introduce the new architecture, the existing method of the boost converter circuit problems is overcomed. The new architecture of the switched capacitor [9], [10], [11], [12], [13] coupled inductor [14 to 21], and lifting of voltage techniques [22] [23] are proposed. The minimum amount of energy strain in switching circuits with an upsurge in alteration ratio of voltage is achieved by using an inductive structure of a coupled inductance stepper-up boosting converter circuit. This type of technique is mostly used,

Source details

Indonesian Journal of Electrical Engineering and Informatics

Scopus coverage years: from 2017 to Present

Publisher: Institute of Advanced Engineering and Science (IAES)

E-ISSN: 2089-3272

Subject area: (Computer Science: Computer Science (miscellaneous)) (Mathematics: Control and Optimization)

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	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)	Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)	Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	
Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)		
Additional details (Attach supporting documents)	Impact Factor 0.925	DOI / Patent No./ Scheme https://doi.org/10.2298/CICEQ210750244		NIRF Ranking
Approved amount in Rs.	5000/-			

Investigator / Coordinator

Dept. IRRP Coordinator

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SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

R&D Coordinator   Added in Google Scholar

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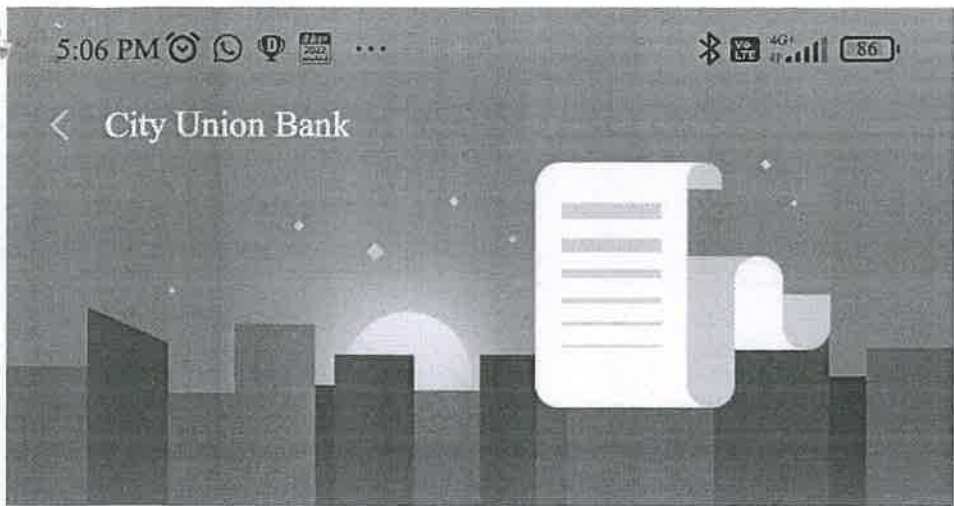
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SCIENTIFIC PAPER

TWO-PHASE LEACHING FOR METAL RECOVERY FROM WASTE PRINTED CIRCUIT BOARDS: STATISTICAL OPTIMIZATION

Article Highlights
- Two-stage leaching was employed for the efficient recovery of heavy metals from PCBs
- Optimization by RSM results in a leaching efficiency of 97.06% Cu, 94.66% Sn, 96.64% Zn, and 96.89% Pb
- Simultaneous extraction has proved to be successful in separating and recovering heavy metals

Abstract
The rapid growth of technology is inevitable in humankind's life and has a significant stint in electronic waste (e-waste) generation. Electronic waste possesses tremendous environmental and health effects, and one such major contributor to it is printed circuit boards (PCBs). The present work deals with the recovery of heavy metals from PCBs by using aqua regia as a leaching reagent in two stages (first stage HCl and HNO_3 and second stage HCl and H_2SO_4). The response surface methodology was used to determine the optimal recovery conditions for the heavy metal ions: the recovery time of 5 h, the pulp density of 25 g/L, and the temperature of 90.1 °C with desirability 0.761. These optimized values provide a maximum recovery rate of Cu (97.06%), Sn (94.66%), Zn (96.64%), and Pb (96.89%), respectively. EDXs are used to analyze the metal concentrations of the sample before and after treatment.

Keywords: aqua regia, e-Waste, printed circuit board, response surface methodology, two-step leaching.

Electronic waste (e-waste) means electrical or electronic waste. Technological advancement, business expansion, economic growth, and shorter electrical and electronic equipment (EEE) have contributed to a significant rise in e-waste. PCBs are the main components of this e-waste, which typically includes 40% metals, 30% ceramics, and 30% plastics [1,2]. The metallic composition consists primarily of 10-30 % of cu and other metals such as Sn Zn, Pb Ni, Fe, Ag, Cd, Au, etc., in different proportions based on PCB sources [3]. The recovery of metals from PCBs is very difficult due to the heterogeneous distribution of materials in PCBs. An analysis of PCBs by atomic adsorption spectroscopy shows that 2 kg of PCBs contains 5.94% of Sn, 21.3% of Cu, 3.2% of Pb, and 2.24% of Fe [4]. Informal processing of e-waste in developing countries can lead to adverse effects on human health and environmental pollution. In 2016, 44.7 million metric tons of e-waste were produced worldwide [1,2]. An estimated 3.8 tons of e-waste were produced annually in India, of which only 19,000 tons were recycled. India faces a considerable challenge to dispose of an estimated 4.5 tons of e-waste per year produced domestically and imports from abroad [5]. If the e-waste was directly disposed of by filling the soil without removing metal ions from PCBs, the pollution of land and water supplies would result.

E-waste recycling has been accomplished through formal and informal techniques in several countries [6]. While formal recycling techniques ensure protection and efficient separation but are costly to install and

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Date : 17.08.2022

—S.NO: ⑦

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	Scopus/AU-Annexure I ✓	1st Author (Rs.2,500) ✓	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)	Inventor (Rs.2,500)	
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
	0.01	Vol.71 No.35 (2022) ISSN: 2094 0343		-
Approved amount in Rs.	2500/-			

Investigator / Coordinator

G. 17.8.2022
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The details were checked and updated. The above mentioned incentive amount is recommended for approval.

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18/8/2022
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Approved
18/04/22
Executive Director

Amount Received already NIL-

Child Safety Wearable and Visually Impaired Assistive Device with Location Tracking System Using IoT

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Abstract

The idea of a smart wearable system for children and visually impaired is discussed in this paper. The key advantage of this wearable above others is that it can be used with any cell phone and does not required an expensive smart phone are a very tech-savy individual to operate. The GPS, GSM, Wi-Fi and Arduino technologies were used to create a smart wearable gadget for kid safety and to assist visually impaired people with a location tracking system. The prototype system uses a heartbeat and temperature sensor to monitor the health of children. The child will be safe from threads as a result of this. There are many wearable's available now a days that crack children's everyday habits and activities and also assist in locating them utilizing Wi-Fi and Bluetooth services. However, it appears that both the parent and the child are communicating in securely. As a result, the goal is to create a text and Email enabled link in between child's wearable and the relevant parent via SMS. Global System for Mobile Communication is the primary concept behind this. For issuing an emergency alarm, the proposed solution is wearable gear with cellular network and Wi-Fi connectivity. When the push button is touched, an alarm is sent in variety of ways, including SMS and Email, in the event of emergency.

Keywords: GPS, GSM, Wi-Fi, Arduino, Wearable device.

I.   INTRODUCTION

Security becomes an important issue. In 2020 there were 31.6 million in population are visually impaired and 34.33 percent were children. Basically children or blind persons cannot able to complaint about their abusement which they face their daily life to their parents and

Source details

Mathematical Statistician and Engineering Applications

Scopus coverage years: from 2015 to Present

Publisher: Philippine Statistical Association

ISSN: 2094-0343

Subject area: (Mathematics: Statistics and Probability)

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637303

Customer No :853687312
Scheme :PRESTIGE SALARY ACCOUNT
Currency :INR

Statement of Account No :914010033463088 for the period (From : 04-09-2022 To : 05-09-2022)

Tran Date	Chq No	Particulars	Debit	Credit	Balance	Init. Br
		OPENING BALANCE				
04-09-2022		ATM-CASH/THIRUNAGAR BR SALE/SALEM/040922	2000.00			
05-09-2022		SRI RENGASWAMY /EXCEL PAYMENT		2500.00		
05-09-2022		SRI RENGASWAMY /Excel Salary Aug 22				
05-09-2022		UPI/P2A/224893404045/PREETHI R/Axis Bank/UPI		11000.00		
05-09-2022		UPI/P2A/224894941729/MURUGESAN/Axis Bank/UPI		500.00		
		TRANSACTION TOTAL	2000.00	61970.00		
		CLOSING BALANCE				

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PUR   - POS purchase
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I-S. ①

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Komarapalayam - 637303
Centre for Industrial Relation and Research Projects (IRRP)

Date : 27-08-22

S.NO: ⑨

FACULTY INCENTIVE FORM

Staff Name	Dr. R. VINOTH			
Designation / Department	ASP / MECH			
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500) ✓	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)
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Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—
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Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—
Participation	IITs/NITs/up to NIRF Top 100 colleges		Registration Fee - Actual (Max.Rs.5,000)	—
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
		10.1016/j.matpr.2022.06.464		—
Approved amount in Rs.	1,500/= [one thousand and five hundred]			

Investigator / Coordinator

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SUBMITTED TO THE PRINCIPAL

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Amount Received already - Nil.

S.NO: ⑧+⑨ - 5000/- + 1500
- 1500/-

Balance - 3500/=

Study on the use of selective catalytic reduction technique for NOx emission reduction in an diesel engine fuelled with Methyl ester of Water Hyacinth

B. Sachuthananthan [a,*], R. Vinoth [b], R. Satya Meher [a], B. Sandeep [a], N. Sudheer Kumar [a], C. Deekshith [a]

[a] Department of Mechanical Engineering, Sree Vidyanikethan Engineering College, Tirupati-517102, Andhra Pradesh, India
[b] Department of Mechanical Engineering, Excel Engineering College, Namakkal-637 303, Tamilnadu, India

A R T I C L E   I N F O

A B S T R A C T

The emission standard is a big challenge to Automobile Manufacturers in bringing down the diesel engine emissions. Use of renewable fuel which substitutes conventional fuel in diesel engine which results in enhanced pollution levels, specifically NOx. In the present work an initiative is made to analyse the efficacy and pollution attributes of diesel power train propelled with Methyl Ester of water Hyacinth(B20) was investigated. Magnesium Oxide (MgO) and Zinc oxide (ZnO) nano additives at various proportions were added to Water Hyacinth biodiesel (B20). To reduce the NOx emission levels an improved methodology named as selective catalytic reduction (SCR) system was used. The experiment was performed with and without SCR to study the NOx emission characteristics. The results revealed that Methyl Ester of Water Hyacinth was found to be proper alternate instead of Diesel fuel without any engine alterations. The Brake thermal Efficiency(BTE) for diesel fuel was 28.4% and for B20 it was 27.1%, for B20 with 100 ppm NAM it was 27.3%. For B20 blend with 100 ppm NAM, the NOx emission was 786 ppm, and this NOx emission reduced to 596 ppm when SCR was used for B20 blend with 100 ppm NAM.
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Selection and peer-review under responsibility of the scientific committee of the International Conference on Advanced Materials and Modern Manufacturing.

1. Introduction

Trial was performed on a mono barrel CI engine to check the variation in Thermal Efficiency and exhaust emission for various combinations of Kapok Methyl Ester (KME). NOx emission, Exhaust Outlet Temp. and Specific fuel usage (SFC) improved for mixtures of Kapok Methyl Ester (KME), BTE, CO, HC and smoke viscosity inclined combinations of B20 and B40 of KME to charge the requirements[1]. The consequences of blending nanoparticles with create some important properties to biodiesel. The nanoparticles behaves as oxygen contributing agent and supplies oxygen through CO oxidation and distracts the O_2 through NOx. The mixtures of nanoparticles can perform as both catalyst and an energy source where it is used along base fuel in diesel engines[2]. Many people investigated the impact of blending Zinc oxide nanoparticles to biodiesel. The facts reveal that the rate of rise in fuel consumption, BTE, NOx, EGT and decline in CO, HC and smoke emissions is significant. The fuel consumption improved by 5.2%, carbon

monoxide and smoke discharges dropped by 13% and 9%, NOx discharges raised by 5%. The BTE, pressure rise, heat release rate, NOx discharge will be improved due to the presence of particles [3,4]. Karthikeyan et al. [5] analysed the impact of blending ZnO_2 nano additives in palm oil biofuel. Results revealed that the BTE, EGT, NOx increased, and CO, HC and smoke pollution dropped tremendously. Sajith et al. [6] studied the impact on certain physical characteristics of biofuel by blending cerium nanoparticles to it. It can be noted that adding nanoparticles enhances the fluid flow resistance consequences in the rise in absolute viscosity of the mixture. The presence of nanomaterials in the mixtures encourages comprehensive burning equated to the diesel and increases the efficiency of fuel.

2. Materials and methods

2.1. Manufacturing of biofuel

2.1.1. Transesterification process

The process of producing biofuel from any oil extracted from seed is named as transesterification. The process of production of

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Centre for Industrial Relation and Research Projects (IRRP)

Date : 27-08-22

SNO: 8

FACULTY INCENTIVE FORM

Staff Name	Dr. R. VINOTH			
Designation / Department	ASP / MECH			
Publication Category	SCI/SCIE/WoS ✓	1st Author (Rs.5,000) ✓	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)	Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)	Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—
Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)		—
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
	4.8	10.1016/j.ijthermalsci.2022.107848		
Approved amount in Rs.	Rs.5,000/= [Five Thousand only]			

Investigator / Coordinator   Dept. IRRP Coordinator   HOD

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Director - IRRP   Director (Admin.) / Principal   Approved Executive Director

Amount Received : already — NIL

Good Journal

Heat transfer enhancement in oblique finned curved microchannel using hybrid nanofluid

R. Vinoth [a],[*], B. Sachuthananthan [b], A. Vadivel [c], S. Balakrishnan [a], A. Gnana Sagaya Raj [b]

[a] Excel Engineering College, Tamilnadu, India
[b] Sree Vidyanikethan Engineering College, Andhra Pradesh, India
[c] Sri Ramakrishna Engineering College, Tamilnadu, India

ABSTRACT

The significant development of power converters in electric vehicles demands higher energy consumption and in turn larger heat generation. To prevent overheating of power converters, a newly designed curved microchannel is being developed with different cooling fluids. The objective of present experimental study is to analyze the heat transfer characteristics of oblique finned curved microchannel heat sink (MCHS) with various working fluids like Deionized water, nanofluid and hybrid nanofluid. Here heat sink has been designed with cross sectional area of 80×53 mm^2. The DI water, Al_2O_3/water nanofluid and Al_2O_3+CuO/water hybrid nanofluid was utilized separately with rate of mass flow varied between 0.1 and 0.5 lpm maintaining steady heat flux of 25.5 kW/m^2. Investigational output exposed that the rate of heat transfer, PEC and fall in pressure for the curved MCHS enhanced by 11.98%, 16.5% and 30.1% respectively in comparison to the heat sink which has straight channel. Also using hybrid nanofluid, the rate of heat transfer increased by 3.5% and 2.1% with curved MCHS in comparison to water and nanofluid. This is endorsed to the secondary flow generated by curved MCHS which improved the rate of heat transfer significantly. Overall, the curved MCHS with hybrid nanofluid is suggested as a preferred cooling medium for power converter in electric vehicles.

1. Introduction

To avoid environmental pollution, conserve energy and also to solve the problem of energy crisis, internal combustion engine vehicles are converted in to dedicated electric vehicles (EV) and hybrid electric vehicle (HEV) by automobile giants. During this technological change, the problem of overheating of power converters comes in to picture. Battery with power converters which acts as power source plays major role in converting the conventional vehicles into EV's and HEV's. The power electronic control device is being widely used to convert and to control electrical energy in both domestic and industrial appliances. The efficiency, size of the power control unit has been optimized to have high heat dissipation rate and heat density significantly. Because of less area of contact with atmospheric air, the power converters produce more heat flux. Due to overheating of the power converters there has been a surge in the failure rate of element. These demands led to the invention of MCHS by Tuckerman (1981). To achieve higher cooling rate in front of the present generation, some modification needs to be done in the existing MCHS or a novel cooling fluid may be developed.

Since conventional fluids have poor thermal conductivity as compared to nanofluids and hybrid nanofluid. So it is not suitable for larger cooling applications. In addition to prevent overheating of power converters they are cooled using high thermal conductivity fluid and forced flow required. A Hybrid nanofluid is the one where more than one nanoparticle is added to the nanofluid.

Many attempts were made for the design modification of the MCHS for electric vehicle application which are discussed as follows. Hong et al. [1] developed a heat exchanger with plain louvered fins to improve the frosting and defrosting property of air source heat pump in the electric vehicles. It was found that the plain louvered fin was found to be a favourite open-air heat exchanger in the air source heat pump for electric vehicles. Lyu et al. [2] analyzed the battery thermal management system through forced air cooling, thermoelectric cooling and liquid cooling. Results revealed that the shell temperature falls by 43.0 °C with TEC-based aqua cooling medium with 40 V supply to the heater and 12 V supply to the TEC module for single cell along copper holder. Krishnadash et al. [3] investigated the heat proliferation by utilizing a combined PCM and MC plate cooling system in the electric vehicle

5:50 PM

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Transaction Date	28-Sep-2022
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Amount	Rs.1,500.00 Cr
Closing Balance	Rs.34,085.76

Transaction Date	28-Sep-2022
Value Date	28-Sep-2022
Reference No	UJ1183357
Remarks	NEFT Cr SRI RENGASWAMY EDUCATIONAL TRUST AXIS P0032
Amount	Rs.5,000.00 Cr
Closing Balance	Rs.39,085.76

Transaction Date	30-Sep-2022
Value Date	30-Sep-2022
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S.NO: 10

FACULTY INCENTIVE FORM

Staff Name	Dr. M. VENKATESAN			
Designation / Department	Assistant Professor / Mechanical Engineering			
Publication Category ✓	SCI/SCIE/WoS ✓	1st Author (Rs.5,000) ✓	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
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Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—
Participation	IITs/NITs/up to NIRF Top 100 colleges		Registration Fee - Actual (Max.Rs.5,000)	—
Additional details (Attach supporting documents)	✓Impact Factor	✓DOI / Patent No./ Scheme		NIRF Ranking
	2.416	10.1007/s10265-022-03082-1		
Approved amount in Rs.	Rs. 5000/= (Five thousand only)			

Investigator / Coordinator
30/08/22

Dept. IRRP Coordinator
30.08.22

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IRRP Chief-Coordinator
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12/9/2022

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9/9/22

Executive Director
16/09/22

Amount Received
already - NIL

Experimental Study of Thermal Performance on Waste In-filled Building Wall Construction

M. Venkatesan[1] · M. Raja[2] · S. Sivalaksmi[2] · P. Dineshkumar[2] ·
R. Alex Arputhanathan[3]

Abstract

Energy spent on buildings accounts for 40 % of world energy in which, the walls alone consume 50 %. To reduce the energy consumption, different materials are studied for construction of building walls. The waste material generation is also increasing rapidly world-wide. This research attempts to utilize such suitable wastes effectively in wall construction. In this study, three wastes were used as fill-in materials namely sago pith waste (SPW), crushed asbestos waste (CAW) and areca nut husk waste (AHW). The heat transfer rate across the walls was found for five test conditions from 30 °C to 50 °C in steps of 5 °C each. Apart from reduction in energy consumption, the total heat flux decreased by 21.35 %, 14.26 % and 24.85 % compared to conventional red clay brick wall for SPW, CAW and AHW in-filled walls, respectively. The average value of total heat transfer coefficients were 7.86 $Wm^{-2}\cdot K^{-1}$, 7.94 $Wm^{-2}\cdot K^{-1}$ and 7.82 $Wm^{-2}\cdot K^{-1}$ for SPW, CAW and AHW in-filled walls, respectively. Also the lowest values of total heat transfer coefficient were found in the AHW in-filled wall in all the cases. From the experimental results, new correlations of total heat flux are proposed for heating/cooling load calculations. The results revealed that the waste in-filled walls are energy-saving wall structure. The waste in-filled walls provide a waste management method that result in reduced pollution for sustainable environment.

Keywords Building wall · Energy saving · Heat transfer coefficient · Red clay brick · Total heat flux · Waste materials

✉ M. Venkatesan
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[2] Department of Mechanical Engineering, Government College of Engineering, Salem, Tamil Nadu 636 011, India

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Drawing Power	: 0.00
Interest Rate(% p.a.)	: 2.7
MOD Balance	: 0.00
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MICR Code	: 636002141
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Balance as on 1 Oct 2022	: 22,826.97

Account Statement from 1 Oct 2022 to 14 Oct 2022

Txn Date	Value Date	Description	Ref No./Cheque No.	Debit	Credit	Balance
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3 Oct 2022	3 Oct 2022	TO TRANSFER-UPI/DR/227606595154/billdesk/ICIC/billdesk.e/UPI-	TRANSFER TO 5097537162097	617.00		20,209.97
3 Oct 2022	3 Oct 2022	TO TRANSFER-UPI/DR/227606613935/billdesk/ICIC/billdesk.e/UPI-	TRANSFER TO 4696788162091	148.00		20,061.97
3 Oct 2022	3 Oct 2022	ATM WDL-ATM CASH 693 SBI II ATM AMMAPETTA SALEM-		10,000.00		10,061.97
3 Oct 2022	3 Oct 2022	BY TRANSFER-UPI/CR/227609491416/SUBRA MAN/SBIN/kumaran.as/under-	TRANSFER FROM 4693042162091		200.00	10,261.97
4 Oct 2022	4 Oct 2022	TO TRANSFER-UPI/DR/227704775419/Amazon Pay/UTIB/amazonupi@/You-	TRANSFER TO 4692489162090	409.00		9,852.97
4 Oct 2022	4 Oct 2022	TO TRANSFER-UPI/DR/227740377466/Inox Rel/PYTM/paytm-0481/combo-	TRANSFER TO 4692492162095	200.00		9,652.97
7 Oct 2022	7 Oct 2022	by debit card-OTHPOS228015342303SALE M TIMES SALEM-		2,125.00		7,527.97
8 Oct 2022	8 Oct 2022	TO TRANSFER-UPI/DR/228187728712/YesBank/YESB/amazon@yap/You ar-	TRANSFER TO 4692643162096	2,899.00		4,628.97
9 Oct 2022	9 Oct 2022	by debit card-OTHPOS228213715708ARRS SILKS SALEM-		2,639.00		1,989.97
10 Oct 2022	10 Oct 2022	BY TRANSFER-NEFT*UTIB0001449*AXISP003 27138471*SRI RENGASWAMY E-	TRANSFER FROM 3199960044301		29,926.00	31,915.97

Txn Date	Value Date	Description	Ref No./Cheque No.	Debit	Credit	Balance
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Centre for Industrial Relation and Research Projects (IRRP)

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FACULTY INCENTIVE FORM

Staff Name	Dr. S. Anbu Karuppusamy				
Designation / Department	Professor / ECE				
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)		3rd Author (Rs.1,500)
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	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %		
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—	
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—	
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking	
	2·098	https://doi.org.10115 5/2022 2265904		—	
Approved amount in Rs.	1,500/- [One Thousand Five hundred only)				

Investigator / Coordinator 13/9/22

Dept. IRRP Coordinator 13.9.2022

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SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

R&D Coordinator 13/9   Added in google Scholar

IRRP Chief-Coordinator 14/9/22

Director IRRP 14/9/22

Director (Admin.) / Principal

Executive Director

Amount Received
already - Rs 1500/-

Balance : 7000/- KK

Hindawi

Research Article

Design and Fabrication of Flexible Nanoantenna-Based Sensor Using Graphene-Coated Carbon Cloth

Senthil Kumar Kandasamy ,[1] S. Maheswaran ,[1] S. Anbu Karuppusamy ,[2] J. Indra ,[3]
R. Anand ,[4] P. Rega,[5] A. Kavitha ,[6] K. Immanuvel Arokia James ,[7] Kasthuri Nehru ,[1]
and K. Kathiresan [8]

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[7]Department of Information Technology, Vel Tech Multi Tech Dr.Rangarajan Dr.Sakunthala Engineering College, Chennai 600062, Tamilnadu, India
[8]School of Civil Engineering and Architecture, Adama Science and Technology University, Adama, Ethiopia

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Carbon nanomaterials have attracted significant consideration and concern due to the unique chemical and physical properties. Recently, nanodiamonds, graphene, and carbon nanotubes are served as electrodes, hydrogen storage elements, and composite materials. In this work, a 5 GHz graphene nanoantenna that falls inside the very-small-aperture terminal (VSAT) C-band range has been fabricated. A graphene substrate with a thickness of $h = 0.5$ cm is formed which is then used for fabricating a graphene nanoantenna working at 5 GHz. To design and simulate the antenna, Analysis System (ANSYS) electromagnetic desktop software was used. Using the designed graphene antenna, the parameters such as voltage standing wave ratio, three-dimensional radiation pattern, and directivity were obtained. After designing of the antenna using ANSYS software, it was physically fabricated. The graphene was used as a dielectric, copper sheet acted as a patch over as well as ground. Finally, the design was tested using Vector Network Analyzer (Model: N9925A) and the transmission range was found as 5 GHz.

1. Introduction

Nanotechnology refers to scientific and technical domains in which nanoscale phenomena are utilized in the production, characterization, design, and application of nanomaterials, nanodevices, and systems. Nanotechnology has emerged as one of the most important and exciting frontier subjects in physics, chemistry, engineering, and biology in recent years. It has the potential to provide substantial breakthroughs in the near future, impacting the direction of technological growth in a variety of applications. Nanotechnology, in all of its forms, has the potential to make a tremendous impact on society. Nanotechnology goods are expected to have an environmental effect due to the dispersion and permanence

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Centre for Industrial Relation and Research Projects (IRRP)

Date : 13.09.2022

S NO. 12

FACULTY INCENTIVE FORM

Staff Name	Dr. K. Boopathy				
Designation / Department	ASP / Mechanical				
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)	
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)	
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500) ✓	
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—	
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—	
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—	
Participation	IITs/NITs/up to NIRF Top 100 colleges		Registration Fee - Actual (Max.Rs.5,000)	—	
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking	
	—	Ap.No: 202241050110		—	
Approved amount in Rs.	RS. 2500 /—				

K. Boopathy 13/09/22
Investigator / Coordinator

Dept. IRRP Coordinator 13.09.

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HOD

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

14/9 **R&D Coordinator**

Added in google scholar

14/9/2022 **IRRP Chief-Coordinator**

14/9/2022 **Director - IRRP**

14/9/22 **Director (Admin.) / Principal**

16/09/22 **Executive Director**

Amount Received already - NIL

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :02/09/2022

(21) Application No.202241050110 A

(43) Publication Date : 09/09/2022

(54) Title of the invention : MACHINE LEARNING APPROACHES TO FOR IMPROVING THE AUTOMATIC SOLAR LIGHT TRACKING SYSTEM FOR ENERGY EFFICIENCY

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(51) International classification : C07D0411040000, H04N0005225000, A61B0001000000, A61B0005000000, B29L0031300000

(86) International Application No : PCT//
    Filing Date : 01/01/1900

(87) International Publication No : NA

(61) Patent of Addition to Application Number : NA
    Filing Date : NA

(62) Divisional to Application Number : NA
    Filing Date : NA

(57) Abstract :
Machine Learning approaches to for Improving the Automatic Solar Light Tracking System for Energy Efficiency is the proposed invention. The proposed invention focuses on designing and implementing a framework of machine learning to predict the area of high intensity solar rays. Based on the prediction from machine learning unit, the solar panel is tilted to absorb more and more solar energy and thus increasing the efficacy of solar systems.

No. of Pages : 13 No. of Claims : 4

NAME : Dr. k. BOOPATHY , ASP/Mech

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Publication Category	SCI/SCIE/WoS	1st Author (Rs 5,000)	2nd Author (Rs.3,500)	3rd Author (Rs 1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs 1,000)
	Patent-Published	Applicant (First) (Rs.5,000)	Inventor (Rs 2,500)	
	Patent-Granted	Applicant (Rs.15,000)	Inventor (Rs 10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—
Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)		
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
		202241052856 A		
Approved amount in Rs.	Rs.5000 (Five thousand)			

Investigator / Coordinator   Dept. IRRP Coordinator 08.10.2022   HOD

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Institution's Innovation Council (IIC)

Date : 19.10.2022

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Designation / Department	Associate Professor / Civil Engineering			
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)	Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)	Inventor (Rs.10,000)	
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Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—
Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)		—
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
		202241051460		
Approved amount in Rs.	Rs 5000/- (Rupees Five thousand only)			

P.L ___ 19/10/22
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Dept. IIC Coordinator

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The details were checked and updated. The above mentioned incentive amount is recommended for approval.

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IIC Chief-Coordinator

Director IIC

19/10/22
Director (Admin.) / Principal

may be approved
Executive Director 21/10/22

Amount already
Received - NIL

22/10

(12) PATENT APPLICATION PUBLICATION   (21) Application No.202241051460 A

(19) INDIA

(22) Date of filing of Application :08/09/2022   (43) Publication Date : 16/09/2022

(54) Title of the invention : ANALYSIS OF MECHANICAL BEHAVIOR OF CONCRETE WITH DIFFERENT TYPES OF ADDING FIBRE THROUGH THE PROPAGATION OF ULTRASOUND WAVES

<table>
<tr><td>(51) International classification</td><td>:A61P0025280000, A61P0043000000, A61P0035000000, A61P0009120000, H04W0052020000</td></tr>
<tr><td>(86) International Application No
Filing Date</td><td>:PCT//
:01/01/1900</td></tr>
<tr><td>(87) International Publication No</td><td>: NA</td></tr>
<tr><td>(61) Patent of Addition to Application Number
Filing Date</td><td>:NA
:NA</td></tr>
<tr><td>(62) Divisional to Application Number
Filing Date</td><td>:NA
:NA</td></tr>
</table>

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--

(57) Abstract :
[05] The addition of steel, polypropylene and rubber fibers to concrete can change mechanical properties such as flexural strength, compression and elasticity, in addition to preventing cracking. There is also a change in physical properties, for example, absorption of temperature, sounds and blocking of moisture. Taking into account that currently the evaluation of the resistance of structures is carried out through destructive methods, the ultrasound test allows evaluating the integrity of materials through ultrasonic pulses. The joint analysis of ultrasound data with destructive testing data allows for data reliability. The purpose of the present research was to analyze samples of conventional concrete and with 2% addition of different types of fibers (steel, rubber and polypropylene). With the intention of comparing the interference of the fibers in the propagation speeds of waves (V), for the frequencies of 45 kHz and 80 kHz and in the mechanical properties of the concrete through the tests of compressive strength (fc) and modulus of elasticity (Eci) . Correlations were performed between the parameters obtained by destructive tests and wave propagation, demonstrating that the ultrasound test is capable of inferring the quality of concrete parts. Accompanied Drawing [FIG. 1] [FIG. 2][FIG. 3]

No. of Pages : 22 No. of Claims : 4

(54) Title of the invention : ANALYSIS OF MECHANICAL BEHAVIOR OF CONCRETE WITH DIFFERENT TYPES OF ADDING FIBRE THROUGH THE PROPAGATION OF ULTRASOUND WAVES

(51) International classification	:A61P0025280000, A61P0043000000, A61P0035000000, A61P0009120000, H04W0052020000
(86) International Application No Filing Date	:PCT// :01/01/1900
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to pplication Number Filing Date	:NA :NA

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Name of Applicant : NA
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(72)Name of Inventor :
 1)Dr. P. Loganathan
Address of Applicant :Associate Professor, Excel Engineering College (Autonomous), NH 544, Komarapalayam, Namakkal-637303, Tamil Nadu Namakkal ----------- -----------
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Address of Applicant :Assistant Professor, Erode Sengunthar Engineering College (Autonomous), Erode - Perundurai Rd, Post, Thuduppathi, Tamil Nadu- 638057 Thuduppathi ----------- --------
--

(57) Abstract :

[05] The addition of steel, polypropylene and rubber fibers to concrete can change mechanical properties such as flexural strength, compression and elasticity, in addition to preventing cracking. There is also a change in physical properties, for example, absorption of temperature, sounds and blocking of moisture. Taking into account that currently the evaluation of the resistance of structures is carried out through destructive methods, the ultrasound test allows evaluating the integrity of materials through ultrasonic pulses. The joint analysis of ultrasound data with destructive testing data allows for data reliability. The purpose of the present research was to analyze samples of conventional concrete and with 2% addition of different types of fibers (steel, rubber and polypropylene). With the intention of comparing the interference of the fibers in the propagation speeds of waves (V), for the frequencies of 45 kHz and 80 kHz and in the mechanical properties of the concrete through the tests of compressive strength (fc) and modulus of elasticity (Eci) . Correlations were performed between the parameters obtained by destructive tests and wave propagation, demonstrating that the ultrasound test is capable of inferring the quality of concrete parts. Accompanied Drawing [FIG. 1] [FIG. 2][FIG. 3]

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Institution's Innovation Council (IIC)

Date : 01/11/2022

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FACULTY INCENTIVE FORM

Staff Name	Dr. S. P. VENKATESAN			
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Publication Category	SCI/SCIE/WoS ✓	1st Author (Rs.5,000) ✓	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
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	Patent-Granted	Applicant (Rs.15,000)	Inventor (Rs.10,000)	
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
	—	10.1188/LT -03-2022-093		—
Approved amount in Rs.	Rs. 5000/= [Five thousand only]			

Applicant
Investigator / Coordinator
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SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

11/10/2022 Added in Google Scholar

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Amount Already
Received - NIL

Experimental investigation on the wear behavior of low-cost composite made from industrial wastes

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Excel Engineering College, Komarapalayam, India

K. Ramachandran

N.S.N. College of Engineering and Technology, Manalmedu, India

A. John Presin Kumar

Hindustan Institute of Technology and Science, Chennai, India, and

Balamurugan G.M.

Solamalai College of Engineering, Veerapanjan, India

Abstract

Purpose – Aluminum alloy AA5083 is applicable in ship building, military, railway and industry because of its excellent properties like resistance to chemical and sea water attack. However, its performance is affected by weak wear resistance. Hence, this should be solved to improve the performance of AA5083 alloy in the aforementioned fields. The purpose of this research is to enhance the wear properties of AA5083 alloy.

Design/methodology/approach – In this research, AA5083 alloy was reinforced with industrial wastes such as red mud and granite particles using stir casting method. Totally, four types of composites were fabricated, namely, AA5083/3 Wt.% red mud (C1), AA5083/3 Wt.% granite (C2), AA5083/1 Wt.% red mud-2Wt.% granite (C3) and AA5083/2 Wt.% red mud-1Wt.% granite (C4). Wear properties such as mass loss and coefficient of friction (COF) were analyzed for different wear parameters. Further, the mechanical properties like hardness and tensile strength were investigated.

Findings – Results showed that the inclusion of reinforcement particles improved the wear and mechanical properties of AA5083 alloy (C0). The C2 sample displayed the maximum hardness of 87 HV and tensile strength of 317 MPa owing to the inclusion of 3 Wt.% granite particles. Furthermore, the wear study results showed that the C2 sample displayed the minimum mass loss and COF. It was concluded from this research that C2 sample could be a good candidate to be applicable in marine, military, railway and industrial applications with improved performance.

Originality/value – This work is original as the industrial waste is used as reinforcements in the performance improvement of AA5083 aluminum alloy.

Keywords Aluminum alloy, Industrial waste, Wear, Mechanical properties, Metal matrix composites

Paper type Research paper

1. Introduction

Aluminum alloy AA5083 is a soft material attracted in marine and industrial applications owing to its superior properties like resistance to chemical attack and sea water. Further, it has added advantages like light weight and low cost. However, it suffers with inadequate hardness and wear resistance. Hence, it is necessary to enhance the aforementioned properties to make broad application of AA5083 alloy. To improve the wear performance of composites, several attempts have been made by earlier researchers using different types of fillers (Chelladurai *et al.*, 2021; Samal *et al.*, 2020; Reddy *et al.*, 2020). Generally, the aluminum alloy composites showed better performance while adding different reinforcement elements (Akbari *et al.*, 2021, 2018). For example, Gangwar *et al.* (2021) fabricated AA5083/fly ash composites and studied the tribological properties. Results showed that the hardness of AA5083 alloy was increased from 50 BHN to 70 BHN while adding 8 Wt.% fly ash content. Moreover, minimum sliding wear was noted while maintaining the optimum sliding velocity of 1.047 m/s and load of 15 N.

Anandaraj *et al.* (2021) examined the tribological properties of AA5083/MoO_3 composites fabricated by stir casting method. Increased MoO_3 weight percentage showed minimum wear rate and coefficient of friction (COF). Sudherson *et al.* (2020) investigated the wear behavior of AA5083/cadmium composites at dry sliding conditions. Results showed that wear loss was declined with increased weight percentages of cadmium. Maximum wear resistance was observed for AA5083/5 Wt.% cadmium.

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Institution's Innovation Council (IIC)

Date : 01/11/2022

S.NO 16

FACULTY INCENTIVE FORM

Staff Name	Dr. S.P.VENKATESAN				
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Publication Category	SCI/SCIE/WoS ✓		1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I		1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published		Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)
	Patent-Granted		Applicant (Rs.15,000)		Inventor (Rs.10,000)
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Program Fund	Greater than Rs.50,000/-		Coordinator	5 %	—
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Participation	IITs/NITs/up to NIRF Top 100 colleges		Registration Fee - Actual (Max.Rs.5,000)		—
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme			NIRF Ranking
		10.1080/15440478.2022.2134261			
Approved amount in Rs.	Rs.5000/= [Five thousand only]				

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Applicant
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Dept. IIC Coordinator

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The details were checked and updated. The above mentioned incentive amount is recommended for approval.

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R&D Coordinator

IIC Chief-Coordinator

Director IIC

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Amount Already Received
NIL :

S.NO: 15+16 → 5000+5000 = Rs 10,000

Balance : NIL

Experimental Investigation on the Mechanical Properties of Indian Almond Fiber - Reinforced Composites Prepared by Different Types of Resins

Venkatesan Saradha Paramashivaiah, Padmavathi Kuppusamy Ramamoorthy, Ganesamoorthy Raju & Velmurugan Duraisamy

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Tran Date	Chq No	Particulars	Debit	Credit	Balance	Init. Br
		OPENING BALANCE			79947.43	
14-11-2022		SRI RENGASWAMY /EXCEL PAYMENT		5000.00	84947.43	170
14-11-2022		SRI RENGASWAMY /EXCEL PAYMENT		5000.00	89947.43	170
14-11-2022		BY CASH DEPOSIT-BNA/DWRO459701/9271/141122/SALEM		51000.00	140947.43	170
14-11-2022		BY CASH DEPOSIT-BNA/DWRO459701/9273/141122/SALEM		73500.00	214447.43	170
14-11-2022		BY CASH DEPOSIT-BNA/DWRO459701/9275/141122/SALEM		16500.00	230947.43	170
15-11-2022		BY CASH DEPOSIT-BNA/DWRO459701/9523/151122/SALEM		11000.00	241947.43	170
15-11-2022		BY CASH DEPOSIT-BNA/DWRO459701/9529/151122/SALEM		22000.00	263947.43	170
15-11-2022		BY CASH DEPOSIT-BNA/DWRO459701/9531/151122/SALEM		18000.00	281947.43	170
15-11-2022		NEFT/MB/AXMB223190378893/VENKATES/STATE B/Others	200000.00		81947.43	170
		TRANSACTION TOTAL	200000.00	202000.00		
		CLOSING BALANCE			81947.43	

Legends :

ICONN - Transaction trough Internet Banking

VMT-ICON - Visa Money Transfer through Internet Banking

AUTOSWEEP - Transfer to linked fixed deposit

REV SWEEP - Interest on Linked fixed Deposit

SWEEP TRF - Transfer from Linked Fixed Deposit / Account

VMT - Visa Money Transfer through ATM

CWDR - Cash Withdrawal through ATM

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Institution's Innovation Council (IIC)

Date : 3/XI/22

S.NO (18)

FACULTY INCENTIVE FORM

Staff Name	Dr. P.C. SENTHIL MAHESH				
Designation / Department	ASP / CSE				
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000) ✓	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)	
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)	
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—	
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—	
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—	
Participation	IITs/NITs/up to NIRF Top 100 colleges		Registration Fee - Actual (Max.Rs.5,000)	—	
Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking	
	—	https://doi.org/10.37896/pd91.5/ 91566		—	
Approved amount in Rs.	Rs. 5,000/-				

Investigator / Coordinator   Dept. IIC Coordinator   HOD

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

Added in Google Scholar

R&D Coordinator   IIC Chief-Coordinator

Director IIC   Director (Admin.) / Principal   Executive Director

amount already received - NIL

S-No: 17 + 18 → Rs.5000 + Rs.5000/- = Rs.10,000/-

Balance : NIL

A Trustworthy Platform for Safeguarding and Validating Educational Credentials using Blockchain Technology

DR. P. C. SENTHIL MAHESH
Associate Professor,
Department of Computer Science and Engineering,
Excel Engineering College, Namakkal, Tamilnadu, India.

DR. K. MUTHUMANICKAM
Professor, Kongunadu College of Engineering and Technology,
Department of Information Technology, Tiruchirappalli, Tamilnadu, India

Abstract:

In one way or another, education serves as the soul of society growth. Aspirants who earn their degrees honestly will use their knowledge and abilities to benefit society. While the number of universities and graduates continues to rise year after year, the need to simply validate degree credentials creates new business prospects. Students seek a low-cost, easy-to-understand evidence of certification, while companies demand quick and reliable verification of degrees when hiring. Because a large number of students graduate each year, the issue of fake credentials could become a major problem. In this case, an overlay method based on blockchain technology is used to keep legitimate certificates in digital form and quickly verify them when needed. The proposed approach ensures that the certifications, once verified, are available in an irretrievable form for immediate verification with future reference and that the existing certification system is kept tamperproof. A prototype of a blockchain-based credential security and verification system is constructed in the Ethereum test network to confirm the legitimacy of the suggested method. The results of the implementation and testing reveal that it is a safe, secure and practical solution for online credential management.

Keywords: *Blockchain, Document Verification, Digital Certificate, distributed, Preprocessing.*

INTRODUTION

The basic pattern of a student's education in India is as follows: admittance to preschool, then constant changes in faculty for primary, secondary, and high school studies. Students who have completed high school must now apply for college entrance. In addition, there is a constant rotation of instructors for graduation. This is frequently the basic cycle for a student's academic years. Some pupil continues their education after that. As a result, the disadvantage of this cycle is that a student must submit all of his/her certificates for validation at each level. The certificate may be lost or damaged as a result of this. It's also time-consuming for the validator to show each certificate. According to survey of All India Higher Education 2019-20 [1], in recent years with around 93 lakh students graduating each year as shown in Figure 1 which is extremely difficult to keep track of and validate such a big number of records.

Associate degree undesirable state of affairs, such as change of state and the manufacture of fake or duplicate certificates, is on the rise. Fake universities are issuing certifications, as well as forged certificates from existing trustworthy universities. This phoney credential problem has become a pain in the neck for both colleges and recruiting businesses as a result of centralization and digitization, and it requires a swift response. Since technology has progressed so far, distinguishing

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An Efficient Android Malware Detection Using Adaptive Red Fox Optimization Based CNN

P. C. Senthil Mahesh[1] · S. Hemalatha[2]

Abstract

Android smartphones are employed widely due to its flexible programming system with several user-oriented features in daily lives. With the substantial growth rate of smartphone technologies, cyber-attack against such devices has surged at an exponential rate. Majority of the smartphone users grant permission blindly to various arbitrary applications and hence it weakens the efficiency of the authorization mechanism. Numerous approaches were established in effective malware detection, but due to certain limitations like low identification rate, low malware detection rate as well as category detection, the results obtained are ineffective. Therefore, this paper proposes a convolutional neural network based adaptive red fox optimization (CNN-ARFO) approach to detect the malware applications as benign or malware. The proposed approach comprising of three different phases namely the pre-processing phase, feature extraction phase and the detection phase for the effective detection of android malware applications. In the pre-processing phase, the selected dataset utilizes Minmax technique to normalize the features. Then the malicious APK and the collected benign apps are investigated to identify and extract the essential features for the proper functioning of malware in the extraction phase. Finally, the android mobile applications are detected using CNN based ARFO approach. Then the results based on detecting the benign and malicious applications from the android mobiles are demonstrated by evaluating certain parameters like model accuracy rate, model loss rate, accuracy, precision, recall and f-measure. The resulting outcome revealed that the detection accuracy achieved by the proposed approach is 97.29%.

Keywords Android phones · Malware applications · Convolution neural network · Red fox · Databases · Detection rate

✉ P. C. Senthil Mahesh
pcsenthilmahesh@gmail.com

[1] Department of Computer Science and Engineering, Excel Engineering College, Komarapalayam, Namakkal District, Tamil Nadu, India

[2] Department of Computer Science and Engineering, Panimalar Institute of Technology, Chennai, Tamil Nadu, India

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638052

Customer No :898562904
Scheme :LIBERTY SALARY ACCOUNT
Currency :INR

Statement of Axis Account No :920010056287459 for the period (From : 14-11-2022 To : 15-11-2022)

Tran Date	Chq No	Particulars	Debit	Credit	Balance	Init. Br
		OPENING BALANCE			8939.97	
14-11-2022		SRI RENGASWAMY /EXCEL PAYMENT		5000.00	13939.97	1449
14-11-2022		SRI RENGASWAMY /EXCEL PAYMENT		5000.00	18939.97	1449
		TRANSACTION TOTAL	.00	10000.00		
		CLOSING BALANCE			18939.97	

Legends :

ICONN   - Transaction trough Internet Banking

VMT-ICON - Visa Money Transfer through Internet Banking

AUTOSWEEP - Transfer to linked fixed deposit

REV SWEEP - Interest on Linked fixed Deposit

SWEEP TRF - Transfer from Linked Fixed Deposit / Account

VMT   - Visa Money Transfer through ATM

CWDR   - Cash Withdrawal through ATM

PUR   - POS purchase

TIP/ SCG - Surcharge on usage of debit card at pumps/railway ticket purchase or hotel tips

RATE.DIFF - Difference in rates on usage of card internationally

CLG   - Cheque Clearing Transaction

EDC   - Credit transaction through EDC Machine

SETU   - Seamless electronic fund transfer through AXIS Bank

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Int.Coll - Interest collected from the customer

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Institution's Innovation Council (IIC)

NO: (19)

Date : 3/11/2022

FACULTY INCENTIVE FORM

Staff Name	: Dr. K. Geetha				
Designation / Department	Prof / CSE				
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)	
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	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)	
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—	
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—	
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—	
Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)		—	
Additional details (Attach supporting documents)	Impact Factor 0.21	DOI / Patent No./ Scheme		NIRF Ranking —	
Approved amount in Rs.	Rs 3500/-				

Investigator / Coordinator 3/11/22

Dept. IIC Coordinator 3/11/22

HOD 3/11/22

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

Added in Google Scholar 3/11/22

R&D Coordinator

IIC Chief Coordinator

May be approved

Director IIC

Director (Admin.) / Principal

Executive Director

Amount Already
Received NIL -

An Optimized Machine Learning Framework for Detecting Alzheimer's Disease By MRI

Dr. T. S. Suganya
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ABSTRACT

Machine learning has extensive application in diverse medical fields. With advancements in medical technologies, access has been given to data for the identification of diseases in theirearly stages. Alzheimer's Disease (AD) is a chronic illnessthat will cause degeneration of the brain cells and ultimately will lead to memoryloss. AD causedcognitive mental problems like forgetfulness and confusion, as well as other symptoms such aspsychologicaland behavioralproblems, are further recommended to undergo test procedures usingneuroimagingtechniques. This work's objective is to utilize the machinelearning algorithms for processing the data acquired via neuroimaging technologies for early-stage AD detection. The framework extracts featuresusingcurvelet transform from MRI brain image. This work will also present the Decision Tree, the Adaptive Boosting (AdaBoost), and the Extreme Gradient Boosting (XGBoost) classifiers. In machine learning, Population-Based Incremental Learning (PBIL) is an optimization algorithm, in spite of being simpler than a conventional genetic algorithm, the PBIL algorithm is able to achieve much better results in several cases.PBIL is used to optimize the AdaBoost and XGBoost classifiers to improve AD classification. The experimental outcomes will demonstrate the proposed approach's superior performance over that of other existing approaches.

Keywords: *Alzheimer's disease (AD), Machine Learning, Curvelet Transform, Decision Tree, Adaptive Boosting (AdaBoost), Extreme Gradient Boosting (XGBoost), and Population-Based Incremental Learning (PBIL).*

1   INTRODUCTION

Alois Alzheimer, a German physicist and neuro-pathologist, was the first person to identify as well as to discuss about theAlzheimer'sDisease (AD). As per the World Alzheimer Report, around 50 millionpeopleacross the globe were affected by dementia in the year 2018,andabout two-third of that population were suffering from AD. There will be about 152 million AD patients in the year 2050, and this disease's cost has been forecasted to be USD 2 trillion in the year 2030. At present, the AD treatment is predominantly involved with the usage of either Alzheimer's disease-modifying or delaying drugs instead of drugs which are able to either reverse or permanently stop the disease's progression. Hence, it is [...] for early-stage AD prediction, so as to make it feasible to delay the effects of the disease [1].

AD is characterized by the loss of neurons as well as synapses within the cerebral cortex,and also specific subcortical regions, that will result in gross atrophy of the affected regions, which is inclusive of degeneration in the temporal lobe andparietal lobe, and also portions of the frontal cortex as well as the cingulate gyrus. Earlier studies have shown the correlation between several impairments in the AD as well as the atrophy in many regions such as the amygdala,the temporal lobe, and the hippocampus. These characteristics are used for delineating the AD patients from the normal patients.

The key focus of the researchers is to monitor the change in a patient's health, the disease's clinical progression as well as reaction to the therapy. However, they find it most cumbersome to identify relevant bio-markers which are good representations of the AD as well as the Mild Cognitive Impairment (MCI). The researchers' objective is inclusive of diagnosingearly-stage AD as well as identifyingthe individuals who are at most risk for AD development. Magnetic Resonance Imaging (MRI) is employed by physicians to diagnose AD. The multi-class classification of AD, MCI as well as Normal Control (NC) will employ as biomarkers the individual or combined structural MRIbiomarkerslike the hippocampus's shape as well as texture, corticalmeasurements, and volume measurements [2].

The MRI's key role in the AD analysis is to assess the volume alteration in the characteristic positions so as to provide up to 87% of analytical accuracy of up to 87%. Quite often, the appraisal is carried out on the mesial temporal lobe atrophyand the temporoparietalcortical atrophy. Direct or indirect estimation is done for the mesial temporal lobe atrophy. While the direct estimation is based on measuring the volume loss of hippocampal orparahippocampal tissue, the indirect estimation is dependent ontheparahippocampalfissures' magnification. Normally, analysis of these estimations is done along with the medial temporalatrophy score, that has been proved to be predictive of the progression from MCI to dementia[3].

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About the Journal

JOURNAL OF ALGEBRAIC STATISTICS

e-ISSN: 1309-3452 | **Frequency:** Bimonthly (6 Issue Per Year) | **Nature:** Online | **Language of Publication:** English | **Article Processing Charges:** 500 USD

Introduction
The Journal of Algebraic Statistics offers an avenue for researchers and practitioners to present contemporary issues associated with Algebraic Statistics and Engineering Computing Applications. The journal publishes peer-reviewed papers, case studies, technical notes, and discussions of interest to the practice of Algebraic Statistics and Engineering Computing Applications. Interdisciplinary studies and collaborations are encouraged. Theoretical papers submitted for publication should preferably include real-world applications of the techniques.

Basic Journal Information

e-ISSN: 1309-3452 | **Frequency** Bimonthly (6 Issue Per Year) | **Nature:** Online | **Language of Publication:** English | **Article Processing Charges:** 500 USD

Coverage Areas: Although the list is not prescriptive, **Journal of Algebraic Statistics** intends to focus on advances in the following sub-domains:

1. Computational Theory
2. Computer Science
3. Ring and Module theory
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Periodicity: The Journal is published in 6 issues per year.

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Centre for Industrial Relation and Research Projects (IRRP)
Date : 05-11-22

FACULTY INCENTIVE FORM

Staff Name	Dr. R. VINOTH			
Designation / Department	ASP / MECH			
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
		doi.org/10.1080/01430077550.2021		
Approved amount in Rs.	Rs. 2500			

Investigator / Coordinator   Dept. IRRP Coordinator 25-12-22   HOD 5/11/22

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

R&D Coordinator   5/11/2022   Added in Google Scholar   IRRP Chief-Coordinator 5/11/20

Director - IRRP 5/11/20   Director (Admin.) / Principal 5/11/20   Executive Director 14/11/22

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Experimental study of heat transfer and pressure drop characteristics of microtube condenser using R134a

R. Vinoth[a] and B. Sachuthananthan[b]

[a]Department of Mechanical Engineering, Excel Engineering College, Namakkal, India; [b]Department of Mechanical Engineering, Sree Vidyanikethan Engineering College, Tirupati, India

ABSTRACT

The condensation heat transfer coefficient and the pressure drop were investigated experimentally and numerically in a microtube condenser using R134a. The microtube condenser comprises of trapezoidal oblique finned microchannel at the top and rectangular fins at the bottom of the tube. Water and air are used as cooling fluids on both sides of the microtube condenser. The experimental setup is validated initially with the existing work of Shah. The condensations effect included the vapour quality and mass flux ranging from 0.25 kg/m²s to 0.9, 99 to 468 kg/m²s, respectively. The results indicate that the condensation heat transfer coefficient and pressure drop enhance with mass flux and vapour quality. The experimental and numerical results are compared with existing experimental work. The microtube condenser enhances the heat transfer coefficient to 22.4% and a pressure drop of 5.6% more than the existing model. The heat transfer coefficient and pressure drop obtained from the numerical study is in superior agreement with the experimental results.

Nomenclature

A	Area [m²]
C_p	Constant pressure specific heat [J/kg-K]
d	Tube diameter [m]
G	Mass velocity [kg/m²s]
h	Heat transfer coefficient [W/m²K]
k	Thermal conductivity [W/m K]
l	Length [m]
$\dot{m}$	Mass flow rate [kg/s]
Re	Reynolds number = $\rho u d/\mu$
Nu	Nusselt number = hd/k
p	Pressure [N/m²]
Q	Heat transfer [W]
q	Heat flux [W/m²]
T	Temperature [°C, K]
u	Velocity [m/s]
x	Vapour quality
μ	Dynamic viscosity [Pa-s]
v	Kinematic viscosity = μ/ρ [m²s]
ρ	Density [kg/m³]
f	Fluid
g	Gas phase
l	Liquid phase

1. Introduction

The drift towards the miniaturisation and advancement in microtechnology led to the development of microtube condenser. Also, getting higher demand for the compact refrigeration system has been increased, which accelerates the manufacturers to improve the design of condenser that explores approaches, opportunities and solutions already having an impact. Moreover, the strategies focus on increasing the effectiveness of the condenser by decreasing the vapour quality from 1 to 0.65 over the length of the tube. The effects of reducing the pressure drop on the airside cause a raise in the heat transfer coefficient on the refrigerant. The refrigerant used here is R134a which is eco-friendly and safe to use. The impact of miniaturisation of the condenser is, by drop the tube diameter in the condenser that leads to boost in the heat transfer coefficient and enhances the condensation effect. The main applications of the microtube condensers include the compact refrigeration system and compact heat exchangers in the electronics industry. Several types of research have investigated the condensation effect in microtube condenser with microchannel by experimentally and numerically. Goss and Passos (2013) carry out a study on heat transfer coefficient (condensation) using R134a in an eight parallel microchannel through 0.77 mm hydraulic diameter. The heat flux and mass velocity ranging from 17 to 53 kW/m² to 230–445 kg/m²s respectively. The result shows the heat transfer coefficient raise with mass velocity and the vapour quality. Also, they study the pressure drop through convective condensation of R134a in eight circular microtube condensers. The result shows that the pressure drop augments with a raise in mass flux. The maximum pressure drop was obtained in a microtube condenser is 10 kpa at 445 kg/m²s. Melanie Derby et al. (2012) proceeds the study on the condensation heat transfer in the triangular, square and semi-circular mini-channels to found the mass flux and vapour quality which have an influence on condensation effects. The experimental and numerical studies

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Amount	Rs.1,000.00 Dr
Closing Balance	Rs.25,233.86
Transaction Date	20-Nov-2022
Value Date	20-Nov-2022
Reference No	UJ9381523
Remarks	UPI/DR/232472687136/UB IN/nanosinduatr@okhdfcb ank
Amount	Rs.2,000.00 Dr
Closing Balance	Rs.23,233.86
Transaction Date	21-Nov-2022
Value Date	21-Nov-2022
Reference No	UJ1854161
Remarks	NEFT Cr SRI RENGASWAMY EDUCATIONAL TRUST AXIS P0033
Amount	Rs.2,500.00 Cr
Closing Balance	Rs.25,733.86

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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
		202241060640		
Approved amount in Rs.	Five thousand Rupees only.			

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SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

R&D Coordinator   Added in Google Scholar   IRRP Chief-Coordinator

Director - IRRP   Director (Admin.) / Principal   Executive Director

Amount already Received NIL

(54) Title of the invention : SMARTER AND GREEN ENERGY GENERATION SYSTEMS USING PHOTOVOLTAICS IN MACHINE LEARNING APPROACH

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(57) Abstract :
In the not-too-distant future, photovoltaic (PV) technology will play an essential role in the production of energy. Improvements in processing power, data storage, and data-driven algorithms have all contributed to the rise of machine learning. We take a look at machine learning strategies for PV systems. To begin, PV electrical and thermal models are introduced. Following this, PV systems are analyzed using machine learning. We take a look at how machine learning may aid in the worldwide effort to achieve carbon neutrality and a cleaner environment. In this paper, we look at the challenges and opportunities that lie ahead for machine learning in PV system analysis. In terms of system efficiency and economic sustainability, many small-scale PV technologies, such as building integrated photovoltaic thermal systems (BIPV/T), have not yet reaped the full benefits of machine learning. Solar photovoltaic (PV) systems may benefit from machine learning in terms of generating more eco-friendly.

No. of Pages : 11 No. of Claims : 7

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Staff Name	Dr. Mahesh A. Kumar			
Designation / Department	AP/ME			
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	—
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	—
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
		202410600641		—
Approved amount in Rs.	Five thousand rupees only.			

Investigator / Coordinator   Dept. IRRP Coordinator   HOD

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

R&D Coordinator   IRRP Chief-Coordinator

Director - IRRP   Director (Admin.) / Principal   Executive Director

Amount Already Received - NIL

(12) PATENT APPLICATION PUBLICATION

(9) INDIA

(21) Application No.202241060641 A

(22) Date of filing of Application :24/10/2022

(43) Publication Date : 28/10/2022

(54) Title of the invention : PRESENT AND FUTURE ROLE PLAYED BY AI IN SUPPLY CHAIN PROCESS GREEN CLOUD COMPUTING ENERGY EFFICIENCY

(51) International classification	G06F0009500000, H04L0067100100, H04L0067100000, G06Q0020140000, H04L0047700000
(86) International Application No Filing Date	PCT// 01/01/1900
(87) International Publication No	NA
(61) Patent of Addition to Application Number Filing Date	NA NA
(62) Divisional to Application Number Filing Date	NA NA

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(57) Abstract

Today cloud computing became an impressive solution to address the challenges in the storage and process of high-volume data, with low-cost, high-speed, on-demand and pay-per-use characteristics. Although rapid progress has been recorded in the area of cloud computing and its services, attaining the implementation of green clouds is still under development due to a lack of research and several barriers to its implementation. Green clouds are committed to designing as eco-friendly, energy efficient, max resource utilizable, low carbon emissions, long-lasting and recyclable. In order to satisfy the ever-growing enterprise data storage and processing needs, the cloud service providers are coming up with cutting-edge technologies like Green Cloud Computing in cloud architecture design to reduce the huge power consumption, water consumption, need for physical hardware peripherals, infrastructure and harmful carbon emissions etc. To protect our environment from negative cloud impacts, service providers must adopt and update their cloud infrastructure towards green computing. Green computing research widely focuses on designing efficient clouds with green characteristics like Power Management, Virtualization, High-Performance Computing, Load balancing, Green data centre, Reusability, Recyclability etc. As part of my research on green clouds, this paper presents an analysis report about green cloud computing and its characteristics in a detailed manner. This paper thoroughly discusses the former green computing achievements, current trending concepts of green computing and future research challenges as well. This comprehensive green cloud analysis report helps the naïve green research fellows to learn about green cloud topics and to understand the future green cloud research challenges

No. of Pages : 13 No. of Claims : 7

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Centre for Industrial Relation and Research Projects (IRRP)

Date : 02. 12. 2022

FACULTY INCENTIVE FORM

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Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000) ✓	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)	
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)	
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)	
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)	
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Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	—	
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Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)		—	
Additional details (Attach supporting documents)	Impact Factor 3.503	DOI / Patent No./ Scheme 10.1016/j.micpro.2022.104709		NIRF Ranking —	
Approved amount in Rs.	RS 5000/-				

Investigator / Coordinator   Dept. IRRP Coordinator 7.12.2022   HOD 7/12/22

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

R&D Coordinator 15/12/2022 Added in Google Scholar

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Director - IRRP 15 Tulron   Director (Admin.) / Principal 15/12/22   Executive Director

Amount Received already RS: 2500/-
16/12/2022

An in-tire-pressure monitoring SoC using FBAR resonator-based ZigBee transceiver and deep learning models

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ARTICLE INFO

ABSTRACT

In automobiles, tires play an important role in ensuring safe driving. Hence tire pressure monitoring system (TPMS) has become the most important safety system in automobile vehicles. In this work, a new indirect TMPS is proposed that measures the pressure of all the tyres indirectly using the available sensors already mounted for typical vehicle dynamics control purposes. The available sensors in vehicles usually contain a power supply module, a microcontroller, and transceiver and resonator circuitry. The available wheel speed sensor is modified by reducing the wireless receiver system in communication protocols to minimize the power consumption. The transceiver structure is modified using a suitable local oscillator (LO) frequency plan based on a temperature-compensated thin film bulk acoustic wave resonator (FBAR). In addition, the proposed TPMS SoC uses a deep-stacked autoencoder to detect the adherence conditions of the tires and a pressure loss based on wheel speed. This module will initially pre-process the speed signals to remove the speed error caused by manufacturing error. After pre-processing, different features such as statistical, frequency-domain and the fitted frequency-domain characteristics are extracted from the wheel speed signal and fed to the learning model for the judgment of the tire state. The proposed system was designed in Verilog synthesis and layout were made in cadence tool. For ASIC implementation, we use TSMC 65nm CMOS Library for LNA/hybrid mixer design. The performance measures of the pressure detection model in terms of accuracy and errors are evaluated. Also, the performance metrics of the transceiver architecture in terms of gain, NF, IIP3, S11 and FOM are evaluated. The experimental evaluation describes that the model procures a maximum gain of 58 dB, NF of 2.15 dB and IIP3 of 6.6 dBm respectively. The die area is 0.45 mm^2 with 0.8 supply voltage and 0.83 mW power. In addition to this, the relationship between peak amplitude and speed vehicle regarding time and frequency domain features are evaluated.

1. Introduction

With the rapid advancements in automobile vehicles, traffic safety increases quickly [1]. Hence tire pressure monitoring system (TPMS) has become the most important safety system in automobile vehicles [2]. The TPMS is the monitoring system that continuously monitors the air pressure and immediately reports the warning information to the driver [3]. Most people do not give importance to considering the convergence of the tires. Moreover, the tires are considered the safety equipment for maintaining the proper motion of the vehicle [4]. The tire's pressure gets continuously changed due to outside conditions like rocky roads and fast driving [5]. Thus, the tire's friction increases and results in a

lack of robustness of the vehicle [6]. Due to this, a sudden failure of tires arises while driving on the highways. Generally, in other countries like the US and Korea, the TPMS system has become more important in recent years [7].

The TPMS is commonly divided into direct TPMS and indirect TPMS [8]. Direct TPMS directly estimates the tire pressure with an antilock braking system (ABS). It mainly depends on the barometric pressure sensors and temperature sensors. In some other systems, accelerometers are used to examine the centrifugal acceleration obtained by the tire movement without sensors [9]. An indirect TPMS system does not estimate the tire pressure directly. Instead, it calculates the angular speed of the tire to understand the present status of the tire. In the indirect

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TPMS approach, the vehicle needs to be in a motion state to detect the vehicles' pressure. This can be done with the aid of the re-learn approach [10].

The TPMS approach uses controllers, the Simulink model, wake-up circuitry, transmitter and power source for a better system evaluation [11]. This approach helps to detect the dimension of the tire, acceleration, and wheel angle and it works based on the input information of each wheel rotation [12]. The android application is implemented to provide information to the vehicle driver to display the detected data. Pressure sensors, microcontrollers, transmitters, and lithium-based batteries detect tire pressure during stationary and motion states [13]. For efficient communication, Zigbee based transceivers are widely used. The solenoid valves in the Zigbee inflate and deflate the information easily [14]. It captures the tire pressure mechanism and warns the drivers if any problems occur. Normally, pressure sensors emit high-frequency signals that affect the tire pressure and overcome this resonator [15].

Recently, researchers have been keen on resonators that generate waves of a particular frequency and remove unwanted noisy frequencies from the signal [16]. The resonators are widely used in several applications that emit a frequency of about 100 MHz to 20 GHz [17]. These resonators can even act as a sensor or as a filter. It is widely used in radio frequency (RF) front-end circuits like RF filters to produce a high Q-factor [18]. In recent years, researchers have been interested in AI-based techniques such as ML and DL approaches. The smartphone based vehicular tire pressure and condition monitoring [19] are introduced to monitor the pressure changes rapidly. A design approach is developed to handle tire pressure monitoring in autonomous vehicles [20] to estimate tire pressure without any sensors. The frequency analysis based TPMS [21] approaches are emphasized to remove unwanted frequency from the signals. But the approaches above are highly suffered due to multiple drawbacks such as high-frequency emission, error occurrence, poor sensing quality etc.

A lot of researches are fascinated with the tremendous outcome of the DL approach. Only peripheral studies have been reported based on the TPMS approach. But, the capability of such approaches remains a challenging task. Hence, an efficient approach is highly required to improve the robustness of automobile vehicles. Even though peripheral research was undertaken, multiple drawbacks arise, such as noisy outcomes, high error, cost complexity, etc. These major drawbacks motivate us to develop an enhanced TPMS method for automobile vehicles.

2. Related work

Liu et al. [22] proposed noise cancelling common gate (CG) common source (CS) low noise amplifier (LNA) to enhance the gain and noise performance. Here, the current-bleeding (CBLD) circuit is introduced to provide DC current of the auxiliary amplifier. At the output the passive network had been added to eliminate the noise of the CBLD circuit. Also, to assist the gain and noise performance over the desired band the passive network provides shunt peaking. The amplifier was designed in TSMC 40 nm CMOS technology and it attains a gain of 16.5–19.5 dB, noise figure (NF) of 3.2–5.2 dB and IIP (third input intercept point) of −3.5 dBm. The compact area is $0.092 mm^2$ with supply voltage of 1.2 respectively. Barzgari et al. [23] had defined current reuse LNA amplifier with mixer and oscillator for low power applications. The proposed receiver architecture attains low power consumption and it is implemented in CMOS technology. The experimental evaluation describes that the model procures a maximum gain of 57 dB, NF of 10.5 dB and IIP3 of −15.5 dBm respectively. The die area is $0.75 mm^2$ with 0.8 supply voltage.

Mauludin et al. [24] proposed a Balun low-noise amplifier (LNA) to achieve low NF. The proposed LNA is an integration of a common-gate (CG) to attain wideband input matching and a common-source (CS) to eliminate distortion and noise. At the CS stage a feedback connection is

given to the gate of the CG to improve the transconductance of phase. Also, a complementary transistor with a current reuse tec are employed to improve the overall transconductance of without maximizing power consumption by the phase. The pr LNA was constructed using TSMC 65 nm technology. The sim results of the proposed LNA shows a maximum power gain of 20 of 4 dB, and IIP3 of −10 dBm by consuming a power of 5 mW fro supply. The area covered by the entire circuit is 475 × 366 μ design does not possess balanced condition for the noise canc technique.

Eskandari et al. [25] proposed balun inductorless wideban along with active loads for multi-standard radio applications. (reuse and noise cancelling techniques are integrated to redu requirement for high energy consumption. A common gate s employed in which it process without decreasing the input matcl allowing a large scaling metric for the CS phase in noise can approach. The proposed LNA was constructed using RF CMOS technology. The simulation results of the proposed LNA circuit s voltage gain of 20.2 dB, NF of 2.37 dB, bandwidth of −3 dB, retu of −13 dB, and IIP3 of −2.1 dBm by utilizing a power of 6 mW fr V supply. The area covered by the entire circuit is 0.026 mn design can also compensate gain and phase imbalances by util passive capacitor between differential outputs.

Tiwari et al. [26] proposed wideband inductorless LNA along single to differential conversion for multi-standard radios and multiband. A dual shunt feedback is utilized to decrease the bias of CG phase while the current is reused by CS phase. To gain ma transconductance complementary CS phase is used. Two shun backs are used to reduce the bias current of CG phase. The ci implemented using CMOS technology in 180 nm with an area mm^2. The simulation results of the proposed LNA circuit achi maximum voltage gain of 18.5 dB, low NF of 2.8 dB, and −13 IIP3. The implemented circuit draws a power of 5.58 mW fron power supply.

Tiwari et al. [27] proposed CS and CG-based balun LNA for s IoT applications. The proposed circuit uses pMOS-nMOS config to gain efficiency and double the transconductance. Noise canc technique is employed using CS-CG pair. Loads of CG and CS ph coupled to eliminate the tradeoff between voltage headroo voltage gain. The proposed LNA is implemented using RFCMO nology in 0.18 μm. The LNA circuit achieves maximum of i voltage gain, minimum of 3.6 dB NF, bandwidth of 3 dB, minin −8.5 dBm of IIP3, and minimum of 12 dBm of IIP2. The LNA cov area of 0.18 mm^2 and utilized 3 mW of total power from 1.8 V supply. The proposed design is only for a single-ended LNA an suitable for single to differential conversion.

Kim et al. [28] proposed a broadband temperature (PVT)-ins noise cancelation balun LNA for wireless communication appli The proposed LNA is based on CS-CG topology and it diode-connected loads to decrease the noise contribution raise CGCS transistors and improves linearity due to post linearizat reduce NF an auxiliary CS amplifier with a diode-connected t mented with the LNA. The proposed LNA is designed using technology in 0.13 μm. The experimental results shows that t posed LNA attains NF of 4 dB, and return loss of 10 dB. The consumed by the LNA circuit is 2.7 mW from 1.2 V supply volta proposed design unaware of input matching.

Abbasi et al. [29] proposed low-power and wi RF-to-baseband-current-reuse receivers (CRR). The proposed des shares a single supply and bias current between the LNTA and ba circuits to decrease power consumption. The components of tl posed design are LNTA, active-inductor (AI), down-conversion ve-mixer, noise cancelation technique, and transimpedance a (TIA) circuits. The technology used to design the proposed LNA i in 130 nm that occupies an area of 0.025 mm^2. The LNA a wideband input matching of −10 dB, 39.5 dB of conversion-ga

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Title	Microprocessors and Microsystems
Abbreviation	Microprocess. Microsyst.
Publication Type	Journal
Subject Area, Categories, Scope	Computer Networks and Communications (Q2); Hardware and Architecture (Q2); Artificial Intelligence (Q3); Software (Q3)
h-index	41
Overall Rank/Ranking	9301
SCImago Journal Rank (SJR)	0.538
Impact Score	3.03
Publisher	Elsevier
Country	Netherlands
ISSN	1419331

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Date : 17/12/22

S-NO 25

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	Scopus/AU-Annexure I	1st Author ✓ (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)
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Additional details (Attach supporting documents)	Impact Factor	DOI / Patent No./ Scheme		NIRF Ranking
Approved amount in Rs.	Two Thousand Five hundred only			

J. Jaya 17/12/22
Investigator / Coordinator

G. 17/12/2022
Dept. IRRP Coordinator

HOD

SUBMITTED TO THE PRINCIPAL

The details were checked and updated. The above mentioned incentive amount is recommended for approval.

20/12 Added in Google Scholar
R&D Coordinator

IRRP Chief-Coordinator

Director - IRRP

Director (Admin.) / Principal

Approved 2,500/-

Executive Director

Amount Received already - NIL
12/12/2022

ORIGINAL PAPER

Systolic optimized adaptive filter architecture designs for ECG noise cancellation by Vertex-5

S. Jayapoorani[1] · Digvijay Pandey[2] · N. S. Sasirekha[3] · R. Anand[4] · Binay Kumar Pandey[5]

Abstract
The adaptive sign least mean square (SLMS) filter may change dynamically depending on the filter output. Noise cancellation is one of the most common adaptive filter applications. In real-time applications such as medical computing, the speed of the process producing hardware is critical, hence, this study proposes the hardware implementation of the SLMS adaptive filter utilizing the Xilinx System Generator. The suggested design seeks to improve performance while decreasing convergence rate and route latency. In this paper, (i) we proposed a modified architecture for an 8-tap SLMS adaptive filter is built, and (ii) multiplier-less structure for a Modified DLMS Filter is introduced and compare the same. The ECG signal was evaluated using the intended architecture. The algorithm's functionality is tested in MATLAB using varied ECG data from the MIT-BIH database as input. Using Xilinx system generator, the LMS and SLMS are developed, simulated, synthesized, and implemented on a Virtex-5 FPGA. When comparing Systolic Sign LMS Filter to LMS Filter, the result reveals a 5% drop in total real-time router completion and a drop in the number of adders and subtractors, as well as a drop in reduction in maximum combinational path latency.

Keywords Xilinx · System generator · Least mean square · Sign least mean square

1 Introduction

Adaptive filters are mainly used in the field such as digital signal processing such as adaptive equalization, system identification, noise cancellation, etc. All these applications are based on the LMS, because it has easy calculation and high performance [1]. Thus Roy et al., developed the Delay Least Mean Square (DLMS) algorithm for the Very Large-Scale Integrated (VLSI) design of LMS adaptive digital filter. It is observed from this paper that the path delay and convergence rate problems are present due to the feedback error term. It is needed for updating all the corresponding weights of the adaptive filter. In case, the hardware implementation, it is essential to reduce path delay, area and power and increase the speed of the structure.

Van and Feng [2]., developed the efficient tree structure for real time digital signal processor using Systolic Architecture for the DLMS Adaptive Filter. With the advancement in VLSI technology, it is possible to perform hardware realiza-

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Source details

Aerospace Systems

Scopus coverage years: from 2018 to Present

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E-ISSN: 2523-3955

Subject area: (Social Sciences: Social Sciences (miscellaneous)) (Earth and Planetary Sciences: Computers in Earth Sciences)

(Engineering: Aerospace Engineering) (Engineering: Mechanical Engineering)   View all ∨

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OPEN DATE: 08/07/2019

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et al., 2007) and flavonoids (Zhu et al., 2013). Furthermore, antioxidants also have the potential to inhibit α-Syn oligomer formation.

Since 2001, many researchers have reported their work on DA induced α-Syn oligomers and its selective DAergic neuron degeneration (Maries et al., 2003). The current article reviews the recent works reported on the interaction of DA metabolites with α-Syn oligomers, and its promotive effect by divalent metal ions as well as preventive effect by antioxidant GSH.

2. Dopamine and α-syn in PD

DA can have many fates within the DAergic neurons which include the synthesis, storage, release, re-uptake and degradation (Fahn and Cohen, 1992; Jenner and Olonow, 1996; Stokes et al., 1999; Best et al., 2009; Elsworth and Roth, 1997; Lawlor and During, 2006; Kaufman, 2013; Jose et al., 2013; Sotnikova and Gainetdinov, 2009; Vorwieger et al., 1998; Yeh et al., 2016; Kuriakose and Stoessl, 2010; Ravan et al., 2014). This whole process can be controlled by the presynaptic protein called α-Syn as shown in Fig. 2 (Cheng et al., 2011; Emanuele and Chieregatti, 2015). α-Syn modulates DA synthesis and controls the formation and re-clustering of synaptic vesicles for DA storage (Perez et al., 2002). α-Syn also controls DA release and reuptake process by modulating DA transporter (DAT) and expression activity (Abeliovich et al., 2000; Yavich et al., 2004). Thus, α-Syn also controls the auto-oxidation of DA by modulating vesicular monoamine transporter 2 (VMAT2) activities. Therefore, both DA and α-Syn levels have significant role in the presynaptic DAergic neurons and their abnormal levels may lead to neuronal death in PD (Eiden, 2000; Parsons, 2000; Weihe and Eiden, 2000; Lotharius et al., 2002; Guo et al., 2008; Graham, 1978).

3. Dopamine in α-syn oligomer formation

α-Syn is a neuro protein which is highly expressed in the central nervous system and only a small amount is released from nerve cells. α-Syn release increases under cellular stress conditions which causes more α-Syn aggregates (Lashuel et al., 2013; Hamilton, 2000; Giguère et al., 2018; Spillantini et al., 1997). α-Syn is a protein with 140 amino acids (mass range = 14.4 kDa or 4.7 pKa) which is terminated into three regions (Hashimoto et al., 2000). Amino acid residues 1–64 is an amphipathic Lys-rich amino terminus that contains the mutation sites of familial PD (A30P, E46K, A53T) which can form amphiphilic alpha-helix structure. An amino acid residue 65–90 is a central region that contains a highly hydrophobic motif (NAC region) (Giasson et al., 2001; Ulmer et al., 2005). Amino acid residues 91–140 is a disordered acidic carboxy-terminal tail (C-terminal) (Heise et al., 2005) α-Syn can assume various conformations from monomeric α-helix to β-sheets, oligomers, fibrils and LBs (Hashimoto et al., 2000; Rodriguez et al., 2015;
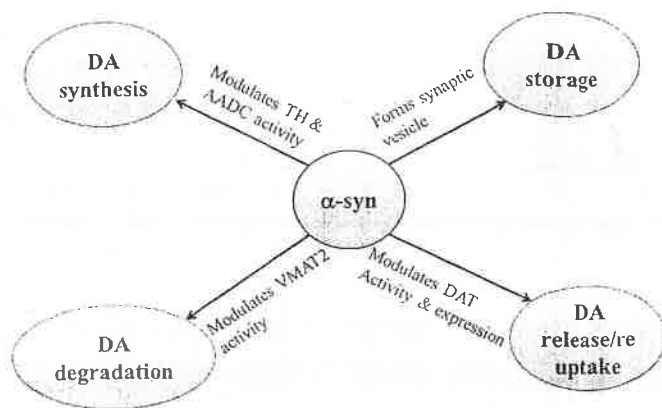
Fig. 2. Role of α-Syn on the molecular pathway of DA.

Dibenedetto et al., 2013a).

α-Syn deletion induces presynaptic accumulation of DA to generate cytotoxic DA oxidation products (or metabolites) such as DAQ, DOPAL, DAC, neuromelanin, and ROS (mechanism is shown in Fig. 3). On the other hand, α-Syn expression decreases DA levels which further leads to the aggravation of PD symptoms, (Werner-Allen et al., 2016). The oligomer can either be formed by interaction between DA metabolites and α-Syn (Herrera et al., 2017; Lopes et al., 2014) or interaction between oxidized α-Syn sequence and DA (Masarik et al., 2004; Bryan et al., 2012; Warner et al., 2004). The oxidation products of DA metabolites can interact with α-Syn covalently or non-covalently to convert α-Syn monomers into oligomers (Herrera et al., 2017; Lopes et al., 2014). The decreased levels of α-Syn leads to the increase of DA synthesis by increased TH and AADC activity which increase presynaptic DA accumulation (Cheng et al., 2011; Emanuele and Chieregatti, 2015; Perez et al., 2002; Abeliovich et al., 2000; Yavich et al., 2004). The accumulated DA is oxidized by ROS and/or presynaptic enzymes which further induces presynaptic DA metabolites thus leading to DAergic neuronal damage. On the other hand, the amino acids (ex: methionine (Met) and tyrosine (Tyr)) of α-Syn monomer can be oxidized by presynaptic ROS and/or enzymes to form oligomers through covalent and non-covalent interaction with DA (Rekas et al., 2010b; Follmer et al., 2015; Chan et al., 2012; Burke et al., 2008; Hattoria et al., 2009).

According to Fig. 3, DA expression was observed in the presynaptic neuron due to the inhibition of VMAT2 activity caused by deletion of α-Syn (Eiden, 2000; Parsons, 2000; Weihe and Eiden, 2000; Lotharius et al., 2002; Guo et al., 2008; Graham, 1978). Then the accumulated DA in presynaptic neuron was exposed to ROS and/or enzymes and oxidized into DAQ and DOPAL (Lopes et al., 2014). The oxidation of DA was also
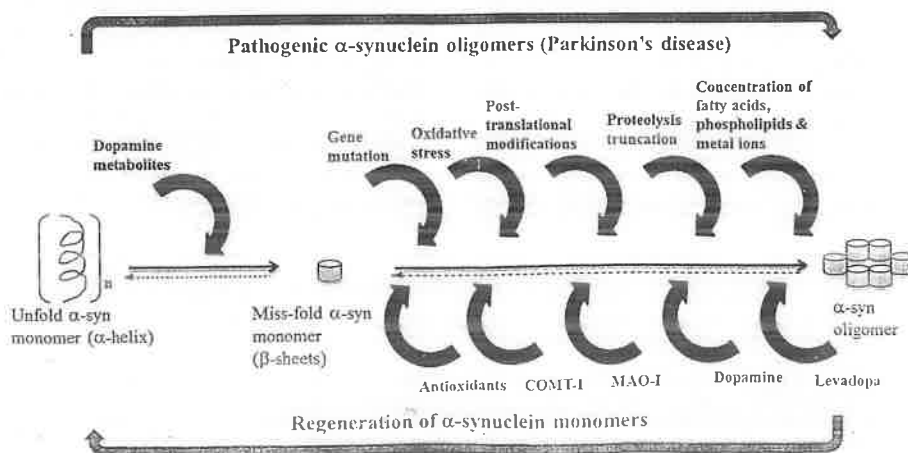
Fig. 1. Pathogenic and regeneration features of α-syn structure.

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amino acid Lys to make covalent interaction with DOPAL for forming pyrrole ring after eliminating water as side product. This pyrrole ring formation can be inhibited by adding antioxidant GSH. GSH can reduce divalent Cu^{2+} into monovalent Cu^+ ion by forming $GSH\text{-}Cu^+$ complex which cannot interfere with α-Syn structure (Binolfi et al., 2006; Lawson et al., 2016; Outeiro et al., 2009). Moreover, Fe also plays a cellular role in the DAergic degeneration in PD. For example, Cappai et al., found that DA can inhibit Fe induced α-Syn amyloidogenic aggregates (Pham et al., 2014).

α-Syn-lipid interaction can inhibit the formation of DA-induced oligomers by altering the actions of α-Syn which requires membrane association (Cappai et al., 2005). DOPAL can induce α-Syn oligomers but DOPAL-α-Syn adduct inhibits the formation of oligomers in N-terminal lipid-binding domain into lipid vesicles or detergent micelles (Chan et al., 2012). Outeiro et al., studied that, DA and its agonists cannot induce conformational changes in α-Syn structure which can be pre-vented by blocking DA transport into the cell (Jethva et al., 2011). Jethva et al., studied the modulation of α-Syn aggregation by DA in the presence of MPTP, and found that the conversion of MPTP to MPP^+ is not required for the aggregation of α-Syn (Palanisamy et al., 2014, 2016; Sivakumar et al., 2020; Prabu et al., 2018).

9. Summary and future perspectives

It seems Lys side chain of α-Syn sequence has major impact in the formation of oligomers and fibrils in PD patients. It is because Lys has higher affinity with quinone containing DA metabolites like DAQ and DAC. However, DAC has higher amount of quinone sites than DAQ, and the quinone binding sites of DAC can further be multiplicated through the polymerization of DAC into neuromelanin. As a dark pigment naturally found in brain, neuromelanin has less toxic effect than DAC. Due to this reason α-Syn fibrils formed through the interaction of neu-romelanin with α-Syn monomer has less toxic effect than the oligomers formed by DAQ and/or DAC. The toxic DA metabolites such as DAQ and DAC can be converted into non-toxic DA and leukoaminochrome through the reduction of toxic quinone adduct into non-toxic catechol adduct by adding antioxidant GSH. The transformation of α-Syn oligo-mers into fibrils can also be naturally protected by human brain through lysosomal CMA decomposition pathway. The lysosomal CMA activity also protects human brain from the formation of neurotoxic α-Syn oligomers by decomposing them into monomers. Moreover, DA me-tabolites induced α-Syn oligomers can be further promoted by excess divalent metal ions especially Cu^{2+}, and it can be successfully inhibited by reducing toxic Cu^{2+} into non-toxic Cu^+ in the presence of antioxidant GSH.

The previous studies on DA metabolites induced α-Syn oligomers are mainly focused on *in-vitro* methods. The researchers have widely used recombinant proteins and tissue extracts for their investigation. The limitation in this research is that, 'no *in-vivo* works' have been done for clinical use. It is because their lack of understanding about the inter-action between α-Syn and DA metabolites. The current review highlights the mechanism between α-Syn and DA metabolites interaction, binding sites, promotive and inhibition effect. It is believed that, the information provided in this review can help the readers to understand the chemistry behind α-Syn-DA interaction for their future endeavors especially in *in-vivo* experiments.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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interaction of DAC with the 125YEMPS129 residues (Kim and Kang, 2005). Mazzulli et al., discovered the cell free and cellular prevention of α-Syn aggregates by DA (Whitehead et al., 2001). While Leong et al., held an opposite opinion that the 125YEMPS129 residue acted as an antioxidant to prevent DA oxidation (Rekas et al., 2010b). Various binding sites of α-Syn and its interaction with DA metabolites are described in Fig. 7.

All of the modifications on amino acid residues of α-Syn by DA induce the conformational change in α-Syn structure which leads to misfold of α-Syn and further formation of α-Syn oligomers in PD (Ebrahimi-Fakhari et al., 2012). So, the neurons can survive themselves by two ways either by transferring the toxic oligomers into non-toxic mature fibers or start-up of autophagy system. Expression of α-Syn in intracellular region may be caused by the following two major α-Syn degradation pathways of ubiquitin-proteasome system and autophagy-lysosomal pathway (Martinez-Vicente et al., 2008). Martinez et al., found that, only a small quantity of DA-modified α-Syn oligomers is degraded by CMA (Kawamoto et al., 2002), which is also consistant with their previous findings (Cappai et al., 2005). 14-3-3 protein is one of the chaperones that related to α-Syn aggregation (Xu et al., 2002). Xu et al., reported 54–83 kDa mediated DA-dependent neurotoxicity that contain α-Syn and 14-3-3 protein (Colapinto et al., 2006). And Colapinto et al., found that DA regulated redox chaperones increased the level of 14-3-3 protein by 60% (Alberio et al., 2010).

DA-induced α-Syn aggregation may also generate inflammation stress to the neurons. For example, Lee et al., reported that the neuro-inflammation caused by DA mediated α-Syn oligomers other than DAergic degeneration (Lashuel et al., 2013). DA itself is able to upre-gulate α-Syn expression, α-Syn significantly reduces NF-kB activation which is completely quenched by DA treatment (Chartier-Harlin et al., 2004).

8. Promoter and inhibiter effect on dopamine induced α-syn oligomers

Metal ions are known to be a potential candidate in the pathogenesis of PD and forms a complex with the DA induced α-Syn aggregation (Brown, 2009) and it has been proposed that a unique Cu can induce toxic α-Syn oligomers (Wright et al., 2009; Kim et al., 2002). α-Syn oligomers expressed by the incubation of Cu^{2+} ions (Lucas and Lee, 2011; Paik et al., 2000; Wang et al., 2010a; Jinsmaa et al., 2014). Burke et al., have investigated that oxidized catecholamine-mediated α-Syn aggregation was enhanced by Cu ions and it was significantly prevented by scavengers, azide and N-cysteine (Hattoria et al., 2009). In Cola-pinto's study, the effect of DA reduced DJ-1 level was enhanced by Cu^{2+}. However, expression of α-Syn oligomer was not found in PD *in-vivo* studies. It is because there is around 65% of reduction in Cu^{2+} within the substantia nigra in PD (Genoud et al., 2020). On the other hand, Fe^{2+} is increased and the interaction between Fe^{2+} and DA has recently been comprehensively reviewed (Hare and Double, 2016).

DOPAL induced α-Syn oligomers are considerably higher in the presence of divalent metal ions than the monovalent and trivalent metal ions. Other DA metabolites, DA itself and metal ions alone or in com-bination with DA also had no effect (Bisaglia et al., 2009). The inter-action of divalent Cu^{2+} with DOPAL is dominant than Fe^{2+} and Mn^{2+} in α-Syn oligomerization (Wang et al., 2010b).

The divalent Cu^{2+} promoted DOPAL interaction with MK amino acid repeats of α-Syn are shown in Fig. 8. Cu^{2+} ions are usually located in the binding sites of Met-1 and histidine-50 in α-Syn sequence. However, here we have considered Met-1 as a model site to explain the Cu^{2+} promoted α-Syn oligomers. It is already well discussed that, the divalent Cu^{2+} ions can oxidize Met and Tyr amino acid sequence of α-Syn. In Fig. 8, Cu^{2+} acted as catalyst to remove the electron from aldehyde adduct of DOPAL by breaking hydrogen atom. During this reaction, Cu^{2+} gets reduced to Cu^+ state. This process catalyzes the oxidation of
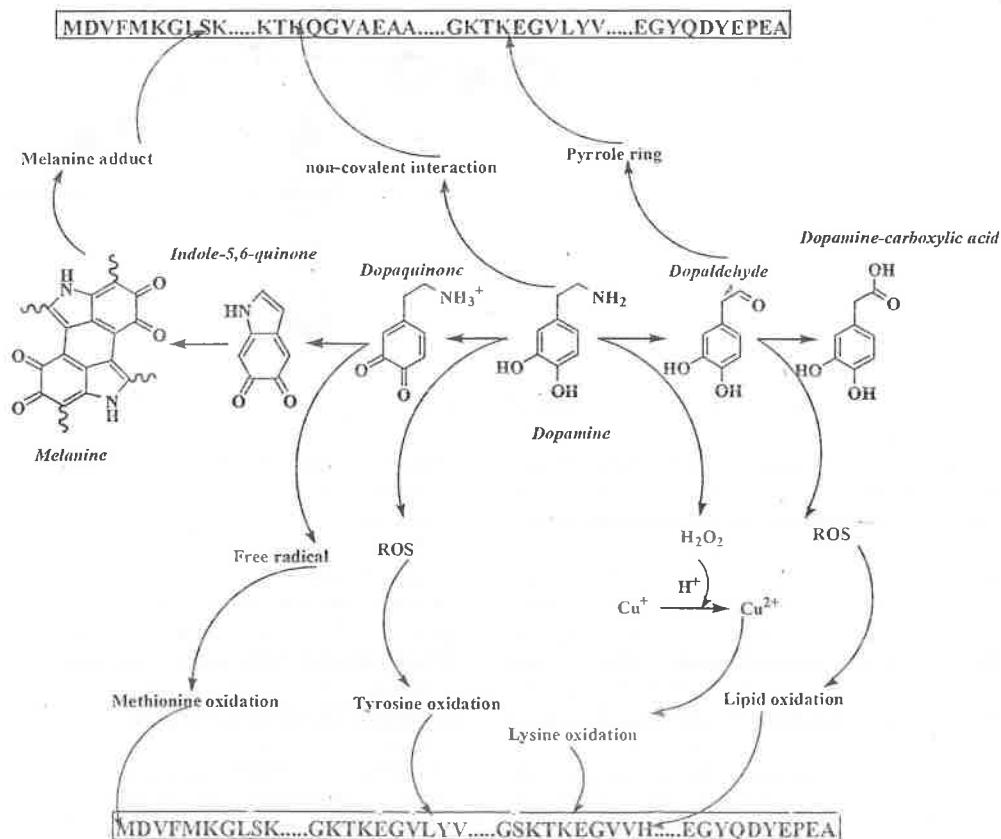
Fig. 7. Mechanism for the modification of α-Syn with DA adducts.
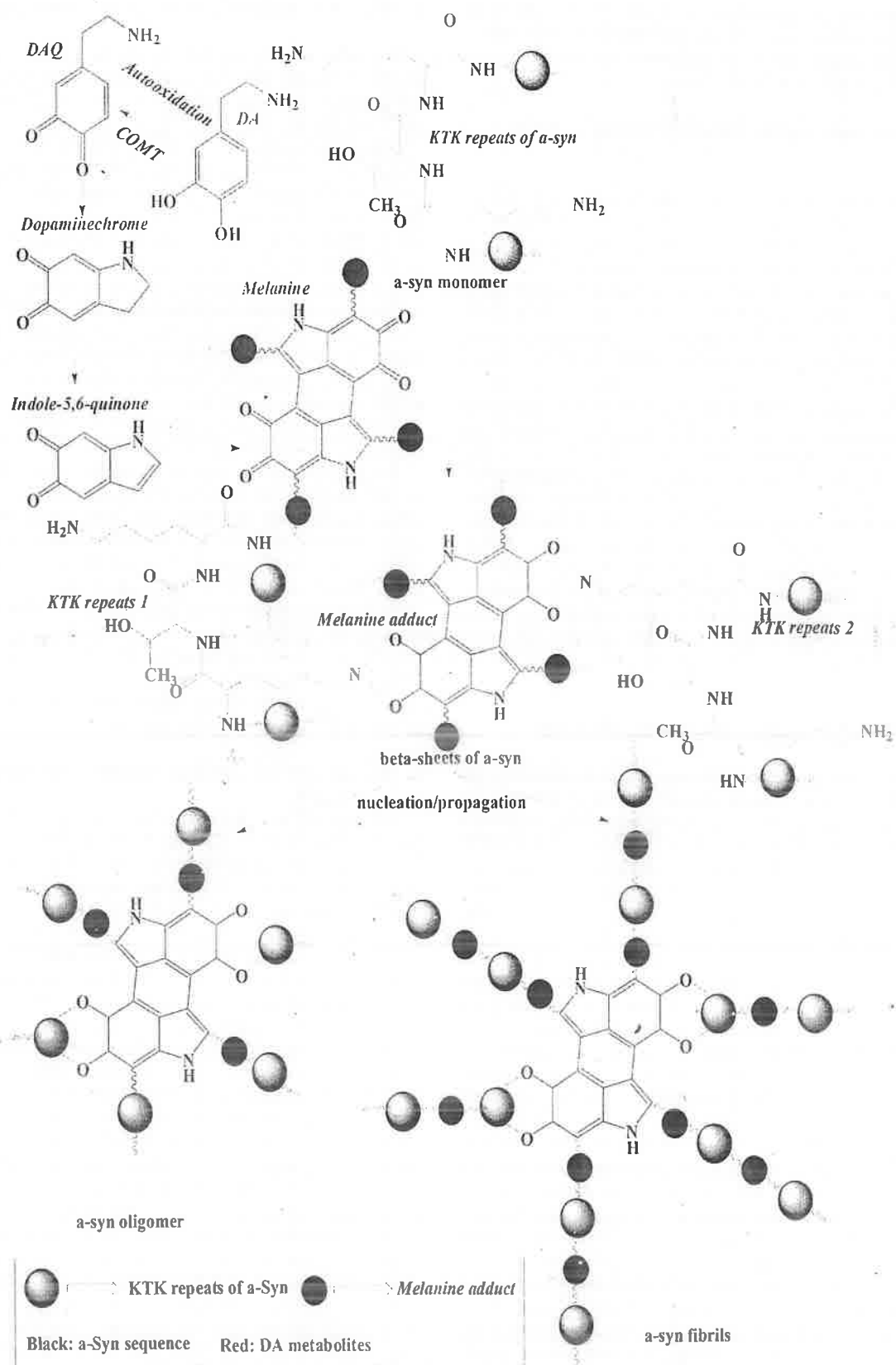
Fig. 5. Mechanism for the formation of melanin induced α-Syn oligomer and fibrils.

contributed by the presynaptic enzymes such as COMT and MAO (Lopes et al., 2014). The DAQ produced further interacts with Lys side chain of KT amino acid repeats to form α-Syn-DA complex through covalent bonding (Hamilton, 2000), while DOPAL forms dicatechol pyrrole adducts (Herrera et al., 2017). In addition, Tyr from YV repeats of α-Syn amino acid sequence was oxidized by ROS produced during the oxidation of DA, and the oxidized Tyr interacts with DA through covalent interaction (Masarik et al., 2004; Bryan et al., 2012; Warner et al.,
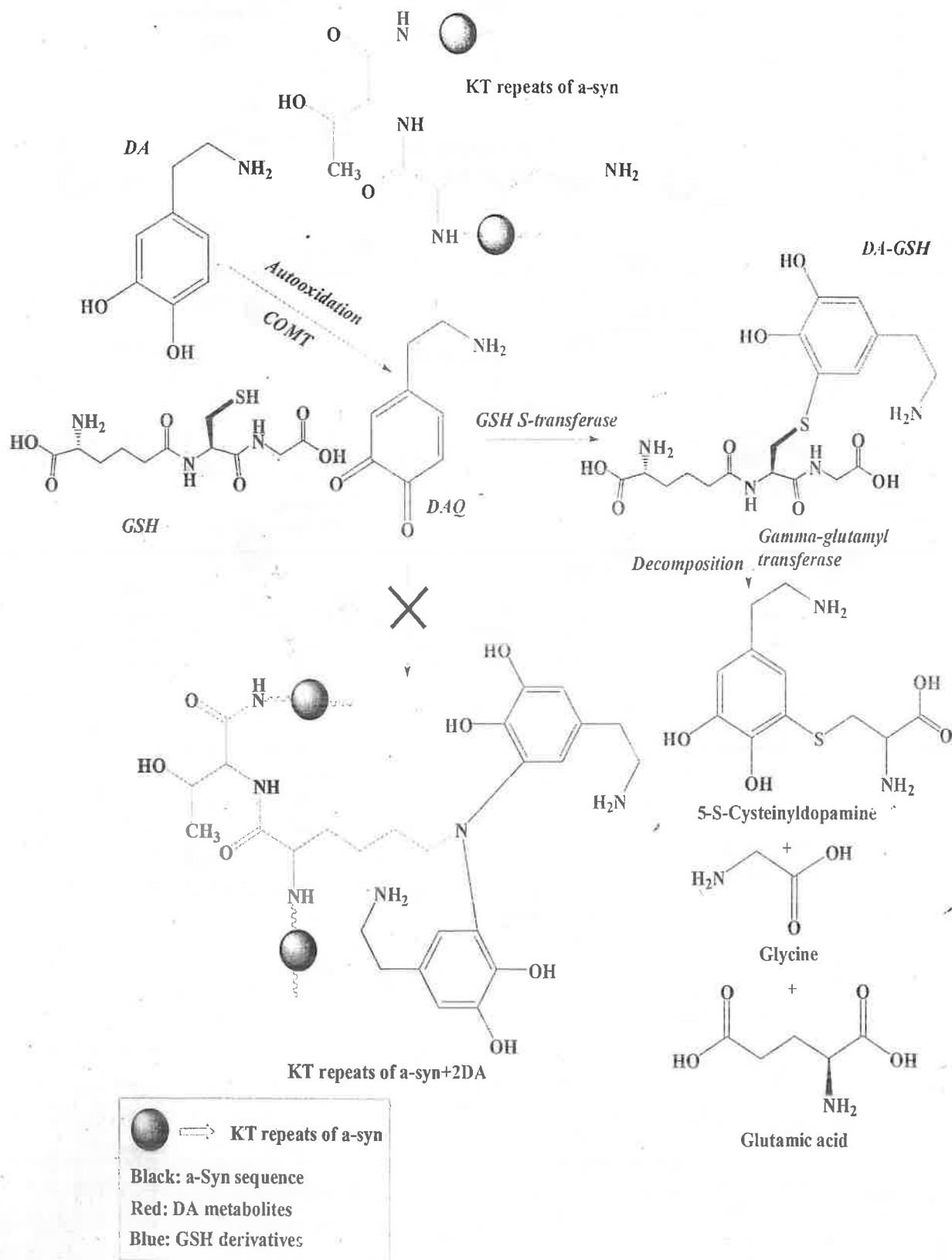
Fig. 4. Mechanism for the formation of GSH-DA complex from DAQ and its decomposition into 5-S-cysteinyldopamine, glycine and glutamic acid.

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Confinement effectiveness of 2900psi concrete using the extract of Euphorbia tortilis cactus as a natural additive

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ABSTRACT

Concrete with cactus is a new type of concrete with high fluidity, strength, and durability with more remarkable advantages. The present paper discusses the role of Euphorbia tortilis cactus (ETC) to achieve the strength, durability, and corrosion resistance properties of concrete specimens. In this work, M_{20} (2900psi) concrete was designed as per Indian standards, and cactus were used as an additive. ETC extracts from Tamilnadu (India) were replaced with water (1%, 3%, 5%, 7%, 9%) by weight. The performance of cactus concrete was analyzed through destructive and non-destructive tests to investigate strength properties. In addition to that, specific tests such as sorptivity, permeability, half-cell potential test, etc. have been performed further for durability and corrosion resistance. ETC concrete improves the fluidity, thereby enhancing the workability of the mixture. Concrete was analyzed through Scanning Electron Microscopy (SEM) to identify the particle distribution. Experimental investigation shows that the strength properties of concrete have been enhanced by 29% due to Polysaccharides at optimum level. However, durability is achieved at a high, which stimulates the effective filling of voids in concrete. It shows that better performance of concrete gives at optimum dosage. On Euphorbia tortilis cactus concrete, no literature has been discovered.

Keywords: concrete; euphorbia tortilis cactos; bio additive; destructive test; non-destructive test.

1. INTRODUCTION

In the construction Division, cement composite is the most extensively utilized construction material. A potential problem with concrete is its strength and durability, which is governed by several factors such as lower values of compressive strength, high chance of clogging, and less resistance to corrosion in severe environments. Various alterations in concrete are made nowadays, like changing mix proportions, adding admixtures, replacing with alternative waste products, and changing composition to achieve good results (Workability, Viscosity of concrete, high performance, and high strength). Present advancement in concrete construction technology demonstrates the possibility of improving concrete quality by altering its composition with fibers. Cement acts as the main role in concrete for binding. While manufacturing cement in industry, more amount of carbon-di-oxide emission happens which is detrimental to the environment. Lime was used as a binding material in ancient times in place of cement, but it was not durable. To modify the properties, Chemical additives are being used in concrete. The use of synthetic polymer additives will emit more toxic species to nature. Moreover, the usage of chemical admixtures is expensive. To cut down these downsides in concrete, the adoption of low-cost natural additives (Euphorbia tortilis cactus) is in the light of current research.

AL-JABRI et al. [1] used copper slag with sand and achieved good strength in high-performance concrete. Starch admixtures were tested with cement by AKINDHAET and UZOEGBO [2], an improvement in durability was observed. Bio-superplasticizer had a small impact on porosity said by BEZERRA [3]. As per Chandra's research [4], the cactus extract is giving good plasticity and improves water holding capacity. CARDENAS et. al. [5]

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Research Article

Mechanical performance of ETC RC beam with U-framed AFRP laminates under a static load condition

P. Loganathan [1]*, R. Mohanraj [2], S. Senthilkumar [3], K. Yuvaraj [4]

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Abstract: In the presented paper, an attempt has been made to first find the permeability of the Euphorbia tortilis cactus (ETC) concrete by the water permeability method and infiltration method. After that, the flexural strength of the ETC RC beam wrapped with AFRP kelvar 149 is carried out by a 2-point load test. This research aimed to develop a more durable, flexural, and sustainable beam under static load. Based on the state-of-the-art information available in the literature, 3-layer Kelvar 149 AFRP is considered as a laminate to solve the deflections of the ETC beam. In this project, RCC beams were strengthened by ETC and aramid FRP sheets. Novel results are obtained by different layers and patterns of Aramid FRP sheets. Based on the investigation 3-layers Kelvar 149 perform well than a normal concrete beam. As no result based on hydraulic conductivity and drying shrinkage of a beam with AFRP laminates are available in the literature, the obtained results are validated with the finite element method (ABAQUS) under static load conditions.

Keywords: Aramid fiber reinforced polymer, kelvar 149, rehabilitation, hydraulic conductivity test, euphorbia tortilis cactus.

1. Introduction

Cement composite is the most extensively utilized construction material in the construction division. Throughout their projected lifetime, concrete structures are supposed to withstand physical, chemical, and weathering impacts while still keeping the desired technical qualities (Hanehara & Yamada, 1999). Often, degradation and failure occur before the predicted lifetime due to micro cracks development and fluids' subsequent entry into these structures. The setting and curing characteristics of the concrete, cement paste, or mortar at the time of production affect durability performance. Though concrete strength and durability is a potential problem, which is governed by several factors such as lower values of compressive strength, a high chance of clogging, and less resistance to corrosion in severe environments.

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Research Article

Torsional performance of reinforced concrete beam with carbon fiber and aramid fiber laminates

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Abstract: In the presented research paper, investigated the torsional performance of reinforced concrete beams with light emissions grade of cement utilizing Carbon fiber and its relative investigation with aramid fiber, for its torsional conduct, utilizing both exploratory and insightful strategies. A distinctive example of its strips folded over RC beams and the torsional conduct of these restrengthened beams is considered. Carbon fiber (CF) is utilized as outside support. Reinforced concrete beam retrofitted with CF tried for torsional disappointment utilizing lever arms exposed to torque. The beams have dimensions of 150mm in width and 200mm in depth and 1 m long, as planned according to IS456-2000. Three bars are intended for a twist. Steel has a stronger ultimate strength but a lower density than aramid FRP, as well as being easier to install and requiring no interim support until it reaches its full strength. The impact of various sorts and designs of CF on the initial stage of breaking load, extreme load conveying limit, and disappointment method of the beam are thought about and its relative examination utilizing finite element programming with aramid fiber gives a better outcome for additional investigation.

Keywords: carbon fiber, aramid fiber, retrofitting, torsional analysis, ANSYS.

1. Introduction

The utilization of strands to work on post strength of considerable conduct is exceptionally well known nowadays. Since the most recent 4 decades, a few diverse fiber types and materials have been utilized to further develop the solidness of concrete and furthermore its actual properties (Abed, El-Chabib, & AlHamaydeh, 2012). Demonstrating such different free examination results shows the capacity of such filaments, which further develop the toughness of concrete and its actual properties. Notwithstanding the beginning, cracking, when initiated by a few cycles like mechanical, chemical, and natural cycles, brings about disintegrated and less-strong concrete (Al-Mahmoud, Castel, & François, 2013). Likewise, the expanded penetrability brought about by breaking can speed up other disintegration measures bringing about less-strong concrete (Askandar, Mahmood, & Kurda, 2020). The greater part of RCC structures have experienced extreme degradation since their

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Journal Details

- Journal Rank: JCR – Q4 (construction and building technology); Q4 (engineering civil)
- Impact Factor 0.810 (2021).
- Five-Year Impact Factor 0.852
- Scimago Journal Rank (SJR) 0.213
- ISSN 0717-7925
- ISSN (online) 0718-915X.
- Issues 63
- Volumes 21

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Date: 27.01.2023

S.NO: 30

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Staff Name	A.VASANTHARAJ			
Designation / Department	ASSO. PROFESSOR / ECE			
Publication Category	SCI/SCIE/WoS	1st Author (Rs.5,000)	2nd Author (Rs.3,500)	3rd Author (Rs.1,500)
	Scopus/AU-Annexure I	1st Author (Rs.2,500)	2nd Author (Rs.1,500)	3rd Author (Rs.1,000)
	Patent-Published	Applicant (First) (Rs.5,000)		Inventor (Rs.2,500)
	Patent-Granted	Applicant (Rs.15,000)		Inventor (Rs.10,000)
Research Grants	Upon Receiving Fund	PI / Co PI	10 %	
Program Fund	Greater than Rs.50,000/-	Coordinator	5 %	
Consultancy	Greater than 2 Lakhs	Coordinators	50% Faculty + 50% Management	
Participation	IITs/NITs/up to NIRF Top 100 colleges	Registration Fee - Actual (Max.Rs.5,000)		
Additional details (Attach supporting documents)	Impact Factor	~~DOI~~ / Patent No./ ~~Scheme~~ 202341067919		NIRF Ranking
Approved amount in Rs.	RS 2500/-			

Investigator / Coordinator   Dept: IIC Coordinator 27.1.2023   HOD 23/1/23

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Amount Recived already: Rs: 7500/-

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② He has filed a patent at PO office. Same has been posted in Patent Journal.

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241067919 A

(19) INDIA

(22) Date of filing of Application :25/11/2022

(43) Publication Date : 16/12/2022

(54) Title of the invention : ARTIFICIAL INTELLIGENCE-BASED APPROACH INTEGRATED WITH IOT POWERED BY SOLAR ENERGY FOR UNMANNED AIR FILING OF TIRES OF VEHICLES

(51) International classification	:G06N0003020000, G06N0020000000, G06K0009620000, H04L0067125000, G10L0019000000	(71)Name of Applicant : 1)Dr.KAMALAKKANNAN Address of Applicant :PROFESSOR, BIOMEDICAL ENGINEERING, GNANAMANI COLLEGE OF TECHNOLOGY, NAMAKKAL 637018 NAMAKKAL 2)VIBIN R 3)Dr.B.DHANALAKSHMI 4)PRATIK KUMAR DUBEY 5)Dr.A.VASANTHARAJ 6)G SUJATHA 7)Dr. PRAMOD BELKHODE 8)Dr. SYED HAUDER ABBAS 9)AMOL SONAWANE 10)Dr.A.SASI KUMAR 11)Dr. JYOTI PRASAD PATRA 12)SHANMUGANATHAN V Name of Applicant : NA Address of Applicant : NA
(86) International Application No Filing Date	:PCT// :01/01/1900	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number Filing Date	:NA :NA	
(62) Divisional to Application Number Filing Date	:NA :NA	(72)Name of Inventor : 1)Dr.KAMALAKKANNAN Address of Applicant :PROFESSOR, BIOMEDICAL ENGINEERING, GNANAMANI COLLEGE OF TECHNOLOGY, NAMAKKAL 637018 NAMAKKAL 2)VIBIN R Address of Applicant :ASSISTANT PROFESSOR, ELECTRICAL & ELECTRONICS ENGINEERING CMS COLLEGE OF ENGINEERING & TECHNOLOGY, COIMBATORE 641032 COIMBATORE 3)Dr. B.DHANALAKSHMI Address of Applicant :APEEE,ADHIPARASAKTHI COLLEGE OF ENGINEERING, VELLORE 4)PRATIK KUMAR DUBEY Address of Applicant :ASSISTANT PROFESSOR, ELECTRONICS AND COMMUNICATION ENGINEERING,DR K N MODI INSTITUTE OF ENGINEERING AND TECHNOLOGY MODINAGAR GHAZIABAD U.P 201204 GHAZIABAD 5)Dr.A.VASANTHARAJ Address of Applicant :ASSOCIATE PROFESSOR/ELECTRONICS AND COMMUNICATION ENGINEERING, EXCEL ENGINEERING COLLEGE, NAMAKKAL, TAMILNADU - 637303 NAMMAKAL 6)G SUJATHA Address of Applicant :ASSISTANT PROFESSOR;EEE, G NARAYANAMMA INSTITUTE OF TECHNOLOGY AND SCIENCE(FOR WOMEN),SHAIKPET,HYDERABAD,500104 HYDERABAD 7)Dr. PRAMOD BELKHODE Address of Applicant :ASSISTANT PROFESSOR, LIT NAGPUR 440033 NAGPUR 8)Dr. SYED HAUDER ABBAS Address of Applicant :ASSISTANT PROFESSOR CSE INTEGRAL UNIVERSITY LUCKNOW LUCKNOW 9)AMOL SONAWANE Address of Applicant :ASSISTANT PROFESSOR, ELECTRONICS AND TELECOMMUNICATION ENGINEERING, NUTAN COLLEGE OF ENGINEERING AND RESEARCH, TALEGAON, PUNE - 410507 TALEGAON 10)Dr.A.SASI KUMAR Address of Applicant :PROFESSOR (MENTOR-IT – INURTURE EDUCATION SOLUTIONS PVT LTD, BANGALORE), DEPARTMENT OF CLOUD TECHNOLOGY & DATA SCIENCE, INSTITUTE OF ENGINEERING & TECHNOLOGY, SRINIVAS UNIVERSITY, SRINIVAS NAGAR, MUKKA, SURATHKAL, MANGALORE-574146, DAKSHINA KANNADA DISTRICT, KARNATAKA STATE, INDIA. MANGALORE 11)Dr. JYOTI PRASAD PATRA Address of Applicant :FACULTY ELECTRICAL ODISHA UNIVERSITY OF TECHNOLOGY AND RESEARCH OUTR MAHALAXMI VIHAR GHATIKIA TECHNO CAMPUS BHUBANESWAR ODISHA 751029 INDIA BHUBANESWAR 12)SHANMUGANATHAN V Address of Applicant :RESEARCH SCHOLAR, DEPARTMENT OF NETWORKING AND COMMUNICATIONS, SCHOOL OF COMPUTING, SRM INSTITUTE OF SCIENCE AND TECHNOLOGY, KATTANKULATHUR - 603203 CHENGALPATTU

(57) Abstract :
Artificial Intelligence-Based Approach Integrated with IoT Powered by Solar Energy for Unmanned Air Filing of Tires of Vehicles is the proposed invention. The invention focuses on implementing techniques of Artificial Intelligence for supporting the monitor of tires. The proposed invention aims at achieving the unmanned air filing aspect along with Internet of Things (IOT) techniques powered by solar energy.

No. of Pages : 13 No. of Claims : 5

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Application Details

APPLICATION NUMBER	202241067919
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	25/11/2022
APPLICANT NAME	1 . Dr.D.KAMALAKKANNAN
	2 . VIBIN R
	3 . Dr.B.DHANALAKSHMI
	4 . PRATIK KUMAR DUBEY
	5 . Dr A.VASANTHARAJ
	6 . G SUJATHA
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	9 . AMOL SONAWANE
	10 . Dr.A.SASI KUMAR
	11 . Dr JYOTI PRASAD PATRA
	12 . SHANMUGANATHAN V
TITLE OF INVENTION	ARTIFICIAL INTELLIGENCE-BASED APPROACH INTEGRATED WITH IOT POWERED BY SOLAR ENERGY FOR UNMANNED AIR FILING OF TIRES OF VEHICLES
FIELD OF INVENTION	COMPUTER SCIENCE
E-MAIL (As Per Record)	sgowthami12@gmail.com
ADDITIONAL-EMAIL (As Per Record)	sgowthami12@gmail.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	--
PUBLICATION DATE (U/S 11A)	16/12/2022

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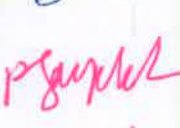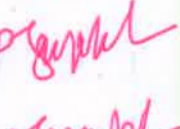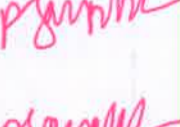
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2.	Arun S Pillai	Five Day online FDP on Thermal Science & Materials Engineering	07.11.22	Srinivasa Ramanujan Institute of Tech, Ananthapusam.	750	**CASH PAID**	
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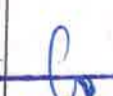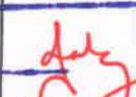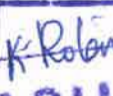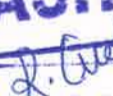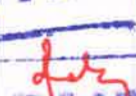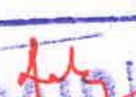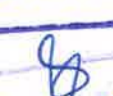
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5.	J. Senthikumar	Internship	23.12.22 to 28.12.22	A.K. Engineering Co., Cbe	1000	Ish **CASH PAID**	
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10	b. godvpuppu	Using Raspberry Pi scrum (VALLE	21/01/2023	1000	CASH PAID	

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18.11.22	Ms. D. Mythili	ICI - Sponsored FDP on sustainable development with innovations in civil Engineering	21.11.22 to 25.11.22	1000	CASH PAID	
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2	Mathiya	ChatGPT & AI Tools	14/6/23 to 21/6/23	Marian College Kutlikkanam	500	Naf CASH PAID	_(sign)_
3	R. Ramya	Outcome Based Education	01/02/23 to 9/02/23	PPG Institute of Technology.	500	R. Ramya CASH PAID	_(sign)_
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1	Dr. K. Greetha	A Parallel Biogeography optimization - Based Feature selection Architecture for Fundus classification	2023	Revista Argentina DE clinica Psicologica kambodhar	3500	CASH PAID	
2	Dr. K. Greetha	Optimized Machine learning Framework for Detecting Alzheimer's Disease. MRI	2022	Algebraic statistics kambodhar	3500	CASH PAID	

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5	Deepankumar E	An Enhanced self-Cooperative Trust scheme Against Routing Attacks	8/2/23 9/2/23	Karpagam college of Engineering	500	CASH PAID	
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7	Dr. K. Geetha	Data Analytics and Machine Learning	13/2/23 to 17/2/23	Ramco Institute of Technology	500	CASH PAID	

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8	Dr. A. Ravi	Application of Artificial Intelligence In solving Various Engineering Problems	23/6/23 to 27/6/23	Vellore Institute of Technology	200 500	Ravi CASH PAID	
9	Sathishkumar M	Application of Artificial Intelligence In solving Various Engineering Problems.	23/6/23 to 27/6/23	Vellore Institute of Technology.	500	M. Sathishkumar CASH PAID	
2	Dorbarajkumar E						

S.No	Name of the Teacher	Date	Name of Conference	Name of the Professional Body for which Membership Fee was Provided.	Amount Support	Faculty Signature	HOD Signature
1.	Ms. S. Theivanayaki	APR-23	NPTEL - Joy of Python Programming		Rs. 1000	CASH PAID	
2.	Ms. M. Ramesh.	APR23	NPTEL - Joy of Python Programming		Rs. 1000	CASH PAID	
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4.	Mr. N. Rajagopalakrishnan	APR23	Introduction to NPTEL - Internet of things		Rs. 1000	CASH PAID	
5.	Ms. R. Pushpavathi	16/2/23	Workshop On PSG College of Technology Coimbatore		Rs. 1000	CASH PAID	
6.	Ms. A. Anitharani	8.7/22/23	PATENT - Systematic approaches to Identify the Impact of Aritificial Intelligence in the growth of agriculture		Rs. 5000	CASH PAID	
7.	Dr. K. Tamilarasi	15/11/22	Journal - Deep Neural Network for Image recognition in Medical diagnosis.		Rs. 1500	CASH PAID	

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9.	Dr. S. Jayapoorani	2/2/23	JOURNEL- SYSTOLIC O EFFICIENT EMPLOYEMENT OF OPTICAL SOURCES INTEGRATED WITH BOTH LIGHT DETECTORS AND FREE SPACE COMMUNICATION MODULATED	RS- 3000	CASH PAID
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14.	Dr. S. Anbu ka-uppu samy	13/9/22	Journal- Design & Fabrication of flexible Nano antenna based Sensor using Graphene-Coated Carbon cloth	Rs. 1500	CASH PAID
15.	Dr. A. Vasantharaj	17/8/22	Journal- child Safely Wearable able Visually impaired assistive device with location tracking system using IoT	Rs. 1500	CASH PAID
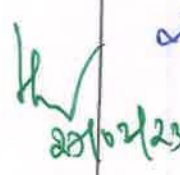
S.No	Name of the faculty	Name of Conference/Workshop attended for which Financial Support	Professional body	Fund Received	Faculty Sign	HOD Sign.
1.	K. S. Nanthini	Online course – 8 weeks.	NPTEL	1000 CASH PAID		CRou
2.	C. Rajeswari	Online course – 12 weeks	NPTEL	1000 CASH PAID	C. Raj	CRou
3.	C. Rajeswari	Paper publication	Scopus	1500 CASH PAID		CRou
4.	M. K. Anandkumar	Paper publication	Scopus	1000 CASH PAID		CRou
5.	M. Anandkumar	Journal publication	International Journal of Engineering Tech & Management Sciences.	500 CASH PAID	22/06/23	CRou

S. No	Name of teacher	Name of Conference/Workshop attended for which financial support was provided	Name of the Professional body for which membership fee was provided	Amount of Support in Rs	Staff Signature	Hd of Signature
1.	Mr. S. Tharani	NAAC Accrediation framework and Documentation		2000 CASH PAID		Ldb
2.	Ms. G. Chithra	Writing Successful research Paper and Project Proposals for funding agencies.		1000 CASH PAID		Ldb
3.	Ms. M. Shibani	Writing Successful research Papers and Project proposals for funding agencies		1000 CASH PAID		Ldb
4.	Mr. M.P. Murugesan	NAAC Accrediation Framework and Documentation.		2000 CASH PAID		Ldb
5.	Mr. S.P. Rajesh	Thermal Science + Materials Engineering		2000 CASH PAID		Ldb
6.	Mr. H. Raja	Integrative approach towards research technique in food and industries.		2000 CASH PAID		Ldb

S. No	Faculty Name	Title of The Event / Seminar / FDP / Workshop	Attended Date	Institute / Organization	Fund received (₹)	Faculty Sign
1.	Mr. M. Vadivel	STTP - IOT and its Application in industry	19/7/2021 - 24/7/2021	SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY	500 CASH PAID	Ouy
2.	Ms. S. kiruthika	FDP - Next generations applications of AI and ML for Smart IoT Application	18/10/2021 - 22/10/2021	AICTE	500 CASH PAID	Suy
3.	Mrs. S. Mouna	FDP Blockchain and Application	7/3/2022 - 11/3/2022	Presidency University	500 CASH PAID	Smy
4.	Mr. N. Naveen	FDP - Cyber Security	14.03.2022 - 18.03.2022	Presidency University	500 CASH PAID	N.Naf
5.	Mr. P. Dinesh kumar	FDP - Advanced Security Mechanism in networks	14/3/2022 - 19/3/2022	Periyar Maniammai Institute of Science and technology	CASH PAID	P.Din

S.No	Faculty Name	Title of the Event/FDP Seminar/Workshop	Attended Date	Institute/ Organization	Fund Received	Faculty Signature
1.	N. Naveen	NPTEL (2)	FEB-2023 APR-2023	AICTE **CASH PAID**	2000	N.Naz
		International Conference On Enhanced Techniques In Real Time Application (CICETRA 2022) An Enhanced Self Co Operative Trust Scheme Against Routing Attacks In Manet.	29.12.22	United College Of Arts And Science	500 **CASH PAID**	N.Naz
		Microsoft Azure AI Engineer Associate	15.11.22 to 19.11.22	Excel Engineering College	300 **CASH PAID**	
2.	S. Mouna	NPTEL	APR 2023	AICTE **CASH PAID**	1000	Sup
		IoT Automatic Irrigation Process	11.04.23	Velammal Engineering Coll **CASH PAID**	500	Sup
3.	S. Kayalvizhi	NPTEL	APR 2023	AICTE	100 **CASH PAID**	
		Contemporary Technique For Lung Diseases	11.04.23	Velammal Engineer -ng College @	500 **CASH PAID**	
4.	K. Ashok Kumar	Vehicle Dogging System Utilizing GPS In Smart Phones	17.03.22	Bannari Amman Institute Of Technology	500 **CASH PAID**	
		Microsoft Azure AI Engineer Associate	15.11.22 to 19.11.22	Excel Engineering College	300 **CASH PAID**	
5.	Nithasabanu	Microsoft Azure AI Engineer Associate	15.11.22 to 19.11.22	Excel Engineering College	300 **CASH PAID**	
6.	P. Dhinesh Kumar	Microsoft Azure AI Engineer Associate	15.11.22 to 19.11.22	Excel Engineering College	300 **CASH PAID**	
7.	Ranya	International Conference On Enhanced Techniques In Real Time Application CICETRA 2022) An Enhanced Self Co Operative Trust Scheme Against Routing Attacks In Manet.	29.12.22.	United College Of Arts And Science	500 **CASH PAID**	Ranya
8.	Saranya				500 **CASH PAID**	

S.No.	Name of the Teacher.	Name of conference/ workshop attended for which financial support was provided	Amount of support (Rs).	Sign.
1.	Mr. R.S. Arun.	Three days National online workshop on Data processing and Data Analysis.	500. CASH PAID	
2.	Mr. P. Nagaraj.	Three days National online workshop on Data processing and Data Analysis	500 CASH PAID	
3.	Ms. M. Nandhini.	Three days National online workshop on Data processing and Data Analysis.	CASH 500 PAID	M. Nandhini
4.	Mr. V.K. Maheskuma	5 days FDP on innovative teaching Learning practices for preparation of NEP-2020.	CASH 1,000 PAID	

S.No.	Name of the Teacher	Name of Conference/workshop attended for which financial support was provided.	Amount of Support Rs.	Sign.
5.	Ms. G. A. Kayathri	5 days FDP on Innovative teaching learning practices for preparation of NEP-2020.	1,000 **CASH PAID**	G.A. Kayathri
6.	Mr. M. Madhankumar	FDP on teaching pedagogy & outcome based education system in NEP 2020.	700 **CASH PAID**	M.Madhan
7.	Mr. P. Vareenkumar	FDP on teaching pedagogy & outcome based education System in NEP 2020.	700 **CASH PAID**	P. Vareenkumar
8.	Ms. S. Abinaya.	FDP on teaching pedagogy & outcome based education System in NEP 2020.	700 **CASH PAID**	S.Abinaya
9.	Mr. N. Srithar.	one week online workshop on Research Methodology.	400 **CASH PAID**	N.Srithar

S.No.	Name of the Teacher.	Name of conference/workshop attended for which financial support was provided.	Amount of Support Rs.	Sign.
10.	Mrs. G. Kiruthika	7 day National level online Faculty Development program on outcome Based Education (OBE).	500 **CASH PAID**	
11.	Mr. P. Mahendara Boopathy.	7 day national level online faculty Development Program on Outcome Based Education (OBE).	500 **CASH PAID**	P.Mahi
12. 13.	Mr. M. Azul Pandiyan.	7 day national level online faculty Development program on outcome Based Education (OBE).	**CASH PAID**	Azul Pandi
13.	Mr. E. Muthuraja -gopal.	5 days faculty Development Programme cum workshop on "Digital Pedagogy".	300 **CASH PAID**	E.Muthoraj
14.	Dr. K. Elamvazhuthi	5 days faculty Development Programme cum workshop on "Digital Pedagogy".	300 **CASH PAID**	
15.	Mr. S. Satheeshkumar.	5 days faculty Development Program cum workshop on "Digital Pedagogy.	300 **CASH PAID**	Satheesh

S.No.	Name of the Teacher	Name of conference/workshop attended for which financial support was provided	Amount	Sign
16.	Mr. R. Kavin.	5 days International FDP on AI applications and its impact on Business Practices.	CASH PAID 600.	Kavin
17.	Mr. A. Nagappan	5 days International FDP on AI applications and its impact on Business practices	CASH PAID ,000.	Naga
18.	Mr. S. Karthik.	5 days International FDP on AI applications and its impact on Business practices.	CASH PAID 060	S. Karthik

6.3.2 No. Of Teachers provided with Financial Support to attend conference and Workshop 2022-2023

NTCA

S. No	Date	Name of the faculty	Name of the conference workshop attended	Funding to Organize	Amount Support	Sign	HOD Sign
1.	16.12.2022 to 17.12.2022	M.K.NAGESWARAN	Two day National level conference On "Role of IQAC In Quality Enhancement In teaching and learning Process in HEI'S"	NAAC	750	CASH PAID	
2.	06/02/2023 to 10/02/2023	Mrs. K. Yasodha	5 days FDP on innovative teaching learning practices for preparation of NEP-2020		2	CASH PAID	
3.	06.02.23 to 10.02.23	M. Deepashri	5 days FDP on innovative teaching learning practices for preparation of NEP-2020		250	CASH PAID	

No.	Date	Name	Program	Organizer	Amount	Sign
4.	06.02.2023 to 10.02.2023	M.K. NAGIESWARAN	5 days FDP on Innovative teaching learning practices for preparation of NEP-2020		CASH PAID	
5	16.02.2023	P. Balagi	One day FDP On "Blooms Tax Onomy in Teaching and Learing		CASH PAID 250	
6	16.02.2023	G. Jeevitha	One day FDB on "Blooms Takonomy in teaching and learning		CASH PAID 50	
7.	11-03-2023 to 15-03-2023	m. Gomathi	Five days FDP on "Data Analytics & cyber security		600 CASH PAID	
8.	11.03.2023 to 15-03-2023	S. Sathish	Five days FDP on "Data Analytics & cyber security		CASH PAID	
9.	11/03/2023 to 15/03/2023	Rajkumar D.V	Five Days JDP on data analytics and Cyber Security		CASH PAID	
10.	23.03.2023 to 25.03.2023	M.K. NAGIESWARAN	Three days Online FDP on "Data analytics and cyber Security"	Netleep IT Training & Solutions	500 CASH PAID	
11.	23.03.2023 to 25.03.2023	Ms. M. Deepashri	three days online FDP on "Data Analytics & Cyber security"	Netleep IT training & Solutions	500 CASH PAID	
12.	23.03.2023 to 25.03.2023	Mrs. K. Yasodha	Three days online FDP on 'Data Analytics' and Cyber Security.	Netleep IT Training & solutions	500 CASH PAID	

| 14. | 19.06.2023 To 24.06.2023 | G. Jeevitha | One week faculty development program on "Mathematical modeling For Data Science" | ICT Academy | 500 | |

SNO	Name of the faculty	Name of Conference/workshop attended for which financial support	Professional Body	Fund Received	Faculty Signature	HOD Signature
1.	Dr. Habbebur Rehman	Patent	Smarter & Green Energy Generation System using photo voltanics in Machine Learning Approach	5,000/-	CASH PAID	Eput
2.	Dr. Habbebur Rehman	patent	Present and future role played by AI in Supply chain Process Green Cloud computing Energy Efficiency	5,000/-	CASH PAID	Eput
3.	Mr. Santhosh.P	FDP	Recent Advance in Separation process	500/-	CASH PAID	Eput
4.	Mr. Yasvanthraja	FDP	Innovation & Intellectual Property Rights	750/-	CASH PAID	Eput
5.	Mr. Harshaavandhan.c	FDP	Sustainable Repair and Rehabilitation of Constructed Facilities	750/-	22/06/23 CASH PAID	Eput

2022-23 Criteria 6.3.2

S.No	Name of the faculty	Name of Conference/ Workshop attended for which financial support	Professional body	Fund Received	Faculty Sign	HoD Sign
1.	Dr. P. Sivakumar	Paper Publication	Scopus & SCIE	5000/- CASH PAID		
2.	Dr. P. Sivakumar	Online Course - 4 Weeks	NPTEL	1000/-	CASH PAID	
3.	Dr. S. Priyatharshni	Online Course - 4 weeks	NPTEL	1000/-	CASH PAID	
4.	Dr. K. Saravanan	Patent	IPR	1000/- CASH PAID		
5.	Dr. K. Saravanan	Online Course	NPTEL	1000	CASH PAID	
6.	Dr. K.B. Nagasharmugam	Online Course	NPTEL	1000 CASH PAID		
7.	Mrs. P. Suseela	Online Course	NPTEL	1000 CASH PAID		
8.	Mrs. C. Suganthi	Online Course	NPTEL	1000 CASH PAID		

No.	Name	Type	Platform	Amount		Payment
9.	Mrs. P. Sudha	Online Course	NPTEL	1000/-	P. Su	CASH PAID
10.	Mr. N. Kathirvel	Online Course	NPTEL	1000/-		CASH PAID
11.	Mrs. K. Malathi	Online Course	NPTEL	1000/-		CASH PAID
12.	Mrs. D. Priyadharsini	Online Course	NPTEL	1000/-		CASH PAID

S. No	NAME OF THE STAFF	NAME OF THE PROGRAMME	FROM DATE	TO DATE	ORGANISATION INSTITUTION	REQUESTED AMOUNT	STAFF SIGNATURE	HO... SIGNA...
1.	S. Saravana Kumar	STTP on "Electrical Safety"	06.02.23	10.02.23	National Skill Training Institute - Bengaluru	Rs. 1000/-	CASH PAID	
2.	K. Gopalakrishnan & B. Surender	STTP on "Priliminary Fire Fighting Training"	13.3.23	27.3.23	Fire Service Station Erode	Rs. 800 + Rs. 800 B. Surf	CASH PAID	
3.	K. Gopalakrishnan	NPTEL Course on "Computer Integrated Manufacturing"	12 week Jan-Apr 23	—	National Programme on Technology Enhanced Learning	Rs. 1000/-	CASH PAID	
4.	U. Prabhu	FPP- Automobile Transmission system & Electric Hybrid vehicles	03-05-23	04-05-23	Kongunadu College of Engineering and Technology, Trichy,	Rs. 1000/- U. Prab	CASH PAID	