3.3.1 Number of research papers published per teacher in the Journals notified on UGC CARE list during the academic year 2022-23.

Sl. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Calendar Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number		
							Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
1	Effect of Water Absorption on the Mechanical Properties of Alkaline Treated Bamboo and Flax Fiber Reinforced Epoxy Composites	Dr. Thirumaleshwara Bhat.	Mechanical Engineering	Trends in Sciences	2022	2774-0226	https://tis.wu.ac.th/index.php/tis	https://tis.wu.ac.th/index.php/tis/article/view/5779/351	Yes
2	Characterization Of Chia Seed Oil Methyl Ester as an Alternate Fuel for Diesel Engine	Dr. Manjunatha S,	Mechanical Engineering	IOP Conf. Series: Earth and Environmental Science	2022	1755-1315	https://iopscience.iop.org/journal/1755-1315/page/scope	https://iopscience.iop.org/article/10.1088/1755-1315/1042/1/012005/pdf	Yes
3	Processing, Mechanical Characterization, and Electric Discharge Machining of Stir cast and Spray Forming-Based Al-Si Alloy Reinforced with ZrO2 Particulate Composites	Dr. Madhukara Nayak,	Mechanical Engineering	Journal of Composites Science	2022	2504-477X	https://www.mdpi.com/journal/jcs	https://doi.org/10.3390/jcs6110323	Yes

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4	Optimization and Prediction of Mechanical Characteristics on Vacuum Sintered Ti-6Al-4V-SiCp Composites Using Taguchi's Design of Experiments, Response Surface Methodology and Random Forest Regression	Dr. Madhukara Nayak,	Mechanical Engineering	Journal of Composites Science	2022	2504-477X	https://www.mdpi.com/journal/jcs	https://doi.org/10.3390/jcs6110339	Yes
5	Processing and Mechanical Characterisation of Titanium Metal Matrix Composites: A Literature Review	Dr. Madhukara Nayak,	Mechanical Engineering	Journal of Composites Science	2022	2504-477X	https://www.mdpi.com/journal/jcs	https://doi.org/10.3390/jcs6120388	Yes
6	Investigative Studies on Performance Behavior on an IDI Diesel Engine with a Geometrically Modified Swirl Chamber using Biodiesel Blends	Dr. Manjunatha S,	Mechanical Engineering	Journal of Mechanical Engineering	2023	0039-2480	https://www.sv-jme.eu/	https://doi.org/10.24191/jmeche.v20i1.21080	Yes

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7	Optimization Production of Simarouba Biodiesel and Performance Study using Design of Experiments in CI Engine	Dr. Thirumaleshwara Bhat,	Mechanical Engineering	YMER, International Open Access Annual Peer-Reviewed Academic Journal	2023	0044 - 0477	https://ymerdigital.com/	10.37896/YMER22.06/92	Yes
8	Performance of SALP Swarm Localization Algorithm in Underwater Wireless Sensor Networks	Yogeshwary B H	Electronics & Communication Engineering	Photonics	2023	2304 - 6732	https://www.mdpi.com/journal/photonics	https://doi.org/10.3390/photonics9120984	Yes
9	Stability analysis and speed control of brushless DC motor based on self-ameliorate soft switching control methods	Nagaraja Rao,	Electronics & Communication Engineering	International Journal of Electrical and Computer Engineering (IJECE)	2023	2088 - 8708	https://ijece.iaescore.com/index.php/IJECE	http://doi.org/10.11591/ijece.v13i3.pp2459-2470	Yes
10	Detection of Pressure points on Diabetic foot	Nagaraja Rao	Electronics & Communication Engineering	Journal of Emerging Technologies aand Innovative Research (JETIR)	2023	2349 - 5162	https://www.jetir.org/	https://www.jetir.org/view?paper=JETIR2305644	Yes
11	Image Encryption based on 3D Chaotic Map	Arun Upadhyaya	Electronics & Communication Engineering	IJARSE	2023	2319 - 8354	http://www.ijarse.com/	https://www.ijarse.com/images/fullpdf/1683967634_935.pdf	Yes
12	Brain Tumor detection using image processing Techniques	Vijayalatha Deavadiga	Electronics & Communication Engineering	IJNRD	2023	2456 - 4184	https://www.ijnrd.org/	https://www.ijnrd.org/papers/IJNRD2304641.pdf	Yes

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13	Spatial Distribution Of Iron Content In The Aquifers Using Gis Interpolation And Treatment Using Low Cost Filter Media: A Case Study In Udupi Taluk	Dr. Deepika B V	Civil Engineering	Journal Of Emerging Technologies And Innovative Research	2023	2349 - 5162	https://www.jetir.org/	https://www.jetir.org/papers/JETIR2307587.pdf	Yes
14	Pushover Analysis Of Two Dimensional Steel Braced Structure With Two Story Height Bracing	Mr. Jayaram Nayak B	Civil Engineering	Journal Of Emerging Technologies And Innovative Research	2023	2349 - 5162	https://www.jetir.org/	https://www.jetir.org/papers/JETIR2307805.pdf	Yes
15	An efficient algorithm for predicting crop using historical data and pattern matching technique	Sharath Kumar, Nagaraj Bhat	Computer Science & Engineering	ScienceDirect-Global Transitions Proceedings	2023	2666 - 285X	https://www.sciencedirect.com/journal/global-transitions-proceedings	https://doi.org/10.1016/j.gltp.2021.08.060	Yes
16	Trends of seasonal and annual rainfall of semi-arid districts of Karnataka, India: application of innovative trend analysis approach. Theoretical and Applied Climatology	Dr. Nagaraj Bhat.	Computer Science & Engineering	Theor Appl Climatol	2023	0177 - 798X	https://journals.scholarsportal.info/browse/01777798x/v134i1-2	https://link.springer.com/article/10.1007/s00704-023-04400-9	Yes

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17	Health Monitoring Based Cognitive Iot Using Fast Machine Learning Technique	Mr. Shrinivasa,	Computer Science & Engineering	Open AIRE	2023	1004 - 9037	https://www.openaire.eu/	https://sjcjycl.cn/article/view-2023/pdf/405.pdf	Yes
18	An artificial hummingbird algorithm based localization with reduced number of reference nodes for wireless sensor networks	Dr. Sowmya J Bhat.	Computer Science & Engineering	Physical Communication	2023	1874 - 4907	https://www.sciencedirect.com/journal/physical-communication	https://doi.org/10.1016/j.phycom.2022.101921	Yes
19	Implementing Real Time Application of Vehicle Theft Detection and Protection	Mr Deepak Rao.	Computer Science & Engineering	International Journal of Advanced Research in Arts, Science,Engineering & Management (IJARASEM)	2023	1864 - 1867	https://ijarasem.com/	https://ijarasem.com/admin/img/46_Real_IJARASEM.pdf	Yes
20	Detection of Phishing Website Using Machine Learning	Mr Deepak Rao.	Computer Science & Engineering	International Journal of Advanced Research in Arts, Science, Engineering & Management (IJARASEM)	2023	1864 - 1867	https://ijarasem.com/	https://ijarasem.com/admin/img/48_Detection_NC.pdf	Yes

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21	A Review on Chronicle of Cloud Computing Security and Storage Environment Models	Mr.Shrinivasa Naik	Computer Science & Engineering	Journal of Survey in Fisheries Sciences	2023	1112 - 1125	https://www.sifisheriessciences.com/index.php/journal	https://sifisheriesscience.com/journal/index.php/journal/article/view/120/114	Yes
22	A Web Application Chronic Kidney Disease Prediction Using MachineLearning	Ms. Dhanya Shenoy.	Computer Science & Engineering	International Journal of Advanced Research in Arts, Science, Engineering & Management	2023	1864 - 1867	https://ijarasem.com/	https://ijarasem.com/admin/img/43_Web_IJARASEM.pdf	Yes
23	Movie Recommendation System	Ms Dhanya Shenoy.	Computer Science & Engineering	International Journal of Advanced Research in Arts,Science, Engineering & Management	2023	1881 - 1888	https://ijarasem.com/	https://ijarasem.com/admin/img/47_Movie_NC.pdf	Yes
24	Unsurpassed Image Surveillance System	Ms Dhanya Shenoy,	Computer Science & Engineering	International Journal for Research Trends and Innovation	2023	2456 - 3315	https://ijrti.org/	Paper Title (use style: paper title) (ijrti.org)	Yes

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25	Multi-Doc Parser for scholarship System using Google Cloud Platform	Ms Sowmya .	Computer Science & Engineering	International Journal of Advanced Research in Arts, Science, Engineering & Management	2023	3671 - 3677	https://ijarasem.com/	https://ijarasem.com/admin/img/53_Multi-Doc_NC.pdf	Yes
26	Sentiment Classification on Women's Safety across Indian Cities using Natural Language Processing and Machine Learning	Ms. Preethi	Computer Science & Engineering	International Journal of Advanced Research in Arts, Science, Engineering & Management	2023	3720 - 3726	https://ijarasem.com/	61_Sentiment_NC.pdf (ijarasem.com)	Yes
27	Text Summarization with Heart Disease Prediction	Ms. Preethi M	Computer Science & Engineering	International Journal of Advanced Research in Arts, Science, Engineering & Management	2023	1796 - 1801	https://ijarasem.com/	31_Text.pdf (ijarasem.com)	Yes
28	Travel Guide Management System-Easy Viaje	Ms. Yashaswini A S.	Computer Science & Engineering	International Journal of Advanced Research in Arts, Science, Engineering & Management	2023	2395 - 7852	https://ijarasem.com/	62_Travel_NC.pdf (ijarasem.com)	Yes

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29	Survey on various approaches and application of Machine Learning algorithms for medical diagnosis of heart abnormalities	Ms Savitha A Shenoy,	Computer Science & Engineering	Journal of BMESI	2023	2456-3315	https://www.bmesi.org.in/	https://bmesi.org.in/uploads/Journal%20of%20BMESI---%20Vol%20-%2017---%20June%202023.pdf	Yes
30	Prediction of mental health illness using machine learning algorithms	Ms. R Soundharya,	Computer Science & Engineering	International Journal for Research Trends and Innovation	2023	826-830	https://ijrti.org/	https://ijrti.org/pubcurrentissue.php?v=8&i=5	Yes
31	Drought Forecasting: Application of Ensemble and Advanced Machine Learning Approaches	Dr. Ganesh Aithal, Arun Upadhyaya,	Computer Science & Engineering	Lecture Notes in Electrical Engineering book series	2023	1876-1100	https://www.springer.com/series/7818	https://doi.org/10.1007/978-981-99-1410-4_35	Yes
32	Integration of Particle Swarm Optimization and Sliding Mode Control: Comprehensive Review	Dr. Ganesh Aithal.	Computer Science & Engineering	Lecture Notes in Electrical Engineering book series	2023	1876-1100	https://www.springer.com/series/7818	https://doi.org/10.1007/978-981-99-4444-6_15	Yes
33	Strategies For Secure Data Aggregation In Wireless Sensor Networks And Optimization Issues: A Comprehensive Survey	Dr. Ganesh Aithal ,Ganesh Srinivasa Shetty ,Raghunatha	Computer Science & Engineering	Journal of Harbin Engineering University	2023	1006-7043	https://harbinengineeringjournal.com/index.php/journal	https://harbinengineeringjournal.com/index.php/journal/article/view/1187	Yes

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34	A cascaded NPID/PI scheme for the regulation of stack voltage in proton exchange membrane fuel cell	Dr. Bharti Panjwani.	Computer Science & Engineering	International Journal of Hydrogen Energy	2023	0360-3199	https://www.sciencedirect.com/journal/international-journal-of-hydrogen-energy	doi.org/10.1016/j.ijhydene.2023.08.008	Yes
35	Design and Evolution of Deep Convolutional Neural Networks in Image Classification – A Review	Dr. Sachin Bhat	Electronics & Communication Engineering	International Journal of Integrated Engineering	2023	2229-838X	https://publisher.uthm.edu.my/ojs/index.php/ijie	https://publisher.uthm.edu.my/ojs/index.php/ijie/article/view/9893/5670	Yes
36	An Area Efficient Low Dropout Voltage Regulator With Improved Transient Response for Hearing-aid Applications	Guruprasad,	Electronics & Communication Engineering	Iranian Journal of Electrical and Electronic Engineering	2023	1735-2827	https://ijeee.iust.ac.ir/	article-1-2612-en.pdf (iust.ac.ir)	Yes
37	Convolutional Neural Network and Transfer Learning based Approach for Brain Tumor Detection in Magnetic Resonance Imaging	Chandana	Electronics & Communication Engineering	Research and Reviews: A Journal of Neuroscience	2023	2277-6427	https://medicaljournals.stmjournals.in/index.php/RRJoNS/index	https://medicaljournals.stmjournals.in/index.php/RRJoNS/article/view/3250	Yes

Total count as per the SOP of the metric given by NAAC i.e paper per teacher = 37+4 = 41

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TRENDS IN SCIENCES 2022; 19(18): 5779 RESEARCH ARTICLE
https://doi.org/10.48048/tis.2022.5779

Effect of Water Absorption on the Mechanical Properties of Alkaline Treated Bamboo and Flax Fiber Reinforced Epoxy Composites

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Abstract

Untreated and alkaline treated bamboo and flax fiber reinforced epoxy composites are processed using a hand layup process. The effect of alkaline treatment on the mechanical properties of the composites has been analysed. Alkaline treatment of the fiber has enhanced the mechanical properties of the developed composites. Composite reinforced with 5 % NaOH treated fiber show better performance when compared with untreated fiber reinforced composites. Alkaline treatment of the bamboo and flax fiber with 5 % NaOH has improved the hardness by 3.57 and 2.43 %, tensile strength by 47 and 20.72 % and flexural strength by 7.36 and 13.85 % in bamboo and flax fiber reinforced composites, respectively. The increase in the percentage NaOH in the alkaline treatment of the fibers resulted in weakening of fiber resulting in a drop in the properties of the developed composites. Water absorption tests of the developed composites were conducted as per ASTM D570 by immersion in distilled water at room temperature. The influence of water absorption on mechanical properties of developed composites is also examined. The quantity of water absorption and diffusion coefficient are reduced with alkaline treatment of fiber. Mechanical properties of the composite were found to decrease by the water absorption, which can be controlled by alkaline treatment of fiber and thereby reducing water absorption rate and improve the mechanical properties of the composites.

Keywords: Bamboo fiber, Flax fiber, Epoxy resin, Alkaline treatment, Water absorption, Mechanical properties

Introduction

Natural plant fibers such as bamboo and flax are emerging as the promising and environmentally friendly alternative for synthetic fibers for the following reasons. The production of fiber consumes less non-renewable energy resources compare to synthetic fiber production and thus reduces environmental pollution. To get the equivalent performance of the composite the volume and weight of the natural fiber required are more compared to synthetic fiber which in turn reduces the volume and weight of the polymer matrix required in the production of the composite, which reduces the energy usage in the production of the polymer. The density of the natural fiber is less than manmade fibers which enhances the fuel efficiency and minimizes emission in the application phase (Example: Automobile application). The use of natural fiber reinforced composites made of lower mass of base polymer matrix compared to synthetic fiber reinforced composites results in reduced carbon emissions when the composite is incinerated, natural fiber reinforced composites offers great environmental benefits such as a decrease in dependence on non-renewable material energy sources, lesser emissions of a pollutant, lesser emissions of greenhouse gas, improved energy recovery and a satisfactory biodegradability of the components at the end of life.

Reinforcing natural fiber in polymer resin is highly beneficial because it helps to improves the strength and toughness of the polymer. However, high moisture absorption rate and lack of interfacial adhesion between the polymer and natural fiber made natural fiber reinforced composites less attractive for the same applications [1]. This problem can be overcome by surface treatment of the fiber. Modification of the fiber surface can be done by a physical method or a chemical method [2,3]. The

Characterization of Chia seed oil methyl ester as an alternate fuel for diesel engine

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[2] Srinivas Institute of Technology, Mangaluru, India

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Abstract. The present world is questing for low carbon fuel, which can replace diesel and biodiesels are one such promising fuel. In this study, the feasibility of Chia seed oil as a blended bio-diesel for use as partial replacement to Diesel is evaluated through transesterification process. 10 grams of dried, moisture free Chia seeds were subject to transesterification process using methanol as a replacement alcohol. NaOH was used as a catalyst. The resulting mixture was stirred for one hour at 700 rpm, maintaining 70oC. The methyl ester was separated after one hour settling period and washed several times using distilled water at 100oC and dried at 70 °C and stored. Impurities were removed by Decalcification process that resulted in 80% yield. Characterization of the oil was used different blends from B05 - B25 in an incremental steps five percent by volume with diesel. Major fluid and thermodynamic properties like viscosity, density, specific gravity, etc. were extracted as per the ASTM prescribed standards. The results show that the flash and fire points of Chia seed oil are respectively 2.96 times and 2.57 times higher compared to Diesel, while the kinematic viscosity and density are comparable but 6.88% and 5.2% higher. Further investigation shows that biodiesel blend B20 could be a second fuel for diesel engine.

1. Introduction

World population is growing at an exponential rate which is increasing the demand for energy. For human welfare and economic growth, energy is the major contributing factor. Petroleum based fuels serve as a major conventional energy source, but it is depleting due to limited availability. Hence, researchers are on the quest for alternate fuels that can replace the fossil fuels. A lot of research work is being conducted from the past two decades to extract biofuel from edible oil, non edible seeds, algae, and waste cooking oil as well as waste industrial oil. Coconuts are grown in large quantity in South India, also biodiesel extracted from coconut oil can also be blended with diesel. Transesterification process is a process which involves alcohol reacting with oil in the presence of catalyst which leads to formation of biodiesel. Out of many issues associated with transesterification process; one such problem is alcohols and oils are not readily reactive due to the chemical structure. To overcome this problem, curcas seed oil was trans-esterified with cosolvent- tetrahydrofuran [1].
Currently, biodiesel cost is expensive, which can be solved by using two solutions, firstly, using low priced non-edible oils, waste oils and second, reducing the cost of processing. Two step process to convert Jatropha curcas L. Oil to biodiesel by ultrasonic transesterification was done by Xian den en, at. Using H2SO4 and NaOH as catalyst, a yield of 92.8% and 47.2% was obtained. Stable biodiesel was obtained by pre-treatment of H2SO4 for one hour and acid decreased to 1.2 mg KOH/g from

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Article

Processing, Mechanical Characterization, and Electric Discharge Machining of Stir Cast and Spray Forming-Based Al-Si Alloy Reinforced with ZrO_2 Particulate Composites

Raviraj Shetty [1], Prakash Rao Gurupur [2], Jamaluddin Hindi [1,*], Adithya Hegde [1], Nithesh Naik [1], Mohammed Sabraz Sabir Ali [1], Ishwargouda S. Patil [3] and Madhukar Nayak [4,*]

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Abstract: High performance lightweight structures made of metal matrix composites (MMCs) are in demand for application in variety of industries such as aircraft, spacecraft, automobile, marine, sports equipment, etc. However, uniform distribution of the reinforcement phase to improve the mechanical properties and quality of MMCs has been the challenge for the manufacturing industries. Hence, researchers are focusing on the development of traditional low-cost method of producing metal matrix composites. In the view of above facts, an attempt is made to study the processing and characterization of Si-Al alloy reinforced with zirconium dioxide particulate composites in this paper. Hence, this paper concentrates on experimentally identifying the effect of stir cast and spray forming processing techniques followed by hot pressing on micro hardness, compressive strength, and tensile strength using Taguchi's design of experiments for aluminum silicon matrix alloy reinforced with zirconium dioxide particulates. From the extensive experimentation on aluminum and silicon reinforced with the ZrO_2 powder particulates, it was observed that there was an improvement in selected mechanical properties as the percentage of ZrO_2 increased with 13 wt.% of silicon under spray forming processing technique compared to stir cast composites. This may be due to uniform distribution homogenous dispersion, larger work hardening rate, and structure of dislocation tangles around the ZrO_2 particulates that occurred during spray forming processing technique. Further, results obtained from the interaction plot, contour plot, main effects plot, and analysis of variance (ANOVA) proved to be successful for identifying the optimum processing parameters for Si-Al alloy reinforced with zirconium dioxide particulate composites. Further, this paper also discusses wear study using pin on disc wear testing apparatus on spray forming processed aluminum and silicon (13.0 wt.%) alloy reinforced with the ZrO_2 powder particulates based on Taguchi's design of experiments followed by second order model generation for wear using response surface methodology. Finally, electrode wear study of spray forming processed aluminum and silicon alloy reinforced with the ZrO_2 powder particulates using electric discharge machining by varying peak current (A), pulse on time (µs), and pulse off time (µs) using brass, copper, and graphite as electrode material based on L_{27}orthogonal array. The understanding gained from the design of experiments in this paper can be used to develop future guidelines for processing and characterization of Si-Al alloy reinforced with zirconium dioxide particulate composites.

Keywords: Si-Al alloy reinforced with zirconium dioxide particulate composites; characterization; design of experiments; orthogonal array; wear

Citation: Shetty, R.; Gurupur, P.R.; Hindi, J.; Hegde, A.; Naik, N.; Ali, M.S.S.; Patil, I.S.; Nayak, M. Processing, Mechanical Characterization, and Electric Discharge Machining of Stir Cast and Spray Forming-Based Al-Si Alloy Reinforced with ZrO_2 Particulate Composites. *J. Compos. Sci.* **2022**, *6*, 323. https://doi.org/10.3390/jcs6110323

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Article

Optimization and Prediction of Mechanical Characteristics on Vacuum Sintered Ti-6Al-4V-SiCp Composites Using Taguchi's Design of Experiments, Response Surface Methodology and Random Forest Regression

Adithya Lokesh Hegde [1], Raviraj Shetty [1,*], Dundesh S Chiniwar [2], Nithesh Naik [1,*] and Madhukara Nayak [3]

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Abstract: Today, among emerging materials, metal matrix composites, due to their excellent properties, have an increasing demand in the field of aerospace and automotive industries. However, the difficulties associated with the processing of these composites have been a challenge to manufacturing industries due to inhomogeneous mixing of the matrix with the reinforcement, oxidation, and microstructural phase transformation during processing. Hence, in this paper, Ti-6Al-4V reinforced with SiCp has been processed through a specially developed compression molding, followed by vacuum sintering. The main objective of this paper was to determine the favorable vacuum sintering conditions for Ti-6Al-4V reinforced with 15 Wt. % SiCp composites under a different aging temperature (°C), aging time (h), heating rate (°C/min), and cooling rate (°C /min) to improve the process output parameters such as the hardness, surface roughness, and to reduce the porosity using Taguchi's Design of Experiments. Finally, the response surface methodology and random forest regression have been used to predict the optimum process output parameters. From the extensive experimentation and understanding gained from Taguchi's Design of Experiments, the response surface methodology and random tree regression approach can be successfully used to predict the hardness, porosity, and surface roughness during the processing of Ti-6Al-4V-SiC_p composites.

Keywords: Ti-6Al-4V-SiCp; Taguchi's design of experiments; random tree regression; response surface methodology; surface metallurgy; hardness

Citation: Hegde, A.L.; Shetty, R.; Chiniwar, D.S.; Naik, N.; Nayak, M. Optimization and Prediction of Mechanical Characteristics on Vacuum Sintered Ti-6Al-4V-SiCp Composites Using Taguchi's Design of Experiments, Response Surface Methodology and Random Forest Regression. *J. Compos. Sci.* 2022, *6*, 339. https://doi.org/10.3390/jcs6110339

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1. Introduction

In recent years, there has been a lot of demand for the replacement of novel materials with conventional metals for their application in aeronautical, automotive, and marine industries. Metal matrix composites (MMCs) are a new class of materials, having metal as a matrix and fibers or particles as a reinforcement, due to its unique properties such as its high strength to weight ratio, ductility, stiffness, and improved corrosion resistance [1,2]. However, there are challenges in the production of a few MMCs such as titanium matrix composites (TMCs) which are prone to high levels of oxidation and embrittlement [3–6]. Powder metallurgical and near net shape manufacturing routes have always been preferred for the production of TMCs owing to their advantages, such as a homogenous distribution of the reinforcement [7–10]. Powder metallurgy involves the compaction of composites followed by a sintering just below their melting points [11,12]. Researchers [13] suggested that Titanium undergoes an oxidation above 600 °C and produces brittle Titanium Oxide

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Review

Processing and Mechanical Characterisation of Titanium Metal Matrix Composites: A Literature Review

Raviraj Shetty [1], Adithya Hegde [1,*], Uday Kumar Shetty SV [1], Rajesh Nayak [1,*], Nithesh Naik [1] and Madhukar Nayak [2]

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[2] Department of Mechanical Engineering, Shri Madhwa Vadiraja Institute of Technology and Management, Bantakal 574115, India
* Correspondence: adithya.hegde@learner.manipal.edu (A.H.); rajesh.nayak@manipal.edu (R.N.)

Abstract: Today, Discontinuously Reinforced Particulate Titanium Matrix Composites (DRPTMCs) have been the most popular and challenging in consideration with development and heat treatment due to their significant weight-saving capacity, high specific strength, stiffness and oxidising nature compared with other metals and alloys. Owing to their excellent capabilities, DRPTMCs are widely used in aerospace, automobiles, biomedical and other industries. However, regardless of the reinforcements, such as continuous fibres or discontinuous particulates, the unique properties of DRPTMCs have dealt with these composites for widespread research and progress around the domain. Even though DRPTMCs are one of the most studied materials, expedient information about their properties, processing, characterisation and heat treatment is still scattered in the literature. Hence, this paper focuses on a literature review that covers important research work that has led to advances in DRPTMCs material systems. Further, this paper also deals with broad details about the particulates, manufacturing processes and heat treatment processes.

Keywords: DRPTMCs; processing; characterization; heat treatment

Citation: Shetty, R.; Hegde, A.; Shetty SV, U.K.; Nayak, R.; Naik, N.; Nayak, M. Processing and Mechanical Characterisation of Titanium Metal Matrix Composites: A Literature Review. *J. Compos. Sci.* **2022**, *6*, 388. https://doi.org/10.3390/jcs6120388

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1. Introduction

The application of composite materials began during the Egyptian civilisation. Today, researchers are focusing on various matrix and reinforcement combinations with enhanced physical and mechanical properties. However, alloys are compositions made of two or more metallic elements [1,2]. To guarantee the stability of the dispersion phase, the matrix phase is a continuous phase in which a composite is created in a microstructure of metals and completely envelops the dispersed phase. Although the dispersive phase differs depending on the material, the matrix phase's significance remains constant in order to guarantee the appropriate execution of the dispersive phase. The strength of the bond in metals, which determines the rate of corrosion in Metal Matrix Composites (MMCs), can be strongly influenced by the effectiveness of the matrix phase [3,4]. Figure 1a—cshows examples of Titanium matrix composite applications [5–7].

High-tech industries like aerospace, defence, automotive, and civil engineering frequently use metal matrix composites (MMCs) as structural materials [8,9]. In particular, titanium alloy with reinforced particles is one such material. Particle-reinforced MMCs have the potential to provide superior mechanical qualities, such as increased specific strength and stiffness [10,11]. In order to increase the titanium matrix's stiffness, strength, hardness, and wear resistance while maintaining a quasi-isotropic behaviour that makes the standard reshaping process easier, ceramic materials are frequently utilised as reinforcement. Due to their superior mechanical qualities, silicon carbide (SiC) is one of the most often employed particles to reinforce titanium matrix [12]. The shape [13,14], size [15], volume fraction [16] and distribution of the reinforcements [17], along with the characteristics

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

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ABSTRACT

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

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

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Optimization production of simarouba biodiesel and performance study using design of Experiments in CI engine

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Abstract- In the areas of transportation, industrial development, and agriculture, petroleum fuel is important. Urbanization, rapid population expansion, and growing automotive density all contribute to an annual rise in the demand for petroleum products. Diesel engines have numerous uses, but they are also notorious for their harmful pollutant emissions that threaten human and environmental health. That's why it's crucial to find a new way to provide the world's energy needs. In this context, biofuels have emerged as one of the alternative viable treatments. Recent advances in nanotechnology have led scientists to investigate the possibility of employing nanoparticle, diesel biodiesel fuel mixes to enhance efficiency, cleaner combustion, performance, and emission characteristics. Many improvements in chemical and thermal physical characteristics of changed fuel were observed. As a result, the objective of our research is to assess the performance of a diesel engine supplied with a fuel containing a mixture of biodiesel and aluminium oxide nanoparticles as well as to find out more about the engine's emission characteristics. Compression ratio and injection pressure are only two of the variables played with to get the desired outcomes. As a result of this effort, we will be able to replace petroleum with a fuel made from nanoparticle-blended biodiesel.

Keywords- *Aluminium Oxide (Al_2O_3) Nanoparticles, Waste cooking oil Biodiesel, Diesel, Statistical Analysis, CI Engine.*

I. INTRODUCTION

Petroleum resources as fuels are running out every day, and the need for fuels, combined with increasingly stringent laws, is a challenge for science and technology. Vegetable oils, both edible and inedible, can be used to refuel non-compression ignition automobiles. Pungai, Jathropa curcas, Paradise Tree Oil, among others, are available non-food biodiesel feedstocks. The main disadvantage of vegetable oils is that their viscosity is substantially higher than that of diesel. As a result, fuel injection systems in diesel engines are extremely sensitive to changes in viscosity. Vegetable oils have a high viscosity that inhibits atomization and can result in a variety of problems, including poor combustion, injector jamming, distributor pump failure,

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Performance of SALP Swarm Localization Algorithm in Underwater Wireless Sensor Networks

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Abstract: In underwater wireless sensor networks, the optimization strategies for localization might be seen as a new boon for the localization of sensor nodes (UWSNs). The techniques for optimization are those that repair the incorrect value, adapt it to the situation, and correct it. Because the algorithm could adapt to the constantly changing environment, it was widely used in terrestrial applications, and the same can be extended to the underwater environment with modifications. To address the localization issue that arises in UWSNs, the Underwater Salp Swarm Algorithm (USSA), a nature-inspired node localization algorithm, has been presented. With the help of this technique, an effort to discover a solution to the localization problem as an optimization problem is considered. The proposed algorithm is accessed in a simulated water environment. The energy is assigned to the anchor well as non-localized nodes, after deploying them in the simulated underwater network. The suggested algorithm is compared with other optimization algorithms, such as UPSO and UBOA, with reference to the computing time, localization accuracy, and the number of localized nodes. It is possible to localize a greater number of nodes in a much faster and more efficient way by considering the proposed algorithm.

Keywords: localization; non-localized nodes; UWSNs; USSA

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1. Introduction

The natural meta-heuristic algorithm's ability to provide better accuracy in real-world applications makes it a good substitute for numerous ancient node localization algorithms. Apart from this, it also showcases properties such as local optima avoidance, gradient-free mechanisms, and flexibility. The meta-heuristics take up the optimization issue as a black box, which effectively eliminates the calculation of search space derivatives, which, in turn, makes the algorithm largely flexible for resolving a different range of problems. Moreover, they also benefit from random operators, as they represent the family of stochastic optimization techniques. This helps them to evade local solutions during the occasion of resolving the actual issues, which generally have huge amounts of local optima.

Generally, there are two types of meta-heuristic techniques: evolutionary and swarm intelligence techniques. Evolutionary techniques are the notion of nature's evolution. The most popular example is a Genetic Algorithm (GA). Swarm intelligence techniques, on the other hand, imitate the intelligence of swarms or flocks of living beings in nature. The basis of these algorithms is the collective behavior of a cluster of creatures. This helps them to provide the improvement in a set of solutions, which, in turn, makes them

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Stability analysis and speed control of brushless DC motor based on self-ameliorate soft switching control methods

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ABSTRACT

In recent years, electric vehicles are the large-scale spread of the transportation field has led to the emergence of brushless direct current (DC) motors (BLDCM), which are mostly utilized in electrical vehicle systems. The speed control of a BLDCM is a subsystem, consisting of torque, flux hysteresis comparators, and appropriate switching logic of an inverter. Due to the sudden load torque variation and improper switching pulse, the speed of the BLDCM is not maintained properly. In recent research, the BLDC current control method gives a better way to control the speed of the motor. Also, the rotor position information should be the need for feedback control of the power electronic converters to varying the appropriate pulse width modulation (PWM) of the inverter. The proposed optimization work controls the switching device to manage the power supply BLDCM. In this proposed self-ameliorate soft switching (SASS) system is a simple and effective way for BLDC motor current control technology, a proposed control strategy is intended to stabilize the speed of the BLDCM at different load torque conditions. The proposed SASS system method is analyzing hall-based sensor values continuously. The suggested model is simulated using the MATLAB Simulink tool, and the results reveal that the maximum steady-state error value achieved is 4.2, as well as a speedy recovery of the BLDCM's speed.

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1. INTRODUCTION

Recently, brushless direct current motors (BLDCM) have gained so much interest due to their simple control and easy maintenance. In other motors, the brushless direct current (DC) motor about torque pulsation shows better performance than the traditional positioning counterparts. This characteristic comes from the low cogging torque of the brushless DC motor. The BLDCM has numerous features such as linear torque-speed characteristics and easiest control arrangements, which do not necessitate complex hardware. The hall sensor-based speed control of the BLDCM is shown in Figure 1.

In this work, Xia and Gao [1] presented that self-ameliorate soft switching (SASS) reduces the torque ripple and the speed control of the BLDC motor. The typical method is pulse width modulation (PWM) control plus a continuous control scheme. By controlling the current-based control structure the hysteresis controller is utilized. Both of these systems have a high current control since the value of the controlled variable is forced

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DETECTION OF PRESSURE POINTS ON DIABETIC FOOT

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Abstract: Diabetes mellitus is a serious global health concern that can lead to various complications, including foot ulcers which are particularly severe. Early detection and prevention of foot-related issues in diabetic patients are crucial to reduce the risk of amputations and other complications. Although plantar pressure distribution analysis is an effective tool for identifying these issues, commercially available systems can be expensive and have data linkage constraints. To address these limitations, this project proposes an alternative method for detecting foot pressure points and dimensions using image processing. The approach involves capturing a complete image of the foot through a camera and extracting the necessary data, such as pressure points and foot dimensions. The challenges associated with obtaining accurate images and precise pressure points are discussed, and the relevance of this work for monitoring foot health in diabetics is emphasized. By detecting foot-related problems early, healthcare providers can take the necessary measures to prevent serious complications. Overall, this project has significant implications for detecting foot-related problems early and reducing the risk of diabetic foot problems.

Index Terms **– OpenCV, KNN Clustering Algorithm, Canny Edge Detection**

I. Introduction

Diabetes mellitus is indeed one of the major challenges in global public health today. The increasing prevalence of diabetes worldwide has significant implications for individuals, communities, healthcare systems, and economies. The threat has increased dramatically over the past two decades. According to epidemiological studies, the number of patients with diabetes mellitus increased from about 30 million cases in 1985 to 177 million in 2000, 285 million in 2010, and it is estimated, if the situation continues, that more than 360 million people by 2030 will have diabetes mellitus. This demonstrates a significant increase in the prevalence of diabetes mellitus over the years.

Patients with diabetes mellitus are prone to have multiple complications. One of the major complications is foot ulcer. Foot ulcers are a common problem in individuals with diabetes and can lead to serious complications if not properly managed. Diabetes can cause damage to the nerves and blood vessels in the feet, resulting in reduced sensation and poor blood circulation. These factors make the feet more susceptible to injuries and slow healing. When a foot ulcer develops, it can become infected and may lead to more severe complications such as cellulitis, osteomyelitis (bone infection), and even amputation in some cases. Diabetic foot ulcer is a major source of morbidity and a leading cause of hospitalization. Once diabetic foot ulcer has developed, there is an increased risk of ulcer progression, leading to infection, gangrene, amputation, and even death, if necessary, care is not provided. Proper foot care, regular monitoring, and early detection of foot ulcers are crucial for individuals with diabetes to prevent complications. It is recommended that individuals with diabetes inspect their feet daily, maintain good foot hygiene, wear proper footwear, and seek medical attention if they notice any signs of a foot ulcer or other foot-related problems.

Measurements of foot pressure points will provide an indication of foot related problems in diabetic patients through which problems like foot ulcer can be predicted earlier and the patients can take necessary measures. By regularly monitoring foot pressure points and analyzing pressure maps, healthcare professionals can identify areas of high pressure and abnormal gait patterns that may increase the risk of foot ulceration. Early detection allows for timely intervention, such as offloading techniques, customized footwear, or orthotic devices, to redistribute pressure and alleviate the excessive load on vulnerable areas. The measurement of foot pressure points is a non-invasive and painless procedure that can be performed during a routine foot examination. The pressure is measured using a specialized device that records the distribution of weight on the patient's feet as they stand or walk on a pressure-sensitive surface. The data collected is then analyzed to create a pressure map that can reveal any areas of high pressure, indicating regions of the foot that are at increased risk of developing ulcers. It may contribute to the development of foot ulcers. For example, patients with reduced sensation in their feet may unconsciously alter their gait to compensate, leading to abnormal pressure distribution and an increased risk of foot ulcers. Overall, foot pressure measurements are a valuable tool in the prevention and management of foot ulcers in diabetic patients.

Plantar pressure distribution analysis is an increasingly popular research area in the study of foot diagnosis and gait evaluation. It provides valuable insights into the interaction between the foot and the ground during walking or standing, and it offers a non-invasive means of assessing foot function and identifying potential issues. By analyzing plantar pressure distribution, researchers and

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Image Encryption Based on 3D Chaotic Map

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Abstract

Secure transmission of images over networks is a challenging issue in communication technology. Encryption can be used to convert original images into a cipher image that cannot be understood or unscrambled by unauthorized access. Image security through the combination of chaotic theory and cryptography is an important field, with numerous image encryption algorithms relying on chaotic maps. However, some of these algorithms can be complex and time-consuming, with limited key space. To address this, we have developed an encryption technique using 3D chaos sequences for image pixel position permutation and pixel value transformation. Our proposed method is statistically resistant and performs well in comparison to similar image encryption methods.

1. INTRODUCTION

The tremendous spreading out of the communication networks has evoked increased dependency on digitized information in our society. As a result, information is more vulnerable to abuse. Today the web is going towards multimedia data due to the development of network and multimedia technology. Multimedia data consist of image, audio, video, text, etc. The digital images have become one of the most important information carriers which are helpful in many applications.

In the past ten years, chaos-based cryptography has become popular because it uses noise-like signals that prevent unauthorized access. These signals have properties similar to those of effective ciphers, like confusion and diffusion. Researchers have proposed many image encryption algorithms based on chaotic systems, some of which rely on chaotic maps. Algorithms that use higher dimensional chaos functions are typically more secure against attacks.

Due to various inherent features of chaotic systems, a significant number of image encryption schemes based on chaos have been proposed. In the field of information security, numerous image encryption algorithms have been proposed which are based on chaotic systems. The two types of encryption processes are known as position permutations and value transformation. Position permutation technique involves the permutation of image positions without changing pixel values; whereas, in value transformation technique, pixel values are replaced by

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BRAIN TUMOR DETECTION USING IMAGE PROCESSING TECHNIQUES

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Abstract : Brain tumor at early stage is very difficult task for doctors to identify. MRI images are more prone to noise and other environmental interference. So it becomes difficult for doctors to identify tumor and their causes. So here we come up with the system, where system will detect brain tumor from images. Here we convert image into gray scale image. We apply filter to image to remove noise and other environmental interference from image. User has to select the image. System will process the image by applying image processing steps. We applied a unique algorithm to detect tumor from brain image. But edges of the image are not sharp in early stage of brain tumor. So we apply image segmentation on image to detect edges of the images. In this method we applied image segmentation to detect tumor. Here we proposed image segmentation process and image filtering techniques for accuracy. Morphological operations will be applied to obtain information on areas of the possible tumor locations. Morphological operation include erosion. Erosion making object less visible and by this tumor outline can be obtained. Then it is used to deliver final detection result. This system is implemented in matlab.

IndexTerms - **Brain Tumor, Matlab, MRI.**

I. INTRODUCTION

Nowadays we have seen most of the tumors are life threatening where brain tumor being one of them. As we know that brain tumor can be of any shape, size, location, therefore it is very difficult to detect tumor and diagnose it. The manual identification of tumor from MRI images is subjective in nature and may vary from expert to expert depending on their expertise and other factors, which include lack of specific and accurate quantitative measure to classify the MRI images as it is brain tumor or not. So automated identification of brain tumor from MRI images help in reducing the major issues and provide better results. Detection of brain tumor from the various symptoms of the patients is always been a major issue for the medical practitioner and pathologist for diagnosis and treatment planning. It is also a fact that some test may be time consuming and gives workloads and difficulty for the pathologists to obtain the accuracy of the presence of the tumor[1].

Tumor is defined as the abnormal growth of cells. Brain tumor is an abnormal mass of tissue in which cells grow and multiply uncontrollably, similarly unchecked by the mechanisms that control normal cells. The symptoms of brain tumor depend on the tumor size, type and location. Some common symptoms of brain tumor are-Headaches. Nausea and Vomiting. Changes in speech, vision or hearing. Problems in walking. Changes in mood, personality or ability to concentrate and problems with memory[2]. There are two types of tumor that can develop in brain, primary tumor and secondary tumor. The primary tumor in brain is classified as low grade or high grade. A low-grade tumor mostly grows very slowly, but with the pace of time, it can turn out to be of a high-grade tumor. High-grade tumor grows very rapidly and hits the brain. In adults, secondary brain tumors which are also called brain metastases, occurs more frequently in adults than the primary tumors. In this project we are going to diagnose brain tumor using digital image processing. The main approach of this project is to detect tumor in more efficient way[3].

II. METHODOLOGY

Image processing is one of most growing research area these days. We are proposing an effective scheme to detect abnormal formation of cells in the brain. Here we prsent an approach the detects the tumor from the brain image. In this proposed approach, we have applied series of operations first to enhance the image and then to detect the tumor from the brain image. There are mainly three processes: Image pre-processing, image segmentation, feature extraction. MATLAB software is used for every process. These are the steps used for detection of tumor:

Step 1: Input the image

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SPATIAL DISTRIBUTION OF IRON CONTENT IN THE AQUIFERS USING GIS INTERPOLATION AND TREATMENT USING LOW COST FILTER MEDIA: A CASE STUDY IN UDUPI TALUK

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Abstract— **Water is an essential resource for various beneficial uses. Surface water and groundwater is extensively used to meet the various domestic and industrial demands. Increased urbanization and industrialization are discharging the wastewater into the environment without treatment. By the runoff and infiltration, the water is reaching surface and subsurface water bodies and contaminating the fresh water. Treating groundwater is costly and requires proper assessment.**

The selected study area is Udupi Taluk of Karnataka state, where the water from the unconfined aquifer is used more than the surface water. The subsurface water usage is much widely done in the region like Udupi. The literature says that among the physio - chemical characteristics iron is very sensitive in the region like Udupi.

The lateritic soil in the region induces iron content to the water. Iron content in the water causes stains on the clothes, increases corrosive action of water, and leads to the growth of iron bacteria. According to the BIS 10500: 2012 the acceptable limit is 0.3mg/lt.

The higher concentration of iron in the region is may be due to point and non - point sources such as leakage from landfills, municipal sewers, septic tanks, infiltration of irrigation water containing pesticides and fertilizers, accidental spillage of paints and pigments, pollution from petrochemical and volatile organic compounds extensively used in industry, saltwater intrusion, etc. All these lead to major health effects and water-borne diseases.

Therefore, the study for the iron plays a major role in the area like Udupi. The groundwater quality parameter such as iron content from randomly chosen open wells is analyzed in the laboratory. The interpolation approaches are used to spatially distribute the iron content across the area. The maps generated gives the variation of iron content and also the vulnerable or the sensitive areas with respect to iron. The generation of maps using GIS application acts as a decision support system for the administrators to take up preventive measures to reduce the water pollution in the area. The area having sensitivity with respect to Iron as per the BIS 10500:2012 were treated using the technique of filtration. In this filtration process the low-cost filter media

The project is relevant to society as water is basic necessity, this kind of maps and low-cost treatment will be having societal benefits. As the low-cost filter media can be used in each and every household, the project also comes under lab to land theme.

Keywords: Iron analysis; Arc GIS; low-cost filter media; interpolation

1. INTRODUCTION

Water is very precious natural resource required for domestic usage. The subsurface water usage is much widely done in the region like Udupi. The literature says that among the physio - chemical characteristics iron is very sensitive in the region like Udupi.

The lateritic soil in the region induces iron content to the water. Iron content in the water causes stains on the clothes, increases corrosive action of water, and leads to the growth of iron bacteria. According to the BIS 10500: 2012 the acceptable limit is 0.3mg/lt.

The higher concentration of iron in the region is may be due to point and non - point sources such as leakage from landfills, municipal sewers, septic tanks, infiltration of irrigation water containing pesticides and fertilizers, accidental spillage of paints and pigments, pollution from petrochemical and volatile organic compounds extensively used in industry, saltwater intrusion, etc. Even geological features sometimes induce some major ions into groundwater. All these lead to major health effects and water-borne diseases.

Therefore, the study for the iron plays a major role in the area like Udupi. The groundwater quality parameter such as iron content from randomly chosen open wells is analyzed in the laboratory. The interpolation approaches are used to spatially distribute the iron content across the area. The maps generated gives the variation of iron content and also the vulnerable or the sensitive areas with respect to iron. The generation of maps using GIS application acts as a decision support system for the administrators to take up preventive measures to reduce the water pollution in the area. The area having sensitivity with respect to

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PUSHOVER ANALYSIS OF TWO DIMENSIONAL STEEL BRACED STRUCTURE WITH TWO STORY HEIGHT BRACING

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ABSTRACT

In this paper the seismic performance of two dimensional braced steel frame structures with two story height bracings have been investigated. For the study purpose, Inverted V braced frames, Diamond braced frames and X braced frames are considered and seismic performance is compared with one story braced frame and bare frame structures. Varying aspect ratios (ratio of height of structure to base width) ranging from one to four are considered. Using ETABS, a finite element software, pushover analysis is performed to study the nonlinear behaviour of structure in inelastic zone. The results of the study indicate that, aspect ratio of one shows a better seismic performance when compared with rest of the models considered in the study. One story height braced frame structures have shown better seismic performance when compared to all other configurations considered.

Key words: aspect ratio, braced frame structure, nonlinear behaviour, pushover Analysis, seismic performance.

1. INTRODUCTION

During seismic excitations, surface waves generate ground motion which induces lateral forces on structures which causes severe damage or collapse of structures. This happens because, when structure subject to earthquake, nonlinear behaviour of elements in structure is not accounted in inelastic zone. Only the elastic linear behaviour is considered. Hence elastic linear behaviour of structure is not sufficient to analyse and design the structures [1]. For seismic evaluation, considering inelastic nonlinear behaviour accounts for the real behaviour of structures.

Pushover analysis is commonly used multiple level performance method to study performance of structure under seismic exaction. Pushover analysis is a method which consider inelastic behaviour, when the structure pushed by providing seismic forces i.e. structure subjected to monotonically increasing lateral force until a predefined target roof displacement is reached or till collapse of structure [2]. Also, pushover analysis predicates capacity of structure for seismic demand [3]. Capacity curves and demand curves represent ability of structure to resist the lateral loads and earthquake ground motion respectively. By superimposing capacity curves over demand curves, Performance point can be obtained.

During seismic exaction, when the structure is pushed beyond its yield point into inelastic zone, to account nonlinear behaviour in structure the hinges are applied on elements of structure. Plastic hinges are formed after the yielding of the elements and till collapse, elements will act as a plastic hinge. Considering the plastic hinges in elements of structure the performance of structures can be divided into four levels. In operational level, no damage should occur with full utility of the structure post-earthquake. In immediate occupancy level, very limited damage and after repairs the structure can reoccupied. In life safety level, the structure remains stable with major repairs or retrofit as to be done to reoccupy the structures. Whereas in collapse prevention

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An efficient algorithm for predicting crop using historical data and pattern matching technique

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ABSTRACT

As agriculture seems to be a crucial part in food security as well as economic development of a country, selecting crops for cultivation is a most important aspect in an agricultural planning. It relies on variety of parameters which includes weather condition, soil property and government policies. The suggested system helps the farmers to select suitable crop based on season and region of sowing. It will in-turn help the farmers by improving the net profit to them. By considering different datasets with respect to five parameters such as rainfall, temperature, slope, humidity and soil moisture of horticulture data, the system builds a model or method using which can suggest list of crops which is mainly helpful for the farmers in his/her decision making.

1. Introduction

In the economic development of a country like India, agriculture shows a vital role as it provides income and employment to the rural population and it acts as a main source of food. With the time, the need for the crop production is also increasing. In India, it devotes around 20% to the GDP of the country. Today the farmers cultivate the crops depending on the experience picked up from the past age. Because of the old techniques the farmers are not aware about the interest that happens in the current horticultural economy. This results in the misfortune to the farmers. Selection of crop is a most important aspect in agricultural planning. When the farmers know the accurate information on the best crop in their field as per season, it minimizes the loss. The rate of production of a crop relies on many factors [1] like weather specific parameters (e.g. rainfall, temperature, humidity etc.), soil parameters (e.g. soil moisture) and geography of a place (e.g. slope). Different datasets of these attributes are collected and then analysed. Collecting the data from right source plays an important role in building a prediction model as it effects on accuracy of the model.

The process of analysing data using various analytical and logical reasoning to evaluate each component of the data plays a very important role. This type of examining is just one of the many steps that must be performed when conducting a research analysis. Xarray can be used as one of the techniques to analyse and process the data. There are several existing models [2] for crop prediction about which farmers are unaware, may be due to its complexity or cost-effectiveness. Hence there is a need of developing such a model that is simple, user-friendly, and cost-effective and reach desired accuracy. All the existing methods [3] are only region (location) based but, in our algorithm, region is embedded with season so that the accuracy of the prediction can be improved. Here crop yield forecast models are prepared based on crop weather studies for estimating yield much before actual harvest of the crops.

2. Related works

About 70% portion of India's residents are dependent upon farming as its occupation. The paper [4] focuses on predicting and prognosticate the yield of the crop by learning the farming land's past data. Numerous factors such as rainfall, temperature, soil type and supplementary entities are contemplated by the process to develop a forecasting model by utilizing machine learning techniques. Various machine learning algorithms such as Polynomial Regression, Random Forest and Decision Tree is used. The system can be enhanced by combining this with other departments like sericulture, horticulture and many more who work towards the growth of agriculture of a country.

In paper [5] the dataset is built from former historic statistics which incorporates various influencing parameters like rainfall, humidity and temperature. Here Random Forest is used for prediction which is a well reputed machine learning algorithm. The chosen algorithm had capabilities to predict best crop by taking a smaller number of models. The proposed method assists the farmers while selecting which crops to grow in the field. This approach works for organized dataset. As a future enhancement same work can be extended to work with inputs of independent system as well.

Understanding spatiotemporal variability of soil moisture is important for amplifying the forecasting power of hydrological models, cli-

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Trends of seasonal and annual rainfall of semi-arid districts of Karnataka, India: application of innovative trend analysis approach

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Abstract

Trend analysis of rainfall is often carried its distribution over a given region. The c from monthly datasets spanning 102 yea Karnataka, India, was used for the trend analysis. The two-step homogeneous test approach was carried out on all the time series. Then, lag-1 autocorrelation was conducted only on homogeneous time series. Only 78.18 % of the total time series data were detected as homogeneous, and 95.35% of time series data were found to have insignificant

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HEALTH MONITORING BASED COGNITIVE IOT USING FAST MACHINE LEARNING TECHNIQUE

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Abstract:

Diabetic patients' pleasant of life is advanced with continuous tracking. The usage of numerous technologies like the internet of factors (IoT), embedded software program, communications generation, synthetic intelligence, along with clever devices can assist to reduce the healthcare system's monetary prices. diverse communication technologies have enabled the availability of customised and remote fitness care. to meet the demands of development of sensible e-fitness apps, we have to construct clever health care structures and boom the amount of packages connected to the community. As a result, as a way to attain important wishes such as high bandwidth and strength efficiency, the 5G community need to consist of sensible healthcare applications. the usage of device getting to know methods, this research proposes an intelligent infrastructure for tracking diabetes sufferers. clever devices, sensors, and mobile phones had been used inside the architecture to enough exposure from the body. so one can produce a analysis, the sensible machine collected statistics from the patient and classified it the use of gadget getting to know. numerous machine getting to know methods were used to check the recommended prediction system, and the simulation results showed that

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An artificial hummingbird algorithm ba with reduced number of reference node sensor networks

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Abstract

Wireless Sensor Networks (WSN) are widely used in recent years due to the ad technologies. Many of these applications require to know the location informat to understand the collected data and to act on them. Existing localization algor nodes for estimating the locations of sensor nodes. But, the positioning and uti cost and complexity of the network. To reduce the dependency on reference nc novel optimization based localization method using only two reference nodes f network. This is achieved by reference nodes identifying a few more nodes as r connectivity information. The sensor nodes then use the reference nodes to ide manner using Artificial Hummingbird Algorithm (AHA). We have observed that reported algorithm at a lower reference node ratio is comparable with other al

Introduction

Wireless Sensor Networks (WSN) are used in a wide range of applications such business services, rescue, aviation, navigation, modern military systems, under applications[1], [2], [3], [4], [5], [6]. In most of these applications, the network sensor nodes in the required fields of interest[7]. Since nodes are deployed ran Localization of sensor nodes is a challenge in these WSNs[8]. But, the location i understand the events and to act on them[9].

The sensor nodes can be attached with positioning systems such as Global Posi locations of sensor nodes. But, it is not practically feasible to integrate every no

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An artificial hummingbird algorithm based localization with...

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Implementing Real Time Application of Vehicle Theft Detection and Protection

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ABSTRACT: Car theft has become a major concern for car owners worldwide. In this paper, we present an antitheft car lock system that uses NodeMCU and Iot with machine learning face detection to detect unauthorized access to the car. The system uses a camera to capture images of the person trying to gain access to the car, and a machine learning model to identify the person's face. If the face is not recognized, the system sends an alert to the car owner's smartphone via Iot. Additionally, the system delivers an electric shock to the thief to prevent further attempts to steal the car. The proposed system is a reliable, secure, and effective solution for preventing car theft.

I.INTRODUCTION

Car theft is a global problem, and traditional lock systems are not always effective against thieves. The use of technology, such as machine learning face detection and NodeMCU, has increased in recent years to combat this issue. This paper proposes an anti-theft car lock system that detects unauthorized access and delivers an electric shock to deter thieves. Image processing, a type of signal processing, is used to extract information from images. It involves importing, analyzing, and altering images to refine and display the retrieved data. Analog and digital image processing are the two techniques used to process images. Digital processing allows for easier manipulation of images using computers, and the retrieved data is pre-processed, refined, and displayed using this technology. Engineering and computing disciplines are the core research fields involved in image processing, making it one of the newest technologies.

II.OBJECTIVES

Arduino is an open source, computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open source hardware and software.

1. training and testing the data of the face which is Stored, such that it can detect the owner's face precisely.

2. the signal is then transmitted to ordinary you know by USB cable, the sensor senses the face and then the signal is transmitted, turn on the engine here using thePC fan, which represents the simulation of the engine.

3. if the face is recognised the engine will get turned on, it is not recognised the alarm will get M turned on, all this data is being monitored by using iot blynk.

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Detection of Phishing Website Using Machine Learning

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ABSTRACT: Phishing attacks, a prevalent threat to online security, employ fake websites to steal sensitive information from naive users. These phishing URLs might be challenging to spot since attackers commonly use evasion techniques like URL obfuscation and redirection. In this study, we propose a machine learning-based technique for detecting phishing URLs. We look at a group of URLs and pull out a number of features, including features based on domains, lexicons, and content. In order to determine whether a URL is phishing or not, we train decision trees, random forests, and neural networks, among other machine learning methods. Our experiments show that the proposed technique successfully recognises phishing URLs with high rates of accuracy, with the neural network model achieving a 98.5% accuracy. The findings highlight the potential of this strategy as a practical tool for increasing internet security and demonstrate how machine learning algorithms are quite good at spotting phishing URLs. The suggested method offers a reliable way to identify phishing websites and might be added to current cyber security programmes to increase their use.

KEYWORDS - Phishing, Classification model, Cyber Crime, Machine Learning Algorithm.

I.INTRODUCTION

Security researchers are currently particularly concerned about the issue of phishing. This is due to how easy it is to make a fake website that mimics the actual one. Few people possess the skills necessary to recognise bogus websites, leaving them open to phishing assaults. Experts can recognise fake websites. Phishing is a type of internet fraud that involves claiming to be a reliable website in order to obtain consumers' sensitive or private information. Phishing attacks employ a number of strategies, including website spoofing, social engineering, manipulating links, and covert redirects. The attackers' main goal is to gain access to bank accounts. The cost to US businesses of phishing victims being their clients is $2 billion a year. The third "Microsoft Computing Safer Index Report," which was published in February 2014, estimates that lost productivity due to phishing may cost $5 billion annually worldwide. Attacks involving phishing are more successful because consumers aren't aware of them. Phishing assaults are extremely difficult to fight since they prey on user vulnerabilities, so it is imperative to advance phishing detection techniques. Updating Internet Protocol (IP) URLs that have been blacklisted in antivirus databases is a common step in the "blacklist" technique, which is used to identify phishing websites. Attackers employ obfuscation and other straightforward techniques to get around blacklists by altering URLs to look legitimate to people who can be duped. There are numerous methods to eliminate phishing websites, Tools that can be used with each of these methods include network security, authentications, client-side tools, user education, server-side filters, and classifiers. at various points in the attack flow. a heuristic-based detection with a very high false positive rate that takes into consideration characteristics that are occasionally but not always present in real phishing attempts. The drawbacks of the blacklist and heuristic-based approaches are currently being addressed by a large number of security researchers employing machine learning techniques. In order to forecast future behaviour or events, many algorithms used in machine learning technology rely on historical data. The programme examines a number of valid URLs that have been blocked using this method.

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A Review on Chronicle of Cloud Computing Security and Storage Environment Models

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Abstract

Cloud computing is a rapidly evolving and expanding technology that is now being used in a wide range of applications all over the world. It offers on-demand and pay-per-use computing services through the internet, allowing users to use a pool of resource sharing without having to buy them. The key benefit of this model is that it eliminates the need for the user to worry about the deployment of expensive computing platform, which saves money and time for any organisation. Because of its services' scale and dependability.Despite its many benefits, the transition from a localized computing platform to a virtual computing platform poses a number of security concerns and issues to both user and the service provider. The objective of this research is to offer a quick overview of cloud computing technology, including current and future developments, what services the CC provides, security difficulties and obstacles, and Cloud Computing Attacks.

Keywords: *Cloud Computing, Cloud Computing Architecture, Cloud Security, Cloud Storage, Challenges and Issues in Cloud Computing, Security Measure in Cloud.*

1. Introduction

Cloud computing is the most latest internet-based computer machine that enables users with accessible and adaptable options for gaining access to and the use of various cloud apps. The internet is the driving pressure behind the diverse technologies that've been created. One of those that has lately been resolved is cloud computing. it's miles a defined preferred [1] for connecting a big quantity of shared or personal structures as a way to provide customizable capability, data, figures, and data garage infrastructure.Cloud computing is a realistic manner to obtain unambiguous value savings, and it has the capacity to convert a facts centre from a massive placing to a variable-price surroundings [2]. Cloud computing has emerged as a singular innovation that has advanced during the last several years and is expected to emerge as the following essential situation inside the coming years. because it's far a brand new generation, it necessitates new safety issues and faces a selection of challenges [3].

The cloud computing paradigm has advanced dramatically and enormously, and it has established a leap forward phenomenon in information technology because it provides huge price financial savings and new business options to its users and companies. customers that use the cloud offerings as requested, who use shared talents as a provider which could speedy and dynamically develop get right of

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A Web Application Chronic Kidney Disease Prediction Using Machine Learning

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ABSTRACT: This paper presents a web application for predicting chronic kidney disease (CKD) using machine learning algorithms. The proposed system utilizes three popular classification algorithms, namely logistic regression,Support vector machine and k-nearest neighbors classifier(KNN) for prediction. The system is implemented using the Python programming language and deployed as a web application. The dataset used for training and testing the models is obtained from the UCI Machine Learning Repository. The performance of the models is evaluated using various evaluation metrics such as accuracy, precision, recall, and F1-score. The experimental results show that the Logistic Regression algorithm achieved the highest accuracy of 99% in CKD prediction, followed by KNN with an accuracy of 97.28%. The proposed web application provides a user-friendly interface for the prediction of CKD, which can be useful for doctors and patients to make informed decisions.

Keywords: CKD, GFR, KNN.

I.INTRODUCTION

A steady loss of kidney function over months or years is known as chronic kidney disease. Our nephrons, which are our kidneys' millions of microscopic filters, operate to remove wastes from our blood in order to keep us healthy. These nephrons start to shut down if they sustain injury. We start to experience the signs of CKD when there are eventually not enough remaining to filter our blood effectively enough to keep us healthy. However, CKD is typically far along when we first start to experience symptoms. In actuality, a person may lose up to 90% of their kidney's capacity before showing any signs or symptoms at all. Because of this, one in ten persons have CKD, yet the majority are completely unaware of it.
Without treatment, CKD stages 1 through 5 advance. End-Stage Renal Disease (ESRD), a stage 5 illness, requires continuing dialysis or a kidney transplant to survive.

- High blood pressure is one of the potential CKD symptoms and consequences.
- Low blood counts (anemia), weak bones, inadequate nourishment, nerve damage, swollen ankles, and exhaustion

II.LITERATURE REVIEW

[1] They have used a variety of data mining approaches to diagnose kidney-related ailments in this process of diagnosing chronic kidney disease, and their main goal is to make a reliable diagnosis rather than to discover the perfect cure. In this proposal, they employed two data mining techniques, Random Forest algorithm and Back Propagation Neural Network, to identify the chronic kidney diseases and analyze them to provide the best algorithm for predicting the chronic kidney diseases.

[2]In this study, feature optimization was done to discover the most advantageous feature extraction algorithm for the prediction of chronic kidney disease. Three distinct feature selection algorithms were used. In order to improve the performance of the classifier model, class balancing is required because many datasets have unbalanced classes. SMOTE was employed in this study as a class balancer. The highest degree of accuracy, 99.6%, was attained.

[3] In this paper, a data mining methodology for knowledge discovery using the CKD datasets is proposed. Datasets related to CKD are amassed in large numbers. The classic methods of data mining are used for data preparation and

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Movie Recommendation System

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ABSTRACT: There is already enough content available on the movie recommendation system. Showing the movie recommendations is essential so that the user need not waste a lot of time searching for the content which he/she might like. Thus, movie recommendation system plays a vital role to get user personalized movie recommendations. After searching a lot on the internet and referring to a lot of research papers, we got to know that the recommendations made using Content-based Filtering are using a single text to vector conversion technique and a single technique to find the similarity between the vectors. In this research work, we have used multiple text to vector conversion techniques and manipulated the results of the multiple algorithm You can think of it as a hybrid strategy that only employs the Contentbased Filtering method.The internet has increased the ability of various domains to interact and share important information during the past few years. Since everything has benefits and cons, the expansion of a domain is accompanied with information overload and challenges with data extraction. The suggestion system is crucial in addressing this issue. With its quick and logical suggestions, it improves the user experience. This study outlines a method that provides users with generalised suggestions based on the popularity and/or genre of a film. The implementation of the Content-Based Recommender System involves several deep learning techniques.This study also provides a glimpse into the difficulties that content-based recommendation systems encounter, along with our efforts to address them.

I.INTRODUCTION

Movies are a part and parcel of life. There are different types of movies some for entertainment, some for educational purposes, some are animated movies for children, and some are horror movies or action films. A recommendation system or recommendation engine is a model used for information filtering where it tries to predict the preferences of a user and provide suggestions based on these preferences.Movie Recommendation Systems helps us to search our preferred movies among all of these different types of movies and hence reduce the trouble of spending a lot of time searching our favorable movies. These systems have become increasingly popular nowadays and are widely used today in areas such as movies, music, books, videos, clothing, restaurants, food, places and other utilities.These systems collect information about a user's preferences and behavior, and then use this information to improve their suggestions in the future.A large number of companies are making use of recommendation systems to increase user interaction and enrich a user's shopping experience. Recommendation systems have several benefits, the most important being customer satisfaction and revenue.

II. LITERATURE REVIEW

1. In content-based recommendation, items are recommended which are similar to those provided by the user, whereas in collaborative recommendation users whose tastes are similar are identified to those of the given user and recommends items they have liked. Later with the evolution of the recommender system hybrid method has been invented which merges two or more techniques. Before the invention of the recommending system, people had to read reviews and choose the movie that best suited their interest or had to randomly choose any movie based on some other criteria. This became difficult as the number of movies that are available online started increasing rapidly.
2. De Campos et al. also made an analysis of both the traditional recommendation techniques. As both of these techniques have certain setbacks, he proposed another system which is a combination of Bayesian network and collaborative technique.
3. Kużelewska proposed clustering as an approach to handle the recommendations. Two methods for clustering were analyzed: Centroid-based solution and memory-based methods. The result was that accurate recommendations were generated.

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Multi-Doc Parser for scholarship System using Google Cloud Platform

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ABSTRACT: The scholarship web application is a user-friendly platform that provides students with the opportunity to apply for scholarships easily and efficiently. The platform allows students to submit their applications online and upload the necessary documents required for their application. The application process is straightforward, with step-by-step guidance provided throughout the process. The platform also features an admin panel that allows scholarship administrators to manage the application process efficiently. The admin panel gets a structured list of all the applicants, and the administrator can access each application and view the necessary information from the documents submitted by the applicants. That is when the admin opens an application, they will see all the relevant information they need to decide on the scholarship application without having to look through the documents themselves. The structured format makes it easier and more efficient for the admin to review the applications and manage the scholarship application process.

KEYWORDS: Google Cloud Platform, Optical Character Recognition, Document AI, Machine Learning, Postman, Virtual Machine.

I.INTRODUCTION

Scholarships are financial aid awarded to students to support their education. They are based on criteria such as academic merit, diversity and inclusion, athletic ability, and financial need, and reflect the values and goals of the donor. The SAR tool helps economically disadvantaged students apply for scholarships. It provides efficient communication, tracks feedback, and offers solutions through excellent administration [1].

Scholarship administration involves not only awarding scholarships to eligible students but also verifying their eligibility criteria and required documents. The staff responsible for administering scholarships often have to go through a lengthy and time-consuming process to ensure that all the information provided by the applicants is accurate and meets the scholarship criteria. They may have to verify academic records, financial needs, and other criteria before awarding scholarships. This process can be challenging, especially when dealing with a large number of applications. Even online scholarship management systems also focus on the other aspect of these issues [6]. However, it is essential to ensure that scholarships are awarded fairly and to deserving students who meet the criteria set by the donor.

The proposed scholarship website aims to simplify the scholarship application process by utilizing cloud storage and document processing technology. Applicants can enter their information and upload their documents in PDF or image format, which will be stored securely in Google Cloud Storage as well as in the database.

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Sentiment Classification on Women's Safety across Indian Cities using Natural Language Processing and Machine Learning

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ABSTRACT: Nowadays women are experiencing lots of violence such as harassment in places in several cities. This starts from stalking which then leads to abusive harassment or also called abuse assault. In this paper, we mainly focus on the role of social media which can be used to promote women's safety in India, given more preference to the participation of many social media websites or applications such as Twitter, Facebook, and Instagram platforms. The proposed work focuses on developing the responsibilities among the common people in various parts of Indian cities so that the safety of women around them is ensured. Tweet on the Twitter application contains text messages, audio data, video data, images, smiley expressions, and hashtags. This tweet content can be used to read among the people and thus can educate them to take strict actions if tweets are abusive to women and hence can punish such people if the harassment is made. Applications that include hashtags such as MeToo has been considered for the study. Machine learning algorithms such as Naive Bayes, Random Forest, Support Vector Machine, and Logistic regression are analyzed.

I.INTRODUCTION

There are some very aggressive patterns of harassment and violence, including staring and commenting, and these unacceptable behaviors are often considered part of city life. There have been a number of studies held in Indian cities and women reporting similar patterns of sexual related harassment and comments made by others they do not know. Research conducted in the cities which are more famous in India which shows that more than half of the percentage of women do not feel safe when commuting to work or when traveling by any means

of transport. Any cities can be visited by women which means they are free to go whenever they want, whether it's at the Institute of Education or wherever the women want to go. But they are not safe in places such as shopping malls which they pass by on their way to work due to many strange eyes. for the harassment of girls. There are times when the harassment of girls was done by their neighbors while they were going to the school. Or the safety of girls where less which created a mindset of fear in the thinking of small girls. who suffered throughout their life due to that one incident that happened in their past life where they were forced to do something unacceptable. Or was harassed by their neighbors or anyone whom they don't even know. Safest cities idea approaches to women's safety by considering the rights of women which may affect the town from getting afraid of violence or harassment. Instead of controlling the actions of women, the mentality of the society can be changed in order to protect women. Analysis of Twitter data also includes the people names and the name of women who are against unusual or bad behavior of people in cities of India which make them uncomfortable to walk freely. Machine learning algorithms were applied on the twitter dataset to smooth the data by removing zero values and using appropriate theory to develop a method of data analysis and delete retweet and repeated data from the obtained dataset. Which gives us the clear view of women's safety status in Indian society. And we can also find the safest cities of the country where there is more safety to the women.

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Unsurpassed Image Surveillance System

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***Abstract*: People use security measures to protect their property whether it is a house or a company. Current security systems include the use of various motion sensors and video surveillance cameras, namely, Perimeter Intrusion Detection Systems. Most video monitoring systems work with algorithms such as background image removal, duplicate screen filter (DBF), a virtual flow path to detect motion where a video is recorded with a digital video recorder when a moving object is identified for memory retention, but in a proper process. Some missing frames even moving objects are perceived as being treated as stable (without considering the minimal movement of objects below the boundary value), here we suggest a combination method to remove the background image and double screen filtering with open morphological motion identification. Items and improve video quality. This project aims to provide one such perspective to ensure the safety and security of personal property. This system performs face recognition as an authentication procedure and alerts the owner when an unknown face is detected by sending an email with the snapshot of unknown face and a SMS. Live feed from multiple cameras can be viewed through smartphones, computers**

Keywords: CCTV, monitor, face-identification, camera

I. INTRODUCTION

Like any CCTV, CCTV smart works by providing real-time monitoring videos. The days of traditional CCTV are long gone. Like any CCTV, CCTV smart works by providing real-time monitoring videos. However, when the traditional camera only records, intelligent CCTV can understand the feed and can make sense of the recording images. Sure, it's a little annoying; however, it is fair to say that experts may outweigh the disadvantages with such technological advances. It constantly monitors frames and monitors any movement in the frame using a high-pass filter where the image edge is sharpened. It uses the LBPH Face Identification Method: So now we have found the face in the frame and this is the time to identify it and check if it is in the database we used to train our LBPH model. This feature is used to find the sounds in the frames well this is something you can find on most CCTV. Simply put all the frames are continuously analyzed and monitored for sounds and any movement Therefore, it works through the following steps:

1 - Begins to hear sounds in the frame.

2 - Then in the event of any movement, find out which side that happened; either left or right.

3 – At last it checks if motion from left ended to right; then it will detect it as entered and capture the frame, or vice-versa.

II. MOVING OBJECT TRACKING (BACKGROUND SUBSTRACTION)

Since the video sequence consists of several frame sequences with some degree of excessive continuity, the detection of moving objects in the video is performed so that the frame sequence is extracted from the video sequence according to a particular cycle. Increase. Therefore, detecting a moving object in a still image relies solely on tracking the moving object based on the object's motion properties the following is a brief definition of the method of video sequence analysis frequently used in moving object detection. Two or more frames captured at different times contain information about the relative motion between the imaging system and the scene. Therefore, information about motion can be obtained by analyzing and processing frames captured at different times optical flow method reflects frame variability caused by movement at specific time intervals. It is estimated that the moving object will contain similar motion vectors in the frame's motion field. The optical flow method requires solving the transcendental equation. Computational complexity, noise sensitivity, computational load, and poor real-time performance and practicality. Therefore, it is difficult to use this method for real-time video processing. This method splits the image into a foreground and a background. The pixels that correspond to the background model are called the background, and the other pixels are called the foreground.

III. FACE IDENTIFICATION MECHANISM (LBPH ALGORITHM)

This a face identification model which uses LBPH algorithm. Here we have to train the model. Algorithm working: What happens is that the face detection, it works by the principle of LBPH algorithm. Mindy's what happens is that it takes the input, face it. You have to train the model. That means it in the model means takes the photo person. Takes about the 300 photos. To be under photos and then the images. Mr Putin is the folder where it is stored. Then near the training is is model is trained. After that we have give also two button one is the ad and another is the start with the loan. When you if you want to add any personal click on the air button or if you want to start with the lone person means any person in the data set. So likewise, this is about the LBPH working in the face detection model.

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Text Summarization with Heart Disease Prediction

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ABSTRACT: Text summarization and heart disease prediction are two important areas of research that have the potential to significantly impact society. Text summarization involves generating a brief and coherent summary of a document while retaining its most important information. Heart disease prediction involves using machine learning algorithms to identify individuals who are at a higher risk of developing cardiovascular disease. There are various techniques and algorithms for text summarization, including extraction-based, abstraction-based, and hybrid methods. These methods can be useful in fields such as medicine, law, and journalism, where it is becoming increasingly difficult to quickly understand and extract the most important information from a document. Based on a variety of risk indicators, including age, gender, blood pressure, cholesterol levels, and smoking status, machine learning algorithms have been used to estimate a person's likelihood of getting heart disease. Heart disease prevention and early detection are crucial areas of research since they can greatly improve patient outcomes and lower healthcare expenditures. However, accuracy and bias problems exist for both text summarizing and heart disease prediction. In text summarization, accuracy and brevity must be balanced, whereas biases in the selection of risk variables and the creation of machine learning algorithms can affect the prediction of heart disease. To identify those who are more likely to develop cardiovascular disease, many techniques and models are used for heart disease prediction.

I. INTRODUCTION

Text summary is a strategy for condensing a text while keeping the important details. The analysis of data and prediction of future coronary heart disease (CHD) risk using machine learning algorithms and deep learning is a significant field of research. Machine learning algorithms including classification analysis, regression, data clustering, feature engineering, and dimensionality reduction are used to create efficient data mining strategies that can accurately forecast the onset of cardiac disease. The outputs of these models are also interpreted using explainable AI methods. The UCI Machine Learning Repository is one of the largest datasets for this application. When there is a lack of data, artificial data can be utilized to address privacy issues and

II. LITERATURE REVIEW

Text summarization has been applied to the field of heart disease prediction to assist medical practitioners in decision-making processes. Studies have utilized various machine learning techniques such as recurrent neural networks, support vector machines, and deep learning models to summarize medical texts and predict heart disease risk. The evaluation of these models has produced encouraging outcomes in terms of performance and accuracy. However, further research is needed to improve the generalization and interpretability of these models for practical use in healthcare settings.

Senthilkumar Mohan, Chandrasegar Thirumalai, Gautam Srivastava proposed a Effective Heart Disease Prediction Using Hybrid Machine Learning Techniques [1]: The proposed approach combines decision trees, logistic regression, and artificial neural networks to generate a comprehensive model for predicting heart disease risk. The authors conducted experiments on real-world datasets and achieved high levels of accuracy in heart disease prediction. They compared the performance of the hybrid model with several traditional machine learning algorithms and found that the hybrid model outperformed other models in terms of accuracy, sensitivity, and specificity. The study demonstrates the potential of combining multiple machine learning techniques to improve the accuracy and performance of heart disease prediction models. The hybrid model can effectively leverage the strengths of different machine learning algorithms and provide more accurate and reliable predictions for heart disease risk. The study

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Travel Guide Management System-Easy Viaje

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ABSTRACT: The travel guide management system project which is known as Easy Viajeis a platform created to help the people who would like to tour around the places in and around Udupi district of Karnataka State, India. It provides user with the tourist attractions along with the restaurant and hotel stay options.A web-based tool called the Easy Viaje refers to easy journey, here Viaje is a Spanish word which refers to journey. In this projectto protect the privacy of user's data, the system offers a secure login option. Tourists can use the system to look up and reserve hotels in the Udupi District, browse lodging details, and discover the area's top attractions. Additionally, the system offers details about nearby transportation, tourism destinations, and events.Tourists may effectively organize their journey using this technique, which will make getting to Udupi District easy and hassle free.

By offering a user-friendly interface that enables users to filter search results depending on their requirements.The system will be created to make the process of trip planning for tourists simpler and clearer. Additionally, the system will contain a payment gateway that will make it simple andsecure for the user to pay for their trip reservations.Also, the system would notify the user about inexpensive activities and sights at their vacation location, assisting them in planning their schedule while staying within their means. Additionally, it will provide tools for organizing group travel, enabling the user to concurrently reserve travel for a number of people.

The Easy Viajeproject will ultimately offer aextensive platform that meets the special requirements of travelers who wish to travel within their financial limits. It will allow the user to go through all the options that are available and make choices based on their requirements.We also worked onproviding a simple and secure payment procedureto our user.

KEYWORDS: Visual Studio, ReactJS ProgrammingLanguage, Tour guide model, Affordable travel options, Budget-based travel plan

I. INTRODUCTION

Being human, it is important to learn new things not just reading books but also by travelling the world and experiencing the various aspects of world. Irrespective of which, a large number of younger generations finds it difficult to travel due to lack of guidance and budget. Considering this, we make an attempt to give people a prepared tour guide by examining their statistics and personal information.

As the nation's economy has grown, a new way of thinking about life has emerged, and the vacation system has been perfected, more and more individuals are choosing to travel over the holidays. It has a large and promising market. The artificial guide service, which has several flaws, is now the dominant method for providing guides.The major focus of the multimedia material is background knowledge on history and culture. Its purpose is accomplished by the use of visitors or employees.Typically, this system is created for a single picturesque location. The picturesque cost a lot of money. Additionally, it is difficult to use and offers little services. Previous methods cannot handle the present scenario due to growing tourism and changing visitor needs, keeping this in mind we created an android application which is known as Easy Viaje to help people find the most important things to travel at a single place. These important things include the Tourist destinations, Food facilities and Staying facilities.

Easy Viaje provides a user-friendly platform where the users can plan and manage their trip while keeping their spending within the budget by exploring the different options in the required field available where the budget is ranged from low to high. with the help of different budget friendly options that are available. This system will offer details on budget-friendly lodging alternatives, using the Hotel field as well as food facilities by using the Restaurant field.

The goal of this project is to develop a system that will provide a simpler and convenient platform for travelers to

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Survey on various approaches and application of Machine learning algorithms for Medical Diagnosis of heart abnormalities

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Abstract *- heart disease, which includes illnesses like coronary artery disease and chronic heart failure, is the main cause of death worldwide. Due to the limits of conventional clinical approaches for diagnosis, researchers have developed machine learning and data mining techniques for faster and more accurate detection. This study intends to assess various modalities, such as medical characteristics, visuals, and ECG, for detecting heart problems.*

Keywords *– Heart disease, Cardiovascular Disease, Machine learning.*

1. INTRODUCTION

According to the World Health Organization, cardiovascular disease (CVD) will account for 32% of all deaths globally in 2019. Early heart abnormality detection is essential to averting major consequences and enhancing patient outcomes. Machine learning (ML) methods offer a dependable, economical, and effective way to find heart problems. Electrocardiograms (ECGs), pictures, and medical feature-based data are the three basic modalities for diagnosing heart disease. Based on these modalities, ML techniques for diagnosing heart disease have been thoroughly researched. Medical feature-based data can be used to train machine learning algorithms to forecast a patient's likelihood of developing heart disease. While ECG-based approaches can find abnormalities in the electrical activity of the heart, image-based approaches can find anomalies in cardiac structure and function. ML-based diagnostic systems can offer a more precise and thorough evaluation of a patient's cardiovascular health by merging data from many modalities. For a lower fatality rate and improved decision-making for future treatment and prevention, early detection of cardiac disease using a prediction model is advised. By enhancing patient outcomes, lowering healthcare costs, and enabling more effective use of healthcare resources, the application of ML in the diagnosis of cardiovascular disease has the potential to revolutionise healthcare.

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As the nation's economy has grown, a new way of thinking about life has emerged, and the vacation system has been perfected, more and more individuals are choosing to travel over the holidays. It has a large and promising market. The artificial guide service, which has several flaws, is now the dominant method for providing guides.The major focus of the multimedia material is background knowledge on history and culture. Its purpose is accomplished by the use of visitors or employees.Typically, this system is created for a single picturesque location. The picturesque cost a lot of money. Additionally, it is difficult to use and offers little services. Previous methods cannot handle the present scenario due to growing tourism and changing visitor needs, keeping this in mind we created an android application which is known as Easy Viaje to help people find the most important things to travel at a single place. These important things include the Tourist destinations, Food facilities and Staying facilities.

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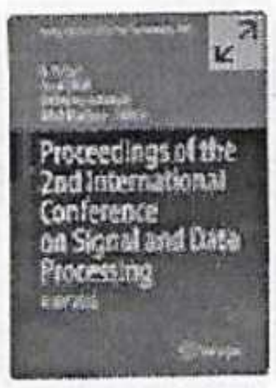

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A Security Enhanced Image Encryption and Compression Using Residue Number System and Discrete Cosine Transform

Arun Upadhyaya ✉, Shubha P. Bhat & Ganesh Aithal

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Integration of Particle Swarm Optimization and Sliding Mode Control: A Comprehensive Review

Sathisha Shetty, Abdul Kareem & Ganesh Aithal

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Abstract

Particle swarm optimization (PSO) is a prominent computing approaches that rely on population-based optimization. It is coupled to a swarm intelligence cluster and is used in global

optimization challenges. Sliding Mode Control (SMC) is a first-order control approach which has a broad range of mechanical device applications. But due to its disadvantages such as chattering effect, a higher order control mechanism is necessary. Super-Twisting SMC (ST-SMC) is a second order control mechanism, has advantages like reduced chattering effect, and achieves convergence in time. In this review article, first a comprehensive review on PSO and its applications is performed. Later, ST-SMC is reviewed in detail and then optimization of SMC parameters using PSO for autonomous vehicle is discussed.

Keywords

Swarm intelligence **Particle swarm optimization**

Optimization problems **Tuning SMC parameters**

Chattering effect

1 Introduction

An external disturbances and model inaccuracies cause instability in the system, it poses a paramount challenge to bring stability in spite of uncertainties. As recorded in various applications and research articles, Sliding Mode Control (SMC) is an effectual methodology in achieving this goal. Accomplishment of SMC is simple, straight forward and needs only few

parameters to be considered. But it is tedious with respect to fine tuning of controller parameters, also dependent on sophisticated methods. Due to worst case assumptions in SMC leads to higher gain, but tends to produce unwanted effects such as chattering. The Super-Twisting Sliding Mode Control (ST-SMC) may eliminate chattering while also maintaining stability across a large parameter range. *In the Conventional SMC*, the equilibrium point is generally asymptotic and not finite time; the ST-SMC not only reduces the chattering effect, but also brings the equilibrium state in the finite time thus takes a vital role in design of the SMC. ST-SMC can explicitly adjust and track the system by conquering the uncertainties and outside disturbances. It is comparably simple and has a wide range of applications due to the fact that it just requires a sliding variable to apply the control law. The Super-Twisting Algorithm (STA) is a Second Order Sliding Mode (SOSM) approach that allows finite period of time convergence of not only sliding variables but also their derivatives. STA implies, in specifically, zeroing the sliding variable and first derivative within a certain time frame.

The ST-SMC is perhaps the most contemporary type of sliding mode controller, providing the distinctive characteristics of sliding mode control techniques while creating a smoother control signal than the ordinary sliding mode controller. As a result, ST-SMC

has far less chattering than conventional sliding mode control.

Additionally, unlike second order sliding mode controllers, the ST-SMC technique has a simple method for ease of implementation since it does not require the derivatives of the sliding surface function. The dynamic performance of ST-SMC, on the other hand, is determined by the controller settings. Nevertheless, determining the ideal parameter values is a time-consuming operation.

Swarm Intelligence (SI) is a novel distributed intelligent model for addressing optimization problems that was inspired by the biological examples of swarms, flock, and grazing in vertebrates. The idea for Particle Swarm Optimization (PSO) came from a group of birds flying, swarms of bees, and human decorum at social gatherings. PSO is a population-based opti-mization method that is simple to design and deploy to address optimization issues. PSO has a significant advantage over other optimization methods, including Genetic Algorithms (GA), Simulated Annealing (SA), and many others, in terms of speed of convergence. As population-based optimization is tends to be expensive since, its dependency on function values is on the higher side, susceptible to untimely convergence; that is the instance when many decision variables are optimised. As a result, the PSO method is a feasible choice for

determining the best combinations of super-twisting sliding mode controller settings.

2 Literature Review

A thorough literature review is conducted in order to comprehend the most recent research work on Particle Swarm Optimization and ST-SMC.

A. Particle Swarm Optimization (PSO)

The Adaptive Inertia Weight Particle Swarm Optimization Algorithm (AIWPSO) was created to address the challenges of global exploration and local exploitation of the population in the particle swarm optimization algorithm. This strategy compensates for the inaccuracy of random mutation and in- creases the diversity of inertia weights [1]. For optimising the controller settings of a Fuzzy PID controller, a novel technique called hybridization of improved particle swarm optimization Algorithm and Cuckoo Search Algorithm (HIPSO-Cs) is proposed [2]. The basic PSO is enhanced in this approach by linearly lowering the number of particles and the inertia weight, and then a Cuckoo Search Algorithm's local random walk procedure is utilised to boost particle homogeneity. This has resulted in enhanced convergence correctness and iteration speed.

Robert et al. introduced a Culled Fuzzy Adaptive Particle Swarm Optimization (CFAPSO) technique for Collaborative Beamforming to increase the

transmission range of Wireless Sensor Networks (CBF). CBF is frequently made up of highly multimodal functions, whereas traditional PSO is susceptible to premature convergence. To deal with it, a novel fuzzy-logic-based confidence and inertia weight parameter adaptation technique has been developed [3].

The author [4] proposed a prototype to reduce the snag of the formal PSO algorithm. The suggested concept was based on Bayesian optimization and stochastic surrogate, in which the model uses a Gaussian process to past estimations of the objective functions to predict the particle shape and thereby modify the movement of the particle. The experimental results of the suggested concept surpass the experimental results of SPSO2011.

The complexity on the number of views on a given set of data in multi-view learning was addressed by the author in his work [5]. To address the complexity, the author exhibited an optimization technique based on Multi-Objective Particle Swarm Optimization (MEL-MOPSO), which was developed with two key goals in mind: the number of data views and the classification accuracy of multi-view supervised methods. The study showed that the optimization process outperformed the existing model and obtained an efficient and effective result.

It is proposed to use an ensemble filter feature selection with PSO and SVM harmonised classification (Ensemble-PSO- SVM) [6]. The author describes the difficulties in prediction of the treatment for a patient depending on the volume of datasets available for the process. The author also pointed the importance of data dimensionality and classifier parameters on the accuracy of the system which are dependent on each other, performing them independently may reduce the system accuracy or efficiency. Tengku Mazlin Tengku Ab Hamid et al. designed an algorithm to remove the unnecessary features based on ranking and to erase the dependency problem between the data sets and accuracy of the system. A unique approach based on multi filters was proposed using the information gain (IG), Gain ratio, Chi-squared, and Relief–F. The system kernel was used to optimise the search results using Particle Swarm Optimization and Support Vector Machine in order to increase accuracy of classification.

The author points at the negative effects of unessential, turbulent and immaterial features used for classification in Machine learning and Data mining process. The effect of these unnecessary data or the attributes can be reduced by filtering the features during the pre-processing stage. To mitigate the negative impact of negative datasets, an unique hybrid binary version of improved chaotic crow

search and Particle swarm optimization approach is created [7]. The proposed system combines enhanced version of CSA algorithm and particle swarm optimization.

The researchers proposed a method for regulating differ-ential settling in an autonomous vehicle utilising higher order SMC and the super-twisting algorithm. The PSO technique was used to optimise the control parameters of higher order sliding modes. The findings of the proposed systems indicated that higher order sliding mode control with parameters optimised by Particle Swarm Optimization yielded better outcomes over random ones [8].

El-Shorbag and Aboul Ella Hassanien [9] evaluated the implications of particle Swarm Optimization in Swarm Intelligence. The authors have presented different issues that may be handled using PSO, such as restricted optimization, unconstrained optimization, nonlinear programming, multi-objective optimization, stochastic optimization, and combina-torial optimization. The discussion started with an overview to PSO behaviour, basic concepts and principles, and PSO innovation.

B. Super-Twisting Controller

To overcome the problem of trajectory tracking and quadro-tor stabilisation, the authors [3, 10, 11] suggested a super-twisting approach with better

proportional integral derivative sliding mode control. To validate the overall stability of the rotational and translational controls, the Lyapunov Theorem is applied. The authors proposed an Adaptive Super-Twisting Sliding Mode Control for micro gyroscope application to achieve the enhanced convergence rate of reaching the sliding surface and trajectory tracking. To obtain, assess, and compute the unknown parameters and angular velocity, a Lyapunov stability theory is applied [12].

In this Lyapunov function is used for the STA, adaptiveness of the proposed controller design is exploited with certainty-equivalence principle [13]. The simulation result has shown the advantages such as structured and unstructured uncertainties are considered.

Ramesh Kumar and Bijnan Bandyopadhyay [14] presented a 6-degree-of-freedom paralleled robot that predicts leg lengths using inverse kinematics and a dynamic gain super-twisting technique that outperforms serialised robots. The su-per twisting observer was used to determine the appropriate leg velocity. The suggested model employs global finite amount of time convergence to provide the appropriate sliding surface for Stewart platform position stabilisation, which has been accomplished in the presence of uncertainties.

A robust tracking method is explained the author [15] for controlling the nonholonomic wheeled mobile robot. In the internal loop, the suggested model employs an inverse dynamic control, while the exterior loop employs a strong kinematic control using sliding modes control. The authors also depicted the deteriorated performance in the system due to the presence of chattering phenomena caused by the unmoulded dynamics.

Jayakrishnan [16] developed a quadrotor remotely piloted aircraft by cascading with an inner outer loop con- struction and using a ST-SMC. The introduction of the super-twisting algorithm reduced the chattering impact, while the SMC eliminated model instability and disruptions. The per- formance of the solutions that have been verified against wind turbulence. The experimental setup's results were compared to those of a linear LQR-PD controller and a nonlinear feedback linearization-based controller. The experimental findings of the first-order sliding mode controller also were compared to the suggested system in terms of robustness.

The scholars [17] established the second order SMC tech- nique that is effective in dealing with uncertainties and external disturbances. The design is for a hovering wind turbine that uses collective blade pitch control. The results of the system were compared with traditional gain PI controller.

A block-controllable model was proposed for the evaluation of Sliding mode control for a rendezvous mission by the authors using a back stepping setup for a Super-Twisting SMC. By taking into account the relationship between translational and attitudinal movements, the suggested method was utilised to launch a timely restorative mission between the chaser spacecraft and an inactive target into a circular orbit around Earth [18].

von Ellenrieder and Henninger [19] proposed a resurrected third order sliding mode disturbance observer architecture for a super-twisting controller that was used for trajectory tracking in fully-actuated maritime where there's unidentified and scalar disturbances with respect to the time. The observer controller creates a generic vector form that may be employed in maritime vehicles, as well as configuration spaces with three, four, and six degrees of freedom. The suggested technology's value is demonstrated via simulations.

The author took advantage of the system's superiority, which was constructed using the particle Swarm Optimization method, to develop the Sliding Mode Control solution for quadrotors with unpredictable disruptions. To demonstrate the process initially author built a dynamic model of the controlled quadrotors with external interferences. An improved Radial basis function neural network was

used to develop a sliding mode control system for quadrotors with unpredictable disruptions in order to reduce the interferences. The efficacy of the investigated model is defined by the author's demonstration of the system using a rapid and smooth trajectory tracking system [20].

The authors presented [21] a novel technique for ST-SMC that removes the tedious attempt process in determining the design criterion to obtain optimum performance of the controller. The main aim of the proposed system was to remove the chattering problem of a traditional SMC and also to inscribe the finite-time convergence of system trajectories to their analogous equilibrium states in a single axis propeller driven aircraft.

Humaidi and Hasan developed [22] a revolutionary approach for a super-twisting sliding mode controller for two axis helicopter that requires less time to gain homeostasis and eliminates chattering. The suggested model was developed utilising the Lyapunov principle to forecast the unknown characteristics of a helicopter with two degrees of freedom.

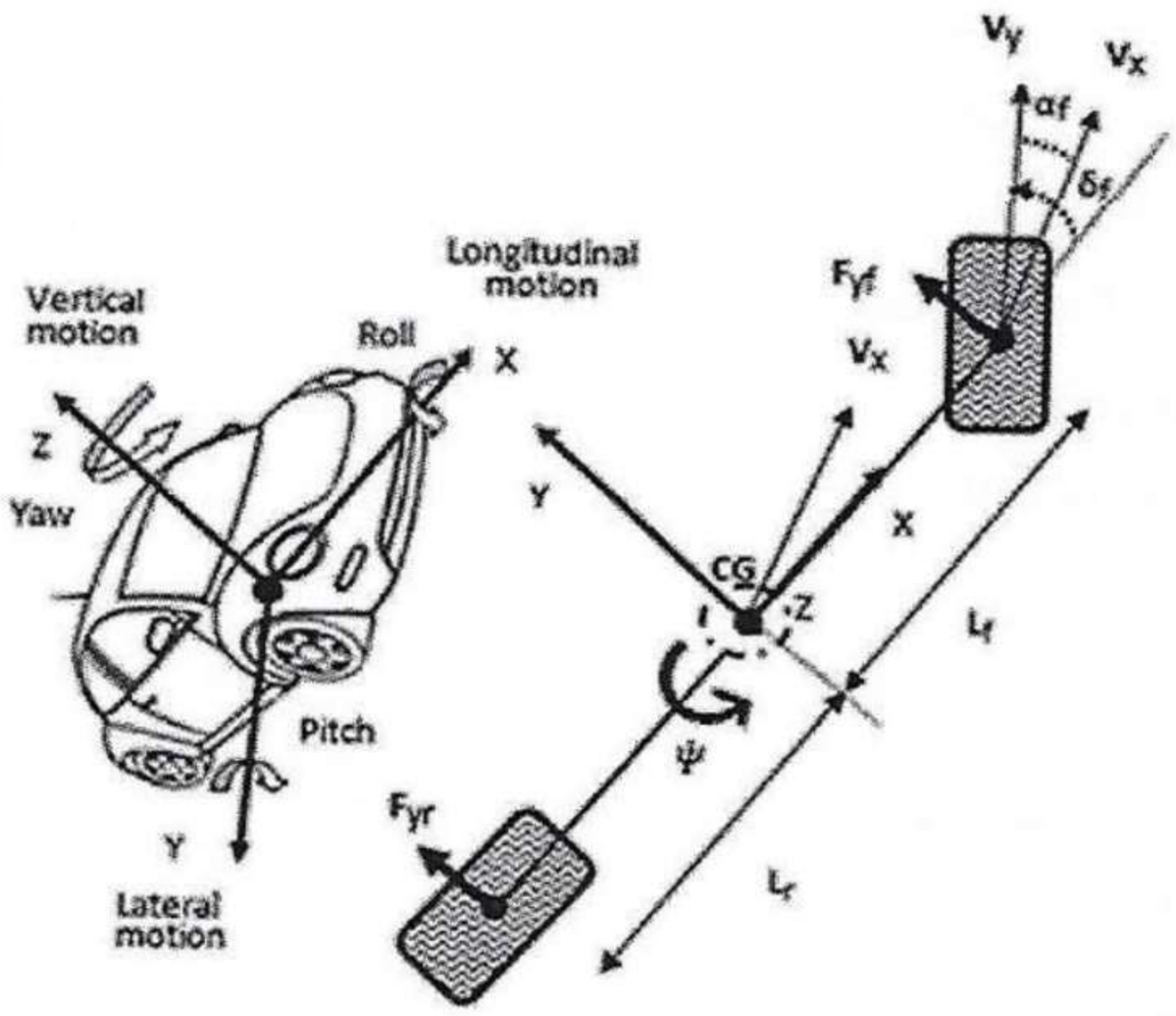
The author of this research [23] suggested a unique strategy for overcoming the control issues associated with nonlinear and undermined systems using set-point weighting for super- twisting sliding mode control employing full order state ob- servers. The

author considered Quadcopter UAV to show the conclusion of the procedure, which is an excellent example of under actuated systems, for the implementation of the pro- posed work. The process findings indicated that the proposed system performed better than SISTASMC in dealing with uncertainty.

3 Integration of PSO and SMC

A new control strategy with combining PSO and SMC is proposed [8], for the autonomous vehicle. Here PSO is used to optimise forces operating on the vehicle's embedded force sensors. ST-SMC is utilised to provide lateral control at greater vehicle speeds. PSO is used to improve the settings of SMC for tracking reference trajectory, enhancing accuracy of the system, and velocity. A bicycle model is used to demonstrate the vehicle's lateral behaviour (see Fig. 1).

Fig. 1



Bicycle modelling vehicle and vehicle structure movements [8]

The Chattering effect is a severe drawback of SMC; to lessen it, the following strategies can be used: use of smooth functions, observer-based approach, and higher order sliding mode. ST-SMC is a second order system that may be applied to a system of subjective degree one, the derivatives of which is expressed in Eq. 1:

$$\dot{s}(t,x) = \Phi (t,x) + \phi (t,x)u(t)$$

(1)

The goal of this design procedure is to ensure that *s* = 0 ensures convergence to the sliding surface; to do this, s must be measured in real time. Researchers Kennedy and Elberhart invented the PSO, it is swarm

theorem based simplified model, the velocity vectors of every particle are utilised to update the location of each and every particle inside a swarm. PSO start off with a random particle made up of "m" particles and the location is then updated by taking into account the fact that its memory, reasoning, and social behaviour aid in the finding of each new particle, as shown in Eq. 2.

$$\begin{aligned} v_{i} \left({j + {1}} \right) = & wv_{i} \left(j \right) + c_{{1}} r_{{1}} \left({p_{i} \left(j \right) {-}x_{i} \left(j \right)} \right) \\ & + \;c_{{2}} r_{{2}} \left({p_{g} \left({\left(j \right){-}x_{i} \left(j \right)} \right)} \right) \\ \end{aligned}$$

(2)

$$x_{i} (j + {1}) = x_{i} \left(j \right) + v_{i} (j + {1})$$

(3)

where j and w indicate the number of iteration and inertial weight, and c1 and c2 are random values distributed evenly between [0,1]. The ith possible solution of the issue is rep- resented by xi, and the flying velocity is represented by vi. The personal and global bests are represented by pi and pg. PSO is used in this experiment to assess the sliding control parameters. Strategy followed to optimise the SMC by PSO is:

Retain the all-other parameters of SMC and optimise only λ.

Retain the all-other parameters of SMC and optimise only β and α.

The improvement of SMC parameters using PSO resulted in much greater angular velocity than the regular SMC settings.

4 Conclusion

A detailed review on theory and applications of PSO and ST-SMC is carried out in this article, and the optimization of ST- SMC parameters using PSO is also considered. It has been discovered that the Adaptive Inertia Weight Particle Swarm Optimization Algorithm (AIWPSO) is the most coherent solution to overcome the hurdles of population-based optimizer's global exploration and local exploitation concerns. To overcome the limitations of the formal PSO technique, a Bayesian optimization and stochastic surrogate model that predicts particle shape and updates particle movement was proposed. ST-SMC is effective to suppress the chattering effect as it is higher order control method, integration of PSO and SMC is discussed for autonomous vehicle. The parameters optimization using PSO has shown significantly effective results as compared to the original parameters of the SMC.

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Strategies For Secure Data Aggregation in Wireless Sensor Networks and Optimization Issues: A Comprehensive Survey

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Abstract
Recent improvements to wireless sensor networks (WSNs) have led to new ways to use them, such as for surveillance and monitoring the environment. The energy that SNs use to send and receive data is a disproportionately large part of the total energy that the network uses. Data aggregation methods, on the other hand, can cut down on energy use by preventing unnecessary data from being sent back to the sink node. It is very important to protect the privacy of personally identifiable information when it is being gathered and sent over a network, because nodes can be changed by what is around them. As a result, researchers are increasingly interested in finding data aggregation strategies that reduce redundant data while still providing assurance of security. In this paper, we will look at the various security measures that may be taken while aggregating data using WSN. Despite WSNs' impressive task-handling capabilities, it is challenging to strike a balance between competing priorities such as long network life, low-latency transmissions, wide coverage, and low packet loss. In addition, this study provides a brief overview of the multi-objective optimization (MOO) approach, which is being used to solve contemporary research issues in WSN with competing objectives.

Keywords: Data Aggregation, Attacks, Confidentiality, Security, Network Optimization

1. Introduction

The invention of wireless sensor networks (WSNs) was one of the most important things to happen in the 21st century. WSNs have been a godsend for modern technology because they make it possible to get data from sensors in different parts of the world about a wide range of environmental phenomena [1]. Their uses in fields like ecosystem tracking, climate prediction, and military surveillance are vast. Due to their compact size, sensor devices have limited storage, weak processing capabilities, and limited power supplies, all of which negatively impact the network [2]. According to the findings, the transmission of data rather than the processing of data consumes the majority of the energy of small nodes. Hence, reducing the amount of communication among WSN nodes is crucial [3]. Yet, the communication burden is increased due to redundant data sensing and transmission due to the dense placement of sensor nodes (SNs). Data aggregation is a method that combines many data packets containing unnecessary information into a single, streamlined packet in order to reduce or eliminate duplicate data [4].

WSNs are made when tens to thousands of SNs that can sense, communicate wirelessly, and do calculations are spread out in an unsupervised environment. These nodes can send and receive data wirelessly and also do sensing and computing tasks [5]. The Internet of Things (IoT) relies heavily on WSNs today. Advantages of the IoT include increased situational awareness, smarter data processing, and more secure data transmission on a global scale. Realizing the information exchanges between a

A cascaded NPID/PI scheme for the regu voltage in proton exchange membrane f

Nikhil Pachauri [a], Bharti Panjwani [b], T. Vigneysh [c], Vijay Mohan [a]

Show more

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Highlights

- A novel NPID/PI cascaded control is proposed for stack voltage control c
- FOPID/FOPI, and PID/PI are also designed for comparative analysis.
- GA is utilised to estimate the design parameters of the all the controller
- Detailed performance analysis for NPID/PI is investigated for different s

Abstract

In this work, a higher-order Proton Exchange Membrane (PEM) Fuel Cell systen approach. The primary and secondary controllers, NPID/PI, are non-linear prop proportional-integral, respectively. The suggested cascade approach controls th compressor voltage to maintain the oxygen excess ratio value within limits. Tw PID/PI and FOPID/FOPI (fractional order PID and fractional order PI), are also cr algorithm is used to determine the controller's optimal parameters by minimis the primary controller. Results show that NPID/PI control structure achieves th overshot (0.9514s, 0.021%) compared to FOPID/PI (1.8980s, 0.036%) and PID/PI (can be concluded from the result of setpoint tracking, disturbance rejection, an controller is efficient and robust compared to other designed controllers.

Graphical abstract

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Design and Evolution of Deep Convolutional Neural Networks in Image Classification – A Review

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Abstract: Convolutional Neural Network(CNN) is a well-known computer vision approach successfully applied for various classification and recognition problems. It has an outstanding power to identify patterns in 1D and 2D data. Though invented in 80's, it became hugely successful after LeCun's work on digit identification. Several CNN based models have been developed to record splendid performance on ImageNet and other databases. Ability of the CNN in learning complex features at different hierarchy from the data had made it the most successful among deep learning algorithms. Innovative architectural designs and hyper parameter optimization have greatly improved the efficiency of CNN in pattern recognition. This review majorly focuses on the evolution and history of CNN models. Landmark CNN architectures are discussed with their categorization depending on various parameters. In addition, this also explores the architectural details of different layers, activation function, optimizers and other hyperparameters used by CNN. Review concludes by shedding the light on the applications and observations to be considered while designing the network.

Keywords: Convolutional Neural Network, Image Classification, hyper parameter, ReLU, ImageNet

1. Introduction

Machine Vision is a specialized area of research in Artificial Intelligence, which gives intelligence to computer systems to extract the features from data to make certain predictions without being programmed. Various Machine Learning(ML) techniques were developed in the last twenty years with an ambition to equal or excel at the human level of perception. But these systems are unsuccessful to give the human level of satisfaction [1-6]. The ambitious virtue of ML algorithms has developed a unique type of Artificial Neural Networks(ANNs) by imitating the human neuron system [7]. These algorithms are called Convolutional Neural Networks(CNNs).

The earliest CNN model was proposed by Hubel based on the cerebral cortex system [8]. But it became popular only after LeCuN's work on time series data in 1989[9]. CNNs are still considered to be the best method to empathize the image data. They have surpassed almost all the ML algorithms in pattern recognition, classification, and extraction [10]. Every major company in the IT sector has its research team to explore the new models and possible options of CNN [11]. CNN models are hot favorites in most machine vision competitions.

The architecture of CNN consists of many learning layers like convolutional, activation, pooling, etc. [12]. Convolutional layers perform many convolution operations with the help of filter banks. This helps the model in extracting and learning the local features of an image. The output of convolution layer is fed to the activation layer. This introduces non-linearity and makes the network to learn separate features from individual filters. Activation also facilitates differentiating the images based on local features. Output of activation is a sampling layer which reduces the overall dimension of the input which will be passed through other similar convolutional blocks [13]. In general, CNN

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Research Paper

An Area Efficient Low Dropout Voltage Regulator With Improved Transient Response for Hearing-aid Applications

Ananthakrishna T*, Guruprasad**(C.A.), and A. Gopalkrishna Pai *

Abstract: This paper presents a low dropout voltage regulator, with the specifications suitable for hearing aid devices. The proposed LDO occupies very less area on chip and provides an excellent transient response. A novel voltage spike suppressor block is employed in the LDO architecture which reduces undershoot and overshoot of the output voltage during the abrupt load transition. It introduces a secondary negative feedback loop whose delay is lesser than the main loop and also steers the quiescent current to output node when required. This not only improves overall current efficiency but also reduces the on chip capacitance. The proposed LDO is laid out in 180 nm standard CMOS technology and post layout simulations are carried out. The LDO produces 0.9 V output when a minimum supply voltage of 1 V is applied. A maximum load of 0.5 mA can be driven by the regulator. The LDO exhibits 4.4 mV/V and 800 μV/mA line and load regulations respectively. When subjected to a step load change, an undershoot of 20.34 mV and an overshoot of 30.28 mV are recorded. For proper operation of the LDO, it requires only 4.5 pF on-chip capacitance.

Keywords: LDO, Voltage Regulator, Hearing-aid, Transient Response, Area Efficient, Bio-Medical Applications.

1 Introduction

AN electronic hearing aid is a device which is worn by those who are suffering from hearing loss. It basically consists of microphone for converting sound from physical to electrical form, signal conditioning, a receiver for converting electrical signals back to sound and a battery for powering the electronics [1], [2].

There are four types of hearing-aids [3] namely, behind the ear (BTE), in the ear (ITE), in the canal (ITC) and completely in the canal (CIC). A hearing-aid device can be analog or digital but digital hearing aid is more popular due to its better performance and flexibility. Fig. 1 shows functional block diagram of a digital hearing-aid [3].

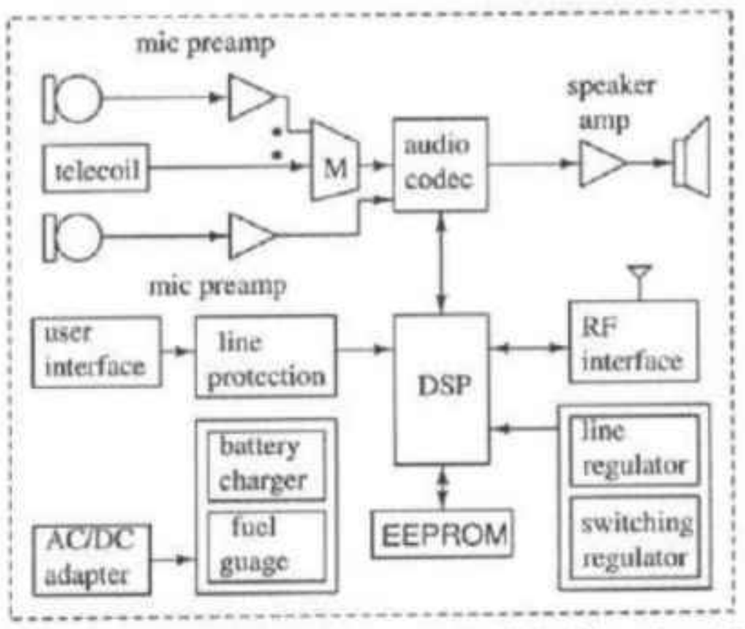

Fig. 1 Functional block diagram of a digital hearing-aid.

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Convolutional Neural Network and Transfer Learning-based Approach for Brain Tumor Detection in Magnetic Resonance Imaging

Kirana D N, Sameeksha ., Chandana ., Shreya Devadiga, Srijanya .

Abstract

Brain tumors are among the most invasive illnesses that can affect both children and adults. Brain tumors develop very quickly, and if not treated at the proper time, they decrease the patient's chances of survival. It is crucial to find brain tumors at an early stage. To increase patients' life expectancy, proper treatment planning and precise diagnostics are most important. The best way to detect brain tumors is via Magnetic Resonance Imaging (MRI). Therefore, to find the types of tumors, an automated brain tumor detection system is needed. This work uses Deep Learning (DL) architectures like Convolutional Neural Network (CNN) and EfficientNetB0 for Transfer Learning to detect the brain tumor. This model is used to predict the types of brain tumors.

Keywords

Deep Learning, Convolution Neural Network, EfficientNetB0, Brain tumors, MRI.

Full Text:

PDF

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