

3.3.2 - Number of research papers per teacher in the Journals notified on UGC website during the year.

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Summary

Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal
An efficient design and demonstration of fault-effects in full-adder circuits based on quantum-dot computing circuits	Mukesh Patidar	Electronics and Communication	Elsevier ScienceDirect	2023	2214-7853	https://www.sciencedirect.com/science/article/abs/pii/S2214785323014207
An efficient design and implementation of a reversible logic CCNOT (Toffoli) gate in QCA for nanotechnology	Mukesh Patidar	Electronics and Communication	Elsevier ScienceDirect	2023	2214-7853	https://www.sciencedirect.com/science/article/abs/pii/S2214785323014190
HDFCN: A Robust Hybrid Deep Network Based on Feature Concatenation for Cervical Cancer Diagnosis on WSI Pap Smear Slides	Nitin Kumar Chauhan	Electronics and Communication	Hindawi BioMed Research International	2023	2314-6141	https://www.hindawi.com/journals/bmri/2023/4214817/
HDFCN: A Robust Hybrid Deep Network Based on Feature Concatenation for Cervical Cancer Diagnosis on WSI Pap Smear Slides	Amit Kumar	Electronics and Communication	Hindawi BioMed Research International	2023	2314-6141	https://www.hindawi.com/journals/bmri/2023/4214817/



Effective design of combinational half-adder and subtractor circuits design based on nanoelectronics using QCA technology	Pranav Paranjpe	Electronics and Communication	Journal of Data Acquisition and Processing	2023	1004-9037	https://sicjycl.cn/article/view-2023/2582.php
An ultra-area efficient ALU design in QCA technology using synchronized clock zone scheme	Mukesh Patidar	Electronics and Communication	Springer Nature, Journal of Supercomputing	Dec-22	1573-0484	https://doi.org/10.1007/s11227-022-05012-2
Efficient designs of high-speed combinational circuits and optimal solutions using 45-degree cell orientation in QCA nanotechnology	Mukesh Patidar	Electronics and Communication	Elsevier ScienceDirect, Material Today Proceedings Journal	Jun-22	2214-7853	https://doi.org/10.1016/j.matpr.2022.06.174
Efficient designs of high-speed combinational circuits and optimal solutions using 45-degree cell orientation in QCA nanotechnology	Ankit Jain	Electronics and Communication	Elsevier ScienceDirect, Material Today Proceedings Journal	Jun-22	2214-7853	https://doi.org/10.1016/j.matpr.2022.06.174



Efficient designs of high-speed combinational circuits and optimal solutions using 45-degree cell orientation in QCA nanotechnology	Arpita Tiwari	Electronics and Communication	Elsevier ScienceDirect, Material Today Proceedings Journal	Jun-22	2214-7853	https://doi.org/10.1016/j.matpr.2022.06.174
An energy efficient high-speed quantum-dot based full adder design and parity gate for nano application	Mukesh Patidar	Electronics and Communication	Elsevier ScienceDirect, Material Today Proceedings Journal	Mar-22	2214-7853	https://doi.org/10.1016/j.matpr.2022.03.532
Optimization of Smart Antenna Performance using GA and PSO	Ankit Jain	Electronics and Communication	IJRSET	2022	2319-8753	https://www.ijrset.com/upload/2022/may/263_Optimization_NC.pdf
Optimization of Smart Antenna Performance using GA and PSO	Devendra Singh Mandloi	Electronics and Communication	IJRSET	2022	2319-8753	https://www.ijrset.com/upload/2022/may/263_Optimization_NC.pdf
Optimization of Smart Antenna Performance using GA and PSO	Shravan Kumar	Electronics and Communication	IJRSET	2022	2319-8753	https://www.ijrset.com/upload/2022/may/263_Optimization_NC.pdf



Engine oil quality deterioration estimation using an integrated sensory system	Dr. Dheerendra Vikram Singh	Mechanical Engineering Department	Proceeding Institution of Mechanical Engineers Part E: Journal of Process Mechanical Engineering	2022-2023	2158-2440	<u>Engine oil quality deterioration estimation using an integrated sensory system - Harish M Shinde, Anand K Bewoor, Ravinder Kumar, Ammar H Elsheikh, Dheerendra Vikram Singh, S Shanmugan, Hitesh Panchal, Ali Jawad Alrubaie, Mustafa Musa Jaber, 2022 (sagepub.com)</u>
CFD Analysis of Ejector Using Different Refrigerants: R141b, R152a, R134a	Dr. Dheerendra Vikram Singh	Mechanical Engineering Department	Journal of Emerging Technologies and Innovative Research	2022-2023	2349-5162	<u>CFD Analysis of Ejector Using Different Refrigerants: R141b, R152a, R134a (jetir.org)</u>
Physical, mechanical and sliding wear behaviour of epoxy composites filled with micro-sized marble dust composites	Dr. Vivek Mishra	Mechanical Engineering Department	Materials Today: Proceedings	2022-2023	2214-7853	<u>Physical, mechanical and sliding wear behaviour of epoxy composites filled with micro-sized marble dust composites - ScienceDirect</u>
Modeling and Analysis of Differential Gear Box using Ansys	Mr. Shantanu Roy	Mechanical Engineering Department	IJFMR	2022-2023	2582-2160	<u>2195.pdf (ijfmr.com)</u>
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CFD Analysis of Ejector Using Different Refrigerants: R141b, R152a, R134a	Mr.Lokesh Aurangabad kar	Mechanical Engineering Department	Journal of Emerging Technologies and Innovative Research	2022-2023	2349-5162	CFD Analysis of Ejector Using Different Refrigerants: R141b, R152a, R134a (jetir.org)
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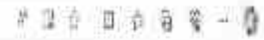


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Comparative Analysis of Green Building Rating Systems for Residential House: Case Study	Ms.Poonam Bagora	Civil Engineering	ECS Transactions - Scopus Indexed	2022	107 7091,D OI10.1149/10701.7091 ECST	https://iopscience.iop.org/article/10.1149/10701.7091ecst
Study of Partial Replacement of Cement using Cow Dung Ash and Marble dust Combination and sand using glass powder for M-25 Gdare of Concrete	Ms. Shanu Sharma	Civil Engineering	IJRASET	2022	2321-9653	Study of Partial Replacement of Cement Using Cow Dung Ash and Marble Dust Combination and Sand Using Glass Powder for M25 Grade of Concrete (ijraset.com)
The Path of rural industry revitalization based on improved genetic algorithm in the internet era	Qifang Duan, Dheeraj Rane	CSE	Computational Intelligence and neuroscience	2022	Article ID 163224	https://doi.org/10.1155/2022/163224
Next geeneration optimization models and algorithms in cloud and fog computing vertulization security: the present state and future	Rohit verma, Dheeraj Rane, Ravi shankar jha	CSE	Scientific programming	2022	Article ID 2419291	https://doi.org/10.1155/2022/2419291



An efficient design and demonstration of fault-effects in full-adder circuits based on quantum-dot computing circuits.

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Abstract

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An efficient design and demonstration of fault-effects in full-adder circuits based on quantum-dot computing circuits

Dr. Priya, Dr. Anshu Singh, Dr. Shikha Singh, Dr. Anshu Singh, Dr. Shikha Singh, Dr. Anshu Singh, Dr. Shikha Singh

- 1 Department of Electronics and Communication Engineering, Indore Institute of Science and Technology, Indore, India
2 Indore Institute of Science and Technology, Indore, India
3 Jangam College of Engineering, Jagpur, Madhya Pradesh, India
4 Indore Institute of Science and Technology, Indore, India

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An efficient design and implementation of a reversible logic CCNOT (Toffoli) gate in QCA for nanotechnology

Naveen Patidar^a, Suresh Kumar Shukla^b, Vikas Tiwari^c, Gajendra Kumar Prasad^d, Manoj Yadav^e

^a Department of Electronics and Communication Engineering, Indira Institute of Science and Technology, Indore, India

^b Department of Computer Science & Engineering, Indian Institute of Technology Indore, Indore, India

^c Department of Electrical and Electronic Engineering, O.P.J.S. University, Jabalpur, India

^d Department of Electronics and Communication Engineering, Sardar Vallabhbhai Institute of Technological Studies, Vadgaon, Indore, India

^e Department of Electronics and Communication Engineering, The Gujarat Institute of Technology and Management, Indore, India

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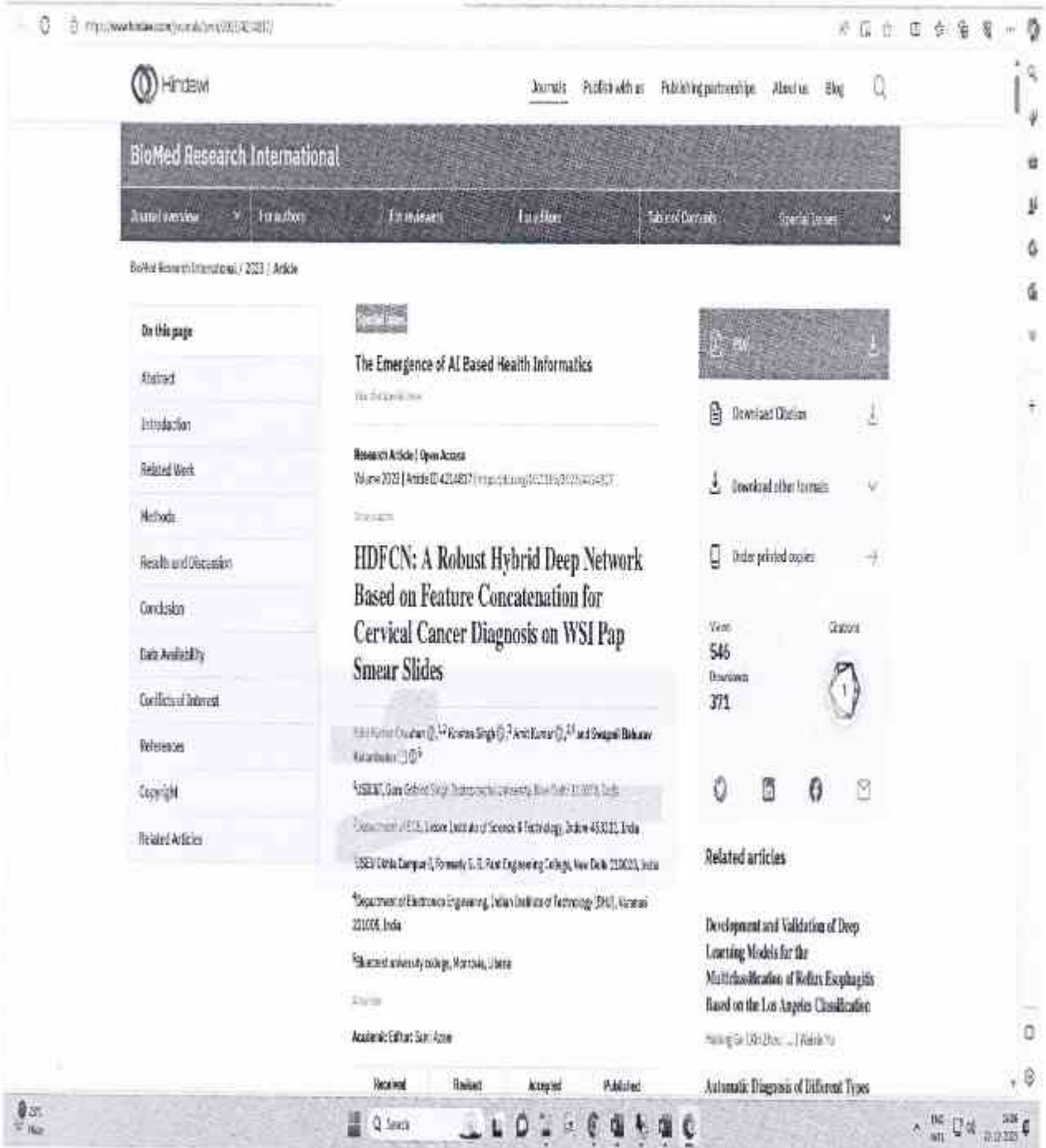
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HDFCN: A Robust Hybrid Deep Network Based on Feature Concatenation for Cervical Cancer Diagnosis on WSI Pap Smear Slides



The screenshot shows the article page on the Hindawi website. The article title is "HDFCN: A Robust Hybrid Deep Network Based on Feature Concatenation for Cervical Cancer Diagnosis on WSI Pap Smear Slides". The authors listed are Rishi Kumar Chauran, Anurag Kumar Singh, Anil Kumar, and Swagati Bhanuwar. The article is published in "BioMed Research International" in 2023. The page includes a table of contents on the left, a main article section with abstract and introduction, and a right sidebar with download options and related articles. The bottom of the page features a navigation bar with "Received", "Revised", "Accepted", and "Published" tabs, and a search bar.



HDFCN: A Robust Hybrid Deep Network Based on Feature Concatenation for Cervical Cancer Diagnosis on WSI Pap Smear Slides

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HDFCN: A Robust Hybrid Deep Network Based on Feature Concatenation for Cervical Cancer Diagnosis on WSI Pap Smear Slides

Nikhil Kumar Chaudhary^{1,2}, Anshu Singh³, Anil Kumar⁴ and Sangeeta Balaram Kolambakar^{5,6*}

¹RUSSET, Guru Gobind Singh Indraprastha University, New Delhi 110070, India

²Department of ECE, Indore Institute of Science & Technology, Indore 462015, India

³ISEI Bhopal Campus, Tatyasaheb G. S. Pant Engineering College, New Delhi 110022, India

⁴Department of Electronics Engineering, Indira Institute of Technology (IITM), Varanasi 221005, India

⁵Government Engineering College, Meerut, India

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The screenshot shows the journal article page for "Effective design of combinational half-adder and subtractor circuits design based on nanoelectronics using QCA technology." The page is from the "Journal of Data Acquisition and Processing" (JDAP), Volume 8, Issue 2, 2020. The article is authored by Dr. Jyoti Chavhan and Dr. Manoj Kumar. The abstract describes the design and verification of a combinational half-adder and subtractor circuit using Quantum Cellular Automata (QCA) technology. The design is implemented using QCA Designer software and verified using the truth table. The results show that the proposed design is more efficient than conventional designs. The article is available for free download.

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Abstract

Quantum Cellular Automata (QCA) is a novel and powerful technology for implementing computing architectures on the nano-scale. The main objective of this work is to design and verify a combinational half-adder and subtractor circuit using QCA technology. The design is implemented using QCA Designer software and verified using the truth table. The results show that the proposed design is more efficient than conventional designs.

Keywords: Quantum Cellular Automata, Nanoelectronics, Half Adder, Subtractor.

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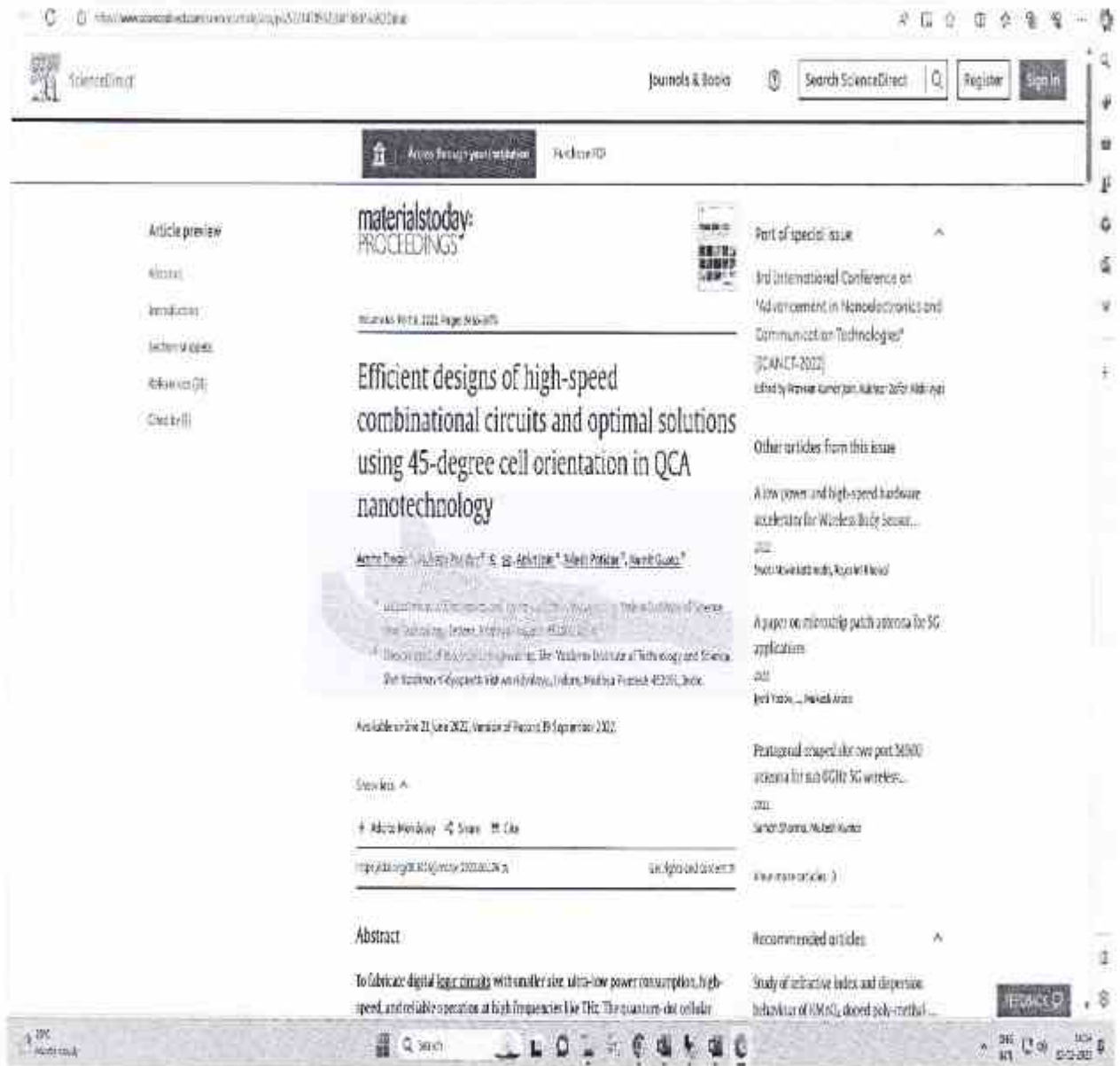


An ultra-area efficient ALU design in QCA technology using synchronized clock zone scheme.

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Efficient designs of high-speed combinational circuits and optimal solutions using 45-degree cell orientation in QCA nanotechnology.



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Efficient designs of high-speed combinational circuits and optimal solutions using 45-degree cell orientation in QCA nanotechnology
 Anura Deyan, Anshu Prakash, S. G. Sankaranarayanan, Manish Prakash, Samir Ghosh*
 *Department of Computer Science and Engineering, The Institute of Science and Technology, Indore, Madhya Pradesh 473005, India
 Department of Information Technology, The Western Institute of Technology and Science, Wai, Maharashtra 422004, India
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Abstract
 To fabricate digital logic circuits with smaller size, ultra-low power consumption, high-speed, and reliable operation at high frequencies like THz, the quantum-dot cellular

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Efficient designs of high-speed combinational circuits and optimal solutions using 45-degree cell orientation in QCA nanotechnology.

The screenshot shows the ScienceDirect website interface. At the top, there are navigation links for 'Journals & Books', a search bar, and 'Register'/'Sign In' buttons. The main content area features the article title, authors (Arshad Taseer, Mahesh Prasad, et al.), and a brief abstract. The abstract states: 'To minimize digital logic density with smaller size, ultra-low power consumption, high-speed, and reliable operation at high frequencies like THz. The quantum-dot cellular automata (QCA) is a promising nanotechnology for designing high-speed combinational circuits. In this paper, we propose a novel design of high-speed combinational circuits using 45-degree cell orientation in QCA nanotechnology. The proposed design is compared with the existing design and it is found that the proposed design is more efficient than the existing design. The proposed design is implemented using QCA and the results are compared with the existing design. The proposed design is found to be more efficient than the existing design. The proposed design is implemented using QCA and the results are compared with the existing design. The proposed design is found to be more efficient than the existing design.' The page also includes a sidebar with 'Port of special issue' information and 'Other articles from this issue'.



Efficient designs of high-speed combinational circuits and optimal solutions using 45-degree cell orientation in QCA nanotechnology.

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An energy efficient high-speed quantum-dot based full adder design and parity gate for nano application.

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Optimization of Smart Antenna Performance Using GA and PSO

Shravan Kumar Nandoo¹, Ankil Jain², Devendra Singh Mandloi³

¹Assistant Professor, Department of Electronics and Communication, IIST Indore, Madhya Pradesh, India

²Assistant Professor, Department of Electronics and Communication, IIST Indore, Madhya Pradesh, India

³Assistant Professor, Department of Electronics and Communication, IIST Indore, Madhya Pradesh, India

ABSTRACT: The smart antennas are antenna arrays with smart signal processing algorithms used to identify spatial signal signature such as the direction of arrival (DOA) of the signal, and one of the most important processes is beam forming. In the most important function in beam forming is changing beam pattern of antenna for a particular angle with minimize side lobe level. Particle Swarm Optimization algorithm is use for the beam forming. In the particle Swarm Optimization algorithm, a set of position and velocity for angles and amplitudes of antenna currents has been generated to optimized solution in desired direction. By using this method, the side lobe interference will be reduced. The implementation result shows that the system a good performance.

KEYWORDS: Smart antenna, PSO, Phase angle, DOA, etc

I. INTRODUCTION

The advent of technology and recent developments in communication, wireless communication has reached to new level. Recent updates in wireless communication were not possible without application of smart antennas. Use of smart antennas is one of the vital characteristic that has led to third and fourth generation standard developments. However, smart antenna theory is always driven by the Antenna array and so do the wireless communication. With antenna pattern synthesis there comes speed and robustness to the existing system thereby improvising transmission



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Optimization of Smart Antenna Performance Using GA and PSO

Shravan Kumar Namdeo¹, Ankit Jain², Devendra Singh Mandloi³

Assistant Professor, Department of Electronics and Communication, IIST Indore, Madhya Pradesh, India¹

Assistant Professor, Department of Electronics and Communication, IIST Indore, Madhya Pradesh, India²

Assistant Professor, Department of Electronics and Communication, IIST Indore, Madhya Pradesh, India³

ABSTRACT: The smart antennas are antenna arrays with smart signal processing algorithms used to identify spatial signal signature such as the direction of arrival (DOA) of the signal, and one of the most important processes is beam forming. In the most important function in beam forming is changing beam pattern of antenna for a particular angle with minimize side lobe level. Particle Swarm Optimization algorithm is use for the beam forming. In the particle Swarms Optimization algorithm, a set of position and velocity for angles and amplitudes of antenna currents has been generated to optimized solution in desired direction. By using this method the side lobe interference will be reduced. The implementation result shows that the system a good performance.

KEYWORDS: Smart antenna, PSO, Phase angle, DOA, etc

I. INTRODUCTION

The advent of technology and recent developments in communication, wireless communication has reached to new level. Recent updates in wireless communication were not possible without application of smart antennas. Use of smart antennas is one of the vital characteristic that has led to third and fourth generation standard developments. However, smart antenna theory is always driven by the Antenna array and so do the wireless communication. With antenna pattern synthesis there comes speed and robustness to the existing system thereby improvising transmission



Optimization of Smart Antenna Performance using GA and PSO

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Optimization of Smart Antenna Performance Using GA and PSO

Sirwan Kumar Nandoo¹, Ankit Jain², Devendra Singh Mandloi³

Assistant Professor, Department of Electronics and Communication, IST Indore, Madhya Pradesh, India¹

Assistant Professor, Department of Electronics and Communication, IST Indore, Madhya Pradesh, India²

Assistant Professor, Department of Electronics and Communication, IST Indore, Madhya Pradesh, India³

ABSTRACT: The smart antennas are antenna arrays with smart signal processing algorithms used to identify spatial signal signature such as the direction of arrival (DOA) of the signal, and one of the most important processes is beam forming. In the most important function in beam forming is changing beam pattern of antenna for a particular angle with minimize side lobe level. Particle Swarm Optimization algorithm is use for the beam forming. In the particle Swarm Optimization algorithm, a set of position and velocity for angles and amplitudes of antenna currents has been generated to optimized solution in desired direction. By using this method, the side lobe interference will be reduced. The implementation result shows that the system a good performance.

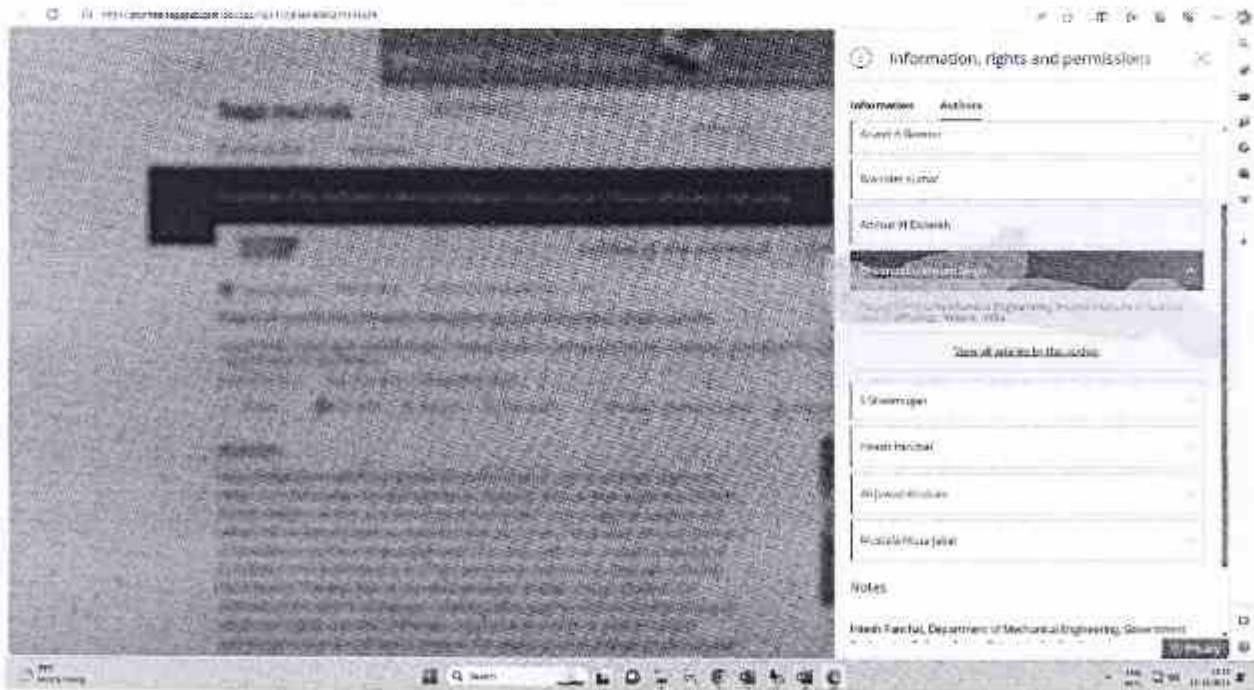
KEYWORDS: Smart antenna, PSO, Phase angle, DOA, etc

I. INTRODUCTION

The advent of technology and recent developments in communication, wireless communication has reached to new level. Recent updates in wireless communication were not possible without application of smart antennas. Use of smart antennas is one of the vital characteristic that has led in third and fourth generation standard developments. However, smart antenna theory is always driven by the Antenna array and so do the wireless communication. With antenna pattern synthesis there comes speed and robustness to the existing system thereby improvising transmission




Engine oil quality deterioration estimation using an integrated sensory system.



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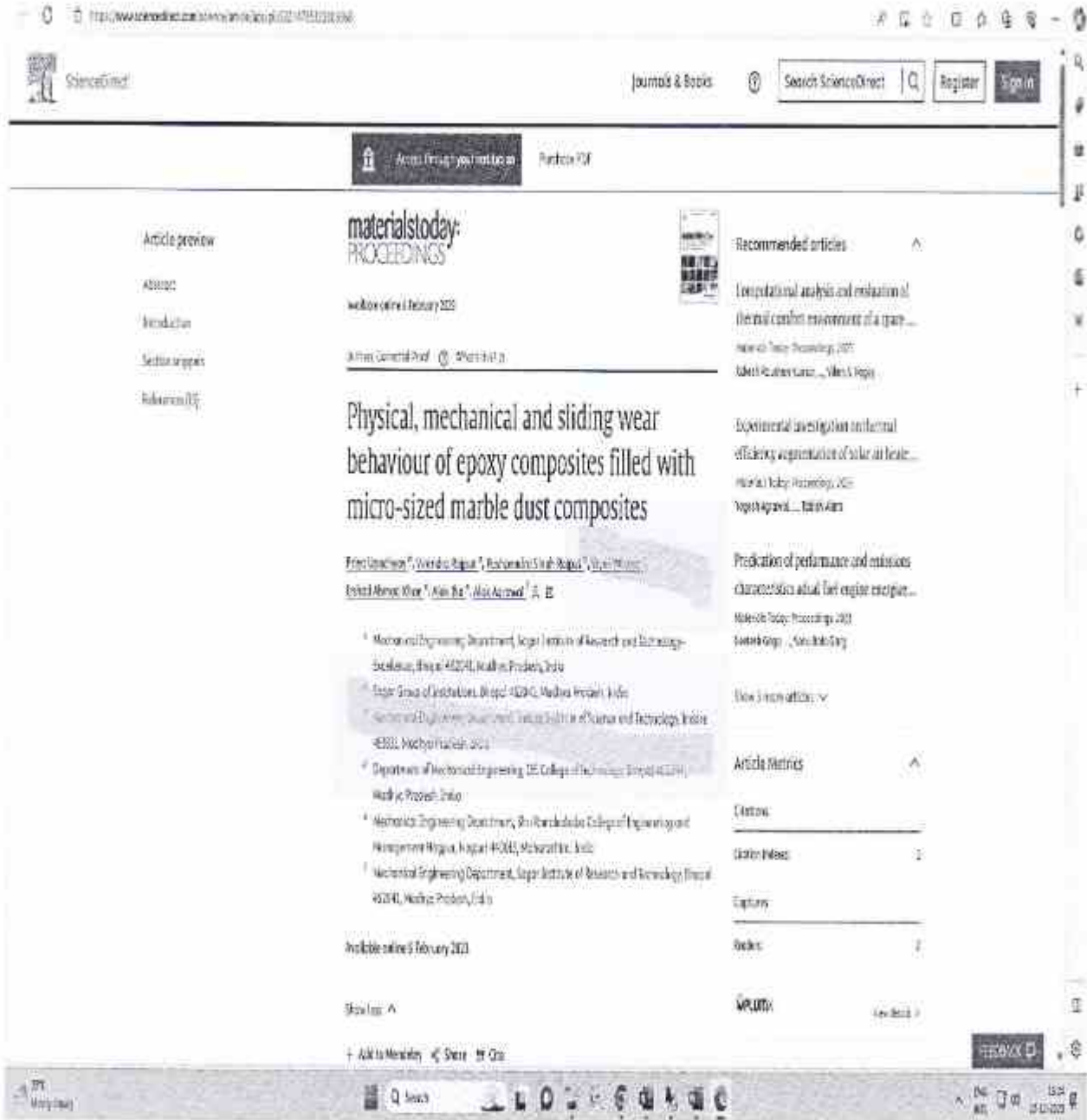
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Physical, mechanical and sliding wear behaviour of epoxy composites filled with micro-sized marble dust composites
 Pratik Ghoshal^a, Venkatesh Rajput^a, Rajeshwari Singh Rajput^a, Vikas Mittal^b,
 Ishita Anand Khosla^c, Anshika^d, Manoj Kumar^e, A. B.

^a Mechanical Engineering Department, Super Institute of Research and Technology, Secular, Bhopal-462041, Madhya Pradesh, India
^b Super Group of Institutions, Bhopal-462041, Madhya Pradesh, India
^c Mechanical Engineering Department, Indore Institute of Science and Technology, Indore-462031, Madhya Pradesh, India
^d Department of Mechanical Engineering, DE College of Technology, Bhopal-462041, Madhya Pradesh, India
^e Mechanical Engineering Department, Shaheed Bheem College of Engineering and Management, Bhopal-462041, Madhya Pradesh, India
^f Mechanical Engineering Department, Super Institute of Research and Technology, Bhopal-462041, Madhya Pradesh, India

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Modeling and analysis of Differential gear box using Ansys

Gufran Ansari¹, Mr. Shantanu Roy²

¹Student, Indore Institute of Science & Technology, Indore

²Guide, Indore Institute of Science & Technology, Indore

Abstract

The differential is a component of the rear axles, along with the wheels, bearings, and the inner axle housing assembly. Transmission gears in the differential link the rear wheels to the engine, which in turn powers the propeller. When turning, a car's differential gear arrangement creates a speed difference between the left and right driving axles. Outside wheels have further to travel in a turn than inside wheels. To provide this torque variation, a differential gear system constructed from a variety of materials using a refined 3-D model of the gear system is an option. Additionally, it transmits the power from the propeller shaft to each wheel hub. It takes a differential gear system at each wheel hub for an all-wheel drive system, whereas a rear-wheel drive system only needs one at the back.

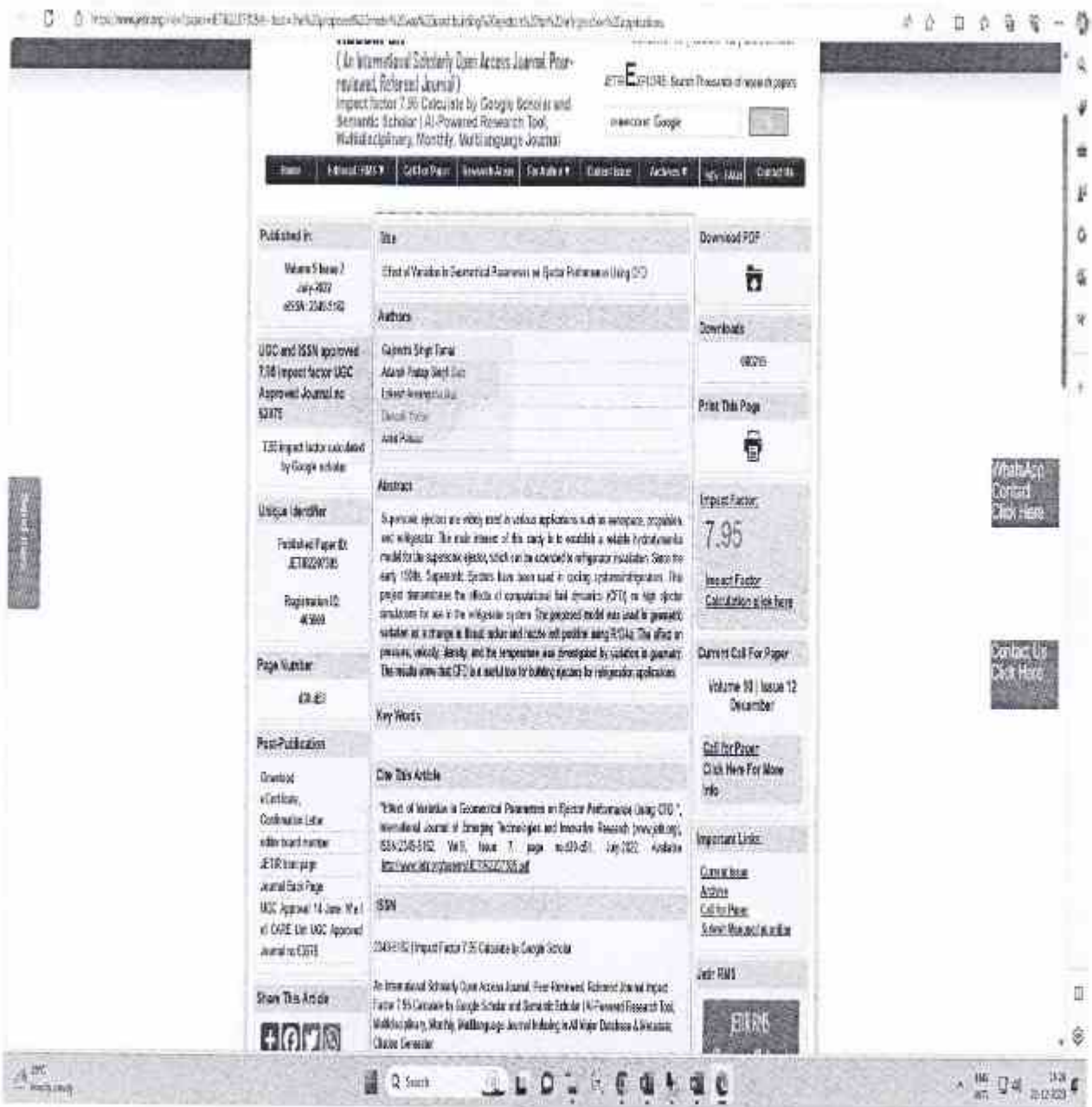
INTRODUCTION

Gears are an integral part of nearly every mechanical device. Gears are a fundamental component of machinery, just as springs, nuts, and bolts. Gears have come a long way from their first uses, both in terms of materials and design. Aristotle, writing in the fourth century B.C., discovered the reversible rotation of gears and the transmission of motion from one wheel to another. Then, gears found their way into water wheels, clocks, and other devices. After that point, nothing changed for quite some time, until the 17th century, when the need for conjugate profiles began to increase. The significance of involute profiles emerged as a result. The modern form of these curves as used in gear toothing was developed, however, by Professor Robert Willis of Cambridge University. Hobbing equipment, including hob cutters, made its debut. Numerous advancements followed, and we're now in the present day.

Simply put, a gear is any component with teeth whose purpose is to transmit or receive motion via a mesh of successively engaged teeth. Because of its positive nature, the gear drive is superior to friction drives such as friction drums and belts. Gears can be found in a wide variety of vehicles and machines including cars, tractors, rolling mills, naval engines, forklifts, and metal-cutting machine tools. They're simple to operate, take up little space, consistently deliver on their promises, and are incredibly efficient. However, specialised equipment and materials are required to make them. Tooth milling flaws might also create operational vibration and noise. Gears on parallel shafts and gears on shafts with axes crossing at right



Effect of Variation in Geometrical Parameters on Ejector Performance Using CFD



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Abstract:
 Supersonic ejectors are widely used in various applications such as aerospace propulsion and refrigeration. The main objective of this study is to establish a reliable hydrodynamic model for the supersonic ejector, which can be used for refrigeration modulation. Since the early 1980s, Supersonic Ejectors have been used in cooling applications. This project determines the effects of computational fluid dynamics (CFD) on high ejector conditions for use in the hydrodynamic system. The proposed model was used to generate ejector jet in change in throat radius and nozzle exit position using RANS. The effect on pressure, velocity, density, and the temperature was investigated by variation in geometry. The results presented in CFD is a useful tool for building systems for refrigeration applications.

Key Words:
 CFD, Ejector, Supersonic, Refrigeration, Hydrodynamic

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Structural And Thermal Analysis of Steam Turbine Casing Using Ansys



STRUCTURAL AND THERMAL ANALYSIS OF STEAM TURBINE CASING USING ANSYS

Mayar Malanpure¹, Nitesh Khatarke², Aditya Yadav³, Ayush Suryawanshi⁴, Lokesh Aurangabadkar⁵^{1,2,3,4}Student, Mechanical Engineering, Indore Institute of Science & Technology⁵Assistant Professor, Mechanical Engineering, Indore Institute of Science & Technology

Abstract— Steam turbine is an excellent prime mover to convert heat energy of steam to mechanical energy. In power generation mostly steam turbine is used because of its greater thermal efficiency and higher power-to-weight ratio. Because the turbine generates rotary motion, it is particularly suited to be used to drive an electrical generator – about 80% of all electricity generation in the world is by use of steam turbines. In addition, the realization of critical turbine components need improved design and materials, which offer all possibilities for a cost effective and flexible service. High thermal stress gradients were found at the region of casing where fatigue cracks were detected during engine operation. In this work the thermal mechanical analysis of steam turbine casing will be established by finite element method. In this work the temperature and stress distributions for turbine inner casing were calculated by finite element analysis. The three-dimensional model of the Steam Turbine Casing was created using the SOLIDWORKS software. Boundary conditions were given on the finite element model through ANSYS.

Index Terms— 3D CAD model, Ansys Analysis, Comparing Results, Designs

1 INTRODUCTION

The steam energy is converted mechanical work by expansion through the turbine. The expansion takes place through a series of fixed blades (nozzles) and moving blades each row of fixed blades and moving blades is called a stage. The moving blades rotate on the central turbine rotor and the fixed blades are concentrically arranged within the circular turbine casing which is substantially designed to withstand the steam pressure.

- To analyse steam turbine casing geometry using Ansys for different materials.
- To obtain the various contour in the form of temperature, pressure, velocity and heat flux.
- To Observe the effect of turbine Material on the performance of system.
- Result comparison for both materials

stresses and the moving blades must be fitted to the rotor securely to withstand the high centrifugal forces. Where the shaft of the rotor passes through the ends of the casing, a seal is required to prevent steam leakage. Also, within the casing, seals are required to prevent steam from leaking around the blades rather than passing through them. Turbine seals are of the labyrinth type where there is no mechanical contact between the fixed and rotating parts. Leakage is thus not really eliminated but merely controlled to minimal amounts. The shafts of the rotors are carried on bearings and are linked together and to the electrical generator. Bearings must be properly aligned to accommodate the natural gravitational bending of the shaft. Allowance must also be made for differential expansion between the rotors and the casings during thermal transients.

2 Methodology

Steam turbines consist essentially of a casing to which stationary

Initially, we have gone through the literature and read some articles



CFD Analysis of Ejector Using Different Refrigerants: R141b, R152a, R134a

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Key Words: [Blank]

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Obstacle Detection in Self-Controlled Cars

Shivangi Patidar¹, Shivam Patel², Shubham Dwivedi³, Vikas Ojha⁴, Sarvesh Chandra Dubey⁵
^{1,2,3,4,5}UG Student, Assistant Professor, Department of Mechanical Engineering, IST, Indore, India

Abstract: An autonomous car is a vehicle that can guide itself without human command and control. It is also known as a driverless car, self-driving car, unmanned vehicle, or robot car. Autonomous vehicles can perceive their surroundings (obstacles and track) and commute to their destination with the help of a combination of sensors, cameras, and radars. There is a basic need for a system that can detect obstacles and move in a pre-computed path, a system that can detect the obstacles that appear suddenly which may cause accidents.

Therefore, the automatic obstacle avoidance vehicle is designed for obstacle detection and collision avoidance. The ultrasonic sensor is tuned to enable the real-time obstacle avoidance system for wheeled robots, allowing the robot to continuously sense its environment, avoid obstacles and move to its target area. The design requires an ultrasonic sensor (HC-SR04) to detect the obstacle and determine its distance.

This sensor module is placed on the front of the vehicle and mounted on a servo motor rotating in the direction of the sensor. The system includes a motor driving module and four dc wheel motors which are used to move the vehicle forward, reverse, left, right, and stop. The Arduino Uno microcontroller is mainly used to control the vehicle and achieve the desired detection and prevention.

Keywords: Arduino Uno, ultrasonic sensor, DC motor, servo motor, motor driver module

I. INTRODUCTION

With the development of automation technology, automation begins to develop from simple system control to complex system control and advanced intelligent control, and that too in various fields.

An intelligent car is based on the automobile as the background, including automatic control, sensor technology, computer, machinery, and other disciplines of design.

An intelligent car integrates a complex integrated system, which can realize environment perception, self-planning, and self-decision functions. It can make full use of computers, sensors, information, communication, artificial intelligence, automatic control technology, and high-tech complex technology.

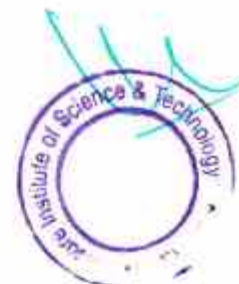
As demand for autonomous projects increases, the use of the sensor increases. The sensor is a complex device that converts physical parameters (e.g. temperature, pressure, humidity, speed, etc.) to a signal that can be electrically measured. They are very important to robots. It offers robot remote access and decisions about the desired environment.

The project is designed to build an obstacle avoidance robotic vehicle using ultrasonic sensors that will move according to the code assigned and will a free space, navigating from any obstacle on its way.

The so-called obstacle avoidance system is made to use the advanced range finding device in front of the autonomous car. When the car faces an obstacle, it can locate and respond to the location sensor and enter the Arduino through the data transmission starting the core processing.

Ultrasonic sensors are known for their reliability and great versatility in the industry. Ultrasonic sensors can be used to solve the most difficult tasks involving object detection or level measurement with millimeter accuracy because the measuring method works reliably in almost all conditions.

In this project, a robotic vehicle that moves in different directions like forward, backward, left, and right are designed and built to avoid the obstacle when it senses the sensor unit that the object is detected.





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Design and Analysis of Component of Hydraulic Gripper



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Life cycle assessment (LCA) of lead, chromium, and cadmium removal from water through electrocoagulation

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Life Cycle Assessment (LCA) of the lead, chromium, and cadmium removal from water through electrocoagulation

 Vikas Choudhary^a, Hemant Goyal^b, Anil Kumar Varma^c, Ravi Shankar^d, Sankar Chakma^e, Pankaj Malviya^f, Lokendra Singh Thakur^{g,*}
^a Department of Chemical Engineering, Ujjain Engineering College Ujjain, Madhya Pradesh, India

^b Department of Chemical Engineering, Indian Institute of Technology Rohtak, Haryana, India

^c Department of Chemical Engineering, Assam Engineering Institute (A centre of RGVP), Jala, Assam, Shillong 785697, Assam, India

^d Department of Chemical Engineering, Madan Mohan Malviya University of Technology, Greater Noida 201310, Uttar Pradesh, India

^e Department of Chemical Engineering, Indian Institute of Science Education and Research Bhopal, Bhopal, Madhya Pradesh, India

^f Department of Chemical Engineering, Indore Institute of Science and Technology Indore 451332, Madhya Pradesh, India

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ABSTRACT

Presence of lead, chromium, and cadmium metals in drinking water poses serious health risks to living beings around the world. Hence, the simultaneous treatment of these pollutants from water using electrocoagulation (EC) technology is a promising development. The current study is focus to evaluate the environmental impact of EC and its sludge management by conducting Life Cycle Assessment using Gabi software. The electricity consumption in EC-reactor (Global warming potential, GWP: -46% and Acidification potential, AP: -41%) and sludging of leach (GWP: -35% and AP: -31%) are found major contributor to total environmental impacts. The total GWP and AP are found to be 62.8 Kg CO₂-eq. and 0.0966 kg SO₂-eq.

1. Introduction

Due to the variety of contemporary human-made and natural activities, including rapid industrialization, the amount of heavy metals in water is rising frequently [1]. Drinking water tainted with heavy metals can seriously harm a person's health. The wastewater contains heavy metals such as chromium, cadmium, lead, arsenic, silver, selenium, nickel, cobalt, and mercury etc. Long-lasting environmental contaminants like lead, chromium, and cadmium are typically released by the battery, pesticide, metal plating, fertilizer, electroplating, leather, tanning, and glass industries [2]. One of the most hazardous metals in the environment is recognized to be lead [3]. The occurrence of lead in drinking water contributes to a number of illnesses that affect the nerve, brain, and renal systems [4]. Chromium is required in small amounts for the tissue of the liver, kidneys, and nerves [5]. However, excessive chromium consumption raises the risk of lung cancer and causes skin allergies [6]. Cadmium has been found to be the most frequently occurring pollutant in the industrial wastewater [7]. Testicular

shrinkage, renal disturbances, and hypertension are all major cadmium-related health problems [8]. According to WHO and IS the acceptable guideline value of lead, cadmium and chromium in drinking water are 0.01, 0.003 and 0.05 mg/L, respectively [9,10].

Numerous techniques have been proposed and explored to remove hazardous heavy metals from water bodies. Whereas, this has been accomplished with the use of coagulation, solvent extraction, chemical precipitation, ion exchange, evaporation, filtration, and membrane techniques [2,11-13]. However, each of these methods has its own benefits and drawbacks. Adsorbent must be pretreated, and the procedure takes a long time. High amounts of sludge are produced through precipitation, coagulation, and chemical treatment, which cause environmental problems. When compared to the methods stated above, the electrocoagulation (EC) procedure is shown to be the most effective for removing the heavy metals. No additional chemicals are required since the in-situ coagulant produced during the EC process is efficient for heavy metal removal [14]. Thakur et al., 2023 successfully removed the lead (initial con.: 18 mg/L), chromium (initial con.: 451 mg/L) and

Abbreviations: ADP (R), Abiotic Depletion Elements; ADP (F), Abiotic Depletion Fossil; AP, Acidification Potential; EP, Eutrophication Potential; FAETP, Freshwater Aquatic Toxicity Potential; GWP, Global Warming Potential; HHPA, Human Health Particulate Air; HTP, Human Toxicity Potential; HT (C), Human Toxicity; cancer; HT (NC), Human Toxicity, non-cancer; ODP, Ozone Layer Depletion Potential; POP, Photochem Ozone Creation Potential; Res.F.F, Resouces, Fossil fuels.

* Corresponding author.

E-mail address: lokendraist@ccitindia.com (L.S. Thakur).



Engineering Matrix Materials for Composites: Their Variety, Scope and Applications.

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Engineering Matrix Materials for Composites: Their Variety, Scope and Applications

G. S. Mahajan
Defence Research & Development Organisation (DRDO), Aerials House DRDO/DRS/DRDC Complex, Gurgaon-110054, India
gsmahajan@drdo.org

N. George
Nanoscience and Nanotechnology Laboratory, School of Physics, Devi Ahilya University, Chandigarh Road, Indore-452017, India

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Keywords: Metal matrix composite (MMC), matrix, flexible matrix, carbon-carbon, ceramic matrix

Abstract

Matrixes are essentially binders for the reinforcements of composite material. Appropriate selection of the chemical is vital for the creation of desired matrixes for generating composite materials. In fact, matrix is a subunit of a composite material. Matrixes are generally of four kinds such as (i) polymer based as well as flexible, (ii) metal, (iii) ceramic, and (iv) cement. Each type of these subunit of the matrix is discussed with a brief of their pros and cons. Polymer matrixes are generally organic based whereas metal or ceramic matrixes are inorganic in nature. Hard plastic matrix as well as flexible rubbery matrix are also discussed in the light of their applications. Carbon as matrix material for hi-tech (C/C) (carbon/carbon) composite material is also stated. Cement is a special kind of inorganic matrix material because of its very special solidification mechanism during the formation of concrete composite and it carries bulk values in the engineering area. For higher temperature, carbon, ceramic or metal matrix materials are useful. Ceramics possess various conductivities, but they have poor tensile strength despite their ability to afford high-temperature products. Generally lightweight metals such as titanium, aluminum, magnesium, and intermetallics such as Melalimide and Thialimide are used and the operating temperature can be extended to 2000 °C. The advantages of metal matrixes are higher strength and

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Comparative Analysis of Green Building Rating Systems for Residential House: A Case Study

Rina Sachdev¹ and Poojam Toppo²

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Abstract

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The Path of rural industry revitalization based on improved genetic algorithm in the internet era

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