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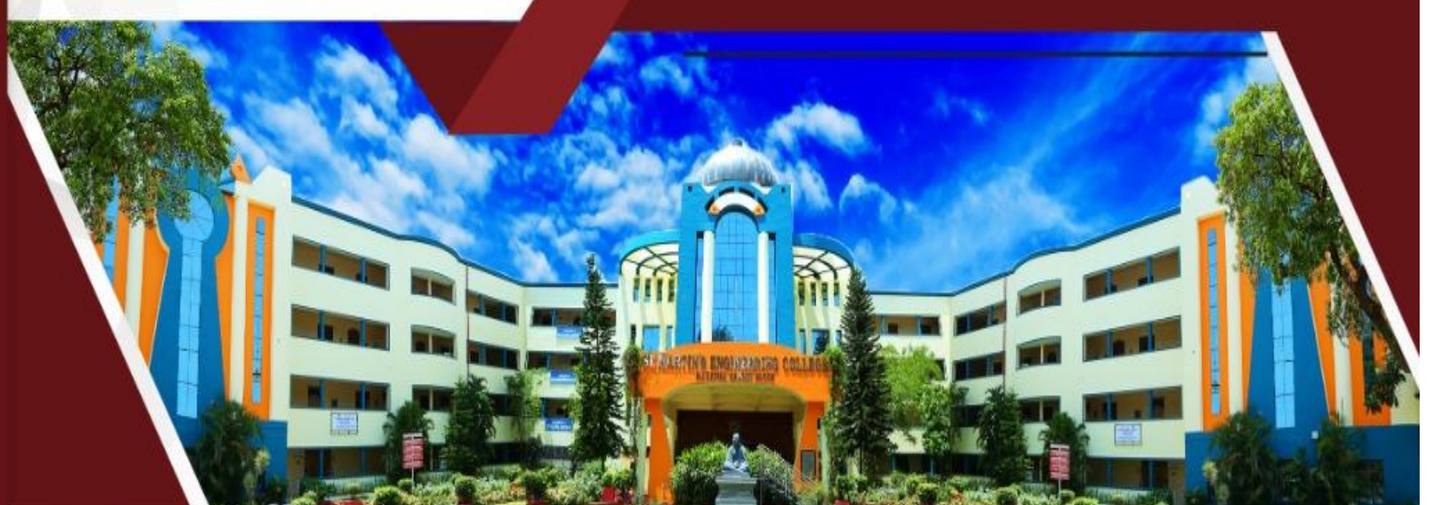
Department of ***Mechanical Engineering*** Presents

Online International Conference on

"Robotics and Intelligent Manufacturing"

(ICRIM-2021) *on 16th & 17th July, 2021*



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Department of Mechanical Engineering

Online international Conference on "Robotics and Intelligent Manufacturing" On 16th & 17th July, 2021 (ICRIM 2021)

Patron, Program Chair
&
Editor in Chief
Dr. P. SANTOSH KUMAR PATRA
Principal, SMEC

Editor
Dr. D. V. SREEKANTH
Professor & Head, Dept. of MECH, SMEC

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ISBN: 978-81-952678-0-4

Sri M. LAXMAN REDDY

CHAIRMAN

MESSAGE

I am extremely pleased to know that the Department of Mechanical Engineering of St. Martin's Engineering College is organizing Online International Conference on **"Robotics & Intelligent Manufacturing"** on 16th & 17th July 2021. I Understand that the large number of researchers has submitted their research papers for presentation in the conference and also for publication. The response to this conference from all over India and Foreign countries is most encouraging. I am sure all the participants will be benefitted by their interaction with their fellow researchers and engineers which will help for their research work and subsequently to the society at large.

I wish the conference meets its objective and confident that it will be a grand success.

M. Laxman Reddy

M. LAXMAN REDDY

Chairman

Sri G. CHANDRA SEKHAR YADAV

EXECUTIVE DIRECTOR

MESSAGE

I am pleased to state that the Department of Mechanical Engineering of St. Martin's Engineering College is organizing Online International Conference on **"Robotics & Intelligent Manufacturing"** on 16th & 17th July 2021. For strengthening the "MAKE IN INDIA" concept many innovations need to be translated into workable product. Concept to commissioning is a long route. The academicians can play a major role in bringing out new products through innovations.

I am delighted to know that there are large number of researchers have submitted the papers on Interdisciplinary streams. I wish all the best to the participants of the conference additional insight to their subjects of interest.

I wish the organizers of the conference to have great success.

G. CHANDRA SEKHAR YADAV

Executive Director

Dr P. SANTOSH KUMAR PATRA

PRINCIPAL

I am delighted to be the Patron & Program Chair for Online International Conference on **"Robotics & Intelligent Manufacturing"** on 16th & 17th July 2021. I have strong desire that the conference to unfold new domains of research among Robotics & Artificial Intelligence in Manufacturing and will boost the knowledge level of many participating budding scholars throughout the world by opening a plethora of future developments in the field of Mechanical Engineering.

The Conference aims to bring different ideologies under one roof and provide opportunities to exchange ideas, to establish research relations and to find many more global partners for future collaboration. About 130 research papers have been submitted to this conference, this itself is a great achievement and I wish the conference a grand success.

I appreciate the faculties, organizing committee, coordinators and Head of the Department of Mechanical Engineering for their continuous untiring contribution in making the conference reality.

Dr. P SANTOSH KUMAR PATRA

Principal

CONVENER

The world is always poised to move towards new and progressive engineering solutions that results in cleaner, safer and sustainable products for the use of mankind. India too is emerging as a big production center for world class quality. Mechanical Engineering play a vital role in this endeavor.

The aim of the "International Conference on **Robotics and Intelligent Manufacturing"** (ICRIM – 21) being conducted by the Department of Mechanical Engineering of SMEC, is to create a platform for academicians and researchers to exchange their innovative ideas and interact with researchers of the same field of interest. This will enable to accelerate the work to progress faster to achieve the individuals end goals, which will ultimately benefit the larger society of India.

We, the organizers of the conference are glad to note that more than 130 papers have been received for presentation during the online conference. After scrutiny by specialist 52 papers have been selected, and the authors have been informed to be there at the online platform for presentations. All the registered papers will be published in conference proceedings and all the selected papers will be published in UGC recognized reputed journals.

The editorial Committee and the organizers express their sincere thanks to all the authors who have shown interest and contributed their knowledge in the form of technical papers. We are delighted and happy to state that the conference is moving towards a grand success with the untiring effort of the faculties of Department of Mechanical Engineering of SMEC and with the blessing of the Principal and Management of SMEC.

Dr D V SREEKANTH
Professor & HOD
Department of Mechanical Engineering

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Paper ID: ICRIM072021C1

An Effective Framework for Brain Tumor Detection Using A Machine Learning Technique

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Abstract

Brain tumor detection plays a significant role in medical image processing. Treatment for patients with brain tumors is primarily dependent on faster detection of these tumors. More rapid detection of brain tumors will help in the improvement of the patient's life chances. Diagnosis of brain tumors by doctors most commonly follow manual segmentation, which is difficult and time- consuming; instead, automatic detection is necessary. Nowadays, automatic detection plays a vital role and can be a solution to detecting brain tumors with better performance. Brain tumor detection using the MRI images method is an essential diagnostic tool for predicting brain tumors; the implementation for these kinds of detection can be done using various machine learning algorithms and methodologies. It helps the doctors understand the actual progression of the evolving tumor, allowing the doctors to decide how the treatment has to be given for that particular patient and measures required to follow up. Therefore, the intention is to create a framework to detect brain tumors in MRI images using a machine learning algorithm and analyze the performance of the brain tumor detection using sensitivity and specificity, which helps us to analyze how well the algorithm has performed in detecting the brain tumors accurately and develop a mobile application framework in which we can directly scan the MRI images to know whether the cancer is present in a scanned MRI image or not.

Keywords: Image processing; Machine learning; Brain tumor; Convolutional Neural Networks; Confusion matrix; Mobile application

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Paper ID: ICRIM072021C2

Assessment Of Hole Expansion Ratio for Hot Rolled Micro Alloyed Steels

Sowmiya S
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Abstract

Hole expansion ratio is generally defined as the resistance provided by materials to fracture at edges of sheet during forming operation. The present work focuses on evaluation of hole expansion ratio (HER) of hot rolled micro alloyed steel sheets. In the present work we take E46, E34 and SAE1020 three steel sheets which undergoes hole expansion test to evaluate HER and also to understand the effect of microstructure and tensile properties on HER. The hole expansion ratio is a key factor which denotes the edge formability of steel sheets. HER can be obtained by testing the steel sheets using hole expansion test which follows ISO/TS 16630 standard. The hole expansion test was done using a punch which is either cylindrical or conical. The edge formability will be tested by punching the sheets until through thickness crack observed. The test was carried out in 250KN capacity shimadzu universal testing machine. From the HER obtained for three samples we found that E34 grade steel has higher formability compared to other two grades.

Keywords : Hole expansion ratio, micro alloyed steel, hole expansion test, edge formability

Paper ID: ICRIM072021C4

Parametric Study on Influence of Ply-Drop Off's on Buckling Behavior In Composites

Vijay Mohan Shetty[1], Uday Kumar Madduri[2], Balakrishna N[3]
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Abstract

This study emphasis on designing composite materials with ply drop offs subjected to combined effect of excessive stresses which lead to buckling and result in failure of laminated composites. Composites which are buckled due to stresses are evaluated by selecting the areas where the loads are varied with thickness variations in laminates as these plies are decisive because of design requirements. The main aim of this investigation is to find the effect of ply-drop i.e., the termination of plies at different extents on the buckling behavior of laminated composite plates is conceded because the stress concentration is more near the geometric discontinuities due to ply drop offs and further the stiffness of the plates is reduced. Hence the study of such laminates with ply drop offs is significant to investigate the buckling nature of such tapered plates and to reduce that complexity in understanding the behavior of drop off's a finite element analysis (FEA) is carried out using an analysis tool like Ansys workbench (Ansys composite pre post Tool) is used to design and analyze the effect of different parametric studies. After the study it is concluded that critical buckling loads of all laminate configuration schemes are significantly influenced by aspect ratio i.e., length to thickness ratio and with the increase in number of layers the buckling load also increases this is for the reason that as the no. of layers increases the interface between each layer increases and as a result high amount of load is required to obtain the critical buckling load.

Keywords: Composites, Ply drop off's, E Glass Epoxy, Staggering length, Ply orientation, Buckling, Critical load, Ansys.

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Paper ID: ICRIM072021C5

Face Recognition Based Smart Attendance Management System

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Abstract

Attendance is a tool to record the regularity of a student, teacher, and employee on a day to day basis. When students improve their attendance percentage, they improve their knowledge and improve their academics results. However, the manual attendance process is very time consuming and proxy. We need a system which may deal with the time, proxy attendance and basically a system which replaces the current manual attendance management system. A lot of time is spent on attendance time sheets. Hence, an effective replacement of manual attendance is required which will reduce the manpower and it also makes the attendance process faultless. Biometrics is certainly the most secure and good genuine form of credentials, it is very hard to imitate and proxy because biometrics are unique for everyone. Basically, what the biometric does is, it makes sure that a individual is present at that time, that is nothing but we cannot use proxy result. It will make the attendance system flawless. Face, Iris and fingerprint are the widely used biometrics for attendance Management system. It can used for security, authentication, identification, and has got many more advantages in many applications. Some of them use frontal faces, which is again a prolonged task, but none of them commented on developing an application layer for the end users. This project aims to design a robust face recognition based attendance system using deep learning. The purpose of this system is to build an attendance system which is based on faced recognition technique. The major steps in this project are face detection using Convolutional Neural Network (CNN), face recognition using FaceNet Model and design of android application for the end user. Face detection is done by employing facial feature extraction and mapping. This project aims to provide an attendance solution for schools, educational institutes and hospitals. The proposed method obtained a real time accuracy of (99.63%) which is better than that of the existing model.

Keywords: Face Recognition, Face Detection, Attendance system, Convolutional Neural Network (CNN), FaceNet, android application.

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Paper ID: ICRIM072021C7

Evaluation of Multi Performance Characteristics of Heat-Treated AA 6061 and 5154 Welded Joints Using Grey Relational Analysis

Vijay Mohan Shetty[1], Uday Kumar Madduri[2], Balakrishna Nellutla[3]
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Abstract

This present paper uses an approach for the optimizing the welding parameters on AA 6061and 5154 welded joints with multi responses based on orthogonal array with grey relational analysis. Experiments are conducted to improvise the outcome at joint interface of dissimilar welded joints with different ageing parameters and welding process parameters. In this appropriate heat treatment parameters like artificial ageing and solutionizing methods are considered with diverse temperatures – time conditioning with suitable current, voltage, inert gas and welding speed to observe the changes in behavior with the consideration of multi responses such as ultimate tensile strength and hardness. A grey relational grade (GRR) is achieved from the grey analysis. Depending upon the relational grade optimal levels of parameters have been found and considerable input of parameters is determined by analysis of variance (ANOVA). After the experimentation a confirmation test is conducted to validate the result. It is found that by means of an appropriate selection of age hardening parameters, it is possible to achieve an enhanced perceptive of fusion of TIG welded AA 6061 and AA 5154 aluminium alloy with required mechanical properties.

Keywords: Gas Tungsten Arc Welding, Aluminum AA 6061, AA 5154, dissimilar materials, Inert gas, heat treatments, ANOVA, ultimate tensile strength (UTS), Hardness, gray relational method.

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Paper ID: ICRIM072021C8

The Performance of Combustion Ignition Engine By Using Bio-Diesel From Animal Fat With Proportions

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Abstract

In the present generation diesel and petrol are rapidly increasing the cost and not able to relied and concerning its growing and availability. The demand of the goes on increase in the daily life and risk of the cause of the atmosphere pollution the global. The animal fat are using the emission and perform an evaluation of the internal combustion engine to add of alternative fuel like animal fat, neem oil, peanut oil, palm oil, vegetable oil, plastic oil are the using on the engine with the different proportion. The effect of biodiesel in the CI engine the alternative fuel are some problem in the engine the problem are solve by using high viscosity fuel is used to compare to agreement of diesel fuels. The biodiesel are receiving development to consideration each day related to fuel combustion of its same diesel. Now days fuel cost are growing on increase from stage to stage. To reduction the emission and improve the performance of the did work are improving to the parameter of the diesel engine. The current work on the paper are animal fat are biodiesel and additive are dimethyl carbonate working on the improve the emission and performance of the CI engine.

Keyword: CI Engine, Animal fat bio-diesel, dimethyl carbonate, thermal efficiency

Paper ID: ICRIM072021C10

Design and development of Grease interceptor

A. Ganga Sudershan Teja[1], Boora Srikanth[2], P Yasmin Banu[3], Perla Sumanth Kumar Reddy[4]
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Abstract

The aim of project was to design and fabricate i.e., to develop a grease interceptor. A grease interceptor is a plumbing device designed to intercept most greases and solids before they enter a wastewater disposal system. Grease interceptors are generally used to prevent clogging of pipelines with grease, fat and oils. They are also used to prevent large amount of grease accumulating in sewage systems. The separation of gasoline and oils from waste water is also accomplished by use of this fixture installed in the plumbing systems. A properly installed and maintained grease interceptor can prevent up to 99% of grease and oils from entering sewage systems. We mainly focus on making our product cost effective. We designed our project using solid works, maintaining all the dimensions as required to with stand high pressure and flow rate. We have fabricated prototype using Fiber- reinforced plastic (FRP) material. After testing and making changes as required, the final product has been manufactured using stainless steel Material.

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Paper ID: ICRIM072021C11

Design of Grease Interceptor

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Abstract

The aim of project was to design and fabricate i.e., to develop a grease interceptor. A grease interceptor is a plumbing device designed to intercept most greases and solids before they enter a wastewater disposal system. Grease interceptors are generally used to prevent clogging of pipelines with grease, fat and oils. They are also used to prevent large amount of grease accumulating in sewage systems. The separation of gasoline and oils from waste water is also accomplished by use of this fixture installed in the plumbing systems. A properly installed and maintained grease interceptor can prevent upto 99% of grease and oils from entering sewage systems. We mainly focus on making our product cost effective. We designed our project using solidworks, maintaining all the dimensions as required to with stand high pressure and flow rate. We have fabricated prototype using fibre- reinforced plastic (FRP) material. After testing and making changes as required, the final product has been manufactured using stainless

Keywords: FRP, fixture, plumbing systems

Paper ID: ICRIM072021C13

Development of Puncharless tyre

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Abstract

The objective of our project is to Develop a puncture-less and air-less tire, to over the most prevalent problems encountered due to traditional automobile tires. The trigger reason for the several complications in conventional tires, causing adverse effects is due to their dependence on 'air'. Thus, the main intent with this product development is to overcome few such constraints. Design development and Draft procedure are done in SolidWorks software, and Material-Refinement & Analysis of the tire are done in Ansys software. Tire is fabricated out of TPU (thermo-plastic polyurethane), using an Additive Manufacturing Technique namely FDM (fused deposition modelling) process. The tire holds hemispherical dome structure with multiple edges for spokes in it. Analytical Results showed that TPU material holds better properties with respect to the part and the technique, in addition to an Environmental benefit.

Keywords: FDM, TPU, tire, punctureless

Paper ID: ICRIM072021C14

Automatic drum Seeding

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Abstract

Direct seeding and transplanting are the two methods of planting rice. The traditional method followed by many years in lot of farming lands is transplanting of seeding raised in nursery. Transplanting method involves seedbed preparation, nursery growing, care of seeding in nursery, uprooting of seeding, hauling and transplanting operations. The preparation of seedbed and sowing are done 30 days before planting. The rice farmers practicing transplanting are facing problems like shortage of labour during peak time, hike in labour charges, small and fragmented land holdings etc. Direct seeding is becoming increasingly popular now days in India. The wet seeding of rice is generally followed in irrigated areas. For wet drum seeding the paddy seeds are soaked in water for 24 hours and incubated for 24-48 hours. These sprouted seeds are sown in puddle field 1-2 days after paddling using perforated drum seeder. Eight row paddy seeder is manually drawn low-cost equipment. Direct paddy drum seeder tested was manually drawn Rice cultivation in INDIA is predominantly practiced in transplanting method which involves raising, uprooting and transplanting of seedlings. This is rather a resource and cost intensive method. Since, preparation of seedbed, raising of seedling and transplanting are labour and time intensive operations. Research reports show that labour involvement in these operations consume nearly one third of the total cost of production in INDIA. In addition, transplanting is not a healthy method as the farmers as it takes huge troll to their body. Direct sowing by drum seeder in 8 rows facilitated to take up organic fertilizer application, plant protection measures and weed control in an efficient manner. Further the crop duration is reduced around one weak in direct sown rice as compared to normal transplanted which facilitated to raise another crop. The farmers in OFTs had realized that direct sowing by drum seeder is only a viable option to reduce cost of cultivation of rice and increase net return due to less seed rate, less labour requirements at the time of sowing and no need of nursery raising etc.

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Paper ID: ICRIM072021C16

Crops Protection System Using IOT and UAV In 5G

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Abstract

Agriculture is one of the major backbones of the Indian economy. India is a country of framers since edges. India has maintained its identity as a farming country, but, unfortunately, farming has not been developed up to the certain extent that was expected 50 years ago. With the 5G that made remarkable advancements towards precision agriculture, the researcher has now started thinking about the latest technological solutions to make farming more efficient. We had gone through certain research, but it seems that a very critical and common issue held in over loop by most researchers, and that issue is how to save crops from unwanted cattle and birds. Most of the conventional cattle & bird repelling strategies are not approved by the farmers. These present advanced algorithms are not competent enough to accomplish proficiently for a delay-constrained application when several event requests are generated at a time in huge farmland. This paper uses a significant feature of IoT and UAV (Unmanned Aerial Vehicle), i.e., drone-based techniques, precision farming landscape, etc., to protect the crops from cattle and birds. In this paper, UAV aeronautical speediness is measured as 25 mph (12 feet/sec). This speediness proficiently helps 20 events (13 rational points) within 105 secs where the entire trip measurement is 2426 feet accordingly, it attains a success ratio of 100%.

Keywords: IoT (Internet of Things), UAV (Unmanned Aerial Vehicle), ACO (Ant Colony Optimization), UTM (UAV traffic management).

Paper ID: ICRIM072021C20

Design and Development of Autopilot Delivery Drone

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Abstract

The rapid increase in usage of online ordering has increased the requirement of manpower to deliver in multiple folds. Drone based technology is being used to meet this requirement. A quadcopter can achieve vertical flight in a stable manner and be used to monitor or collect data, delivery in a specific region.As the demand for commercial deliveries increases within cities, companies face a fundamental limitation in surface road capacity. Drone delivery aims to overcome that limitation by exploiting the vertical dimension above city streets.With advancing drone technologies and increasing commercial usage, we believe the last mile shipping industry is ripe for disruption by delivery drones. Drones can significantly accelerate delivery times and reduce the human cost associated with the delivery. UAV has been designed which is an unmanned aerial vehicle that have reduced the cost and increase the performance of the low power microcontrollers that allowed the general public to develop quadcopter. The goal of this project is to design the brushless direct current (BLDC) motor and its driving circuits, for quadcopter kit to obtain stable flight, gather and store GPS data, and perform auto commands, such as auto-landing.

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Development of Autopilot Delivery Drone

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Abstract

The rapid increase in usage of online ordering has increased the requirement of manpower to deliver in multiple folds. Drone based technology is being used to meet this requirement. A quadcopter can achieve vertical flight in a stable manner and be used to monitor or collect data, delivery in a specific region.As the demand for commercial deliveries increases within cities, companies face a fundamental limitation in surface road capacity. Drone delivery aims to overcome that limitation by exploiting the vertical dimension above city streets.With advancing drone technologies and increasing commercial usage, we believe the last mile shipping industry is ripe for disruption by delivery drones. Drones can significantly accelerate delivery times and reduce the human cost associated with the delivery. UAV has been designed which is an unmanned aerial vehicle that have reduced the cost and increase the performance of the low power microcontrollers that allowed the general public to develop quadcopter. The goal of this project is to design the brushless direct current (BLDC) motor and its driving circuits, for quadcopter kit to obtain stable flight, gather and store GPS data, and perform auto commands, such as auto-landing.

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Paper ID: ICRIM072021C23

Development of Grease Trap

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Abstract

A Grease Trap manufactured to properly manage the Fats, Oils and Greases (FOG) in sewage that impacts our collection systems and treatment processes, the reason for this is these materials harden and plug sewer line. Small amounts of grease and oil accumulate in the sewers resulting in a large blockage in pipelines which can be prevented using grease trap. All the sanitary sewers flow through local wastewater treatment plants which are designed to remove fuel products, grease, or cooking oils, more commonly known as FOG. Our device is significantly needed in large scale usage of filtering water outlet and removing the excess materials like oil and grease. Given the current environmental conditions it is crucial to decrease pollution for creating a sustainable environment. The wastes in food solids, oil, and grease (FOG) if left unchecked, could end up accumulating in pipes creating problems such as foul odor, blocked drainpipes, restricted flow rate of wastewater. Our objective in his project is to create an efficient and economical grease trap to treat these mixture and separate water from FOG.

Keywords: FOG, fats, oils, grease, trap

Paper ID: ICRIM072021C24

Development of Chainless Bicycle

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Abstract

Chainless Bicycle System (CBS) is a setup which makes bicycles run on the road without chains. CBS uses a shaft-driven concept; it uses a drive-shaft for the transmission of power from the pedals to the wheels in place of chains. In the present era, development in internal gear technology produces various advantages. So, decided to construct a bicycle using the shaft-driven system rather than using chain driven. In this system, spur gears, shaft rod, and another two spur gears and the hub assembly. The rider pushes the pedal which rotates the shaft rod using spur gears at the front end. This rotating shaft has a spur gear at the rear end also which meshes with another spur gear on the rear hub along with the rear wheel and drive the rear wheel of bicycle. the design of the cycle is done through Solid Works and structural analysis of the frame is performed to analyse the strength of the design using Ansys software

Keywords: bicycle, CBS, drive-shaft

Paper ID: ICRIM072021C25

Design and Development of Air Purification System

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Abstract

In present scenario due to increase in industrialization air pollution is one of the biggest problems all over the world. Air pollution is mixture of industrial smog, solid dust particles, harmful bacteria and harmful gases in the air. Air pollution isn't just outside but also inside buildings. Polluted indoor air is most commonly found in homes in larger cities. The dust mites, smog, smoke from kitchen, outdoor pollutants together pollute the air inside building. Breathing air with contaminants like this can adversely affect person's health. There are several methods to purify the polluted air, some are using HEPA filters, chemical ionizers, ozone generators etc. These methods works great but worried about by-products released like ions and ozone in ionizers and ozone generators are harmful and can cause health hazards. This project works for a solution to these problems and developed an air purifier which can remove contaminants without producing any by-products. In this project, the main objective is to build an air purifier with maximum efficiency which supplies purified air at high CFM (cubic feet per minute). In this project a fan with high air extraction capacity is used to extract the air from surroundings through filter components to filter and deliver purified air at required speed. This purifier comes with a 3-stage purification system includes pre-filter trap dust particles (like hair, paper, wood dust, tiny particles), a true HEPA filter trap PM2.5, PM0.3, pollen, an activated carbon filter trap chemical waste, domestic waste, bad smells and harmless UV light to kill bacteria and viruses. A regulator is used to control the speed of purified air and a sensor with display unit is used to detect the air quality and display air quality index

Keywords: HEPA, filters, CFM, purifier

Paper ID: ICRIM072021C27

Genetic Algorithms with Cloud Computing for Data Security & Performance Enhancements

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Abstract

Cloud computing is referred to as having many equipment & programming is used as the main computing paradigm in several IT industries. It defines a global programming framework & helps the management to have distributed environment for developing the applications. It sets an internet-dependent stage well-defined by the clients interest level. In this era of the IT industry, the cloud assumes a significant part in getting the clients & users space across the globe. With expanding requests & ubiquity of cloud computing, the risks & potential threats have also been added to it to the greatest extent. Data integrity & privacy are the central points of interest in cloud computing & should be dealt with very seriously as the information at the cloud is broadcasted in various geological areas. Consequently, each cloud client, as well as the cloud service, provides is interested in the protection of sensitive data in its integrity too. In this research paper, the authors propose a new archetype of cloud data security with the help of a Genetic Algorithm (GAs). The idea is to utilize the GAs core concepts to create the encryption and the decryption keys, which will further incorporate with a cryptographic algorithm to provide the integrity & security of data on cloud computing. The authors also focus on the standard boundaries of encryption like execution time, throughputs, key size, etc., for assessment & correlation of the proposed idea. The different data sets are utilized to approve the efficiency of the proposed algorithm. Experimental results show that the proposed model provides the security of the data from unauthorized access. This research idea also compares the proposed algorithm with the cutting-edge cryptic algorithms like AES, Blowfish, DES, RSA & 3DES.

Keywords: Cloud computing, Genetic Algorithm (GAs), Data security

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Paper ID: ICRIM072021C30

Machining of CFRP using AWJM and Analysis using CFD

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Abstract

Computational fluid dynamics (CFD) Models for ultra-high velocity by abrasive water jet machine. The present experimental study is about drilling of carbon fiber at different stand of distance as input parameter. The abrasive water jet machine is a non-conventional machining process in which abrasive and water are mixed required ratio to impinge on the work material at high velocity. CFD analysis is a branch of fluid mechanics that uses of numerical analysis and data structure and analyse and solve problem that involve fluid flows. Here we are finding the output velocity of the nozzle.The main experimental results demonstrated that the stand-off distance and the abrasive flow rate were the major parameters affecting the surface roughness (Ra) and the hole taper

Keywords: CFD, abrasive, machining

Paper ID: ICRIM072021C31

DEVELOPMENT OF METAL MATRIX COMPOSITE MATERIAL USING SAND CASTING USING SAND CASTING

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Abstract

There is a growing interest worldwide in manufacturing hybrid metal matrix composites [HMMCs] which possesses combined properties of its reinforcements and exhibit improved physical, mechanical and tribological properties. Aluminum-based Metal Matrix Composites (MMCs) have received increasing attention in recent decades as engineering materials. Composite materials are known as advanced materials for their high strength, high wear resistance, good damping characteristic and their enhanced high temperature performance. The hybrid metal matrix composite (HMMCs) materials are prepared by using sand casting technique. In this project, The Development of Al7075alloy based metal matrix Hybrid composite reinforced with different compositions such as BFS 3 % + SiC 10% weight, BFS 6% + SiC 14% weight and BFS 12 % + SiC 18%. Experimental study was carried out to investigate the mechanical properties such as hardness, tensile strength, and microstructure

Keywords: casting, composite, HMMC, SiC

Paper ID: ICRIM072021C33

LPG refrigeration system with zero operating cost.

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Abstract

Supply of continuous electricity is still not available in several areas of the country and the world. At such places, this work will be helpful for refrigeration of food, medicines, etc... This paper investigates the result of an experimental study carried out to determine the performance of domestic refrigerator when a liquefied petroleum gas (LPG) which is locally available which comprises of 24.4% propane, 56.4% butane and 17.2% isobutene which is varied from company to company is used as a Refrigerant. The LPG is cheaper and possesses an environmental friendly nature with no Ozone Depletion Potential (ODP) and no Global Warming Potential (GDP). It is used in world for cooking purposes. The refrigerator used in the present study is designed to work on LPG. The performance parameters investigated is the refrigeration effect in certain time. The refrigerator worked efficiently when LPG was used as a refrigerant instead of R134a.Also from the experiment which done in atmospheric condition, we can predict the optimum value of cooling effect with the suitable operating condition of regulating valve and capillary tube of the system. The use of LPG for refrigeration purpose can be environment friendly since it has no ozone depletion potential (ODP). Usually LPG is used as a fuel for cooking food in houses, restaurants, hotels, etc. and the combustion products of LPG are CO2 and H2O. In this project we have designed and analyzed a refrigerator using LPG as refrigerant. LPG is available in cylinders at high pressure. When this highpressure LPG is passed through the capillary tube of small internal diameter, the pressure of LPG is dropped due to expansion and phase change of LPG occurs in an isoenthalpic process. Due to phase change from liquid to gas latent heat is gained by the liquid refrigerant and the temperature drops. In this way LPG can produce refrigerating effect for a confined space.

Keywords: LPG, refrigeration, temperature

Paper ID: ICRIM072021C34

Machining and analysis of CFRP(basalt) by using AWJM

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Abstract

Computational fluid dynamics (CFD) Models for ultrahigh velocity by abrasive water jet machine. The present experimental study is about drilling of basalt fiber at different stand of distance as input parameter. The abrasive water jet machine is a non-conventional machining process in which abrasive and water are mixed required ratio to impinge on the work material at high velocity. CFD analysis is a branch of fluid mechanics that uses of numerical analysis and data structure and analyze and solve problem that involve fluid flows. Here we are finding the difference between the CFD analysis and practical

Keywords: CFD, velocity, AWJ

Paper ID: ICRIM072021C36

Fabrication of Uniform Water Cooler with Copper Tubes

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Abstract

Water cooler are needed where there is required drinking of cooling water for human beings in hot climate, Uniform water cooler is produced the cooling water simultaneously up to required quantity in water tank. copper tubes are present in refrigerator for efficient heat exchange, And the quality of cooling water in water cooler has a grade of corresponding in refrigeration. We have the compressor which will compress the R134a cooling refrigerant as a coolant in water cooler, and low temperature refrigerant enters into compressor and compress the R-134a refrigerant temperature changes from low temperature to high temperature. we have a condenser for condense the coolant, heat transfer take place in condenser and refrigerant get condensate by using blower. we have cooper tube as connecting flow of refrigerant, throttle valve is regulate or control the flow of refrigerant in the system. Evaporator is used to change the liquid form to the gaseous - vapor form copper tubes are present in the vessel and used for heating and cooling system as a refrigerant line and copper is a corrosion resistance.

Keywords: cooler, copper, refrigeration, evaporator

Paper ID: ICRIM072021C37

Pneumatic Powered Metal Pick And Place Arm

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Abstract

The system is a pneumatic powered metal pick and place arm. It demonstrates how a pneumatic power can be utilized to achieve pick and place mechanism. The system makes use of 4 pneumatic actuators and one gripper claw to achieve the purpose. The robotic arm is controlled by 4 pneumatic valves. The valves control the air flow to the pneumatic actuators in order to control the movement of the cylinder stroke. The other valves work in coordination to achieve the complete arm movement held together by a series of linkages and connector rods. This robotic arm can be used for the transfer of materials from one work station to another and can also perform other industrial applications. The robot arm is designed with simple design where the transformation of the components is carried out using the pneumatic cylinders and the gripper claw.

Keywords: pneumatic, pickup, stroke, robot

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Paper ID: ICRIM072021C38

Air Powered Pneumatic Punching Machine

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Abstract

This project deals with pneumatically operated hole punching machine. The designing was done on the Solid Works software. In the end, the conclusion is made, and several suggestions are made to make scope for improvements in future. The sheet metal punching process is a main part of all industries. Usually, the sheet metal punching machine is hand operated for small scale industries. The design used involves the properties such as mechanical and automation which uses microcontroller. This project deals with the design of pneumatically controlled punching machine to carry out punching operation on thin sheets of 1-2 mm for different material like aluminum and plastic. Punch force reduction is the main aim of this project and is obtained by modification in punch tool design. Subsequently it results in reduction in amount of punching force requirement and further a PNEUAMTIC CNC machine is developed. The secondary aim of the project is to reduce the setup. While changing the pitch distance between two holes during punching there is lot of time is wasted to set up the machine for new pitch design. In this project we are reducing this time by controlling the machine by microcontroller through which we can change the pitch distance automatically without changing the setting of the machine by feeding the pitch distance changes via computer programming.

Keywords: punching, pneumatic, machining

Paper ID: ICRIM072021C40

To Improve the Performance of bike by using HHO Energy

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Abstract

In the past few years Automobile companies have been searching for technological advantages to increase fuel millage and reduce the air pollution in order to protect the environment. We want a automobile that can do everyday activities whilst spending the least amount of fuel possible. Not only customers are demanding for better gas millage, but the government as well. In our scenario we will attempt to address this issue by building an HHO Energy generator. This generator uses the principle of electrolysis to split water into its two molecules, hydrogen and oxygen in the gasses form. This gas will be introduced into the combustion chamber of an engine to increase its power, burn less gas, and exhaust water particles out to the environment. HHO generator is an efficient approach used to increase the fuel efficiency in combustion engine by increasing energy produced for mole of fuel during ignition process. As a result the amount of unburned fuel in a combustion engine was reduced. Here the generator was tested under several conditions in order to determine the convenient design for an HHO generator. Therefore, such a system will be able to increase the efficiency of the engine and also reducing the air pollution.

Keywords: HHO, energy, generator, gasses

Paper ID: ICRIM072021C41

Fabrication of Shaft with Development Aluminium Alloy Composite Material

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Abstract

Aluminium plays an important role in many applications in various industries especially in automobile and aerospace industries. Therefore, We are using Aluminium 7075,Nickel as a and silicon carbide which have attracted much attention in the aerospace fields due to their excellent combination of high-strength and high melting point as compared to aluminum alloy 7075, by stir casting nickel, silicon-carbide to Aluminium 7075 it might increase Tensile strength, hardness, and elongation. We are manufacturing this aluminum alloy for airline and automobile industries. With the change in the composition of Silicon carbide as 4%,8%,12% and Nickel as 0.5% (constant) we will compare the three composite materials by conducting a Hardness Test, Tensile Test, and microstructure

Keywords: Al, composite, shaft

Paper ID: ICRIM072021C43

Automatic Paint Spraying Machine

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Abstract

The primary aim of the project is to design, develop and implement Automatic Wall Painting Robot which helps to achieve low cost painting equipment. Despite the advances in robotics and its wide spreading applications, interior wall painting has shared little in research activities. The painting chemicals can cause hazards to the human painters such as eye and respiratory system problems. Also the nature of painting procedure that requires repeated work and hand rising makes it boring, time and effort consuming. When construction workers and robots are properly integrated in building tasks, the whole construction process can be better managed and savings in human labour and timing are obtained as a consequence. In addition, it would offer the opportunity to reduce or eliminate human exposure to difficult and hazardous environments, which would solve most of the problems connected with safety when many activities occur at the same time. These factors motivate the development of an automated robotic painting system.

Keywords: paint, sprayer, machine, AI

Paper ID: ICRIM072021C44

Development of Oxygen-Filter

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Abstract

Now a days there is a tremendous changes in the climatic conditions due to global warming, greenhouse gases and increasing the usage of fossil fuels. The living organisms on the earth suffering from air pollution by inhaling air bone particles in atmosphere and its causes the skin & lung disorders. For the control of this emission rate in atmosphere we have chosen ―DEVOLOPMENT OF OXYGEN FILTER‖ to gasoline vehicles. The purpose of implementing this application is to reduce the air pollutions which coming from exhaust system of an engines. By investigated and made this application, to reduce emission rates of particular matter and exhaust gases. By continentally observed problems are facing-off by living organisms from global warming, air pollution, factories, engines and mining areas etc.

Keywords: filter, pollution, smoke, exhaust

Paper ID: ICRIM072021C46

Heat Transfer Enhancement using Sisal Water Nanofluid with Metal Oxide

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Abstract

Nanofluid is a suspension of nanoparticles which is promising heat transfer fluid in the heat transfer enhancement having a plethora of applications because of its superior thermal conductivity and rheological properties. This project points out the previous studies and recent progress in the improvement of heat transfer using nanofluid. The recent progresses on preparation and enhancement of stability will be calculated. Thermophysical, heat transfer characteristics of nanofluid and different factors are measured at the temperature range of about 20^*o*C, 40^*o*C & 60^*o*C. The present study reveals the microscopic structure of Sisal nano fluid prepared with different volume fraction, the thermal conductivity test is carried. The thermal conductivity increases with the volume concentration of nano particles.

Keywords: nano fluid, sisal, metal oxide, heat exchanger

Paper ID: ICRIM072021C45

Heat Transfer of Nanofluid in a Shell & Tube Heat Exchanger

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Abstract

In this project investigates the enhancement of heat transfer coefficient and Nusselt number of a nanofluid containing nanoparticles (Sisal Nano Fluid & Al2CO3) with a particle size of 20 nm and volume fraction of 0.1%–0.3% (V/V). Effects of temperature and concentration of nanoparticles on Nusselt number changes and heat transfer coefficient in a shell and tube heat exchanger with counter turbulent flow are investigated. Comparison of experimental results with valid theoretical data based on semiempirical equations is carried. Proposed simulation of Experimental results show a considerable increase in heat transfer coefficient and Nusselt number up to 20%–21%, respectively. So based on the data the analysis is carried out on an ANSYS Workbench 2021 R1 and the result of the simulation are documented.

Keywords: heat exchanger, nano fluid, shell & tube

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Paper ID: ICRIM072021C47

Development of Smart Helmet

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Abstract

The main objective is to build a safety system which is integrated with the smart helmet and intelligent bike to reduce the probability of two-wheeler accidents and drunk drive cases. The flex sensor checks if the person wearing the helmet or not. Alcohol sensors detect the alcoholic content in riders' breath. If the rider is not wearing the helmet or if there is any alcohol content found in rider's breath, the bike remains off. The bike will start until the rider wears the helmet and if there is no alcoholic content present. An Ultrasonic sensor provides the feasibility of detecting vehicle in front of the driver if the person has some vision problems.

Keywords: smart, helmet, safety, accidents

Paper ID: ICRIM072021C49

Design, Analysis and Prototype making of Air-less tyre by Additive Manufacturing Process

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Abstract

Non-Pneumatic Tyre (NPT) as the name suggests is a type of tyre that doesn't use air to support the load. The main principle involved in the airless tyre is, the flexible tread and shear bands deform temporarily as the spokes bend, then quickly going back to the initial shape. The NPT discussed here consists of mainly three parts. A rigid hub, Deformable spokes that support vertical load, Reinforced shear band and tread made out of rubber which comes into contact with the surface. Several types of research are being carried out all over the globe to make NPT an alternative to the conventional pneumatic tyre. This project consolidates an overview of the design and analysis of the Non-Pneumatic Tyre. The model of the tyre is designed in NX Cad software and Analysis is to be done in the Ansys workbench. The prototype of the model is done by 3D printing.

Keywords: NPT, additive, manufacturing, NX cad

Paper ID: ICRIM072021C50

Tailoring The Thermo Mechanical Properties Of High-Performance Aerospace & Automotive Composite Materials

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Abstract

There is a rising need to create high performance, lightweight and strong yet tough materials for use in various industries including aerospace (civil, military aircraft), automotive (sports, utility, emergency vehicles) and others (civil engineering etc.). The use of composite materials to meet this need is now commonplace for several reasons. These include significant weight savings over traditional materials and design flexibility (load bearing only where required/reduced number of parts). In this project we modelled such multiple composite sheets and experimented with their mechanical properties by changing materials and defined which material composite is safe to use in automobile and aerospace industry.

Keywords: thermal, aerospace, composite, industry

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Paper ID: ICRIM072021C51

Weight Optimization Of Chassis Frame By Using Topology Optimization To Reduce The Pollution In Environment

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Abstract

Since past few years major cities across the world have been witnessing an upsurge in pollution levels. The smoke released from automobile and especially high fuel consuming heavy vehicles like trucks and building machinery constitutes to a major portion of these pollution levels. Decreasing the weight of such heavy vehicles can reduce the fuel consumption and can also indirectly reduce the smoke emitted and will have a positive impact on the environment. Chassis is one such part of automobiles whose weight can be decreased to achieve this feat. The automotive chassis is a skeletal frame on which several mechanical parts are bolted. The main purpose of trailer chassis is to withstand all the loads acting on it. Usually, chassis frame of trailers has heavy weight that causes high fuel consumption and emission which pollutes the environment.

Keywords: chassis, fuel, pollution

Paper ID: ICRIM072021C53

Natural Convective Heat Transfer From Inclined Narrow Plates With Geometry Variation

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Abstract

Natural convection is a mechanism, or type of heat transport, in which the fluid motion is not generated by any external source (like a pump, fan, suction device, etc.) but only by density Differences in the fluid occurring due to temperature gradients. In natural convection, fluid surrounding a heat source receives heat, becomes less dense and rises. The surrounding, cooler fluid then moves to replace it. This cooler fluid is then heated and the process continues, forming convection current; this process transfers heat energy from the bottom of the convection cell to top. The driving force for natural convection is buoyancy, a result of differences in fluid density. Steady state natural convection from heat sink with narrow plate fins having parallel arrangement mounted on inclined base was experimentally investigated. Aluminum heat sink with different lengths and fin thicknesses are modelled and analyzed. Few models of tapered fins are also modelled. And also comparing these results with original heat sink properties, finally we can conclude how the temperature and heat flux is varying while changing fins height and also which material is most suitable for these thermal boundary conditions

Keywords: convection, fluid, transport, Al

Paper ID: ICRIM072021C54

Experimental Study On Discharging Performance Of Vertical Multitube Shell And Tube Latent Heat Thermal Energy Storage

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Abstract

Heat transfer is phenomena that rate of heat exchange between the two different body's for this heat transformat Heat t ion in industries are large number of body's we will use. A device which will used to transform heat form one fluid to and another fluid that the device called heat exchanger. we have various industries which are using the heat exchanger like engineering process, refrigeration, air-conditions systems power system, food processing units and chemical reactors. In this project we did design of shell and heat exchanger by using the catia v5 r20 after the design we did analysis of heat exchanger by using the ansys14.5 with different materials we calculate the heat flow over the shell and tube heat exchanger. Keywords: heat exchanger, heat transfer, nano fluids, periodic flow, mass flow rate, nusselt number & reynolds numbe

Keywords: shell & tube, heat exchanger, flow rate

Paper ID: ICRIM072021C56

Prediction And Comparison Of The Dilution And Heat Affected Zone In Submerged Arc Welding (Saw) Of Low Carbon Alloy Steel Joints

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Abstract

The project has been made to realize the effect of submerged arc welding (SAW). Submerged arc welding is a fusion joining process, known for its high deposition capabilities. This process is useful in joining thick section components used in various industries. Heat Affected Zone (HAZ) produced within the base metal as a result of tremendous heat of arc is of big concern as it affects the performance of welded/surfaced structure in service due to metallurgical changes in the affected region. This work was carried out to investigate the effect of polarity and other SAW parameters on HAZ size and to establish their correlations. Welding flux constitutes nearly half of the cost in SAW process. Over the years, development of better welding flux compositions in terms of mechanical properties and productivity, which are economically cost effective too, has caught the eye of many researchers

Keywords: heat, welding, carbon alloy, dilution

Paper ID: ICRIM072021C57

Experimental Investigation And Optimization Of Process Parameters Of AWJM By CFD Flow Analysis

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Abstract

Here we need to run analysis on fluid dynamics and flow characteristics using Computational Fluid Dynamics (CFD), which is a science that uses data structures to solve issues of fluid flow like velocity, density, and chemical compositions. Here in CFD analysis we need to run experimental investigation of the general nature of flow through the nozzle and its results in rapid wear of the nozzle which affects the cutting performance. And we need to investigate how the flow is effected in mixing chamber which is connected with abrasive supply pipe and the nozzle

Keywords: CFD, nozzle, density

Paper ID: ICRIM072021C59

Modelling And Experimental Study Of Latent Heat Thermal Energy Storage With Encapsulated PCMS For Solar Thermal Applications

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Abstract

The world generates major energy from fossil fuel based thermal power plant which uses coal, oil and natural gas. The fossil fuel-based energy sources have a major impact on the climate change. As a result, the usage of renewal energy sources such as solar, wind and tidal has emerged as an alternative. Among these, solar energy is available in abundance in many parts on the earth and has zero global warming potential (GWP), which can be used as heat source in thermal power plant. The variability in solar radiation creates a gap between energy demand and supply, which necessitates the use of efficient thermal energy storage for bridging the gap to make the solar thermal power plant a viable solution for continuous power generation. In this work, a model of encapsulated phase change materials (PCMs) based latent heat thermal energy storage (LHTES) is developed to analyse the transient variation in heat transfer fluid (HTF) temperature at the outlet of LHTES and PCM temperature. Experiments on a spherical capsule reveal melting and solidification behaviour of PCM from the measured temperature field

Keywords: modelling, GWP, PCMs

Paper ID: ICRIM072021C60

Fatigue Analysis And Design Optimization Of Excavator Bucket

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Abstract

As we see there's climb within the earth moving machine industries because the construction work is rapidly growing is understood through the high performance of construction machines. An excavator may be a typical hydraulic heavy-duty human operated machine utilized in general versatile construction operations, like digging, ground levelling, carrying loads, dumping loads. Normally backhoe excavators are working under worst working conditions. Due to severe working conditions, excavator parts are subjected to high loads and must work reliably in the unpredictable working conditions. Thus, it's necessary for the engineers to provide an equipment of maximum reliability. In this project we focused on reducing the weight of one such excavator bucket keeping in mind the stresses developed in the bucket during operation. A 3d model of an excavator bucket is modelled and structural analysis is performed to determine its initial parameters. Then the weight of same model is reduced using topology optimization and then reanalyzed to make sure the stresses in the bucket are not increased. Then both the models are compared and the best one is defined

Keywords: fatigue, excavator, bucket

Paper ID: ICRIM072021C62

Computational Fluid Dynamic Analysis Of Convergent-Divergent Nozzle

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Abstract

The convergent-divergent nozzle finds application in many areas of industry and technology. The present work focuses on the CFD simulation of a convergent-divergent nozzle undergoing compressible flow, as there exist a few works on this topic. The work performed using a standard geometry to capture the normal shock under different exit pressure conditions. Finite volume method is to be utilized for the numerical simulations using ANSYS FLUENT. The results are to be analyzed using pressure plot, Mach number plot, different contour plots for pressure, temperature, density, velocity ,flow . The study is performed to contribute towards the fundamental knowledge and practical applications.

Keywords: CFD, nozzle, Convergent, divergent

Paper ID: ICRIM072021C64

Design Of Foot Over Bridge With The Variation Of Stiffness To Weight Ratio With The Help Of Topology Optimization

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Abstract

Footbridges are needed where there is a separate pathway must be supplied for human beings to move site visitors flows or some physical impediment, along with a river. The masses they convey are, with regards to toll road or railway bridges, pretty modest, and in most circumstances a reasonably light structure is needed. They are but, often required to give a protracted clear span, and stiffness then becomes an crucial consideration. The bridges are frequently required very virtually on view to the general public and consequently the advent deserves careful attention. Steel offers financial and appealing kinds of creation which suit all of the requirements demanded of a footbridge.

Keywords: foot over bridge, stiffness, optimization

Paper ID: ICRIM072021C65

Modelling and thermal analysis of 3D Printer Extruder In Fused Deposition Modelling

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Abstract

Fused Deposition modeling is the prime method of Additive manufacturing process used for the polymer manufacturing. As in this process the polymer filament enter into heat sink through feed filament where it gets melts and extruded from nozzle and deposited layer by layer to build the component.so to extrude the PLA melt, the feed polymer in solid form is used as plunger. In order to remain feed filament in solid state it is necessary to remain the temperature of the heat sink much below the melting temperature of polymer. Therefore fins are provided on the heat sink to increase the surface area. Here in this way thermal behavior of heat sink is analyzed, in this analysis heat sink having circular, elliptical and rectangular having fins are analyzed for working material that is poly – Latic – acid.

Keywords: printer, fused, modelling

Paper ID: ICRIM072021C67

Topology Optimization Of Four Stroke Engine Block To Convert In To 6 Stroke Engine

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Abstract

In six stroke engine, there are additional two strokes, namely another power and exhaust strokes. The engine works through harnessing wasted heat energy created by the fuel combustion. After the combustion stage water is injected into the superheated cylinder. The water explodes into steam and force the piston down. It in turn helps to cool the engine. That resulted in normal levels of power but using much less fuel. It also has the advantage of not requiring an external cooling system. In these six stroke engines an additional water tank is added which stores water in it. In order to counter this extra weight, the weight of the original engine must be decreased. In this project, one such four stroke engine is modelled and its weight is decreased by removing unnecessary material by using topology optimization. Weight of water tank completely filled with water is assumed and equivalent amount of weight is decreased from the engine to convert it into a six stroke engine block.

Keywords: four stroke, engine, piston

Paper ID: ICRIM072021C71

Design and Development of Artificial Wireless Arm

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Abstract

Today's technology increased the interest in robotic systems thus, increasing the number of studies conducted in this area. There are many studies on robotic systems in several fields to facilitate human life. In this project, a robot hand is designed to imitate finger movements using the flex sensors mounted on a wearable glove. Various sensors that detect the finger movement are used. The sensor that detects the angle of the fingers has been shown to provide accurate values. Various servo motors are placed on the robotic hand in order to mimic the muscle movements depending upon the data transmitted by the flex sensors. Thus, in this project an Animatronic hand is developed using ZigBee module and Arduino UNO. As the whole body of the robot would have been expensive, we only developed a hand which will act as shadow hand. The main aim of this project is to highlight the use of wireless communication and its application by developing Robotic Hand which can be used in many fields like medical, defence, chemical industries.

Keywords - Arduino, Servomotors, Flex sensors, Programming of the Arduino.

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Paper ID: ICRIM072021C72

Impact Response And Damage Tolerance Characteristics Of Glass Carbon/Epoxy Hybrid Composite Plates

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Abstract

The most ideal approach for fabrication without giving up security is to utilize fiber reinforced composite materials. The present work describes the characterization and cost parameters of polymer composites consisting of glass fibre reinforcement and followed by analysis of sheet made of composites. Comparison of materials is done in all possible ways to accomplish a conclusion regarding weight reduction, strength, Impact response of material and many more. Based on the design data impact response and damage tolerance analysis is carried out on an ANSYS Workbench 2019 R3 and the result of the simulation are documented

Keywords: Epoxy, composite, glass carbon

Paper ID: ICRIM072021C74

Crash Analysis Of Space Frame Chassis

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Abstract

Conventionally chassis is made up of AISI1018 steel. As the level of progress in improvising the efficiency of engine has come to saturation point. It is important to study the different aspect to enhance the overall performance of an automobile. As chassis forms the base mount all the automotive components like engine, transmission, braking and steering systems, it must be able to take the entire weight of components efficiently. Using steel grades gives us necessary strength. Considering the fact that the car to be manufactured is a sport car, it is necessary to eliminate the factors which may hamper the performance of a car. So, one of the important alternative is to change the material and it must be chosen in such a way that it imparts necessary strengths and also keep entire weight under limit. The main purpose of this project is to design and analysis of POLYSTERENE and CARBON FIBRE for a space frame chassis to withstand all forces experienced under realistic experience condition using NX Simmens and ANSYS. A complete analysis by using POLYSTERENE and CARBON FIBRE is to be carried out as to compare it with AISI1018 steel for ensuring improved performance

Keywords: frame, carbon fiber, steel

Paper ID: ICRIM072021C76

Study Of Couple Field Analysis Of Automotive Fins With Variation Of Geometry To Increase The Life

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Abstract

The Engine cylinder is one of the major automobile components which is subjected to high temperature variations and thermal stresses. High thermal and structural stresses inside the cylinder due to combustion of fuels results in expansion in the cylinder material and will indirectly decrease the life of engine. In order to cool the cylinder, fins are provided on the surface of the cylinder to increase the rate of heat transfer. By doing thermal analysis on the engine cylinder fins, it is helpful to know the heat dissipation inside the cylinder. We know that, by increasing the surface area we can increase the heat dissipation rate, so designing such a large complex engine is very difficult. Various researches done in recent years show that heat transfer by fins depend upon on variety of fins, fin pitch, fin layout, wind velocity The main aim of the present study is to analyse the thermal properties by varying geometry of cylinder fins. The 3D model of the geometries is created and its thermal, structural properties are analysed. The variation of temperature distribution over time is of interest in many applications such as in cooling. The accurate thermal simulation could permit critical design

Keywords: engine, automobile, fuel, thermal

Paper ID: ICRIM072021C77

Strengthening Car Bumper In Load-Bearing Direction By The Usage Of Materials Of Impact Abs Plastic And Carbon Fiber-Reinforced

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Abstract

The project focuses on the design and stress analysis of a car frontal protection system (Bumper) simulations. To achieve that, we go to basic concepts of improving the safety onthe car by do analysis the car bumper. It is importance to know their mechanical properties, how their failure mechanism during the impact. This analysis was carrying out by using commercial Finite Elements software ansysto evaluate the behavior of bumper system. Another additional innovative for improving crashworthiness is the use of the material to a to produces the part to absorbed Energy during the process of a crash . Research concentrates on polymer composite material. It is considering their function, geometry, and other parameters that influencing the compatibility of the bumper.In future research, this bumper will face the static test and analyses do on their load distributions by applying the variation of load and locations. Resulted will be compare for the centre and side load. How the load applied effect the stress distribution. After that a related study was carried out to know bumper properties during the impact. Bumpers play an important role in preventing theimpact energy from being transferred to the automobile and passengers. Saving the impact energy in the bumper to be released in the environment reduces the damages of the automobile and passengers.

Keywords: Bumper, catiav5R20, ansys15.0.7, impact loads, structural analysis

Paper ID: ICRIM072021C80

Pressure Drop Characteristics Of Nano Fluids

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Abstract

Pressure drop (Δp) in pipes of basic importance in several applications in which fluid flows through pipe passages for heat removal. This investigation studies the effects of variations in nanofluid properties due to convective heat transfer on basic laminar flow parameters: wall shear stress, pressure drop and velocity. These effects are classified as direct and indirect. The direct effects are due to the variations in fluid flow parameters, fluid density (ρ) and dynamic viscosity (μ), which determine the axial velocity field, wall shear stress, and pressure drop. The indirect effects are due to the variations in fluid thermal parameters, specific heat at constant pressure, and thermal conductivity, which affect the temperature field; consequently, ρ and μ are affected. The examination with nanofluids showed that the different nanofluid properties have little effect on the refrigerator performance. Thus, nanofluids can be used in domestic refrigerators to considerably reduce energy consumption.

Keywords: nano fluids, pressure, characteristics

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