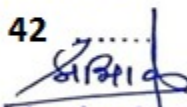


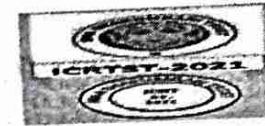
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Designing a Mechanism to Paint a Conical Shaped Part

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Authors and affiliations

Rufus R. Thomas, C. N. Sakhale, M. S. Giripunje, Sagar D. Shelare

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Development of Sheet Metal Die by Using CAD and Simulation Technology to Improvement of Quality

Authors Authors and affiliations

Amrapali L. Ramteke, Shubash N. Waghmare, Sagar D. Shelare, Piyush M. Sirsat

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Abstract

Minimizing manufacturing time is a major advancement that decreases the entire cost of production and reduces the time for a commodity to be sold. One of the main titles of the sheet metal industry is the convergence of sheet metal product design, simplification, and fabrication applications. Sheet metal formation is one of the most common finished product procurement technologies in almost every industrial production field, especially in the aircraft, automobile, food and home appliance industries. Because of its intricate forms and the possibilities of applications it requires, the incorporation of sheet metal product design and development in a computer-aided setting is a challenge. To solve this problem, many methodologies are being developed, such as a Single Minute Exchange Die System (SMED) that

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Keywords

Conical shaped part, automation technology, Fixture development, Synchronized movement

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A Critical Review on Dissimilar Joining of ASS and FSS

Authors

Authors and affiliations

Chetan Tembhurkar, Ravinder Kataria, Sachin P. Ambade, Jagesvar Verma

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Austenitic stainless steel used worldwide in various major industries like chemical, petrochemical and shipbuilding industries but the cost of material is high and it highly affects the producers and end-users. But, Ni price is the prime concerned for various industries as there is a shortage of nickel and nickel price increasing day by day according to the London Metal Exchange (LME). So, the demand for low nickel alloy which might be welded with austenitic stainless steel will be used worldwide in industries that need higher heat input, correct choice of filler material and defect-free joints for high production rate. However various welding techniques like Tungsten Inert Gas (TIG)/Metal Inert Gas (MIG)/Electron beam (EBW)/Shielded metal arc (SMAW)/Submerged arc (SAW)/Electron Beam Melting (EBM)/Resistance Spot/Laser and friction welding are used for welding austenitic with ferritic stainless

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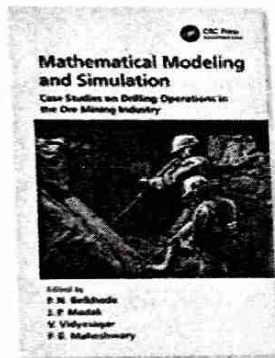
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Chapter

Procedure of Collecting Field Data: Causes, Extraneous Variables, and Effects

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Assessment of Average Resistive Torque for Human-Powered Stirrup Making Process



Subhash N. Waghmare, Chandrashekhar N. Sakhale,
Chetan K. Tembhurkar and Sagar D. Shelare

Abstract Bar twisting technique is needed for stirrup creating action, stirrup or equivalent tie is one in all the requisite part of rock-hard cement concrete that's utilized for strengthening columns and beams. In the Asian country, these stirrups are made directly which causes a lot of physical strain on workers. This investigation work legitimizes the look of the investigational process to be dead for assessment of an estimated general mathematical model for assessment of resistive torque for the stirrup making operation. The collected data was formulated by utilizing the conventional method of the theory of experimentation. It conjointly incorporates the formulation of the arithmetical model and its sensitivity examination, desirableness, change, and ANN simulation.

Keywords ANN · HPFM · Reliability · Resistive torque · Sensitivity analysis · Stirrup

1 Introduction

In little building destinations workers twist stirrup bar by using the usual process. In usual method, stirrups are created on a wood stage outfitted with pins and bar is twisted utilizing a lever like hand device daag [1]. The power is applied on daag and the pin acts as a pivot for twisting the bar. There is no different methodologies to build stirrup with less individual effort and at the same time the investigation

S. N. Waghmare (✉) · C. N. Sakhale · C. K. Tembhurkar · S. D. Shelare
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Formulation of a Mathematical Model for Quantity of Deshelled Nut in Charoli Nut Deshelling Machine

Sagar D. Shelare, Ravinder Kumar, and Pravin B. Khope

Abstract Charoli (*Buchanania lanzan*) is a vital multipurpose tree and essential plant for a rural and tribal economy. Charoli tree gives food, fuel, fodder, wood, and medicine to the local rural and tribal society. In traditional ways, this Charoli kernel removal is made manually by using hammer and hands due to which there is lower efficiency with damaged and broken kernels. Hence, there is a demand to create an indigenous and sustainable design of Charoli nut desheller for improvement in Charoli nut processing efficiency and reducing the wastage occurring due to kernel damage. In this investigation, a theoretical mathematical model based on a dimensional analysis method was disclosed to identify the quantity of deshelled nut of a Charoli nut deshelling process. Dimensional analysis applying the Buckingham Pi (π) theorem was adopted to get an effective relationship among the quantity of deshelled nut and independent variables. Independent variables comprise diameter of grinding disk, thickness of grinding disk, number of grinding disk, clearance between two rotating disks, energy of flywheel, angular speed, time to speed up the flywheel, % moisture content, hardness of nut, moment of inertia of flywheel, gear ratio, bulk density of nut, and feed rate. Established relation is useful to the prediction of behavior between dependent and independent variables corresponding to the different process conditions.

Keywords Quantity of deshelled nut • Dimensional analysis • Buckingham pi (π) theorem • Mathematical model • Prediction equation

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Formulation of a Mathematical Model for Quantity of Deshelled Nut in Charoli Nut Deshelling Machine



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Sagar D. Shelare, Ravinder Kumar, and Pravin B. Khope

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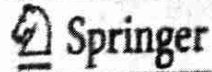
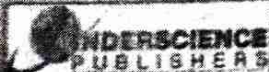


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ROLE OF BLOCKCHAIN ORIENTED SMART CONTRACT IN SUPPLY CHAIN

Abhishek Rajput¹, Dayaneshwar Ghode² and Rakesh Jain³

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ABSTRACT

Supply chain visibility and optimization were always a concern of utmost importance due to its increasing complexity of the network of trading parties in the chain which result in inefficient processes. This has led to a higher cost and poor customer satisfaction. A novel solution for this oblige problem of trust can be given by blockchain technology (BT). It is an evolving technology that combine the supply chain by providing means to track and manage the goods movement in the chain using a decentralized network that is secured enough and provides the benefits of preserving the manufacturers. With the involvement of the blockchain, the smart contract has given one of the most looked for/after advancements in account of the high secure manner they supplement so transactions. In this paper, we will focus on smart contracts as one of the promising future research areas of BT. This paper is a literature review-based overview of smart contract in supply chain management which includes analysis of the technological principles, benefits and challenges and how it works. Paper also deals with the theoretical background of the smart contracts to make the readers familiar with the subject which eventually will help in a better understanding. This work may provide a platform for further research with a wider scope in this topic. Looking at the current scenario in the supply chain and logistics industry, this paper can also guide the business partners to implement blockchain-based applications in the industry.

Keywords: Supply Chain Management, Smart Contract, Blockchain Technology, Literature Review

Paper ID: CIMS_443

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A CRITICAL REVIEW OF COLD SPRAYING COATING TECHNIQUES

Sagar Sbelare¹, Trupti Gajthare², Dipak Hajare³ and Subhash Wagmare⁴

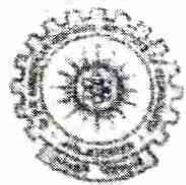
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Corresponding Author Email ID: sagar133@gmail.com, trupti2006@gmail.com, dipak2008@gmail.com, subhashgajthare1994@gmail.com

ABSTRACT

Cold spraying is a procedure of solid-state powder deposition employing various cohesive properties, permitting the creation of coatings from a wide range of materials. This innovation was found accidentally while researchers were attempting to study the two-phase supersonic flows by putting copper particles into the wind tunnel. Possible deposition of a variety of materials by cold spray gives the chance to tailor a wide range of substrate/coating systems with special capacities for various applications. This paper briefly describes the different parts of the available and imaginative development of the cold spraying procedure inside a field of re-production / repair using an idea of added substrate/finishing. An intensive report was laid on the feasibility of this innovation to form both thick and thin coatings while finishing by detonated treated and stress level constructed with traditional thermal spray coatings procedure via application of composite particles of concentrated spheres of a porous technological, especially concentrating on application of composite particles of concentrated material utilized into a deposition was conducted; additionally explanation was prepared relevant to materials effect and bonding mechanism at the time of deposition. The review is concluded with an assigned area to propose new avenues for additional exploration and improvements.

Keywords: Cold Spraying, Coating, Coating Materials, Corrosion, Thermal Spraying



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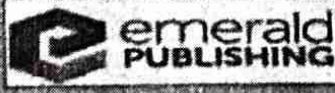
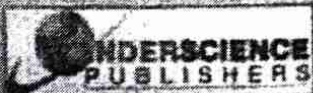


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Paper ID: CIMS_455

AN AUTOMATED BELT CONVEYOR SYSTEM FOR BOLT AND WASHER ASSEMBLY

Sudhish Waghmare¹, Sagar Shtare¹, Nishal Musgle¹ and Krunal Modake¹

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ABSTRACT

Automation is the need for this competitive era to maintain quality and to reduce the overall processing time and cost. In the automobile industry, the time taken for assembling the bolt and washer takes comparatively much longer time hence increase in time of overall assembly. The proposed research is carried out to minimize the time taken for bolt and washer assembly. To obtain the objective, a novel kind of machine was designed and developed. The developed machine mainly comprised of a motor, the conveyor, motor for gear, inductive proximity sensor, and Adavans Line. The outcome of the assembly experiment was carried out by put down the bolts on a conveyor belt at a different location. The developed machine was successfully used for the assembly of bolt and washer and the time required for identification and assembly was noted. Identification time was varied from 0.15 seconds to 0.32 seconds whereas assembly time varies from 2.1 seconds to 4.2 seconds. The average identification time and time to take for assembly were 0.23 and 3.73 seconds respectively. The developed machine was found feasible for its adaptation in the industries where the bolt and washer assembling are carried out.

Keywords: Automation, belt conveyor, automobile industry, bolt washer assembly

Paper ID: CIMS_456

VISUAL EFFECTS OF SECOND ORDER RECURRENCE EQUATIONS THROUGH SPACE-TIME DIAGRAM

Sudhakar Sahoo¹, Suryakanta Pal² and Ranjeet Rout³

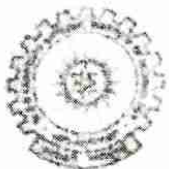
¹Institute of Mathematics & Applications Bhubaneswar, ²Model Degree College, Malkangiri, ³NIT Bolangir

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ABSTRACT

In this paper, the space-time diagrams of both one dimensional two state Cellular Automata (CA) with triangular neighborhoods and two dimensional Integral Value Transformations (IVTs) have been constructed. Computational mechanism of both these discrete dynamical systems works in a common paradigm of Boolean functions and hence they have an interconnection with each other. Some interesting patterns and their effects arising from two initial rows of configurations have been explored. Computation of these space-time diagrams has been visualized in a second order recurrence relation of the form $s(i) = f(s(i-1), s(i-2))$ where $s(i)$ represents i -th configuration of the corresponding discrete dynamical system.

Keywords: Cellular automata rules, Triangular neighborhoods, Discrete dynamical systems, Pattern formation, Space-time diagrams, Integral value transformations, Second order recurrence relations



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EXPERIMENTAL ANALYSIS OF IMPROVED VORTEX TUBE

Sukhasti Namdeo Waghmare¹, Ketan Sanjay Mewate¹, Sagar Shelare² and Sanjay Mewate³

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ABSTRACT

Nowadays, the fastest and vind quality of any analysis is its eco-friendly nature. The main concern of any industries is to keep up environment safety. This paper focuses on investigation and efficiency of vortex tube which works on the principle of hot gas stream through one end and a cold gas flow from the further end without any external source of energy. The vortex design is the prime concern of the research as it will give greater cooling effect as compared to inlet and outlet orifice of vortex tube. The geometrical parameters have been analyzed to get the better and efficient design of improved vortex tube.

Keywords: Vortex tube, Cold and hot air, Nitride, Vortex Analysis

Paper ID: CIMS_458

Track Name: I&M

INDUCTION OF CROSS-FUNCTIONAL DEPARTMENT TO AVOID DESIGN MIS-MATCH

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ABSTRACT

According to Wikipedia, design can be defined as "a plan or specification for the construction of an object or system or for the implementation of an activity or process, or the result of that plan or specification in the form of a prototype, product or process". Similarly, "Design thinking refers to the cognitive, strategic and practical processes by which design concepts (proposals for new products, buildings, machines, etc.) are developed. Many of the key concepts and aspects of design thinking have been identified through studies, across different design domains, of design cognition and design activity in both laboratory and natural contexts. Design thinking is also associated with prescriptions for the innovation of products and services within business and social contexts. Some of these prescriptions have been criticized for oversimplifying the design process and trivializing the role of technical knowledge and skills". In this context, design is major aspect of any products life-cycle, its positioning in the market and the possible performance with which it will endure its desired function. Having said that, it is not always possible to map out the exact design of a product or component and there can be deviations due to various factors. Without going deep into the restrictive frames of a design, the paper tries to cover the aspect as to how a multi-functional approach can be used to maximize the usage & functionality of a product, decreasing a company's third-party reliance while achieving end-user compliance. A case study is also included to understand how cross functional teaming at the top of the pyramid are still susceptible to design mismatch where two or more products released in market in succession, fail to interact with each other.

Possible approach to overcome these set of problems are explored along with learning while taking note of mutual opportunities and the effect of such design flaws on environment are briefly understood.

Keywords: Product life cycle, Environment, Compliance Product, Design Thinking, Agile, Lean Manufacturing



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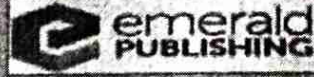


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Paper ID: CIMS_408

A REVIEW ON DEVELOPMENT OF JIG AND WELDING FIXTURE FOR CAR PANEL

Diksha Batndure¹, Subhosh Waghmare¹ and Sagar Shetare¹

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ABSTRACT

The current research work seeks to propose a review on the design of jig and welding fixture for car body panel which is used to match and position work pieces and to support them. Their performance influences the manufacturing and assembly process of a product. Besides, the installation will consume a significant portion of the necessary investment and total process planning time for the production system. It is observed that in many instances, cheaper and more automated fixing systems are designed with automation demands in mind. The locating pin is used to control the panel's degree of freedom. The panel can affect the loading and unloading of the panel due to a fixed position pin, as we have to configure the shield and to change the positioning pin during loading and unloading of the panel. We will develop a CAD model jig and welding fixture and a CAD model for testing in this project.

Keywords: Jig, Welding fixture, CAD Model, Work holding device

Paper ID: CIMS_409

A STUDY OF THERMAL CONDUCTIVITY OF NiCrFeSi BASED CERAMIC COMPOSITE COATING

Rahul Yadav¹, Rahul Kumar Saha², Pulkit Mann³, Deepak Kumar⁴ and Pustendra Singh⁵

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ABSTRACT

Abstract

Thermal conductivity has become an critical parameter for new technologies, especially in boilers and turbines and in engines etc. In this article a novel Thermally sprayed composite layer coating is used to solve the problem of heat loss to enhance the efficiency of system by decreasing the ability of thermal conduction. The function of Thermal Barrier Coating is to reduce the penetration of heat loss at high temperature. The microstructure is characterized in detail of this article. This paper is to review theoretical and experimental aspects of thermal conductivity in composite coating coated by thermal spray technique. Measured thermal conductivity of coating is 2.4W/mK and this paper also gives a review and the distinct materials selected for thermal barrier coating and the effect of coatings on thermal conduction ability according to various criteria and conditions. Thermal spray coating is a promising innovation and contender for metal based thermal coating in steam pipes, heat pipes in fire tube boilers, IC engines and other applications.

Keywords: Thermal conductivity, TBC, Thermal Barrier Coating, Insulation

Heat Transfer and Pressure Drop Inside Duct with Different Surface Profiles



P. P. Shirpurkar , V. M. Sonde , P. T. Date , and T. R. Badule

Abstract In this experimental study, the heat transfer rate with respect to the pressure drop in rectangular duct is studied. The ribs with various profiles are used as an inserts and heat transfer rate was determined. The rectangular duct of cross-section 700×100 mm made up of mild steel was used. The experiments were carried for the Reynolds number in the range 5000–22,000. Five cases were analyzed in this study. Case 1 includes the rectangular duct with 300 mm as effective test section without ribs. In Case 2, flat ribs were used at angle of 90° with respect to the direction of the flow. V-shaped broken ribs inclined at an angle of 30° , 45° , and 60° with respect to the direction of flow are used as inserts in case 3, 4, and 5, respectively. The readings were noted at constant heat flux of test section. Initially, air was supplied with velocity of 0.6 m/s and then it was gradually increased to 2.4 m/s. In this case, less pressure drop is observed experimentally, as compared to transverse broken V-shaped ribs.

Keywords Heat transfer and pressure drop · Rectangular duct · V-shaped ribs (30° , 45° , 60°)

1 Introduction

A passive heat transfer enhancement technique generally includes various surface and geometrical shapes as inserts in the direction of flow through channel [1]. These inserts change the heat transfer rate based on various parameters of inserts such as shape, size, type, and orientation of these inserts in the flow channel. The electronic and other devices are getting more compact in size which results in more heat generation inside the devices. This increase in heat generation affects the performance and life of device. So, it is necessary to dissipate heat with some good technique [2].

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An Approach to Form Manual Power Generalized Experimental Model for Wood Chipping Process



V. M. Sonde , P. N. Warnekar , P. P. Ashtankar , and V. S. Ghutke 

Abstract Motion is one the most sources of energy for gathering. This article plays a critical role in the construction of human energy which is a motivation research related to wood chipping process. A successful mathematical model has been developed for three parameters, i.e., power required speeding up the flywheel, blood pressure rise and time required to achieve flywheel speed, the five persons with different physical characteristic were used for pedaling the energy unit and accordingly the power required per person was calculated. The process form pedaling of bicycle to the clutch engagement can be the separate field of research which is done in this research work. The separate experimental plan was developed for measuring the human energy, and various variables were identified for detail study. The first time attempt has been made for calculation of human energy required for any machine operation. The novelty of this research is considered to be a prime importance because it is unique and applicable for any mathematical model formed.

Keywords Human energy · Blood pressure · Pulse rate · Flywheel · Time

1 Introduction

The human-energized flywheel motor basically includes two phenomena [1]. First is the process from pedaling of bicycle to the clutch engagement, and second is the process after engagement of clutch to the process unit. All previous researchers about human-powered concept have done the research work only after engagement of clutch to the process unit. Nobody has worked on the process from rider effort to the clutch the engagement in human-powered systems [2]. This is considered to be a research gap in this type of work area. The proper study based on the identified area is successfully incorporating the solution of human-operated mechanism. Here, the human energy required for pedaling the bicycling unit up to the required rpm is measured. The separate experimental plan was developed for measuring the

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Development of a Model for the Number of Bends During Stirrup Making Process



S. N. Waghmare, Sagar D. Shelare, C. K. Tembhurkar, and S. B. Jawalekar

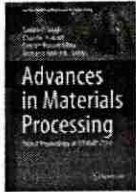
Abstract Stirrup making is a process to angling reinforcement bars at expected edges into civil engineering work. Hand-operated bar bending requires vigorous physical exercise, which is generally done in a bad ergonomic atmosphere at construction site. This could begin to prolonged musculoskeletal complications such as profound back disorder among bar benders. Current research explains a numerical model for number of bends, torque and required time to process of a stirrup making method using human fortified flywheel motor based on testing data collected, applying a method of design for experimentation. Out of the above three models, the numerical model and its analysis for a number of bend for the stirrup producing process is described here. Findings obtained by the numerical model for a number of bends positively describes the degree of interaction of multiple independent parameters for stirrup producing operation.

Keywords Stirrup · Bar bending · Human power · Sensitivity analysis

1 Introduction

The civil construction business is the other most significant businesses in India giving work to higher than 35 million people, that is nearly 16 percentage of India's serving people [1]. However, an industry creates work possibilities on a massive scale, and over 80 percent of the workers are untrained [2]. Globally, construction places are intrinsically terrible, and every year, the industry proceeds to register few most significant levels of misfortune and destructiveness among all industrial divisions [3–5]. Also, by large safety management orders and enactment in place, industrial accidents continue a pervasive, yet preventable dilemma [4, 6, 7]. In civil engineering works, bending of the bar is a method to provide angle to reinforcement bars applied


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Pyrolysis System for Environment-Friendly Conversion of Plastic Waste into Fuel

Authors Authors and affiliations

S. N. Waghmare, S. D. Shelare , C. K. Tembhurkar, S. B. Jawalekar

Conference paper
First Online: 23 June 2020

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Abstract

Because of the draining petroleum combustible reservoirs like crude fuel, coke, and natural gasoline, the current pace of commercial development is indefensible. Accordingly, numerous sustainable power source has been employed; however, the potentials of a few different sources like plastics waste are still to wholly created as a business project. Along with age group of waste plastics expanding, current Indian enactment directs high recuperation rates, and rules favors waste management innovation decisions that possess a higher situation of a waste management progressive system. Pyrolysis is a procedure that changes over waste plastics in a relevant fluid product that can be accepted as a potential origin for several reasons such as automobile vehicles, power generators, and diesel engines, etc. Plastics pyrolysis depends on the thermal or occasionally reactant breakdown of the polymer composition. This examination aimed to develop the pyrolysis system model for the extraction of oil/diesel from plastic wastes that can be sold at extremely cheaper rates than those available. Developed pyrolysis system model has tested as alternative for the extraction of oil. Results shows, oil extraction of 10–20 ml could be obtained by burning 180–380 gm of plastic.


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Assessment of Average Resistive Torque for Human-Powered Stirrup Making Process



Subhash N. Waghmare, Chandrashekhar N. Sakhale,
Chetan K. Tembhurkar and Sagar D. Shelare

Abstract Bar twisting technique is needed for stirrup creating action, stirrup or equivalent tie is one in all the requisite part of rock-hard cement concrete that's utilized for strengthening columns and beams. In the Asian country, these stirrups are made directly which causes a lot of physical strain on workers. This investigation work legitimizes the look of the investigational process to be dead for assessment of an estimated general mathematical model for assessment of resistive torque for the stirrup making operation. The collected data was formulated by utilizing the conventional method of the theory of experimentation. It conjointly incorporates the formulation of the arithmetical model and its sensitivity examination, desirableness, change, and ANN simulation.

Keywords ANN · HPFM · Reliability · Resistive torque · Sensitivity analysis · Stirrup

1 Introduction

IN little building destinations workers twist stirrup bar by using the usual process. In usual method, stirrups are created on a wood stage outfitted with pins and bar is twisted utilizing a lever like hand device daag [1]. The power is applied on daag and the pin acts as a pivot for twisting the bar. There is no different methodologies to build stirrup with less individual effort and at the same time the investigation

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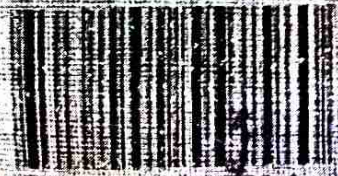
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In the last few decades, Reconfigurable Computing has become the dominant architecture for embedded applications. Reconfigurable systems are able to compensate the differences in logic, microprocessors and high-level ASIC circuits. A reconfigurable architecture takes advantage of both systems. It is more flexible than ASIC circuits which can be reconfigured with changing requirements. In addition, it has better performance than processors since it maintains the desired algorithm on a custom hardware. The most important advantage of FPGAs is their high level of flexibility, wide range and performance. These very attractive recent advances in reconfigurable logic systems and systems have led to a wide range of applications in the field of embedded systems. The most important applications of the reconfigurable logic systems are in the field of embedded systems, where the logic is implemented on a custom hardware. The reconfigurable logic systems are used in the field of embedded systems, where the logic is implemented on a custom hardware.

Shashank Sharma

FPGA Reconfiguration and Self Adaptive Systems

Dr. S.S. Sharma is working as a professor and Dean Academics in Prayagrah College of Engineering, Noida. He has more than 20 years of teaching experience. He completed his Ph.D. in the field of VLSI in 2011. He has published more than 50 research papers in reputed journals and conferences. He has guided 25 PG and 3 Ph.D. students.



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Paper ID: CIMS_405 Track Name: CC

DESIGN AND ANALYSIS OF TWO WHEELER SUSPENSION HELICAL COIL SPRING

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ABSTRACT

A helical spring which allows in both spring plates with maximum amount of motion for horizontal. The paper is about evaluation of the problems of helical spring used into the suspension system, of automobile is obtained in this project. Also of three helical compression spring tested due to corrosion and response characteristics. These values subjected to being redesigning and redesigning of suspension spring and also make by using applied their type of part in a few technical research movement. The stress and deflection can be reduced by using various type of alternative materials in the work spring rate to be increased due to reduced number of active coils used. This basic test can be done by using finite element method to find out detailed stress distribution of spring. The task of examination performed to evaluate the stiffness of helical spring. Calculated results are compared with software and experimental work.

Keywords: Helical Compression Spring, Corrosion Spring, Rate Stiffness

Paper ID: CIMS_405 Track Name: CC

DESIGNING A MECHANISM TO PAINT A CONICAL SHAPED PART

Chandrabhaskar N. Sakhalé¹, Rufus R. Thomas², Manish G. Giripunjé³ and Sagar D. Sutar⁴

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ABSTRACT

The project is based on the mechanism which controls the painting of a conical shaped part through production technology. Now we will think of making a technique that will function via the following mechanism: motor for rotation, fixture developing for mounting of work piece and cam follower principle etc. This can initiate the paint function automatically by pressing ON button. One of the major part is the control over the speed for the motor and paint flow technique which will provide good finishing and access on the system. It consists of many mechanical parts which assembled together for carrying out a specific task. Mainly the synchronized movements between the rotating motor with work piece and spraying spray from automatic spray gun is the key factor for this assembly model.

Keywords: Conical Shaped Part, Production Technology, Fixture, Development, Synchronized Movement

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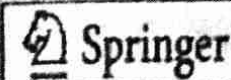


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Paper ID: CIMS_494
EFFECT OF INDUSTRIAL/ AGRICULTURAL WASTE MATERIALS AS REINFORCEMENT ON PROPERTIES OF METAL MATRIX COMPOSITES

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ABSTRACT

Development of industrial/agricultural waste based metal matrix composites is challenging role for all engineers and scientists. Lot of research work is going on to develop MMCs for advanced engineering applications. These composites are demanded by industries due to improved properties. In the present paper, a review was presented related to metal matrix composites using different industrial/ agro based waste materials which is available from industries and farming sectors. Various reinforcements such as fly ash, coconut shell ash, bagasse ash, etc. are now demanding by industries for numerous engineering applications such as structural, automotive, sports stumps.

Keywords: Chiroli, Nut, postharvest operation, nut processing, principles, de-sheller, process parameters

Paper ID: CIMS_494

Track Name: ME

EFFECT OF INDUSTRIAL/ AGRICULTURAL WASTE MATERIALS AS REINFORCEMENT ON PROPERTIES OF METAL MATRIX COMPOSITES

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ABSTRACT

Development of industrial/agricultural waste based metal matrix composites is challenging role for all engineers and scientists. Lot of research work is going on to develop MMCs for advanced engineering applications. These composites are demanded by industries due to improved properties. In the present paper, a review was presented related to metal matrix composites using different industrial/ agro based waste materials which is available from industries and farming sectors. Various reinforcements such as fly ash, coconut shell ash, bagasse ash, etc. are now demanding by industries for numerous engineering applications such as structural, automotive, sports stumps.

Keywords: Metal Matrix Composites, Agriculture Waste Materials, Industrial Waste Materials, Mechanical Properties



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Paper ID: CIMS_445

AN AUTOMATED BELT CONVEYOR SYSTEM FOR BOLT AND WASHER ASSEMBLY

Sudhish Waghmare¹, Sagar Shalga¹, Nishant Mungle¹ and Krunal Modale²

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ABSTRACT

Automation is the need for this competitive era to increase quality and to reduce the overall processing time and cost in the automobile industry, the time taken for assembling the bolt and washer takes comparatively much longer time hence increased in cost of overall assembly. The proposed research is carried out to automate the bolt and washer assembly. To obtain the objective, a novel kind of machine was designed and developed. The developed machine mainly comprised of a motor, the conveyor, motor for gun, inductive gunny sensor, and Arduino Uno. The outcome of the assembly experiment was carried out by put down the bolts on a conveyor belt at a different location. The developed machine was successfully tested by the assembly of bolt and washer and the time required for identification and assembly was noted. Identification time was varied from 0.11 seconds to 0.22 seconds whereas assembly time varies from 2.8 seconds to 4.7 seconds. The average identification time and time to assemble for assembly were 0.23 and 3.73 seconds respectively. The developed machine was found suitable for its application in the industry where the bolt and washer assembling are carried out.

Keywords: Automation, belt conveyor, automobile industry, bolt washer assembly

Paper ID: CIMS_446

VISUAL EFFECTS OF SECOND ORDER RECURRENCE EQUATIONS THROUGH SPACE-TIME DIAGRAM

Sudhakar Dubey¹, Suryabanta Pal² and Ranjeet Rout³

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ABSTRACT

In this paper, the space-time diagrams of both one dimensional two class Cellular Automata (CA) with triangular neighborhood and two dimensional Integral Value Transformation (IVT) have been considered. Computational mechanics of both finite discrete dynamical systems leads to a complex pattern of fractal structure and hence they have an interconnection with each other. Some interesting patterns and their effects starting from few initial state of configurations have been captured. Comparison of these space-time diagrams has been identified as a second order recurrence relation of the form $x(n) = (Mx + N)$ where $x(n)$ represents the configuration of the corresponding discrete dynamical system.

Keywords: Cellular automata rules, Triangular neighborhood, Discrete dynamical systems, Fractal structure, Space-time diagrams, Integral value transformation, Second order recurrence relation



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Paper ID: CIMS_486

Track Name: M8

EXPERIMENTAL ANALYSIS OF IMPROVED VORTEX TUBE

Sudhanshu Namdeo Waghmare¹, Ketan Sanjay Morewad¹, Sagar Shetara² and Sanjay Morewad²

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ABSTRACT

Nowadays, the lifespan and yield quality of any analysis is its eco-friendly nature. The main concern of any industries is to keep up environment safety. This paper focuses on investigation and efficiency of vortex tube which works on the principle of hot gas stream through the end and a cold gas flow from the turbine and without any external source of energy. The main design is the prime concern of the research as it will give greater cooling effect as compared to inlet and outlet orifice of vortex tube. The geometrical parameters were been analyzed to get the better and efficient design of improved vortex tube.

Keywords: Vortex tube, Cold and hot air, Nozzle, Vortex Analysis

Paper ID: CIMS_488

Track Name: M8

INDUCTION OF CROSS-FUNCTIONAL DEPARTMENT TO AVOID DESIGN MIS-MATCH

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ABSTRACT

According to Wikipedia, design can be defined as "a plan or specification for the construction of an object or system or for the implementation of an activity or process, or the result of that plan or specification in the form of a prototype, product or process". Similarly, "Design thinking refers to the cognitive, strategic and practical processes by which design concepts (proposals for new products, buildings, machines, etc.) are developed. Many of the key strategies and aspects of design thinking have been identified through studies, across different design domains, of design cognition and design activity in both laboratory and natural contexts. Design thinking is also associated with prescriptions for the intervention of products and services within business and social contexts. Some of these prescriptions have been conceived for overcoming the design process and trialing the role of technical knowledge and skills". In this context, design is major aspect of any product's life-cycle, as positioning in the market and the possible performance with which it will achieve its desired function. However and then done, it is not always possible to map out the exact design of a product or component and there can be deviations due to various factors. Without going deep into the restrictive factors of a design, the paper tries to cover the aspects as to how a multi-functional approach can be used to maximize the usage & functionality of a product, decreasing a company's dependency reliance while achieving customer compliance. A case study is also included to understand how cross-functional functioning at the top of the pyramid will incorporate to design mismatch where two or more products related to market in succession, fail to interact with each other.

Possible approach to overcome these set of problems are captured along with learning while taking care of missed opportunities and the effect of such design flaws on environment are briefly understood.

Keywords: Product life cycle, Environment, Compliance Product, Design Thinking, Agile, Lean Manufacturing



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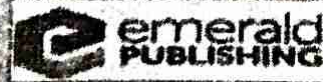


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A REVIEW ON DEVELOPMENT OF JIG AND WELDING FIXTURE FOR CAR PANEL

Diksha Bahaduro¹, Subhoosh Waghmare² and Sagar Shastri²

^{1,2} Piyushkhand College of Engineering, Nagpur

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ABSTRACT

The current research work seeks to propose a review on the design of jig and welding fixture for car body panel which is used to match and position work pieces and to support them. Their performance influences the manufacturing and assembly process of a product. Besides, the justification will comprise a significant portion of the necessary pre-concept and final process planning time for the production systems. It is observed that in many industrial, vintage and more automated fixing systems are designed with manufacturing demands in mind. The locating pins are used to control the panel's degree of freedom. The panel can affect the loading and unloading of the panel due to a fixed position pin, as we have to configure the shift tool to change the positioning pin during loading and unloading of the panel. We will develop a CAD model jig and welding fixture and a CAD model for setting in this project.

Keywords: Jig, Welding Fixture, CAD Model, Work Holding device

Paper ID: CIMS_410

A STUDY OF THERMAL CONDUCTIVITY OF NiCrFeSi BASED CERAMIC COMPOSITE COATING

Rohit Yadav¹, Rahul Kumar Saha², Pulkit Misra³, Udayak Kumar⁴ and Pushpendra Singh⁴

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ABSTRACT

Abstract

Thermal conductivity has become an critical parameter for new technologies, especially in boilers and turbines and in engines etc. In this article a novel Thermally sprayed composite layer coating is created to reduce the gas turbine heat of intractable heat loss to enhance the efficiency of system by decreasing the ability of thermal conductance. The function of Thermal Barrier Coating is to reduce the penetration of heat loss at high temperature. The microstructure is characterized in detail in this article. This paper is to review theoretical and experimental aspects of thermal conductivity in composite coating coated by thermal spray technique. Measured thermal conductivity of coating is 2.4W/mK and this paper also give a review and the different materials selected for thermal barrier coating and the effect of coatings on thermal conductivity ability according to various criteria and conditions. Thermal spray coating is a propitious application and candidate for most hard thermal coating in steam pipes, heat pipes in fire tube boilers, IC engines and other applications.

Keywords: Thermal conductivity, TBC, Thermal Barrier, Coating, Turbine

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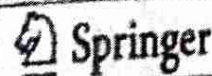


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Paper ID: CIMS_331

Track Name: RB

INVESTIGATION OF LEAN SIX SIGMA BARRIERS IN SMALL MANUFACTURING ENTERPRISES USING BEST WORST METHOD

Mahipal Singh¹ and Rajeev Rathi²

¹LPU Jalandhar, LPU Jalandhar

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ABSTRACT

Lean Six Sigma (LSS) is a breakthrough approach based on the concept of waste reduction, and process variation minimization to improve quality and productivity. During execution of new approach, decision making becomes tedious in terms of selecting the various aspects that integrate quality and productivity in the organization. The current study aims to investigate and prioritize the LSS barriers using an advanced decision making approach as Best Worst Method. The LSS barriers have been extracted through detailed literature review and assessed through expert's opinions selected from the best company in India. Further, the screened LSS barriers have been validated by using the reliability test. The result of present study reveals that top three most demotivating barriers are 'poor top management involvement', 'lack of LSS training and education', and 'wrong project selection' with optimal weight 0.309861, 0.196679 and 0.138179 respectively. This study facilitates the industrial managers of case organization with prominent barriers, which will help in planning and successful execution of LSS initiatives. The application of BWM for prioritization of LSS barriers with the help of case explanation is the novelty of present research work.

Keywords: Lean Six Sigma, Barriers, Best Worst Method, Small manufacturing enterprises (SMEs), Multi Criteria Decision Making Approach

Paper ID: CIMS_333

Track Name: RE

SUSTAINABLE RENEWABLE ENERGY SOURCES AND SOLAR MOUNTING SYSTEMS FOR PV PANELS: A REVIEW ON NEED AND FURTHER ADVANCEMENT

Vishal Kohli¹, Sagar Shrivastava² and Maninder Mahey³

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ABSTRACT

Worldwide requirement of energy is presently increasing beyond the capacity of generation. To fulfill the upcoming energy needs effectively, generation of energy need to be efficient and sustainable energy sources should be examined insistently. Compelling energy arrangements have the option to address future problems by using the abundant & sustainable power sources. Apart from several renewable sources, solar energy is clearly a capable choice because of its availability. Solar power, particularly as it arrives at increasingly higher levels comparing to continuing sources of energy - for as most, may provide its sustainable a flow of lots of oppressed individuals into the developing nations. Additionally, solar energy equipments are able to promote an economy and atmosphere of developing nations. Solar energy is primarily used for heat and power generation. International energy agency (IEA) appears, into a relative report on global energy utilization that over the year 2050 solar energy contribution will give around 15% of global demand. Solar energy is supposed to be a significant sustainable power sources which assume an extraordinary position while giving energy arrangements. Most of the researches have been completed on the solar rays capturing technology and lots of work is still undergoing, that apart from these, limited research was carried out on the solar mounting structures and various mounting technology of the solar panel. This paper aimed to make a short review on the various available renewable energy sources along with solar energy and various mounting systems for the PV panels.

Keywords: Renewable energy sources, Solar panel mounting, PV Panels, Sustainable power sources

3.3.3

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Assessment of Average Resistive Torque for Human-Powered Stirrup Making Process



Subhash N. Waghmare, Chandrashekhar N. Sakhale,
Chetan K. Tembhurkar and Sagar D. Shelare

Abstract Bar twisting technique is needed for stirrup creating action, stirrup or equivalent tie is one in all the requisite part of rock-hard cement concrete that's utilized for strengthening columns and beams. In the Asian country, these stirrups are made directly which causes a lot of physical strain on workers. This investigation work legitimizes the look of the investigational process to be dead for assessment of an estimated general mathematical model for assessment of resistive torque for the stirrup making operation. The collected data was formulated by utilizing the conventional method of the theory of experimentation. It conjointly incorporates the formulation of the arithmetical model and its sensitivity examination, desirableness, change, and ANN simulation.

Keywords ANN · HPFM · Reliability · Resistive torque · Sensitivity analysis · Stirrup

1 Introduction

IN little building destinations workers twist stirrup bar by using the usual process. In usual method, stirrups are created on a wood stage outfitted with pins and bar is twisted utilizing a lever like hand device daag [1]. The power is applied on daag and the pin acts as a pivot for twisting the bar. There is no different methodologies to build stirrup with less individual effort and at the same time the investigation

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Development of a Model for the Number of Bends During Stirrup Making Process



S. N. Waghmare, Sagar D. Shelare, C. K. Tembhurkar, and S. B. Jawalekar

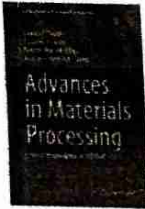
Abstract Stirrup making is a process to angling reinforcement bars at expected edges into civil engineering work. Hand-operated bar bending requires vigorous physical exercise, which is generally done in a bad ergonomic atmosphere at construction site. This could begin to prolonged musculoskeletal complications such as profound back disorder among bar benders. Current research explains a numerical model for number of bends, torque and required time to process of a stirrup making method using human fortified flywheel motor based on testing data collected, applying a method of design for experimentation. Out of the above three models, the numerical model and its analysis for a number of bend for the stirrup producing process is described here. Findings obtained by the numerical model for a number of bends positively describes the degree of interaction of multiple independent parameters for stirrup producing operation.

Keywords Stirrup · Bar bending · Human power · Sensitivity analysis

1 Introduction

The civil construction business is the other most significant businesses in India giving work to higher than 35 million people, that is nearly 16 percentage of India's serving people [1]. However, an industry creates work possibilities on a massive scale, and over 80 percent of the workers are untrained [2]. Globally, construction places are intrinsically terrible, and every year, the industry proceeds to register few most significant levels of misfortune and destructiveness among all industrial divisions [3–5]. Also, by large safety management orders and enactment in place, industrial accidents continue a pervasive, yet preventable dilemma [4, 6, 7]. In civil engineering works, bending of the bar is a method to provide angle to reinforcement bars applied

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Pyrolysis System for Environment-Friendly Conversion of Plastic Waste into Fuel

Authors

Authors and affiliations

S. N. Waghmare, S. D. Shelare , C. K. Tembhurkar, S. B. Jawalekar

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Because of the draining petroleum combustible reservoirs like crude fuel, coke, and natural gasoline, the current pace of commercial development is indefensible. Accordingly, numerous sustainable power source has been employed; however, the potentials of a few different sources like plastics waste are still to wholly created as a business project. Along with age group of waste plastics expanding, current Indian enactment directs high recuperation rates, and rules favors waste management innovation decisions that possess a higher situation of a waste management progressive system. Pyrolysis is a procedure that changes over waste plastics in a relevant fluid product that can be accepted as a potential origin for several reasons such as automobile vehicles, power generators, and diesel engines, etc. Plastics pyrolysis depends on the thermal or occasionally reactant breakdown of the polymer composition. This examination aimed to develop the pyrolysis system model for the extraction of oil/diesel from plastic wastes that can be sold at extremely cheaper rates than those available. Developed pyrolysis system model has tested as alternative for the extraction of oil. Results shows, oil extraction of 10–20 ml could be obtained by burning 180–380 gm of plastic.

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Abstract

In this study, the temperature distribution analysis was performed with the Gas Tungsten Arc Welding (GTAW) process of dissimilar metals such as 316L austenitic stainless steel (ASS) and 430 ferritic stainless steel (FSS) with two filler materials ER309 and ER316 and one without filler. The transient thermal finite element analysis was performed to get the distribution of temperature across the welded zone throughout the welding. The analysis of thermal distribution in the welded zone is carried out with the help of ANSYS 16.0. The heat distribution without filler results in the most extreme temperature distribution across the welded zone as compared to welding with ER309 and ER316 filler material.

Keywords

Transient analysis Austenitic stainless steel Temperature distribution Ferritic stainless steel

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Assessment of Average Resistive Torque for Human-Powered Stirrup Making Process



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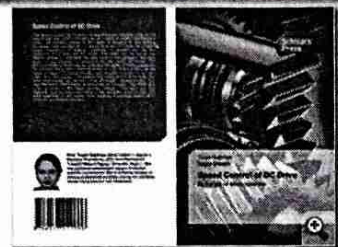
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An IOT Based Private Blockchain Framework for Attendance Management Using QR Code

Priyanka B. Dongre¹, Pushpneel Verma²
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Abstract. Blockchain and Internet of Things are considered as most disruptive technologies of the decade. Internet of Things has established its existence in several areas including manufacturing, smart home system to IT enabled Services on the other several use cases are available for blockchain mentioning its successful application in finances to supply change management, electronic health care record etc. Researchers are also trying to integrate blockchain and Internet of Things. This paper introduces the primary work carried to integrate blockchain and internet of things. To integrate blockchain and internet of things it is essential that all the participating devices work in an environment that allows them to communicate and initiate transactions thereby allowing the successful creation of block and blockchain. The major contribution of this paper includes development of a private blockchain that allows various users of system to perform their activities as per the rules or smart contracts defined while they are the part of blockchain. We have developed a private blockchain framework that utilizes a novel method to create the blocks and blockchain using SHA-256 algorithm, QR Codes and stores the information in blockchain at a particular timeframe. The proposed private blockchain framework is explained in terms of use case taken for marking attendance of students using mobile phones and teacher's laptop which participate in the blockchain creation. The rest of the paper is organized in five sections. Initially a short introduction of the proposed system is given then in second section related work is presented. Third section describes the proposed system architecture, implementation details are highlighted then in last section conclusion and directions to future work are given.

Keywords: Internet of things, blockchain, QR Code, student attendance.

1 Introduction

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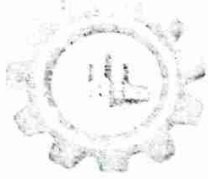
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