PROCEEDINGS

NATIONAL CONFERENCE

ON

RECENT TECHNOLOGY IN ENGINEERING & MANAGEMENT

(NCRTEM 2021)

10th-12th February 2021

In Association with: International Journal of Engineering, Management, Humanities and Social Sciences Paradigms (IJEMHS)

Organized by

Department of Mechanical Engineering
Krupajal Engineering College
Prasanti Vihar, Pubasasan, Kausalya Ganga,
Bhubaneswar, Odisha-751002, India

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Where Tradition Breeds Excellence

Department of Mechanical Engineering
Krupajal Engineering College
Prasanti Vihar, Pubasasan, Kausalya Ganga,
Bhubaneswar, Odisha-751002, India

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ABOUT THE CONFERENCE

The Department of Mechanical Engineering, Krupajal Engineering College, Bhubaneswar are glad to announce the "National Conference on Recent Technology in Engineering & Management (NCRTEM-2021)" during 10th – 12th February, 2021 at Krupajal Engineering College, Bhubaneswar, Odisha, India. The NCRTEM-2021provides a two-day research extravagance which will be having a perfect blend of keynote addresses and oral presentations through which an ample networking opportunity for collaborations and partnerships that can drive wide recognition and adds value to the enlisted career profiles from the world's brightest minds in science, engineering and technology. This platform will eventually benefit the young research minds to bring forth the ideas and develop it into a solution for future world.

ABOUT THE DEPARTMENT

The Department of Mechanical Engineering at Krupajal Engineering College (KEC) deal with theory, design, development and application of Mechanical Engineering and related technologies. Within a short span of time the departments have carved a niche for itself and demonstrated its credentials in all-round development of its students be it academics, research projects, research paper presentation and publication in peer reviewed journals and conferences. The department boast of well-balanced industry experienced and well qualified faculty. The Departments are well equipped with state-of-the-art laboratories and one dedicated workshop, which provides exceptional platform for teaching, learning and developing skills of students. In research, both departments have comprehended a wide range of areas, such as structural analysis, composite materials, environmental science, heat transfer, waste heat recovery, nano-fluid, robotics, composite material under the guidance of eminent personalities from the related field. Some of our faculties are currently pursuing research in nano-fluid and formation of crude oil from waste plastics. Seminars, symposiums and conferences are conducted by the department on a regular basis to cope up with the emerging trends in recent developments in Mechanical Engineering. The department of Mechanical Engineering has active members in student and faculty chapters like, The Institute of Engineers (India), society of Automotive Engineering (SAE), Indian Society for Technical Education (ISTE), Solar Energy Society of India (SESI) and The Combustion Institute India.

ABOUT THE INSTITUTE

Krupajal Engineering College, Bhubaneswar, also called KEC is an engineering institution in the Eastern Zone of Odisha, which was established in 1999 runs under the aegis of Orissa Computer Academy Society. The college is approved by AICTE, New Delhi, affiliated to Biju Patnaik University of Technology, Odisha situated at Kausalya Ganga, Pubasasan, Bhubaneswar. It has more than 10.56 acres of area across the Bhubaneswar- Puri NH with a built-up area of 90,000 sq.mts. Krupajal was founded as a missionary institution to provide myriad professional education, to produce graduates, who can face the challenges of this fast-changing world. Krupajal has grown from strength to strength, establishing top of the line educational institutes in various discipline. Krupajal Engineering College aims to provide the highest-quality education to promising and enthusiastic young minds. With a team of dedicated faculty of scholars distinguished in their respective fields, KEC seeks and adopts innovative methods to improve the quality of education and research on a consistent basis.

Krupajal Engineering College runs various courses, such as M. Tech, B.Tech and has state of the art departments like Civil Engineering, Computer Science & Engineering, Electrical Engineering, Electrical & Electronics Engineering, Electronics & Telecommunication Engineering and Mechanical Engineering. KEC provides conducive environment for learning with accessible teachers and engaged students who participate together in bringing out the best. At KEC students take advantage of opportunities as new fields, and bring up new innovations. The teacher prepares the students to lead lives that are professionally satisfying and successful, personally fulfilling, and enriched by a love of learning.

CONFERENCE

PROCEEDINGS

(ORAL & POSTER PRESENTATION)

Krupajal Engineering College

Prasanti Vihar, Pubasasan, Near CIFA, Kausalya Ganga,

Bhubaneswar, Odisha-751002, India.

Prof. (Dr.) Bhabani Charan Rath

Chairman

Message from the Chairman

On behalf of the Krupajal Engineering College (KEC), I extend a very warm welcome to all the delegates and participants to the "National Conference on Recent Technology in Engineering & Management (NCRTEM-2021)". KEC has borne the mantle of excellence, committed to ensuring the students their own space to learn, grow and broaden their horizon of knowledge by indulging into diverse spheres of learning. In our endeavor to raise the standards of discourse, we continue to remain aware to meet the changing needs of our stakeholders.

Last but not the least; we would also like to thank the staff, faculty members, the organizers especially the convener of NCRTEM-2021 and the students for their contribution in successfully organizing and managing this event. This event wouldn't have been possible without their guidance and constant support.

We welcome all of you to KEC and hope that, this national conference will act as a medium for all to ponder upon the topic of discussions, challenge us to strive towards it, and inspiring us to go ahead.

Thank you!

Prof. (Dr.) Bhabani Charan Rath

Krupajal Engineering College

Prasanti Vihar, Pubasasan, Near CIFA, Kausalya Ganga,

Bhubaneswar, Odisha-751002, India.

Prof. (Dr.) Dillip Kumar Biswal

Principal

Message from the Principal

The conferences are necessary to bring at the culture of information exchange and feedback on developing trends in technologies. I am delighted to note that the Department of Mechanical Engineering is organizing the "National Conference on Recent Technology in Engineering & Management (NCRTEM-2021)". Certainly, this type of conference not only brings all the researchers, students in one platform, but it also inculcates the research culture among the entire fraternity of Education in the country, thereby contributing to the development of the nation.

I hope that this conference would certainly induce innovative ideas among the participants paving way for new inventions and technologies in the field of application of optimization techniques and sustainable development in engineering sciences.

I Congratulate Dr. Bhabani Prasanna Pattanaik, Professor in Mechanical Engineering and Convener of NCRTEM-2021and the entire organizing team for initiating the conduction of such an important event at our institute.

I wish the conference a grand success.

Prof. (Dr.) Dilip Kumar Biswal

Krupajal Engineering College

Prasanti Vihar, Pubasasan, Near CIFA, Kausalya Ganga,
Bhubaneswar, Odisha-751002, India.

Dr. Rajesh Kumar Behera
Head of the Department
Department of Mechanical Engineering

Message from the Head of Department

It is a moment of great pleasure and honour that the Departments of Civil and Mechanical Engineering are organizing the "National Conference on Recent Technology in Engineering & Management (NCRTEM-2021)" at Krupajal Engineering College (KEC), Bhubaneswar, Odisha. I wish that the conference will bring the scientists, researchers, scholars, faculty members, industry personnel and students to a single platform for exchange of their ideas and innovations for development of new technologies and products for future towards betterment of the society and the globe. I am confident that the National Conference NCRTEM-2021 will achieve its key objectives with a great glory.

I wish NCRTEM-2021 a phenomenal success.

Dr. Rajesh Kumar Behera

Krupajal Engineering College

Prasanti Vihar, Pubasasan, Near CIFA, Kausalya Ganga,
Bhubaneswar, Odisha-751002, India.

Dr. Bhabani Prasanna Pattanaik

Professor in Mechanical Engineering

Convener (NCRTEM-2021)

Message from the Convener

It gives me immense pleasure to invite all delegates, industry experts, researchers and students at Krupajal Engineering College (KEC), Bhubaneswar, Odisha, India to the "National Conference on Recent Technology in Engineering & Management (NCRTEM-2021)". New Technologies are introducing every day that will radically transform the future of this fields. The NCRTEM-2021 aims to promote excellence in scientific knowledge and innovations in the diversified fields of science, engineering and technology to motivate young researchers and students. The aim of the conference is to provide a forum to researchers around the globe to explore and discuss on various aspects of science, engineering and technology. The conference consists of various sessions and includes keynote and parallel sessions. Each session will be addressed by outstanding experts who will highlight the recent innovations along with applications in the modern fields of science, engineering and technology. It will also offer the budding researchers to offer different opportunities to present their work in front of eminent experts of individual fields.

As the convener of the NCRTEM-2021, I extend my gratitude to all Professors, Invited speakers, Chief guests, Guest of honors, Keynote speakers, National delegates, invited faculty members, industry personnel, researchers and students coordinators for their wholehearted participation in the National Conference. I would like to thank National & International advisory committee members, organizing committee members, volunteers and departmental faculty and staff members for their continuing support. Special gratitude is offered to RSB Transmissions, Tangi, Cuttack, Odisha for their collaboration and sponsorship. Finally, I would like to thank all the authors, volunteers and persons who directly or indirectly contributed their helping hand in this conference. Without their cooperation and full support, this conference would not have been possible.

I wish the Conference and the Proceedings a grand success.

Dr. Bhabani Prasanna Pattanaik

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From the Editor's Desk...

I appreciate the precious efforts of the Mechanical Engineering Department of Krupajal Engineering College, Bhubaneswar towards the conduct of the "National Conference on Recent Technology in Engineering & Management (NCRTEM-2021)" and in bringing out a volume of the Proceedings of NCRTEM-2021with a compilation of valued papers into edited volume for the benefit of academicians, research scholars, Civil & Mechanical professionals, and students. It is not out of place to mention here that knowledge is an ocean and ideas rule the world. The struggle for existence and survival of the fittest became the order of the day. Therefore, I sincerely extrapolate that the proceedings of the conference will stand as testimony and parameters in revamping and fostering the knowledge, skills, abilities, and practical experiences.

With these words, I wish that the National Conference on Recent Technology in Engineering & Management (NCRTEM-2021) will touch the pinnacle of success and golden memories for the future.

Best wishes!!!

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Test examination of Machining Boundaries for Electrical Release Machining on Al-6061

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Abstract

Composites made of metal, in particular Aluminium Matrix Applications for composite materials in the aerospace, military, and automotive industries are garnering more and more attention. A lot of interest has been developed in the fabrication of intricate shapes like dies using non-traditional machining processes to shape aluminium metal matrix composites. For machining metal matrix composites, discharge machining (EDM) looks to be a viable method. With hybrid Al6061 metal matrix composites reinforced with 10% SiC and 4% graphite particles, this work aims to investigate the effects of parameters such as current (I), pulse on time (T), voltage (V), and flushing pressure (P) on metal removal rate (MRR), tool wear rate (TWR), and surface roughness (SR). Stir casting was used in the construction of the composite. The MINITAB R14 programme was used to create mathematical models.

Keywords: Electrical discharge machining, Metal matrix composites, Response surface method, Hybrid composites, Aluminium composites, stir casting process.

1. Introduction

According to Surappa (2003), a composite material system is one that is made up of a continuous phase (the matrix) and a discrete constituent (the reinforcement), and that derives its distinctive properties from the geometry and architecture of the constituents as well as the characteristics of the boundaries (interfaces) between the constituents. In comparison to monolithic metals, Metal Matrix Composites (MMCs) provide a number of benefits, such as superior characteristics at high temperatures, a lower coefficient of thermal expansion, greater wear resistance, and higher particular modules and specific strengths.

The Influence of Financial Liberty on the Expansion Rate: An Examination of Panel Data

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Abstract: This investigation examines some non-traditional determinants of economic development, utilizing the recently developed datasets of the economic freedom index from the Heritage Foundation/Wall Street Journal (HF/WSJ). The cumulative index is a combination of various sub-indices, including the fiscal freedom index, business freedom index, labor freedom, trade freedom index, and financial freedom index. The cumulative economic freedom index reveals the extent to which a country is open and welcoming to businesses. The sub-indices provide insight into openness in various sectors of the economy, such as the financial or trade sectors. While traditional neo-classical economic theories have focused on the supply of labor, capital, and technological advancements in explaining economic growth, institutional factors have been given little attention. Based on two panel datasets, this study provides evidence that institutional factors play a pivotal role in economic growth. The first dataset covers 186 countries from 2013 to 2015 and demonstrates the significance of institutional factors in economic growth.

Keywords: Economic growth; freedom index; GDP; panel data

1. Introduction

The non-economic determinants of growth rate have been under increased scrutiny in the academia in the recent past. Researchers, policy makers and governments of different countries now agree that these factors play an important role in the economic development of any country with their impact on production. Scholars believe that two countries with the same endowment of resources will prosper at different paces, if the non-economic determinants of business are different. The country with an environment more favorable to business will grow at a faster pace than the one with an environment less friendly to business.

The virtual conference on chemistry and its applications

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Abstract: The virtual conference featured 197 presentations and 400 attendees from 53 nations. Sixteen of the presentations were given by keynote speakers. The participants' virtual interactions took place on a protected platform. After the virtual meeting, there was a call for full papers to be considered for distribution in the gathering procedures. Participants were asked to submit complete papers to be used . In order to be considered for publication in the journal Pure and Applied Chemistry (PAC), keynote speakers and selected participants were invited to submit full papers. De Gruyter's book chapter policy and PAC's journal publication policy were followed when processing and reviewing all submissions. These proceedings, along with those from VCCA-2020, continue.

Keywords: Chemical sciences; virtual conference; Pure and Applied Chemistry

1. Introduction

A database management system with an embedded database of chemical structures is the Nonproliferation Cheminformatics Compliance Tool (NCCT). The database's primary feature is its inclusion of generic structures that describe the entries in relation to chemical families in addition to the structures of the chemicals that are individually listed. Using experimental and density functional theory techniques, Deoghare determined the activation rate constant and equilibrium constant for bromo substituted succinimide initiators in an ATRP process. It was discovered that the type of solvent plays a significant role in the ATRP mechanism that starts the chain activity, and that choosing the right solvent is essential for successful ATRP. Frenking and co used quantum chemical calculations to investigate the C2 precursors with the general formula Me3E–C2–I(Ph)FBF3 [E = C, Si, and Ge]. According to their investigation, -dative Me3E–C2 bonds (E = Si, Ge; Me3EC2) formed as a result of the interaction between singlet states of (C2–IPh(BF4)) and singly charged (Me3E)+ fragments.

Improvement of Three Wheeler Front Suspension Curl Spring

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Abstract: A mechanical component of a suspension system or shock absorber, the helical compression spring is designed to dissipate kinetic energy and smooth out or dampen shock impulses. The medium segment of the Indian automotive market includes a helical compression coil spring that is used to transport three-wheelers. The vehicle appears to veer to one side as a result of the suspension system's heavy weight. The front suspension spring can be improved and redesigned to solve this issue. For the current review the IS 4454 material was taken for thought. The spring was made into prototypes and optimized by reducing the total number of turns. The experimental test was carried out with springs made of material IS 4454 in accordance with the design. The static examination utilizing limited component technique has been finished to figure out the itemized load versus absconding of the spring. The helical compression spring's stiffness and vertical acceleration were determined through the experimental investigation. Additionally, the theoretical calculations were made. The universal testing machine and the quarter car test rig were used for the experimental test to determine the helical compression spring's vertical acceleration

Keywords: Improvement, Three wheeler, Front suspension, Curl spring

1. Introduction

When people think about automobile performance, they normally think of hp, torque, acceleration and most important comfort. So, the suspension is an important system in an automobile and much attention is given to it. The vehicle suspension system is responsible for the vehicle control, driving comfort and safety as the suspension carries the vehicle body and transmits all the forces between the road and the body. Suspension system consist of different parts such as spring, shock absorber etc. In most of the suspension system the spring plays an important role.

A new hybrid GWO-SCA approach to optimization problems

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Abstract: A recent research trend is the hybridization of two or more variants to find better solutions in the field of global optimization problems of practical and recent real applications. This paper teaches a new approach, a hybrid Gray Wolf Optimizer (GWO) - Sine-Cosine Algorithm (SCA) for 22 benchmarks, five biomedical datasets and one sine dataset problem. Hybrid GWOSCA is a combination of the Gray Wolf Optimizer (GWO) used in the exploitation phase and the Sinicosine Algorithm (SCA) in the research phase in an uncertain environment. The direction and speed of the gray wolf (alpha) is improved by the SCA position update equations. The numerical and statistical solutions obtained by the hybrid GWOSCA approach are compared with other metaheuristic approaches such as Particle Swarm Optimization (PSO), Ant Lion Optimization (ALO), Whale Optimization Algorithm (WOA), Hybrid GWO (HAGWO), Average GWO (MGWO), Gray Wolf Optimizer (GWO) and Sine-Cosine Algorithm (SCA). Numerical and statistical experimental results show that the proposed hybrid variant can be very effective in solving benchmark and real-life applications with or without limited and unknown search regions.

Keywords: global optimization problems; Whale Optimization Algorithm ; Grey Wolf Optimizer

1. Introduction

One of the highly effective techniques in searching the best possible results in benchmark and real life functions is the global optimization technique. In optimization, only a few results are compared to best which are known as the goal. Classical optimization approaches have some deficiencies on finding the global optimal solutions of classical optimization problems. These deficiencies are primarily interdependent on their inherent search systems. These classical algorithms are strongly under effects of choosing proper types of variables, objectives and constraints functions.

Fractal Fractional Differentiation and Integration: Combining Fractal and Fractional Calculus for Complex System Prediction

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Abstract: This paper presents new differential operators for the power law, the exponential decay law, and the generalized Mittag-Leffler law together with the fractal derivative. The new operators are called fractal-fractional-differential and integral operators. The new operators attract more non-local natural problems, which at the same time exhibit fractal behavior. Some new functions are presented, numerical approximations of these new operators are also presented to solve a real problem with some applications.

Keywords: Mittag-Leffler law; convolution of power law; fractal-fractional differential; integral operators

1. Introduction

In the past years, the concept of non-local operators of differentiation has embarked many researchers from almost all branches of sciences, technology and engineering due to their capabilities of including more complex natural into mathematical equations. Within this field, three dominants were suggested including the power law, exponential decay law and the generalized Mittag-Leffler law. To distinguish them some names were associated to them including Riemann-Liouville and Caputo fractional operators for power law or non-local and singular kernel type; Caputo-Fabrizio for non-singular local type and Atangana-Baleanu for non-local and non-singular type. It was demonstrated that, the kernel Mittag-Leffler function is more general than power law and exponential decay function; therefore both Riemann-Liouville and Caputo-Fabrizio are special case of Atangana-Baleanu fractional operators. Some researchers suggested to have a general kernel, however the question one will ask is what that kernel is? What will be the properties of this kernel? So far there is no answer to that question, and we believe the idea of having a general kernel is not practical.

Examination on Impact of boring parameters on Push Power and Force - In light of Plan of Tests

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Abstract: The impact of cutting parameters during composites with glass fibre reinforcement drilling is covered in this article. Using HSS twist drills, studies are carried out to determine how point angle, spindle speed, and feed rate affect thrust force and torque. The interplay of drilling parameters and their effects on thrust force and torque are correlated mathematically in this work. To obtain the lowest amount of thrust force and torque, the optimal cutting parameter value is also computed. They found that a drill point angle of 90 degrees produces better outcomes than those of 104 and 118 degrees. Ramulu4 noted that the greatest temperatures occurred at the highest cutting speeds and lowest feeds while using High-Speed Steel (HSS) and HSS-Co drills. Speeding up causes more tool wear, more entrance and exit burrs, bigger damage rings, and fewer holes to be drilled.

Keywords: Response surface methodology, CNC milling machine, Drill tool dynamometer, Thrust force, Torque

1. Introduction

A number of research endeavours have been made in the recent past to fully characterize the drilling process of fibre-reinforced composite material. Using response surface methodology (RSM), the current research endeavour aims to explore the relative importance of drilling factors including point angle, spindle speed, and feed rate on the thrust force and torque. Glass fibre-reinforced composites were drilled using a computer numerical control (CNC) milling machine as part of a series of tests. The thrust force and torque measurements were taken using a drill tool dynamometer. In this study, point angle, cutting speed, and feed rate were considered input factors, and thrust force and torque were used as reaction variables (output variables).

Adaptive control scheme for the dissolved oxygen control of the batch bioreactor using the model reference

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Abstract: The bioreactor plays a crucial role in the production of pharmaceuticals, enzymes, food products, and other products. because these processes are dependent on microorganism-mediated biotransformation. In an aerobic fermentation process, one of the important parameters is the dissolved oxygen (DO) level. Due to the bioreactor's complex nonlinear behavior and variations in process dynamics during batch/fed-batch processes, DO control is difficult to achieve. The stirrer speed is used as a control signal in this paper's design and implementation of the Model Reference Adaptive Control (MRAC) scheme, which is based on the MIT rule. A PC-upheld, completely mechanized, perform multiple tasks control framework has been planned and worked by the creators utilizing LabVIEW .A similar report is done for the trial bioreactor with traditional PI regulator and proposed MRAC conspire for DO control. Results show that MRAC regulator gives great following execution in contrast with PI regulator.

1. Introduction

Most of the microorganisms employed industrially require oxygen for respiration. For bacteria and yeast cultures, the critical oxygen concentration is usually 10–50% of air saturation. Maintaining the appropriate concentration of dissolved oxygen is essential for the survival of microorganism thereby ensuring efficient operation of the fermenter. Measurements of provide important information about a bioprocess or bioreactor. These determinations ensure that processing conditions are such that an adequate supply of oxygen is available for the rapid increase of cells. DO concentration control is a difficult task, especially in batch fermentation because of time varying conditions, time delays and the probe dynamics.

Numerical Analysis On The Effect Of Heat Transfer Rate By Varying The Tube Arrays In A Cross-Flow Heat Exchanger (original)

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Abstract: In this work, laminar flow is considered when the Reynolds number is constrained to a range where the flow field across the cylinder is laminar and stable. The fouling form is thought of as an eccentric annulus with constant thermal characteristics. For both concentric and eccentric situations, the local heat transfer coefficient, temperature distribution, and mean heat transfer coefficient along the fouling surface are provided. Based on the findings, we can infer that the eccentricity and thermal conductivity ratio between the fouling material and fluid affect the cross-flow heat exchanger's capacity to transfer heat. Due of the significant temperature and velocity gradients, the eccentric effect predominates in the area close to the front stagnation point.

Keywords: Heat Transfer Coefficient; Fouling Effect; Heat Transfer

1. Introduction

Due to its link with several real-world engineering applications, the issue of forced convection heat transfer from heated cylinders placed in a transverse fluid stream is of vital relevance. Cross-flow heat exchangers, hot wire anemometers, and many more devices are typical examples. The impact of various factors on the heat transfer process has therefore been the subject of a significant number of theoretical and experimental research. Three authors have provided thorough investigations on the topic: Eckert and Soehngen, Krall and Eckert, and Zukauskas . In earlier research, forced convection from a cylinder with a clean surface was the focus. The operational parameters and fluid type listed by Holman [4] restrict the fouling factor values. By measuring the values of the total heat transfer coefficient for clean and filthy circumstances in the heat exchanger, the fouling factors were experimentally derived.

Utilizing Alkaline-Based Catalysts from Waste Cooking Oil to Produce Biodiesel: Case Study

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Abstract: Utilizing waste cooking oil (WCO) as biodiesel can reduce the cost of diesel-powered operations because it is typically less expensive than diesel and has a much smaller impact on the food chain. In Bangladesh, air-conditioned fast food restaurants (FFR) produce a lot of WCO, but because of frequent load shedding, they also need to burn a lot of diesel to generate captive power. Reusing a portion of the discarded oils to make biodiesel can cut down on the need for diesel fuel and boost the business's profitability. In the event of a FFR in Dhaka, the technological and financial viability of such an operation has been investigated. Due to their lower costs, higher reaction rates, and higher yields, CH3OH (methanol) and NaOH (sodium hydroxide) are typically utilized as base catalysts in this process. From theWCO age of around 80 lites each week, yield for biodiesel creation is viewed as in the scope of 80-90%. Single-stageTran's esterification (SST) process is the least expensive and the most straightforward of the various strategies. In this SST process, recycling of CH3OH and NaOH can further reduce the cost of chemicals.

Keywords: Alkaline-Based Catalysts, Waste Cooking Oil, Biodiesel

1. Introduction

Straight vegetable oils (SVO) are not suitable to be used directly in diesel engines due to their high viscosity. The viscosity of SVOs can be minimized through trans esterification reaction . Biodiesel produced from edible oils have low free fatty acid, whereas biodiesel from non-edible oil sources have higher free fatty acid (FFA)

Optimized Sense Amplifier Design Using Cmos Technology

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Abstract: Using VLSI technology, we created a sense amplifier that is both faster and more power efficient for the Cmos SRAM in this paper. Specifically, the ads (advanced design system) were used to design and simulate the sense amplifier's schematic. The sense speaker then, at that point, carried out and examine at chip level micro wind 3.1-a format manager. The 45 nm and 32 nm advances are utilized to break down the execution of the sense speaker. The reduction in size, reduction in power consumption, and enhancement of the sense amplifier's response time will be our primary goals.

Keywords: SRAM, CMOS Micro wind, ADS, layout

1. Introduction

CMOS technology scaling will be a main driving force of the electronics industry in this era and also provide a path toward both faster and denser integration. The CMOS transistors manufactured today are 20 times faster and occupy very less area than those built 20 years ago. The number of components per chip and the system performance is improving exponentially over the last two decades. As the length of the channel is reduced, the performance of the transistor improves, the power per switching event decreases, and the density improves Oxide thickness, transistor length (Lg), and transistor width (W) were scaled by a constant factor (1/k) in order to provide a delay improvement of 1/k at constant power density. As a consequence of continued density scaling, features are moving ever closer to fundamental dimensions This paper presents the same scaling effects of technologies i.e. 45nm & 32nm using. The layout of the sense amplifier being analyzed & it proves the scaling impact on CMOS devices i.e. the size of the sense amplifier decreases, as the density of the transistor increases the power consumption increases at the chip level, and The Access time also decreases i.e. speed of the sense amplifier increases &as the time decreases, the frequency increases.

Experimental Study on Temperature Evolution during Friction Stir Welding of 2014-T6 Aluminum alloy, Structure-Property Correlation

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Abstract: In this investigation, aluminium 6061-T6 is butted together using a friction stir welding (FSW) procedure, with the goal of experimentally examining the thermal histories and temperature distributions in the workpiece. To monitor the temperature history during FSW at various points on the workpiece in the welding direction, several types of thermocouple arrangements are developed. The highest temperatures that can be maintained throughout the welding process are properly controlled to provide successful welding procedures. The temperatures at the junction line are predicted using least squares regression analysis.

Keywords: Friction Stir Welding; Thermocouple, 2014-T6 Aluminum alloy

1. Introduction

The Welding Institute (TWI) developed the friction stir welding (FSW) method in 1991 [1]. Since then, there has been active discussion over the welding process's material flow mechanism and the microstructures of the welds. Due to the requirement for lightweight components and environmental protection, this novel welding method has been used to aluminium products in a variety of industrial domains, such as the car and aircraft industries. Because the welding in an FSW process takes place in a solid state, it avoids several metallurgical issues that might arise as a result of the melting and solidification procedures employed in a traditional fusion welding process. These issues include deformation, shrinkage, porosity, and spatter. Using an FSW process requires a lower energy estimate.

Trial Examination of TIG Welding and Correlation between Initiated TIG and TIG on Duplex Hardened Steel

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Abstract: The TIG (Tungsten Inert Gas) welding method was utilized in the course of this investigation. In industries like the automotive, chemical, and rail car manufacturing, TIG is used a lot. Duplex Tempered steel (2205) is broadly utilized in businesses as a significant material, in light of its great erosion opposition, better return strength and hardness. Using the taguchi technique (L9 orthogonal array), an attempt is made in this paper to comprehend how tungsten inert gas welding affects mechanical properties like weld joint strength, microstructure, and hardness by varying input process parameters like welding speed, welding current, and gas flow rate. The experimental analysis has been studied to compare Activated TIG welding to TIG welding and to improve weld quality and productivity. Joint penetration can be increased with activated TIG welding. In this study, SiO_2 is used as a flux to compare weld joint penetration and the weld depth-to-width ratio. Weld plates have not been distorted angularly by employing the best clamping technique.

Keywords: Welding, Duplex Stainless Steel, microstructure, Taguchi technique, hardness, Tungsten Inert Gas Welding, Tensile strength.

1. Introduction

The TIG (Tungsten Inert Gas) welding method was utilized in the course of this investigation. In industries like the automotive, chemical, and rail car manufacturing, TIG is used a lot. Duplex Tempered steel (2205) is broadly utilized in businesses as a significant material, in light of its great erosion opposition, better return strength and hardness. Using the taguchi technique (L9 orthogonal array), an attempt is made in this paper to comprehend how tungsten inert gas welding affects mechanical properties like weld joint strength, microstructure, and hardness by varying input process parameters like welding speed, welding current, and gas flow rate.

An Overview of Biodiesel Blend Production, Properties, Performance, and Emissions

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Abstract: The rapid industrialization of the automotive industry is the cause of the sharp rise in demand for fuel derived from petroleum. Fuels made from petroleum have very few reserves. These restricted stores are situated in the specific areas of the world. As a result, countries that do not have a sufficient supply of petroleum-based fuel face fuel price increases, primarily as a result of the cost of importing petroleum-based fuel. As a result, it is necessary to discover and investigate the alternative fuels' other resources, which include alcohol, biodiesel, vegetable oil, and other locally and nearby resources. Methyl or ethyl esters of unsaturated fats delivered from vegetable oil or a creature fat is called biodiesel. The primary sources of biodiesel production are non-edible oil or animal fats like palm, marine fish oil, cottonseed, jatropha, and others. For use in a conventional diesel engine, biodiesel blends can be made with diesel in any ratio. When biodiesel is used in an engine, harmful environmental pollutants are significantly reduced. The production, properties, performance, and emission analysis of various biodiesel blend feedstocks, as well as experimental work conducted in various regions of the world, are examined in this paper.

Keywords: Biodiesel Blend Production, Properties, Performance, Emissions

1. Introduction

Biodiesel is a biodegradable and non toxic fuel produced from vegetable oil and animal fats which are renewable. It can be used in C.I (Compression Ignition) engine without modification. The biodiesel combustion by products are better not only for inhabitants but also for earth's environment. The emissions of unburned hydrocarbon, carbon monoxide, particulate matter of biodiesel combustion are much lesser than conventional diesel fuel. As biodiesel is produced from natural sources it contains very few amount of sulfur which leads to less emissions of sulfur dioxide when it burns in an engine.

Analysis of the performance of a CI Engine through extraction of fuel from waste plastics

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Abstract: The catalytic pyrolysis of waste plastics is used to create a fuel based on petroleum in this work. The polymeric materials are broken down during catalytic pyrolysis by being heated without oxygen and with a catalyst. In this study, waste plastics are used to produce a variety of oil samples using various catalysts and under a variety of reaction conditions. The blended oil tests are exposed to a parametric report in view of the oil yield, selectivity of the oil, fuel properties, and response temperature. The catalyst and reaction conditions were optimized based on the findings of the preceding study. Gas chromatography-mass spectrometry of the chose advanced example was finished to figure out its substance creation. At long last, execution examination of the chose oil test was done on a pressure start (CI) motor. Bags made of polythene are chosen as the waste plastics source. The study made use of silica, alumina, Y zeolite, barium carbonate, zeolite, and combinations of these catalysts. The polymer to catalyst ratio during the pyrolysis reaction was 10: 1. The response temperature ranges between 400° C and 550° C. The latent climate for the pyrolysis was given by involving nitrogen as a transporter gas.

Keywords: Pyrolysis, Extraction of fuel, CI Engine, Synthesis, Plastics, Catalysts

1. Introduction

In the new year's finding in newspapers is very normal furthermore, distributions that plastics are ending up being a threat. Soon, the planet will be completely covered in plastic, and people will live over it. The fact that plastics are no biodegradable in nature unifies all of the arguments in favor of and against them. The removal and decay of plastics has been an issue which has caused various exploration attempts to be completed in this respect. Land filling, mechanical recycling, biological recycling, thermal recycling, and chemical recycling are the current methods of disposal.

Using a Combination of MFCC and UMRT-Based Features to Identify Speakers

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Abstract: An isolated word speaker identification system utilizing an artificial neural network and a brand-new feature extractor is presented in this paper. Both text-independent and text-dependent speaker identification systems for English words are supported by the system. An audio wave recorder is used to record the speech. The given speech signals are then subjected to preprocessing. A transform known as UMRT has been utilized for image compression. As a feature extractor, MFCC and UMRT combinations are taken. The back propagation algorithm and multi-layer perceptron are used to classify the features. The confusion matrix is used to determine the accuracy. Speech dependent systems achieve an accuracy of approximately 97.91 percent, while speech independent systems achieve an accuracy of approximately 94.44%.

Keywords: Combination of MFCC, UMRT-Based Features, Speakers

1. Introduction

When somebody says something, humans have the ability to guess who the speaker is even though we might not have seen their face. This is speaker identification. Voice of almost all human beings is different. So it acts as abiometric measure. Nowadays Speaker identification is used in many services like voice dialing, security services, telephone shopping etc.Speaker recognition involves speaker verification as well as speaker identification. Speaker verification is a procedure of verifying the claimed identity of a speaker based on speech signal from speaker (voiceprint) [1]. While speaker identification is the task to identify the speaker [1]. Speaker identification systems can also be classified into speech dependent systems and speech independent systems.

Utilizing fluorescent sensing constructs, expanding the scope of on-site detection of toxic elements from a bio analytical perspective.

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Abstract: The global problem of environmental pollution has grown as a result of the pursuit of industrial and biotechnological revolutions. Due to the controlled and/or uncontrolled discharge of toxic elements from various industrial sectors, one of the major challenges facing humanity is the rapidly expanding contamination of numerous environmental matrixes. Because of a few unfriendly results of industrious poisonous components, there is basic to propose and send key measures and vigorous bioanalytical instruments with more noteworthy proficiency and exactness to recognize a more extensive scope of destructive contaminations. Real-time and on-site monitoring of the production and release of environmental contaminants in various industrial sectors can benefit even more from the expansion of pollution detecting tools. In light of the criticisms presented above, outstanding efforts by a variety of regulatory and legal authorities are urgently required to effectively address the expanding pollution issue in the environment.

Keywords: Environmental pollutants; Toxic elements;Analytical and bioanalytical measurements;Green analytical chemistry;Green chemistry principles;Nanosensing constructs;Carbon dots, Fluorescent sensors

1. Introduction

Toxic elements, pharmaceutical residues, antibiotics, synthetic toxic dyes, and the leaching of pesticides into water matrices are just a few of the environmental and health threats posed by the ever-increasing discharge of pollutants into the environment. Due to serious health issues and an environment that is unfriendly to human and biotic life in the entire living ecosystem, a variety of harmful heavy metal ions have also received a lot of attention.

Review of Recent Trends In Optimization Techniques Fort Solar Photo Voltaic Wind Based Hybrid Energy System

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Abstract: An updated assessment of the literature on optimisation approaches used in the design and development of hybrid energy systems based on solar photovoltaic and wind is provided. The major goal is to find the most cutting-edge, promising approaches for improving hybrid solar photovoltaic (PV)-wind systems. A methodology for scaling PV-wind hybrid systems is described, along with a discussion of the many strategies researchers have taken to optimise renewable-based hybrid energy systems. Sixteen optimisation techniques, including hybrid algorithms, are provided after an analysis of optimisation studies conducted over the past 2.5 decades by academics employing classic and next-generation approaches. According to the trend, newer artificial intelligence algorithms have been utilised more frequently in recent years because they use less computing power, are more accurate, and exhibit good convergence.

Keywords: Optimization; meteorological characteristics; PV–wind hybrid system optimization

1. Introduction

Resources for fossil fuels are running out because to constant rising residential, industrial, agricultural, and commercial energy consumption. The term "alternative energy sources" in this context. Like sun, wind, biomass, biofuel, hydro, and geothermal, among others, are being used extensively to provide electricity. In terms of price, dependability, and efficiency, a hybrid system based on renewable energy presents a superior alternative to a system based solely on fossil fuels. Renewable energy-based hybrid systems (REHS), which can operate independently or in a grid-connected mode, can make use of one or more energy sources. When the solar resource is at its optimum, wind speeds are frequently low.

The Significance of Petroleum Costs in Fluctuations of Currency Rates: The Commonwealth of Independent States' Petroleum Exporting Nations.

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Abstract: Without a doubt, the performance of oil-exporting developing countries is heavily influenced by the fluctuations of oil prices. Among the key macroeconomic indicators that require close scrutiny, the exchange rate stands out. Previous studies have established that global oil prices have a significant impact on the appreciation of exchange rates in oil-exporting developing countries. Nevertheless, only a handful of research has explored this issue by analyzing all three oil-exporting countries of the Commonwealth Independent States, namely Azerbaijan, Kazakhstan, and Russia, collectively. To address this research gap and given the growing significance of these economies in the global energy markets, this study examines the role of oil prices in the movement of real effective exchange rates in the aforementioned CIS countries. We utilized the autoregressive distributed lag bounds testing method, along with a small sample bias correction, to analyze the data of these countries during the period of 2004Q1-2013Q4.

Keywords: Real effective exchange rate; oil price; CIS oil exporters

1. Introduction

During the last two decades, the economies of CIS countries have been subject to great transformations. A deep collapse in production at the beginning of the transition process was followed by a recovery in the late 1990s. After gaining independence, development in the oil mining industry and oil contracts signed with international oil companies triggered the CIS oil exporters, namely, Russia, Kazakhstan and Azerbaijan, and increased their importance in the world's energy markets.

Intelligent Image compression in constrained eye tracking devices

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Abstract: Images are increasingly being used by embedded systems with limited resources. Examples include wireless sensor networks, autonomous cameras, eye tracking technology, and remote low-power smart sensors. The main criteria for such devices are real-time operation, low power, low heat, and low MIPS. The adoption of an approximation of the original image processing techniques can satisfy these requirements. The world's first cutting-edge solution, EyeDeeTM integrated eye tracking (created by SuriCog), uses the eye as a real-time mobile digital cursor while preserving complete mobility. The system, which is an illustration of a resource-constrained embedded device, consists of a wearable device (WeetsyTM frame) that captures images of the human eye and an embedded preprocessing device (WeetsyTM preprocessing board) that transmits these eye images to a remote processing unit for further gaze reconstruction. In general, this article introduces image compression techniques for devices with limited resources, and some of their implementation in the WeetsyTM pre- processing board in particular.

Keywords: Eye tracking; image compression; resource-constrained devices

1. Introduction

The term "resource-constrained" refers to a compact physical device with confined processing and storage capacities that frequently relies on batteries (Khosrow-Pour, 2005). Such a gadget often has image sensors and uses image compression methods to greatly minimise the quantity of data that has to be transmitted across a chosen media (wired or wireless transmission). These devices are often used in a variety of applications, such as observing environmental conditions utilising wireless sensor networks, or WSN (Hutton, 2005).

A Case Study of Increasing the Thermal Efficiency of a Traditional Indian Biomass Cooker

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Abstract: In the current energy crisis, an energy-efficient biomass cookstove that can replace household LPG stoves is essential. Consequently the usage of biomass energy as pellets (sawdust, garden squander, and so on.) can be utilized as a fuel to run the cooking oven to supplant customary powers (LPG).The past cookstoves fabricated by different ventures in India were less energy effective. The primary objective of this case study is to modify these stoves to make them more user-friendly, less harmful to living things, and more energy-efficient. Because of absence of innovation and mindfulness in regards to biomass and its subordinates, this field has not been explored upto its actual potential. The biomass pellets are lighted, which from that point go through gasification process and are utilized as a fuel in these biomass cook ovens. The warm effectiveness of these ovens is gotten by performing water bubbling test (according to BIS). Subsequently, the test in this field isn't just to foster such ovens yet they ought to likewisebe mechanically possible, ecologically supportable, financially reasonable and socially adequate.

Keywords: Energy efficient; biomass; cook stove; pellets; gasification; thermal efficiency; water, Boiling test

1. Introduction

Biomass is a suitable renewable energy source that could partially assist in ending our reliance on fossil fuels. Biomass is regarded as a carbon-neutral source because it captures the same amount of carbon dioxide while growing [1]. Although biomass combustion releases carbon dioxide into the atmosphere, Wood, rice husk, and other domestic wastes are examples of biomass energy sources. These sorts of different biomass energizes are broadly utilized in modern heaters as well as in homegrown cooking ovens to create heat [2].

On The Evaluation of Best Fit Hyper- Elastic Model for Sandwich Beam with SB Rubber Core

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Abstract: The reaction of the framework to the exposed to upsetting burdens and vibrations can be controlled in numerous ways relying upon climate dynamic or latent vibration control. Because its fundamental frequency is generally regarded as high, the structure would compensate for all levels of vibration if it were sufficiently stiff. In the current scenario, structures tend to be as light as possible, which can be achieved at the expense of the necessary reduction in stiffness even more than the reduction in mass. As a result, resonance frequencies frequently emerge at high excitation frequencies. In order to lessen the effect of vibration, layered composite beams with a damping core have been used extensively in automotive, aerospace, and even household electronic equipment. On sandwich beams, numerical and analytical calculations can be time-consuming. In this way FEA programming is broadly used to tackle the issues. The best mathematical model is developed by attempting to model a three-layered sandwiched beam with a rubber core that exhibits hyperelastic behavior and discovering its static and dynamic properties.

Keywords: Hyper elasticity, strain rate, modeshapes, non linearity, composites, static, transient, Mooney 3parameter, Ogden 1st order, Polynomial 2nd order, Arruda Boyce

1. Introduction

An engine, the primary source of power in a vehicle, is a massive mass that may vibrate due to factors like unbalanced rotary and reciprocating parts and non-uniform gas pressure in the combustion chamber. Therefore, engine mounts can be used to lessen or eliminate these vibrations. Important functions such as isolating the transmission of vibrations to the engine from road surface excitation and supporting the engine's weight are performed by an engine mount, which is positioned between the chassis and engine.

Design of Stimuli for A Brain-Computer Interface Based On SSVEP

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Abstract: The paper presents a course of improvement plan for the SSVEP-based cerebrum PC interface. Without using muscles, a brain-computer interface can be used to communicate directly with a computer. Paralyzed individuals can use this device to communicate with the environment. The design process should make it easy for users to use and accurately recognize the stimuli that are presented. It is common knowledge to use high-quality EEG to create BCI stimuli. OpenBCI, a cheaper EEG that makes use of an ADS1299 amplifier, has seen a rise in popularity in recent years. In this article, we compare our findings with those obtained using the previously mentioned EEG with previous works by other authors. We try to demonstrate that OpenBCI can be successfully utilized in BCI projects.

Keywords: EEG, OpenBCI, SSVEP, BCI.

1. Introduction

BRAIN-COMPUTER interface is a device that allows paralyzed people to navigate a robot, a prosthesis or a wheelchair using only their own brains' reactions. By creation of a direct communication pathway between human brain and external devices, without utilization of muscles or peripheral nervous system, the brain-computer interface makes mapping person's intentions onto directive signals possible. Brain-computer interfaces (BCI) operate using electroencephalograph (EEG) as measuring device and then through analysis of evoked potentials. One of the phenomena being utilized is SSVEP (Steady State Visual Evoked Potential). That is a reaction that can be observed after a subject was "intently looking" at a stimulus flashing with given frequency. Said frequency is then one of the characteristics of signal recorded above visual cortex. In situation, when the number of stimuli is increased and each of them is flashing with its individual frequency, it is possible to determine which of the stimuli was observed by a subject.

Rician-Fading Channel Secrecy Outage Probability in Cognitive Radio Networks

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Abstract: This paper considers cognitive radio networks (CRNs) with a secondary system source transmitting confidential information to a legitimate destination in the presence of an eavesdropper in a Rician-fading scenario. The interference power that can reach the primary user (PU) in CRNs is constrained by a predetermined threshold. A mystery blackout does not just happen at the point when the feasible mystery limit with regards to source-objective connection is more modest than an objective rate, yet in addition, happens in the situation that the impedance power at PU is more noteworthy than that limit. The results of a simulation have been used to validate a derived analytical expression for the probability of a secrecy outage. Moreover, we have likewise determined the scientific articulation for the likelihood of a non-zero mystery limit.

Keywords: Rician-fading, cognitive radio networks, wiretap, probability of non-zero secrecy capacity, probability of secrecy outage.

1. Introduction

Recently, cognitive radio has attracted many researchers' attention as it is a promising technology to support as many services and applications as possible in wireless networks with a limited frequency spectrum [1]. In cognitive radio networks (CRNs), a secondary user (SU) is allowed to access and use the frequency spectrum of a licensed primary user (PU) to transmit its confidential information to a legitimate receiver subject to the constraint of promising PU system performance, and this condition can be satisfied if the interference power at PU is smaller than a pre-defined threshold. Moreover, security is also a very important issue in wireless communications, as it is inherently vulnerable to eavesdroppers [2]. Traditionally, wireless security is considered in the higher layers of communication systems by authentication and cryptography [3].

Noise canceling headphones' effect on memory for recognition in a noisy environment with native and non-native speakers

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Abstract: Cognitive performance can be impaired by noise. Noise has a greater impact on performance for non-native speakers than it does for native speakers. What stays obscure is the viability of countermeasures, for example, commotion weakening gadgets in such conditions. As a result, the primary objective of this study was to investigate the efficacy of active noise attenuating countermeasures in the presence of simulated aircraft noise for English speakers and non-English speakers alike. In the presence of simulated aircraft noise, 32 participants, half of whom were native English speakers and half of whom were native German speakers, completed four English-language recognition (cued) recall tasks. Nonnative English speakers performed worse than native English speakers in simulated aircraft noise at 65 dB(A), according to the study's findings. Non-native speakers' performance was improved as a result of noise canceling headphones' improved signal-to-noise ratio. Particularly significant for aviation-related businesses is the significance of these findings.

Keywords: Aviation, cabin safety, English as a second language, native language, noise, noise cancelling headphone

1. Introduction

Numerous nations have benefited from commercial aviation; The most notable are commercial trade and tourism. Crossing international borders gives airlines the opportunity to increase or even change the demographics of their workforce. The adoption of English as a common language across aviation facilitates this process. As a result, many people who speak English as a second language (ESL) may have a harder time understanding important speech information in an airplane's noisy environment. Naturally, this issue affects passengers on commercial airlines as well as aircrew.

Implications of the Fourth Industrial Revolution on Commerce and Financial Studies

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Abstract: The integration of information technology into every facet of our lives has resulted in significant qualitative and quantitative transformations, which are collectively referred to as the Fourth Industrial Revolution or Industry 4.0. This study aims to bridge gaps in existing research and provide an overview of business and economic perspectives on Industry 4.0. To this end, we conducted a scoping review of microeconomic, macroeconomic, and business issues. Four investigators searched Web of Science, Scopus, and Science Direct for relevant literature published between 2014 and 2018, using the following keywords: Industry 4.0, economics, economic development, production economics, and financial sector. Our search yielded 2275 results, of which 67 full papers were screened. From these studies, we identified six categories of relevant findings: work and skill development, macroeconomic growth, sustainability, intelligent manufacturing, policy, and changes in business processes.

Keywords: Consequences of Industry 4.0; economics; business processes; economy growth

1. Introduction

Originally initiated in Germany, "the Fourth Industrial Revolution", known as Industry 4.0, has attracted much attention in recent literature. Industry 4.0 is defined as "the integration of complex physical machinery and devices with networked sensors and software, used to predict, control and plan for better business and societal outcomes" or "a new level of value chain organization and management across the lifecycle of products" or "a collective term for technologies and concepts of value chain organization".

Performance of NOMA in physical layer security: A Survey

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Abstract: NOMA (nonorthogonal different access) innovation is a compelling specialized means to work on ghostly effectiveness and framework limit. The network security communication is facing very serious challenges at the moment because of the proliferation of access devices and other factors. This study proposes a physical layer optimized security transmission scheme in which AN signals are superimposed at the base station and combines TAS (antenna selection) technology with AN (artificial noise) technology. It applies these technologies to the NOMA system. In this plan, a piece of the all out power is separated into the A sign, and the A sign and the valuable data are superimposed and encoded for transmission. ' e careful arrangement of SOP and the asymptotic arrangement under high sign to-clamor proportion are acquired by numerical induction. Furthermore, the physical layer's security performance is investigated in relation to the power allocation coefficient and legitimate user target rate. e investigation discovered that when the arrangement proposed in this study is embraced, when the proper SOP size is 10−2, taking the ideal SOP bend as the benchmark, it tends to be noticed that the RHI possibly happens when the client hub is listened in, and execution improvement of around 2 dB can be gotten. '

Keywords: Transmission, NOMA, TAS

1. Introduction

AN signals are overlaid at the base station in a physical layer optimised security transmission technique that connects them to the NOMA system. In this system, a portion of the total power is separated into the AN signal, which is then overlaid and encoded for transmission with the valuable information. Mathematical deduction is used to find both the precise solution of the SOP and the asymptotic solution for high signal-to-noise ratio.

Al$_2$O$_3$ Nano fluid Turbulent Forced Convection Heat Transfer: Effects of Ethylene Glycol and Water Mixture Ratio

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Abstract: A numerical analysis is used in this investigation to determine how base fluid and mixture ratios affect the heat transfer coefficient and flow characteristics of nanofluids in the turbulent range of the Reynolds number used. The Van Driest eddy diffusivity equation was utilized in the formulation of this analysis. On a bulk temperature range of 20°C to 90°C, the properties of an aluminum dioxide (Al$_2$O$_3$) nanofluid using a low fluid Ethylene Glycol (EG)-Water (W) mixture in a 60:40 ratio are investigated. The effects of density and temperature on heat transfer coefficients are found to be significant. The most extreme fixations for which the intensity move upgrade can achieve are assessed to be 1.5% and 2.0% at 30ºC and 80ºC individually under fierce reach. The heat transfer coefficient of nanofluids was found to increase with concentration and decrease with temperature when the concentration ratios and the temperature effect were examined.

Keywords: Aluminum dioxide, ethylene glycol, Nanofluids, properties of nanofluids and turbulent region

1. Introduction

In any automobile device, the cooling system is considered a crucial role to act as an efficient condition. Based on the above context to cool the engine continuously, then the engine parts are with the help of base fluid and cooling agents. In an automotive engine component's heat must be removed from the elements to the cooling medium. However, conventional fluids are very poor to extract the heat from ingredients. This is a limitation for a traditional liquid to improve the heat transfer is the aim of the present investigation. To overcome the above problem, the nanofluids are used in a base fluid to increase the heat transfer coefficients. Nanofluids are nothing but the dispersions of nanoparticles in liquids uniformly with metal or metal oxide nanometer-sized spherical particles.

Reasonable and Pragmatic Development of Carbon and Carbon-Heteroatom Bonds Utilizing Organo-Soluble Base Metal Reagents

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Abstract: Metal-catalyzed cross-coupling responses are among the most generally utilized strategies to build new securities straightforwardly. In this association, maintainable and viable conventions, particularly change metal-catalyzed cross-coupling responses, have turned into the concentration in numerous parts of manufactured science because of their high proficiency and molecule economy. This audit sums up late advances from 2012 to 2022 in the development of carbon bonds and carbon-heteroatom bonds by utilizing organo-antacid metal reagents.

Keywords: Metal-catalyzed, organozinc reagents, organomagnesium reagents, organoboron reagents, organosilicon reagents and organotin reagents

1. Introduction

Organometallic reagents are regularly used to bear the cost of new natural particles since they work with the catalyzed course of natural responses as well as the development of explicit bonds. A few proficient, conservative and green reactant processes including organometallic reagents highlight a large number of utilizations, like the combination of normal items and medications, compound science and materials science, etc.1 Emerging from the development of metal-catalyzed cross-coupling responses, the flexible particles can be straightforwardly gotten utilizing different of accessible organometallic reagents, for example, organozinc reagents, organomagnesium reagents, organoboron reagents, organosilicon reagents and organotin reagents.2 Basic metals and s-bunch metal buildings are bountiful in nature and effectively prepared.3 Nonetheless, organo-soluble base reagents stand out in the field of cross-coupling response, probably due to their locally high reactivities.

Effect of Nd^{+3} doping on the microstructure and spectral properties of transparent Nd:SrF2 ceramics.

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Abstract: 0.5-5% (atom percentage) Nd^{+3}-doped SrF2 transparent ceramics were prepared by hot press sintering, and the effect of Nd+3 doping on the microstructure and spectral properties was investigated. As the Nd+3 content increased from 0.5% to 5%, the transmittance of the Nd:SrF2 ceramic at 1060 nm increased from 15.8% to 85.3%. FE-SEM micrographs showed that grain growth was inhibited and the microstructure became more compact and homogeneous. The emission spectra showed that the decrease in concentration occurred at 1-2% Nd+3 concentration. The emission lifetime of the 4F3/2 energy level decreased monotonically from 1805.4 µs to 19.6 µs. Emission intensity and lifetime evolution profiles of a transparent Nd:SrF ceramic with Nd+3 doping concentration were proposed. The Nd+3 content suitable for the spectral characteristics of the transparent Nd:SrF2 ceramic was about 1%. The results showed that Nd:SrF2 transparent ceramics have a long emission lifetime and slight concentration suppression, indicating that Nd+3-doped SrF2 transparent ceramics may be more promising for solid-state lasers than other Nd+3-doped alkaline earth fluorides.

Keywords: Ceramic, Alkaline earth fluorides, Ferroelctric.

1. Introduction

Earth ion-doped polycrystalline transparent ceramics that functioned as solid-state laser (SSL) gain materials have attracted much attention since 1995, when Ikesue et al. fabricated Nd-doped yttrium-alumina-garnet ceramics with excellent optical quality and achieved efficient laser oscillation [1]. Compared with single crystals and glasses, polycrystalline ceramic reinforcing materials benefit from many aspects in both production processes and physical properties, such as low cost, short production time.

Investigating the Mechanism and Characteristics of the Cumulative Antimony Release from an Antimony Smelting Slag Stacking Area Under Rainfall Leaching

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Abstract: At an antimony smelting slag stacking area in southern China, our goal was to investigate the characteristics of the cumulative release of antimony as well as the mechanism behind it. A progression of dynamic and static filtering investigations to reenact the impacts of precipitation were conveyed out. Antimony released from smelting slag increased with a decrease in the solid-liquid ratio, reaching a maximum of 42.13 mg Sb/kg waste and 34.26 mg Sb/kg waste at a solid-liquid ratio of 1: 20; With 7.09 mg/L of cumulative leaching, the maximum amount of antimony was released within the 149–420 m size fraction. Additionally, the antimony release was lowest at pH 4.0 and highest and fastest at pH 7.0. The amount of antimony released increased as rainfall duration increased. Smelting slag release of antimony was little affected by rainfall intensity variation.

Keywords: Antimony, filtering, leaching, progression

1. Introduction

Antimony (Sb) is a typical toxic and harmful heavy metal element; the United Nations health organization stipulates that the body's daily intake of antimony in water should be less than 0.86mg/kg [1, 2]. However, with the exploitation and utilization of antimony ore resources, a large amount of antimony slag is produced from antimony smelting and perennially exposed on the surface in a number of regions in China. Under the continuous action of rain, the process of desorption and mass transfer results in the introduction of antimony from the solid waste into mining area and its surrounding water environment, creating regional water environment pollution problems with great risk to human health [3–6]. Recent studies have concentrated on the release of heavy metal elements in soil, sludge, dust, and other solid media and the influence of a range of factors on waste leaching patterns [5, 7–14].

Kinematic examination of a SCARA robot for deburring of rectangular ways

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Abstract: Popular manipulators like SCARA (Selective Compliance Articulated Robot Arm) are utilised for tasks like pick-and-place, loading and unloading, assembly, etc. Recently, SCARA has been used for 3D printing, deburring, and other processes. The goal of the current study is to analyse the kinematics of a SCARA robot used for deburring rectangular routes. It is assumed that there are no significant forces acting between the end effector and the workpiece. In the current study, the SCARA robot is modelled in NX, motion simulation is used to analyse its kinematics, and MATLAB is used for mathematical analysis of the SCARA robot. Later, a comparison is made between mathematical analysis performed using MATLAB and the NX CAD simulation, and a solid case is built for the conclusion.

Keywords: Kinematic examination, SCARA robot, deburring of rectangular ways

1. Introduction

Emerging from the development of metal-catalyzed cross-coupling responses, the flexible particles can be straightforwardly gotten utilizing different of accessible organometallic reagents, for example, organozinc reagents, organomagnesium reagents, organoboron reagents, organosilicon reagents and organotin reagents.2 Basic metals and s-bunch metal buildings are bountiful in nature and effectively prepared.3 Nonetheless, organo-soluble base reagents stand out in the field of cross-coupling response, probably due to their locally high reactivities.

A CMOS VLSI Circuit Single Event Transient Pulse Width Model

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Abstract: Soft errors are introduced into sub-50 nm CMOS VLSI circuits by the single-event transients in MOSFETs that are brought on by heavy ion strikes. High-frequency CMOS VLSI circuits make it simple to capture and propagate these transients. The circuits' clock frequency and single-event transient (SET) pulse width are the primary factors influencing the capture rate. An assessment of the SET beat width through a material science-based model that considers the gadget electrostatics is important to foresee and moderate these delicate mistakes in VLSI circuits. To determine the SET pulse width of a double-gate (DG) CMOS inverter with the heavy-ion strike on OFF-state NMOS, a physics-based bias-dependent model is developed in this paper. The result voltage irritations due to particle strike in the CMOS inverter and the SET heartbeat width model are gotten from the inclination subordinate SET current model recently detailed. TCAD mixed-mode simulations confirm the inverter's output voltage and pulse width variations for various Linear Energy transfers (LET), supply bias, strike positions, device dimensions, and load capacitances derived from the developed model.

Keywords: double gate MOSFET, pulse width, heavy ion, radiation, single event transients

1. Introduction

The voltage perturbations in the circuit nodes due to heavy ion strikes are the major sources of soft errors in the integrated circuits in the space environment [1]. The ultra-scaled integrated circuits are more sensitive to these soft errors called digital SETs (DSETs). In sub-50 nm technologies, the DSETs are captured and propagated through the circuits much more easily due to the increased frequency of operation [2], [3]. These soft errors due to ion strikes are major reliability concerns for high-speed integrated circuits kept in space radiation environments [3]. The shape of the transient current in a transistor gets transformed when it is integrated into a CMOS inverter [4].

Cognitive Radio's Dual-Port Antenna Combines Sensing and Communication

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Abstract: Dynamic range access has been proposed as the compelling answer for conquer the range shortage issue, upheld by mental radio innovation. In cognitive radio systems, the most crucial tasks are sensing and communication functions. Cognitive radio front-ends could benefit from the integration of an antenna system that combines sensing and communication tasks, as proposed in this paper. The detecting task is performed through a super wideband semi-omnidirectional radio wire. Nevertheless, a narrowband antenna is used to guarantee the communication task. Due to constraints on manufacturing costs, both antennas have been designed on the same layer of an FR4 substrate. As a result, they must take into account their isolation. Over the entire impedance bandwidth, the measured mutual coupling of less than -18 dB is achieved. From 2 to 5.5 GHz, the proposed sensing antenna covers a wide frequency range. The resonant frequency of the communication antenna can be adjusted from 2.6 to 2.7 GHz by adding inductors, even though it operates at 2.8 GHz. The entire system of antennas was planned, built, and tested. The proposed structure is able to be used in cognitive radio applications, as demonstrated by the results of both measurements and simulations.

Keywords: Mental radio, micro strip receiving wire, UWB, coplanar waveguide, detecting and correspondence undertakings, detecting radio wire.

1. Introduction

Nowadays, the exponential growth in terms of wireless users and bandwidth-hungry applications and services, such as video conferencing and streaming, introduces a significant issue for wireless communication systems. Given that all radio-frequency (RF) resources are already allocated by the Federal Communications Commission (FCC). Nevertheless, according to recent measurements done by the FCC [1], the usage of spectrum is inefficient which provides a lot of spectrum holes, known as white spaces.

Analysis of Tool Wear in End Milling of AISI 1018 Steel

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Abstract: Metalworking fluids (MWFs) are exposed to the least amount possible by microfabrication, creating a more cost-effective, safe, and healthy working environment. In this work, micro lubrication is employed to end mill AISI 1018 steel while conducting wear analysis with a vegetable-based lubricant. A solid carbide cutting tool with a variable feed rate and constant depth of cut was employed. For the tool flank wear, a thorough factorial experiment was carried out, and regression models were produced. The lowest cutting speed and feed rate combination showed longer tool life. The study demonstrates that a higher tool life may be achieved by carefully choosing the cutting conditions.

Keywords: Minimum Quantity Lubrication; Milling; Tool wear steel; Design of experiments

1. Introduction

During machining, the tool/workpiece contact is cooled and lubricated using metal working fluids (MWFs). The MWFs carry out a number of crucial tasks, such as minimising friction-heat generation and dispersing produced heat at the tool-workpiece interface, which reduces tool wear. MWFs clean the workpiece and flush the chips away from the tool, reducing built-up edges (BUE).As a result, we are unable to totally avoid employing MWFs. But the expanding risks to occupational health are also brought on by MWF exposure. U.S. 'Minimum quantity lubrication' (MQL) and 'Near-Dry Machining' are other names for microlubrication. In microlubrication, a little quantity of cutting fluid—about 10 ml/hr—is given to the interface between the cutting tool and the workpiece in the form of an aerosol. In microlubrication, the lubrication system does not recycle the fluid. At the application site, it virtually evaporates. Therefore, recirculation is not necessary. However, it is crucial to make sure that the aerosol is removed from the machine effectively. The same coolant is recirculated, filtered, and utilised once more in a flood application.

After Endoscopic Retrograde Cholangiopancreatography with Mechanical Failure, Laparoscopic Common Bile Duct Exploration for the Retrieval of Impacted Dormia Basket: Case Study with Bibliography

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Abstract: During endoscopic retrograde cholangiopancreatography (ERCP), dormia baskets are frequently utilized. Through impaction caused by a gallstone or wire fracture, one complication is basket retention. We depict a situation where the outer handle of the bushel snapped causing held bin in addition to enormous gallstone affected in the normal bile conduit (CBD). The choledochoscope was used for laparoscopic CBD exploration, which followed laparoscopic cholecystectomy for direct stone fragmentation. A Fogarty catheter and choledochoscopic basket were used to remove the fragments, and the basket was removed. There were 114 cases of retained baskets that were treated with shockwave lithotripsy (27%), papillary balloon dilatation (22%), open CBD exploration (11%), and a laparoscopic case, according to the literature search.

Keywords: Endoscopic, fragmentation, exploration, dilatation

1. Introduction

Choledocholithiasis-related biliary obstruction is treated with ERCP [1, 2]. A Dormia basket or balloon catheter can be used to remove stones, removing up to 90% of CBD stones successfully [3, 4]. The four stainless steel wires that make up dormia baskets are typically arranged in a 90-degree radial pattern and are opened onto a stone to allow for capture. Some models allow mechanical lithotripsy when a stone is too large to be removed through the papillary orifice, and rescue mechanical lithotripters are available for impaction. 79% to 92% of the time, this works [5–8]. Mechanical lithotripsy-related complications range from 6% to 13%, with basket impaction or wire fracture accounting for up to 4% [5, 6, 9]. A known problem is Dormia basket retention in the biliary tree [2].

A new optimization algorithm for complex constrained design optimization problems

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Abstract: Compelled and unconstrained enhancement issues. The idea that the solution that is found for a given problem should move toward the best solution and stay away from the worst solution is the foundation of this algorithm. This calculation requires just the normal control boundaries and does not need any calculation explicit control boundaries. The presentation of the proposed calculation is explored by carrying out it on 24 obliged benchmark capabilities having various attributes given in Congress on Developmental Calculation (CEC 2006) and the execution is contrasted and that of other notable advancement calculations. The proposed algorithm's superior efficiency has been demonstrated by the outcomes. The Friedman's rank test and the Holm-Sidak test were also used to conduct the experimental work's statistical analysis.

Keywords: Optimization algorithm, complex constrained, design optimization problems

1. Introduction

The population based heuristic algorithms have two important groups: evolutionary algorithms (EA) and swarm intelligence (SI) based algorithms.Some of the recognized evolutionary algorithms are: Genetic Algorithm (GA), Evolution Strategy (ES), Evolution Programming (EP), Differential Evolution (DE), Bacteria Foraging Optimization (BFO), Artificial Immune Algorithm (AIA), etc. Some of the wellknown swarm intelligence based algorithms are:Particle Swarm Optimization (PSO), Shuffled Frog Leaping (SFL), Ant Colony Optimization (ACO), Artificial Bee Colony (ABC), Fire Fly (FF) algorithm, etc.

A Tool for Green Manufacturing Development Is Energy Value Stream Mapping

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Abstract: By separating activities that add value from those that don't, value stream mapping is an effective lean manufacturing technique for cutting down on waste in any process. In order to address the energy-consumptive, non-productive processes, the current work employs the concept of value stream mapping and developed energy value stream mapping. Green Manufacturing is the goal of this paper, and overall productivity has already reached an acceptable level.The primary issue that has been pointed out is the absence of a tool that can combine Green manufacturing with Lean manufacturing. It focuses on the creation of a method that makes it possible to conduct a preliminary, straightforward, and comprehensive analysis of energy and material flows throughout production processes. The paper concludes with a discussion of process enhancements.

Keywords: Green Manufacturing, Development, Energy Value Stream Mapping

1. Introduction

Manufacturing is a leading energy consumer of the world along with being the aspects for prosperity. With rise for the environmental concerns countries are being pressurized to make their industries energy efficient. This has made researcher to analyze means and methods to develop energy efficient machine or reduce the energy consumption in existing methods. Improvement in existing setup can be made by eliminating the processes which consumes energy and replace them with energy efficient and less costly methods. In recent, studies have been made towards achieving lean and green manufacturing which minimize wastes. Lean techniques are focused on reducing lead time and eliminating wastes in all kinds of forms. Green Manufacturing is a method for manufacturing that minimizes waste and pollution.

The starting points of science: from prehistoric times to 1661.

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Abstract: The grand science of chemistry is the result of human ingenuity, magical natural phenomena, and craftsmanship. The tale of this cycle is portrayed through a progression of milestone improvements: technical chemistry and chemical concepts in the Ancient World, natural philosophy in Ancient Greece, early chemical concepts and technology in Arabia, India, and China, the rise of alchemy in Alexandria and its spread to Arabia and then to Europe, the Chinese invention of gunpowder, the growth of alchemy in Europe and the alchemists' quest to transmute base metals into gold, Michael Sendivogius and his trailblazing alchemical treatise that refocused alchemical investigations on a new path.

Keywords: Science; growth of alchemy; prehistoric times

1. Introduction

Craftsmen were the first chemists: They achieved their practical objectives through chemical changes and their primary characteristics, which were: presence of mind, instinct and manipulative abilities. The early chemical craftsmen were limited in their ability to improve the processes they used and control the reactions they used due to their simplistic understanding of the processes.

Silicic magma supplies in the World's hull.

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Abstract: Magma supplies assume a critical part in controlling various cycles in planetary development, including molten separation and degassing, crustal development, and volcanism. For a really long time, researchers have attempted to comprehend what occurs in these repositories, utilizing a variety of procedures, for example, field planning/petrology/geochemistry/geochronology on plutonic and volcanic lithologies, geophysical imaging of dynamic magmatic regions, and mathematical/trial displaying. This audit paper attempts to follow this multi-disciplinary system while talking about over a significant time span thoughts. We explicitly center around ongoing cases that magma sections inside the World's outside layer are generally kept at high crystallinity ("mush zones"), and that the elements inside those mush segments, but regulated by outer variables (e.g., provincial pressure field, rheology of the covering, prior structural construction), assume a significant part in controlling how magmas develop, degas, and at last emit.

Keywords: Silicic magma; petrologists, planetary development

1. Introduction

Deciding the shape, size, profundity, and condition of magma bodies in the World's hull as well as how they develop after some time stay main points of contention for a few Geology people group. With a superior assurance of these factors, petrologists could build more exact compound models of separation processes; magma dynamists could propose reasons for magma relocation, stockpiling, and communication at various levels inside the outside layer; volcanologists could more readily foresee the style and volume of impending volcanic ejections; and geochronologists could develop a transformative pattern with more noteworthy accuracy.

Experimental Investigations of the Stir Casting Process's Mechanical Behavior of Al₂O₃ and Graphite Reinforced Aluminium Hybrid Metal Composites

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Abstract: In the current study, an attempt has been made to create metal matrix composites employing 6063 Al as the matrix material reinforced with Al2O3 and Graphite particles by the use of liquid metallurgy, namely stir casting technology. The amount of reinforcing graphite added is kept at 3% but the amount of alumina is changed to 6%, 9%, and 12%. To increase wettability and dispersion, reinforcing particles for each composite were warmed to a temperature of 200° before being disseminated in three-step increments into the vortex of molten 6063 Al alloy. To guarantee uniform particle distribution, specimens from the casting's centre were taken for the micro-structural analysis of the composites mentioned above.

Keywords: Al 6063; Al2O3 Particulates; Hybrid metal composites; Stir-Casting; Mechanical properties.

1. Introduction

Recently, there has been an increase in interest in using Metal Matrix Composites (MMCs) as structural engineering materials. Because of their low density and great strength and toughness at high temperatures, they can be employed in areas where traditional engineering materials like steel are utilised. Compared to matrix alloys, MMCs have much better stiffness and mechanical strength, but they frequently have poorer ductility and lower fracture toughness. The distribution of an applied load from the ductile matrix to the reinforcing material allows MMCs to endure greater tensile and compressive stresses. MMCs may be produced in a variety of ways, but among all liquid-state methods, stir-casting technology is seen to have the most promise for engineering applications in terms of output volume and cost-effectiveness.

Implementation of industry 4.0 through collaboration of R&D plans

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Abstract: The reliance on Cyber-Physical Systems (CPS), the construction of Cyber-Physical Production Systems (CPPS), and the implementation and operation of smart factories are examples of future industry development trends that aim to achieve more intelligent manufacturing processes. Industry 4.0 is the fourth industrial revolution. The key technologies, opportunities, and challenges of Industry 4.0 are discussed in relation to strategic planning in this paper. Vital arranging incorporates development of a CPS organization, conversation of two significant subjects which depend on the savvy industrial facility and smart creation, accomplishing three mixes (level coordination, vertical reconciliation and start to finish joining) and accomplishing eight plans which comprise of the definition of framework normalization, proficient administration and so on. At last, it alluded to the illumination for China's assembling businesses, to construct China's Industry 4.0.

Keywords: Implementation, industry 4.0, collaboration, R&D plans

1. Introduction

The "Industrial 4.0" concept appeared first in an article published by the German government in November 2011, as a high-tech strategy for 2020. After mechanization, electrification and information, the fourth stage of industrialization was named "Industry 4.0". In April 2013, the term "Industry 4.0" appeared again at an industrial fair in Hannover Germany, and quickly rose as the German national strategy. In recent years, "Industry 4.0" has been widely discussed, and has become a hotspot for most global industries and the information industry.

UAV Routing for Wireless Sensor Networks That Saves Energy

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Abstract: In recent times, a lot of people have started using unmanned aerial vehicles (UAVs) to make good use of network resources in areas like the Internet of Things (IoT), sensor networks, and three-dimensional (3D) wireless networks. UAV data collection offers a promising solution, especially in wireless sensor networks (WSNs) where the most prominent feature is the energy consumption of sensors during data transmission. We consider a UAV-enabled WSN, in which a UAV is sent to collect data from sensors distributed throughout networks, as a solution to this problem. For energy-efficient UAV routing subject to data collection and UAV traveling distance constraints, we formulate an optimization problem to maximize the minimum residual energy of sensors after data transmission. First, we find a feasible solution to the non-convex optimization problem: the shortest UAV route that ensures data collection at all sensors, where a modified Voronoi diagram is used to identify a set of UAV hovering locations.

Keywords: Remote sensor organization, Voronoi chart, Energy-productive information assortment.

1. Introduction

In WIRELESS sensor networks (WSNs), a mobile data collector has been adopted for energy-efficient data transmission, particularly when sensors are sparsely spread over a wide area [1]– [3]. The mobile collector moves close to each sensor to gather data and sends it to a remote-control center, where each sensor does not need to communicate with the control center directly, resulting in significant energy savings in data transmission. Recently, an unmanned aerial vehicle (UAV) has drawn significant research interest as a flying data collector [4]–[6]. Compared to a ground data collector (e.g., mobile robot) whose mobility is limited by a number of obstacles, UAVs can be swiftly deployed and moved in three-dimensional (3D) free space.

USMW process response surface method optimization technique

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Abstract: The goal of this study is to improve a manufacturing process's parameters. The ultrasonic metal welding of copper sheet and copper wire is the method under consideration here. By optimizing parameters like amplitude, welding pressure, and weld time, the weld's strength is maximized. Focal Composite Plan is taken on and the investigations are led in view of the plan lattice so acquired. In addition, a mathematical model is created for the same. Excel's solver and Response Surface Methodology are used for parametric optimization. Through confirmatory experiments, the results of the experiments are compared and confirmed.

Keywords: USMW, process response, surface method, optimization technique

1. Introduction

The goal of this study is to improve a manufacturing process's parameters. The ultrasonic metal welding of copper sheet and copper wire is the method under consideration here. By optimizing parameters like amplitude, welding pressure, and weld time, the weld's strength is maximized. Focal Composite Plan is taken on and the investigations are led in view of the plan lattice so acquired. In addition, a mathematical model is created for the same. Excel's solver and Response Surface Methodology are used for parametric optimization. Through confirmatory experiments, the results of the experiments are compared and confirmed. Pressure is applied on both sides of the work while a hydraulic piston forces the welding piece against a solenoid that vibrates them at about 20,000 Hz per second. During the USMW, heat is generated due to the friction between the materials that are vibrated at high frequency and low amplitude . The common problem faced in the USMW process is the production of weld of inferior quality and strength. This problem is faced during the manufacturing process due to improper selection of parameters like welding pressure, amplitude of vibration and weld time .

A Review of Nano Fluids and Heat Transfer Enhancement

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Abstract: A liquid suspension of particles having at least one critical size less than 100 nm is referred to as a nanofluid. According to research conducted thus far, nanofluids significantly improve heat transmission compared to traditional base fluids. The improvement depends on a number of variables, including particle size distribution, particle volume fraction, temperature, pH, and the thermal conductivities of the base and nanoparticles. An updated overview of nanofluids is presented in this study, with a focus on improving heat transfer. This review covers formulation, physical characteristics, biological and non-biological uses, stability, potential methods for improving heat conduction, and numerical modelling of nanofluids. Several difficulties are highlighted in light of the research findings in order to comprehend the underlying physics for potential industrial use of the nanofluids technology.

Keywords: Heat transfer enhancement; Nanofluids; Thermal conductivity; Viscosity

1. Introduction

The past several decades have seen a lot of scientific activity as researchers look for new ways to improve the heat dissipation of various cooling equipment. These include a wide range of electronic gadgets, such as microprocessors, whose ever-rising power densities necessitate the development of increasingly cutting-edge heat dissipation methods. Numerous technical applications, including heat exchangers, refrigerators, cars, and power plants, depend on heat transmission over a fluid medium. The design and performance of automotive engines, heat transfer devices, and micro-electro-mechanical systems (MEMS) are all enhanced by a fluid medium's capacity to transmit heat over a tiny temperature difference.

Spatiotemporal fractional derivative model for European option pricing with transaction costs in fractal markets

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Abstract: From the perspective of fractional calculus and fractional differential equation, the paper deals with European option pricing problems with transaction costs in fractal markets. According to the definition of the modified Riemann-Liouville fractional derivative, a price model based on a space-time partial differential equation is represented by a reproduction portfolio containing the Hurst exponent taken as the order of the fractional derivative. European call and put options are then formed and calculated using the advanced Adomian decomposition method in a finite difference framework. Finally, the fractional derivative model is tested with selected market data.

Keywords: fractional calculus ; differential equation; Riemman-Liouville fractional derivative; Adomian decomposition method

1. Introduction

Market friction exists in the real financial world. The existence of transaction costs relates the number of hedging and the price of options. The pricing models with transaction costs are important improvements for the classical Black-Scholes model. As early as 1985, gave a technique to replicate option returns in the presence of transaction costs. In 1992, took transaction costs into account and extended the Cox-Ross-Rubinstein binomial option pricing model. The model can be expressed by the Black-Scholes model with a modified volatility. Davis et al. priced European options with proportional transaction charges based on a model similar to Black-Scholes one. With transaction costs, Barles and Soner derived a nonlinear Black-Scholes equation with an adjusted volatility. Considering transaction costs and the risk from a volatile portfolio, Kratka derived a mathematical pricing model.

Experimental Study of the Mild Carbon Steel Sheet Forming Limit Diagram

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Abstract: The process of deforming sheet metal into the desired shape without fracture or excessive localized necking is known as the sheet metal forming process. Formability and test methods can be discussed alongside the variables in the sheet metal forming process. During the processes of forming sheet metal, numerous defects like cracking, wrinkling, local necking, buckling, and others can occur. The strain estimation in a twisted sheet metal is fundamental for estimation examination. The sheet metal operation is typically regarded as a plane stress issue due to its extremely small thickness in comparison to other dimensions. The measurement of surface strain was also used to determine the Forming Limit Diagram (FLD). The graph between the major strain (strain 1) and minor strain (strain 2) is the FLD. A useful concept for describing the formability of sheet metal is the Forming Limit Curve (FLC) or Forming Limit Diagram (FLD), which depicts the maximum principal strains that can be sustained by sheet materials prior to the onset of localized necking.

Keywords: Experimental Study, Mild Carbon Steel, Sheet Forming, Limit Diagram

1. Introduction

Sheet metal forming process is method of transforming sheet metal into required shape without fracture. In recent years some numerical methods are used for modeling the sheet metal processes. However several finite- element packages are also available for analysis of sheet metal forming processes. As each software gives different results it is important to verify finite results with experimental results. Surface strain measurements are important in case of sheet metal process due to thickness being very small as compared to other dimensions of sheet metal. Forming Limit Diagram also determined by using Surface strain measurement. FLD's can be constructed by using experiments of hemispherical punch-stretch tests and Marciniak cup tests.

Non-Fourier Heat Conduction in Thin Film Semiconductors: A Computational Method for Temperature Field Dependent Variation

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Abstract: This study examines the temperature field in thin films of nanoscale size exposed to ultrashort laser pulses using a non-Fourier two-temperature heat conduction model. MEMS and nanotechnology are the main fields where ultrashort-pulse laser processing for nanometer-sized devices is used. The two-temperature model was suggested to explain the heat transport in metals for ultrashort-pulse laser interactions with metals because there is a significant lack of equilibrium between the electron and lattice temperatures. Due to boundary scattering and the limited relaxation period of heat carriers, the Fourier law cannot adequately describe heat conduction in nanoscale systems. As a result, the Non-Fourier two-temperature heat conduction model was utilised in this study to analyse the processing of nanoscale metal films by ultrashort laser pulses.

Keywords: Temperature, Non-Fourier Heat Conduction, Metal Film.

1. Introduction

The ion cores of metal can be conceptualised as being surrounded by an ocean of electrons that is structured in a crystalline lattice. The metal is initially irradiated by a laser, at which point the electrons absorb the radiant energy. The energy is subsequently transferred to the metal lattice by the electrons. The thermalization time is the amount of time it takes for electrons to reach their equilibrium temperature. At longer intervals, generally times on the range of tens of picoseconds, heat diffusion across the metal also plays a significant effect. These free electrons move and ionise nearby atoms through high-frequency collisions by absorbing energy from the impinging photons in the femtosecond domain, which produces additional electrons. For microscale heat transfer in metals, the heated electrons transfer thermal energy to the phonons through phonon-electron coupling, creating a new thermal property known as the electron-phonon coupling factor.

Developing a Wireless Sensor Network Channel Access Mechanism

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Abstract: There are a number of proposed Medium Access Control (MAC) protocols for Wireless Sensor Networks (WSN), but there is no accepted standard for WSN protocols. This paper proposes a channel access mechanism (CAM) to complete the design of our previously proposed MAC for WSN. The CAM is built on the creation of a backoff mechanism that uses a performance tuning parameter to achieve a required performance objective and primarily differentiates the backoffs of nodes based on their distinct identification numbers. In order to compare the CAM to the IEEE802.15.4 slotted CSMA/CA based on single- and multihop communication in terms of reliability, average delay, power consumption, and throughput, the probability distribution of the backoff period is constructed. The analysis reveals that by selecting the maximum number of backoff stages and the value of the tuning parameter, CAM can achieve the required performance of IEEE slotted CSMA/CA, and that CAM performs better than IEEE with more nodes. The multihop situation brings about a decent start to finish execution of CAM as for the unwavering quality and deferral turns out to be better with lengthier ways to the detriment of expanding the energy utilization.

Keywords: mechanism, distinct identification numbers, probability distribution, energy utilization.

1. Introduction

MAC [1–3] is the rudiment for any wireless communication system to function properly. It coordinates access to and transmission over the medium common to several nodes and puts rules to minimize interference and packet collisions among them under imposed constraints and desired performance goals. It is not highly true to say that the collision cause is the concurrent transmissions, because concurrent transmissions may not cause collision even if the transmitters reside in the same radio range.

Improved Luminescence and High Thermal Stability in Transparent SrBaSiO4 Ceramic Sheet for High Power LEDs.

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Abstract: SrBaSiO4:Eu2 is one of the most widely used green emitters in phosphor-converted light-emitting diodes (pcLEDs), but modest luminescence efficiency under UV excitation has been reported so far. Since it is useful to eliminate powerful excitation light scattering to increase the interaction between light and active ions, transparent fluorine-doped (SrBaSiO4:Eu2, F-) ceramic wafers with high light output were prepared by a solid-state reaction method. This orthosilicate has a broad and effective excitation in the blue region and promotes a change of the maximum excitation group to a higher wavelength (378-393 nm). The fluorine-doped and undoped samples have characteristic green emissions centered at 524 and 522 nm. The reported ceramic wafers have 12% better emissivity compared to powder phosphors due to reduced thermal quenching. Phase identification and crystal structure were investigated using standard X-ray diffraction techniques to elucidate the possible effect of fluoride ions on the spectroscopic properties.

Keywords: Ceramic, TEM, UV, Transducers, Luminescence.

1. Introduction

Activated rare earth phosphor is one of the most important components in the production of phosphor-modified light emitting diodes (pcLED). Their special properties play an important role in modulating light output, correlated color temperature (CCT) and color rendering index (CRI). Currently, white LEDs (wLED) are produced in the correct ratio of yellow emitting phosphor Y3Al5O12:Ce3 (YAG:Ce3) and blue LED chip (InGaN). This array has a luminous efficacy of up to 169 lm/W and is found in street lighting, residential, medical and automotive applications [1], [2], [3], [4]. However, it still contains some problems due to excessive blue light from pcLED, which may have harmful effects on human health.

Reusing Waste Sources Into Nano Composites Of Graphene Materials: From An Energy-Focused Perspective, An Overview.

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Abstract: Scientific articles on the environmentally friendly and sustainable utilization of carbon nanocomposites are being published in great numbers in line with the worldwide acceptance of the waste-to-wealth concept aiming for a circular economy. However, substantial future research is still required to control the structure and properties of carbon nanomaterials derived from waste. The recycling of materials into nanocomposites containing graphene is described in this overview by looking at all 120 publications that are currently available in the literature. These publications include the pioneering study that was conducted in 2012 and their most recent developments up until 2022, with an emphasis on energy-related aspects of functional graphene-based nanocomposites. Interestingly, almost all of the sources that are currently available report on composites in which wastes provide only the other phase and graphene serves as a high-value-added filler or matrix.

Keywords: Graphene-based materials; graphene oxide; functional materials; valorization; eco-friendly resources; energy; supercapacitors

1. Introduction

The synthesis of biomass-derived graphene composites for virtually all industrial applications is made possible by the adaptability of pyrolysis method process parameters. While only a small proportion of graphene material causes significant changes in their physicochemical properties, biomass frequently serves as both a carbon and SiO_2 source. Due to their excellent price-to-value ratio and reusability, wastes are rapidly becoming used in energetic composites. In order to clear the way for new developments that make use of waste sources that have not been investigated, perspectives for the future as well as current difficulties in green chemistry or human health are also discussed.

Opportunities, Challenges, and Solutions of Deep Learning-based Physical-Layer 5G Wireless Techniques

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Abstract: The new demands for high-reliability and ultra-high-capacity wireless communication have led to extensive research into 5G communications. However, current communication systems, which were designed on the basis of conventional communication theories, significantly restrict further performance improvements and lead to severe limitations. Recently, emerging deep-learning techniques have been recognized as promising tools for handling complicated communication systems, and their potential for optimizing wireless communications has been demonstrated. In this article, we first review the development of deep learning solutions for 5G communication and then propose efficient schemes for deep learning-based 5G scenarios. Specifically, the key ideas for several important deep learning-based communication methods are presented along with the research opportunities and challenges. In particular, novel communication frameworks of NOMA, massive multiple-input multiple-output (MIMO), and millimeter wave (mmWave) are investigated, and their superior performances are demonstrated.

Keywords: Deep Learning-Based Massive MIMO, NOMA, LSTM

1. Introduction:

The explosive growth of incremental data, high speed, and low latency communication scenarios has brought significant challenges to the current communication approaches, and the increasing complexity of network structures and computations degrades the performance of conventional communication systems. Recently, to improve the performance of fifth-generation (5G) communications, non-orthogonal multiple access (NOMA), massive multiple-input multiple-output (MIMO), millimeter wave (mmWave) technologies, and other appealing techniques have been developed.

Cooperative optimization algorithm for solving complex optimization problems

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Abstract: In actual industrial production and everyday life, multi-objective optimization problems (MOPs) with changing decision variables exist. These problems are difficult to solve because they have changing Pareto sets and complex relations between decision variables. To effectively deal with MOPs involving shifting decision variables, we present a cooperative co-evolutionary algorithm that dynamically groups decision variables. Maximum entropic epistasis (MEE) is used to initially group decision variables into a series of groups in the presented algorithm, with each group's decision variables having a weak dependency. A sub-population is then created using an existing multi-objective evolutionary algorithm (MOEA) to solve the decision variables in each group. Additionally, cooperation among subpopulations enables a complete solution that incorporates all decision variables. At long last, when a choice variable is added or erased from the current issue, the gathering of choice factors is progressively changed in light of the relationship between's the changed choice variable and existing gatherings.

Keywords: Cooperative optimization, algorithm, complex optimization problems

1. Introduction

The vast majority of optimization issues have more than one goal . Typically, these goals are at odds with one another. To put it another way, multi-objective optimization problems, also known as MOOPs, require solving a set of trade-offs between two or more issues or goals . An optimization problem is said to be a many-objective optimization problem if it has more than three goals.

Photonic RF Channelization and Compressive Sampling-Based Broadband Microwave Spectrum

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Abstract: An original way to deal with acknowledged broadband microwave range detecting in light of photonic RF channelization and compressive testing (CS) is proposed. By employing the photonic RF channelization system, the rate of the pseudo-random binary sequence (PRBS) and the bandwidth of the MZM for CS can be substantially reduced by splitting the input broadband signal into multiple sub-channel signals with narrow bandwidths in parallel. Thanks to photonic RF channelization and CS, it is demonstrated that a spectrally sparse signal with a wide bandwidth can be captured at a sampling rate significantly lower than the Nyquist rate. Furthermore, the impact of the non-ideal sifting of the photonic channelizer is assessed what's more, a clever methodology in view of estimating two times is proposed to beat the issue of recurrence associating instigated by the non-ideal sifting. The fact that a framework with 20 makes it showed Gbit/s PRBS and 2.5 GS/s digitizer can be utilized to catch a sign with numerous tones inside 40 GHz transfer speed, and that implies an examining rate multiple times lower than the Nyquist rate.

Keywords: RF channelization, compressive sampling, microwave photonics

1. Introduction

Microwave signal processing with photonic technology has attracted much interest owing to the advantages of wide bandwidth, low loss, and immunity to electromagnetic interference offered by photonics. In modern wireless communications and advanced radar systems, it is necessary to analyze the spectrum of the received microwave signals within a large bandwidth. Photonics-based approaches for microwave spectrum analysis are considered competitive alternatives since conventional electronic techniques are limited by the inherent bandwidth bottleneck.

Atmospheric Cr Pollution as a Cause of Accelerated Corrosion: A Spectrophotometric Approach

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Abstract: Through simulated laboratory exposure and spectrophotometric detection of Cr(III) deposit as a product of the reaction, the effect of Cr(VI) pollution on the corrosion rate of corrugated iron roof samples collected from tanning industry areas was investigated. The total amount of Cr that was found in the samples ranged from 113.892 0.17 ppm to 53.05 0.243 ppm, and this level kept getting higher as the sampling sites got closer to the tannery and in the direction of the effluent stream from the tannery. A newly produced material was exposed in the laboratory to a simulated condition with a relatively faster corrosion rate in the presence of Cr(VI) and concurrent Cr(III) deposition under pH control. A critical ($P = 0.05$) expansion in the erosion rate was likewise recorded while uncovering scratched or stress broke examples. As a possible explanation for the elevated Cr(VI) deposition on the materials, a coupled redox process in which Cr(VI) is reduced to a stable, immobile, and insoluble Cr(III) in conjunction with the corrosion of the iron has been proposed. All in all, the expanded stores of Cr recognized in the ridged iron rooftop tests gathered from tanning industry zones proposed conceivable environmental Cr contamination as a variable to the sped up consumption of the materials.

Keywords: spectrophotometric, immobile, coupled redox process, contamination.

1. Introduction

Accelerated corrosion of corrugated iron roof (galvanizedsteel) is a subject of global concern because of its importance to the service life of the material and its aesthetic appearance [1, 2]. Atmospheric corrosion is the result of a redox reaction between the metal component of the material and its atmospheric environment that occurs in the presence of a conducting thin aqueous adlayer [3].The common incorporation of pollutant species into this adlayer usually enhances the degradation process.

The Impact of Sintering Conditions on the Inkjet Printed Ways Opposition

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Abstract: The sintering of components performed with the inkjet printing procedure is one of the phases of adaptable printed circuit-producing process. Conductivity plays a crucial role in the printed circuit and is a crucial factor in determining the printed paths. The study of how the conditions of thermal sintering—temperature and time—affect the resistance of inkjet-printed paths on flexible substrates using two electrically conductive inks was presented in this paper. The investigations revealed that the main factor in determining the resistance of the paths is the sintering temperature. In this manner, in some applications the sintering temperature higher than the one determined by the ink producer can be utilized to diminish the ways obstruction and to further develop some circuit boundaries. In any case, it ought to be seen that the powerful opposition decline happens up to a specific temperature because of the appearance breaks in the printed ways.

Keywords: Sintering, inkjet printing, printed electronics, flexible electronics, nanosilver ink.

1. Introduction

In recent years, attempts to implement technologies which until now were unnoticeable in the area of electronic industry are observed more often. An example of a promising technology is the inkjet printing, until recently used only in the printing industry. This non-contact printing technique is a digital technique with a relatively high precision and can be used in the electronic industry both for prototyping and manufacturing microstructures to form contact pads, conducting paths or more complex elements [1-5].The inkjet printing technique requires the use of special liquids called inks which should be true solutions with a low viscosity. These inks should enable one to create conductive paths.

Uplink Cooperative NOMA for NLOS channel

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Abstract: This paper proposes a new cooperative NOMA scheme to reduce the UAV's uplink interference without significantly lowering its achievable rate. In particular, some BSs with better channel conditions are chosen to first decode the UAV's signals and then forward the decoded signals to their BSs that are connected to the backhaul for IC. To examine the ideal plan of agreeable NOMA and air-ground execution tradeoff, we expand the weighted aggregate pace of the UAV and ground clients by mutually enhancing the UAV's rate and power designations over different asset blocks as well as their related BSs. However, finding the best solution to this issue is difficult. To get useful insights, we first look at two special cases involving the UAV's egoistic and altruistic transmission strategies and find the best solutions to their problems.

Keywords: NOMA, Uplink, Interference

1. Introduction

The demand for unmanned aerial vehicles (UAVs) or drones, has been soaring globally over the recent years, due to their cost effectiveness and capability to perform complex tasks in various applications such as aerial imaging, cargo transport, traffic monitoring, and communication platform [1]. To pave the way towards the upcoming era of "internet-of-drones" [2], W. Mei is with the NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore, Singapore 117456, and also with the Department of Electrical and Computer Engineering, National University of Singapore,

Profound Brain Computerized reasoning for IoT Based Tele Wellbeing Information Insightful

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Abstract: In order to provide clinical and educational assistance, telehealth makes use of information and communication mechanisms to convey medical information. It tries to solve problems with health service delivery like time, space, and difficult terrain by proving cost-efficiency and finer ingress in both developed and developing nations. Either real-time electronic communication or store-and-forward communication have been used to describe telehealth. Lately, a second rate class has been seen as distant medical services checking or tele wellbeing, assuming information acquired through Web of Things (IOT). Despite the fact that, tele wellbeing information examination and machine learning have been explored in extraordinary profundity, there is a shortage of studies that completely focus on the advancement of ML-based methods for tele wellbeing information examination in the IoT medical services area. A technique known as the Weighted Bayesian and Polynomial Taylor Deep Network (WB-PTDN) is proposed in this work to improve health prediction in a way that is both computationally efficient and accurate because of this fact.

Keywords: Telehealth; internet of things; independent component; weighted bayesian; first order polynomial; taylor; deep neural network

Introduction

With the assistance of the Internet of Things (IoT), every connected node are said to communicate with each other nodes with the objective of transferring indispensable data for precise and instantaneous decision making. This makes IoT a very efficient environment in critical circumstances like medical healthcare systems. IoT can significantly bestow platform for emerging smart healthcare systems. The transformation of traditional healthcare systems to a data driven and patient-centric healthcare has instituted a realistic revamping in the health demographics..

An Experimental Investigation of the Effects of Process Parameters on the Thermal Performance of a Single-Loop Pulsating Heat Pipe

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Abstract: The constant demand for micro electronics systems that are smaller and faster has made it more important to develop cooling systems that are more effective. Like that, improvement of Intensity pipes is ended up being a promising cooling innovation for microelectronic frameworks for the expulsion of high nearby intensity transition rates and to accomplish uniform chip temperatures. The counter current stream between the fluid and fume eases causes huge entrainment misfortunes in customary intensity pipes and the impediments in ordinary intensity pipes have prompted the improvement of throbbing intensity pipes. Because it is influenced by a number of factors, the heat transfer mechanism in a PHP is a complex phenomenon. As of right now, no single author could present a comprehensive heat transfer study. In addition, since there is very little open literature on single loop PHPs, an effort is made to verify the impact of various process parameters on a PHP's flow and heat transfer behavior. In order to comprehend the behavior of fluid flow and heat transfer characteristics of a single loop PHP without evacuation conditions, this work has built in an experimental setup and carried out experiments.

Keywords: Electronics cooling; single loop pulsating heat pipe (PHP); Air cooling; Thermal Resistance; Heat transfer co-efficient

1. Introduction

Modern businesses make extensive use of electronic components for automation and efficiency enhancements. Heat dissipation issues have gotten worse as a result of the miniaturization of semiconductor manufacturing processes [1]. The created heat transition ought to be scattered to direct the surface temperature and to abstain from any breaking down. From the electronic components, the heat flux may soon rise to 450 W/cm2 or higher [2].

Cognitive Radio's Dual-Port Antenna Combines Sensing and Communication

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Abstract: Dynamic range access has been proposed as the compelling answer for conquer the range shortage issue, upheld by mental radio innovation. In cognitive radio systems, the most crucial tasks are sensing and communication functions. Cognitive radio front-ends could benefit from the integration of an antenna system that combines sensing and communication tasks, as proposed in this paper. The detecting task is performed through a super wideband semi-omnidirectional radio wire. Nevertheless, a narrowband antenna is used to guarantee the communication task. Due to constraints on manufacturing costs, both antennas have been designed on the same layer of an FR4 substrate. As a result, they must take into account their isolation. Over the entire impedance bandwidth, the measured mutual coupling of less than -18 dB is achieved. From 2 to 5.5 GHz, the proposed sensing antenna covers a wide frequency range. The resonant frequency of the communication antenna can be adjusted from 2.6 to 2.7 GHz by adding inductors, even though it operates at 2.8 GHz. The entire system of antennas was planned, built, and tested. The proposed structure is able to be used in cognitive radio applications, as demonstrated by the results of both measurements and simulations.

Keywords: Mental radio, microstrip recieving wire, UWB, coplanar waveguide, detecting and correspondence undertakings, detecting radio wire.

1. Introduction

Nowadays, the exponential growth in terms of wireless users and bandwidth-hungry applications and services, such as video conferencing and streaming, introduces a significant issue for wireless communication systems. Given that all radio-frequency (RF) resources are already allocated by the Federal Communications Commission (FCC). Nevertheless, according to recent measurements done by the FCC [1], the usage of spectrum is inefficient which provides a lot of spectrum holes, known as white spaces.

Using Person to Person Communication Destination (SNS) to Keep Up With Formal And Casual English In Language Instruction: A Strategic Study

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Abstract: The COVID-19 pandemic accelerated the gradual trend toward the use of social networking sites (SNS) in both formal and informal English language instruction. Although there are a lot of articles looking into the in-depth use of SNS in English language learning, there is still not much of a clear connection between the formal and informal use of SNS in English language learning. Subsequently, this precise survey expects to comprehensively break down the new discoveries in regards to the combination of SNS in English language learning in both formal and casual learning settings. Thirty articles were extracted for further analysis from two databases: the Web of Science (WoS) and the Educational Resources Information Centre (ERIC). These articles were specifically confined to a five-year (2018-2022) territory and have been evaluated for any inconsistency against the exploration targets. In general, SNS is preferred for various teaching and learning applications due to observed improvements in social interactions, motivation, and adaptability. It is suggested that future researchers concentrate on a specific target group and SNS platforms that may aid the research.

Keywords: social networking sits (SNS); formal learning; informal learning; as second language (ESL); social media; literature review

1. Introduction

Evolution in learning and technology have always been inseparable. Most of the time, progress in one area leads to the same reaction in the other. Since 10 years prior, social orders have seen a development spray in two of the most essentially entwined subjects in the fields, person to person communication locales (SNS) and language schooling.

Using FEA, the influence of the process parameters of the Single Point Incremental Deep Drawing Process on Truncated Pyramidal Cups Made of 304 Stainless Steel

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Abstract: For 304 hardened steel sheet, the single point gradual profound drawing process has been mimicked utilizing limited component investigation programming code and Taguchi exploratory preparation. The cycle boundaries are clear thickness, step profundity, instrument range and coefficient of contact for the shortened pyramidal cups. It has been observed that the step profundity and apparatus sweep are exceptionally powerful in controlling the formability of cups.

Keywords: single point incremental deep drawing process, 304 stainless steel, truncated pyramidal cups, blank thickness, tool radius, step depth, coefficient of friction.

1. Introduction

In single point incremental (SPI) deep drawing, the sheet is clamped along its edges and a hemispherical-headed tool is moved along the necessary path to press the sheet locally along the path. Due to the sheet's bending near clamped edges, it has some drawbacks, such as a lengthy processing time and poor dimensional accuracy. A CNC milling machine can be used to carry out the process, which is highly adaptable. The way of the device is constrained by a section program produced utilizing PC supported assembling (CAM) programming. The regular super plastic framing is acknowledged at low strain rates, in everyday around 10-4 - 10-3 s-1 and high framing temperatures. Numerous studies on the deep drawing process have shown that materials like AA1050 alloy [1], AA1070 alloy [2].

Combinations of hydrocarbon refrigerants in place of R134a in domestic refrigeration systems: The most recent review

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Abstract: This paper's goal is to provide an overview of different refrigerants that can be utilised in residential refrigerators to improve performance while minimising losses. This publication provides an overview and list of the different refrigerants used in household refrigerators. Our goal is to lessen the impact of global warming while also maximising the performance of residential refrigerators by employing the most up-to-date refrigerants. Global warming is caused by the usage of refrigerants, which have an impact on the environment. The current advancements made in residential refrigerators are represented in this review study. Utilising various refrigerants improves a refrigerator's performance. Domestic refrigeration systems and other vapour compression systems use R134a.

Keywords: Hydrofluorocarbon refrigerant, GWP, ODP, Alternative refrigerants, Hydrocarbon refrigerants, Propane (R290)

1. Introduction

Refrigerator is one of the home appliances utilizing mechanical vapor compression cycle in it process. The Vapor Compression Refrigeration Cycle is a process that cools an enclosed space to a temperature lower than the surroundings. To accomplish this, heat must be removed from the enclosed space and dissipated into the surroundings. The mechanical vapour compression cycle is used by the refrigerator, one of the household appliances. The Vapour Compression Refrigeration Cycle is a method for lowering the temperature of an enclosed area relative to the environment. In order to do this, heat must be expelled from the contained area and dispersed into the surroundings. Furthermore, it was stated at the Kyoto Protocol in 1997 that the concentration of greenhouse gases in the atmosphere should be set at a level that does not exacerbate ozone layer depletion due to global warming.

The Problem of Data Exchange in a Semi-Passive RFID System in the UHF Band

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Abstract-The specifics of data exchange in semi-passive transponder-based UHF band RFID systems are the subject of this article's abstract. Notwithstanding the radio wire and the RFID chip, there is additionally an extra wellspring of energy (eg. battery) in the transponder's structure. Additional capabilities, such as the capacity to measure physical quantities (such as humidity, and temperature). In this regard, the discussion of the phases of communication associated with additional data (measurement results) between the transponder and RWD received particular attention. An examination of communicated information outlines has been introduced. The starter aftereffects of the estimations have shown that the quantity of memory block sent from transponder affects the adequacy of RFID framework.

Keywords: Semi-passive transponder, RFID, dynamic system, data exchange

1. Introduction

Radio frequency identification systems (RFID) are currently applicable in many fields of daily life and economy [1]. In most frequently implemented passive systems, electronic transponders are composed of two primary elements: antenna and directly connected chip [2]. Data on the tagged object and a unique Electronic Product Code (EPC) are stored in its memory. It is read contactless by read/write device (RWD). In less popular semi-passive transponders there are also replaceable or constant energy source (for example battery) [3]. Its task is to support RFID chip activity. Thanks to this, geometric dimensions of RFID system Interrogation Zone are increased. That means the space inside which the energy and communications conditions of proper system operation are met [4,5]. Additional energy can also be used for execution of measurement of selected environment parameters in which tagged object exists (for example temperature, intensity of light, humidity) [3].

Verbal Grammar: A Critical Need in the EFL Setting

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Abstract: Recent corpus linguistics studies have shown that native speakers' speech and the prescriptive grammar used in EFL textbooks appear to be inconsistent. These variations and learning gaps prevent EFL students from actually using English and impede their oral and aural development. Therefore, the purpose of this study is to emphasize the significance of incorporating spoken grammar features into L2 materials. Abasic comparative analysis is used to compare how the Longman Grammar of Spoken and Written English (LGSWE) presents reported speech, particularly direct speech, to how it is presented descriptively in Oxford Pocket English Grammar (OPEG). According to the analysis, there are no spoken grammatical features in the reported speech in (OPEG). Based on the analysis, the paper suggests incorporating a spoken and written grammar approach that primarily targets advanced EFL learners. Academic ramifications and contemplations for the fuse of the two-crease syntax approach are completely talked about.

Keywords: comparative analysis, conversational grammar, prescriptive/descriptive grammar, OPEG/LGSWE, reported speech, spoken/written grammar

1. Introduction

"Descriptive grammar is dominant among theorists, but prescriptive grammar is taught in schools and exercises a range of social effects," says Bodine (1975, p. 129). In fact, this is the case in many EFL settings, particularly EFL schools and higher education, where prescriptive grammar has long been taught to English learners. Unmistakable sentence structure, then again, is given little consideration relying extraordinarily upon the instructors' information on the expressive idea of language structure. Another reason why the descriptive approach to grammar is not popular in the context of English as a foreign language instruction is because students are willing to learn grammar from a new perspective that may be somewhat ambiguous to them.

Vapour Liquid Equilibrium Constant Variation Estimation for Modeling a Multicomponent Crude Distillation Column

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Abstract: In order to predict the concentration (mole fraction) of any component on each tray of the column, the mathematical model of a multicomponent crude distillation column is examined in this paper. In the literature, it has been observed that the steady state composition profile of various multicomponent varies dramatically at each tray of the column. In real-time petroleum industries, the assumption that Vapor Liquid Equilibrium (VLE) ratios remain constant throughout the tray for any component is the source of these variations. Choosing equilibrium constants using an estimation method based on the Thomas algorithm's reverse calculation is demonstrated in the proposed method. Thus, an opposite computation is performed involving a Tridiagonal framework strategy for assessing the VLE values from the consistent state creation profile for every part combination. In addition, estimates and comparisons are made of the composition profiles of various components, particularly Whole Naphtha, Straight Run Kerosene (SRK), Light Diesel Oil (LDO), Heavy Diesel Oil (HDO), and Atmospheric Residue (AR). This changed calculation is a basic method for ideal and non-ideal frameworks effortlessly of carrying out a piece profile for a multicomponent combination and decrease in computational intricacies.

Keywords: Vapour Liquid Equilibrium, Constant Variation Estimation, Modeling, Multicomponent Crude Distillation Column

1. Introduction

Distillation is the process of separation of various hydrocarbons into its component parts or fractions based on the differences in their relative volatilities or boiling points. The separation is done in a large column that contains a number of trays where hydrocarbon gases and liquids interact. The liquid flow down the column and the vapor goesup (Charles, 1997).

Phase-Stable Sub-Single-Cycle Pulses at 3000 cm-1 Generation and Analysis

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Abstract: High-energy stage stable sub-cycle mid-infrared heartbeats can give remarkable open doors toinvestigate deliberately work serious areas of strength for delicate light-matter communications in particles, atoms and solids.At the mid-infrared frequency, the Keldysh boundary could be a lot more modest than solidarity indeed, even at somewhat unobtrusive laser powers, empowering the investigation of the solid field sub-cycle electron elements in solids without harm. Based on a mid-infrared optical parametric amplifier, we present a high-energy sub-cycle pulse synthesizer for a solid-state high-harmonic generation. The combined spectrum of the idler and signal extends from 2.5 to 9.0 m. We coherently synthesize the idler pulses and the passively carrier-envelope phase-stable signal to generate energy-scalable 33 J, 0.88-cycle, multi-gigawatt pulses at 4.2 m. In thin silicon samples, the mid-infrared sub-cycle pulse is used to drive high harmonic generation. The isolated emission of the sub-cycle driver results in continuous spectral coverage and harmonics up to the 19th order.

Keywords: Deep Learning-Based Massive MIMO, NOMA, LSTM

1. Introduction

For generating high-energy, few-cycle mid-infrared(mid-IR) pulses have progressed markedly over the last decade, driven by a number of applications, such as coherent soft X-ray high-harmonic generation (HHG)1–3, incoherent hard X-ray generation in laser-induced plasmas4, subform to second electron emission5, two-dimensional infrared spectroscopy6 and time-resolved imaging of molecular structures7.The use of a carrier-envelope phase (CEP)-stable single cycle or even sub-cycle pulse can inherently isolate the electron dynamics in the strong-field interactions8, 9.

Tuning water science for the recuperation of greener items: commonsense and maintainable methodologies.

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Abstract: In the extraction of plant bioactives, the use of organic solvents presents significant difficulties for extraction systems due to their impact on the environment and tendency to denaturate. Consequently, proactive consideration of procedures and evidence for adjusting water properties for improved recovery and positive impact on green product synthesis becomes crucial. An intensified modern hydro-extraction process was discovered for tuning water properties with an appreciable yield comparable to organic solvents within 10–15 minutes. In contrast, percolation, distillation, and Soxhlet extractions take approximately 1–6 hours for product recovery. Nearly ninety percent of the active metabolites were recovered in the percentage yield of tuned hydro-solvents. The preservation of bioactivities and the prevention of contamination of biomatrices during organic solvent extractions are two additional advantages of tuned water over organic solvents. When compared to the conventional method, this advantage is based on the tuned solvent's rapid extraction rate and selectivity.

Keywords: green chemistry, hydro-extraction process; extraction methods

1. Introduction

The early methods for recuperation of bioactive metabolites include customary cold or hot dissolvable extraction.1 The decision is an element of the idea of the bioactive compound of interest.2 The unfavorable impact of natural solvents (Table 1) which are generally favored extraction strategies has justified the quest for greener other options. One of the manners in which green extractions is portrayed includes the seclusion of restoratively dynamic bits from a bio-material,3 with the concurrent utilization of eco-accommodating solvents and ideal utilization of energy.4-9 Prospecting for green solvents has carried water to the front of extraction technology.

VLSI ERSFQ Circuits based on Distributed Bias Techniques

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Abstract: As a promising alternative to CMOS for exactable computing, rapid single flux quantum (RSFQ) circuits have recently received a lot of attention. RSFQ circuits, in contrast to conventional CMOS circuits, necessitate the delivery of a specific bias current to each Josephson junction. As a result, robust bias networks are crucial for large-scale integration. ERSFQ is an energy-proficient, inductive inclination plot for RSFQ circuits, where power dispersal is definitely brought down by killing the inclination resistors while the cell library stays unaltered. An ERSFQ predisposition conspire requires the presentation of numerous circuit components - current restricting Josephson intersections, predisposition inductors, and also, Josephson transmission lines. There are numerous design guidelines for these structures. In order to reduce dynamic power dissipation and physical area while simultaneously increasing bias margins, additional parameter guidelines and design strategies are presented in this paper. These rules and procedures are material to computerizing the combination of inclination organizations to empower enormous-scope ERSFQ circuits.

Keywords: Bias distribution, ERSFQ, RSFQ, Energy efficient SFQ

1. Introduction

It has taken a lot of research to find a suitable technology replacement or supplement for a variety of compute-intensive applications due to the slower scaling of conventional CMOS circuits [1]. For superior execution supercomputers, distributed computing, and quantum calculation, superconductive gadgets (SCE) is a promising past CMOS innovation [2]. Even though these circuits require cryogenic refrigeration to function, SCE-based supercomputers consume less energy per bit, including the cost of refrigeration, than conventional CMOS systems [3].

A Non-parametric Assessment of the Best German Export and Import Expansion Projections with Adaptable Loss Evaluation

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Abstract: This study contributes to research on the nonparametric evaluation of German trade forecasts. To this end, I compute random classification and regression forests to analyze the optimality of annual German export and import growth forecasts from 1970 to 2017. A forecast is considered as optimal if a set of predictors, which models the information set of a forecaster at the time of forecast formation, has no explanatory power for the corresponding (sign of the) forecast error. I analyze trade forecasts of four major German economic research institutes, a collaboration of German economic research institutes, and one international forecaster. For trade forecasts with a horizon of half-a-year, I cannot reject forecast optimality for all but one forecaster. In the case of a forecast horizon of one year, forecast optimality is rejected in more cases if the underlying loss function is assumed to be quadratic. Allowing for a flexible loss function results in more favorable assessment of forecast optimality.

Keywords: Trade forecasts, German economic research institutes; forecast optimality; flexible loss; random forests

1. Introduction:

As one of the world's main exporters, Germany's trade policy has received much attention in recent years. Professional forecasts play a crucial role in this context, as economic agents rely on such forecasts, when shaping economic expectations. In order to make accurate policy and investment decisions, it is, therefore, necessary to correctly predict trade developments, as these dynamics greatly influence output growth and price levels through inflationary pressures from import prices.

DOE Analysis Applied for Enzymatic Transesterification of High FFA Rubber Seed Oil

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Abstract: In this study, the use of a biocatalyst to produce biodiesel from non-edible oils with a high free fatty acid content was investigated. For the transesterification of rubber seed oil, a catalyst in the form of free powder pancreatic lipase was utilized. The effect of reaction parameters like the molar ratio of oil to acylacceptor, water concentration, and catalyst concentration was investigated. The tests were planned and examined utilizing the measurable technique Plan of Examinations. The results of the analysis indicate that the concentration of water has a significant impact on the percentage of biodiesel produced from vegetable oil.

Keywords: Biodiesel; enzymatic transesterification; pancreatic lipase; rubber seed oil; high free fatty acid

1. Introduction

Biofuels are acquiring a ton of consideration over oil based commodities in the new past. The mono alkyl esters of long chain fatty acids derived from renewable lipid sources make up biodiesel, a non-petroleum diesel fuel. Glycerin and biodiesel (also known as methyl esters) are typically produced through the reaction of a vegetable oil or animal fat with methanol in the presence of a catalyst. Satyanarayana and Muraleedharan [8] compared the properties of biodiesel made from coconut, palm kernel, and rubber seed oils.

The Concept of Enhancing UHF RFID System Directional Energy Radiation with a Phased Antenna Array

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Abstract: When considering RFID systems, the most significant parameter is the interrogation zone IZ. The antenna's parameters and construction in a read/write device determine its predictability. The IZ ought to meet the requirements for an application of object automated identification and be of sufficient size. In this area, effective but unconventional opportunities are provided by the method of shaping an antenna radiation pattern. In the paper, the phased antenna array for UHF read/write devices' concept and practical solution are presented. Based on their tests, the authors suggested that a developed device could be used to synthesize a determined IZ for an anti-collision RFID system.

Keywords: Phased antenna array, interrogation zone, RFID .

1. Introduction

COMPLEX hardware-software radio frequency identification (RFID) systems are commonly utilized in industry, commerce, science, medicine and many other fields [1-6]. Among other things, this is due to better diagnosis of the issues determining their parameters, the essence of which often must be understood differently than in conventional radio systems [7], [8]. The main parameter of RFID systems is interrogation zone (IZ). It is defined as the space within which it is possible to conduct the radio transmission between read/write devices (RWD) and transponders intended for marking objects. The shape and size of the interrogation zone strongly depends on many factors, e.g. RFID system band (HF/UHF) [7], the transponder type (passive/semi-passive) and its parameters (e.g. sensitivity) [8]-[11], type, orientation and location of the marked object in operation space or how they are recognized in an automated process. In each of these cases, for the correct exchange of data with a predetermined communication protocol, a key factor is to provide energy electromagnetic field with RWD antenna to chip transponders [12-13].