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Kumar L, Shuaib M, Tanveer Q, Kumar V, Javaid M, Haleem A (2018) "3 D scanner integration with product development". International Journal of Engineering & Technology. Vol. 7, pp 220-225.

Abstract

Purpose: The purpose of this paper is to give a basic understanding of the working and use of 3 D Scanner in reverse engineering, shape reconstruction and product designing. It discusses the use of 3 D Scanner in product development field and also presents a method to acquire the required data of existing component through which we can develop the new product.

Design/methodology/approach: To understand the fundamental working principle of the scanner, an algorithm is discussed which shows the data collection procedure of the scanner. The obtained data is verified with existing CAD data with the help of software, and an example is also discussed to explain the process.

Findings: This study shows that the integration of scanner technology with product development cycle will help to improve the development process of any product, as this technology provides benefits through reduction in time, money and resources.

Research limitations/implications: The speed and accuracy of the Scanner depends upon the method adopted to capture the data.

Practical implications: Reverse engineering is a process of change an existing product into a new product. Development of an existing product we required the three-dimensional data of the product. The data acquisition process is critical and time-consuming. The design expert uses different approaches to collect the necessary parameters. This study discusses one of the data acquisition technology, i.e. 3-dimensional scanner.

Originality/value: In this article, we are discussing one of the original methods to show the integration of scanner technology with product development.

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Haleem A, Javaid M (2018) "3D scanning applications in medical field: A literature based review". Clinical epidemiology and global health.

Abstract

Background: Medical field has extensive use of different scanning like X-rays, CT, MRI and Ultrasound. These techniques are quite useful for providing information on the internal organs. However, there is a gap for obtaining information of the outer body parts which can now be taken care by 3D Scanning technologies. A large number of research papers about different scanning techniques and 3D scanning has been studied to identify the impact of them and the subsequent research.

The aim of the work: Doctors and technologists use the available scanning technologies in different sub-medical fields. This paper endeavors to find out the best possible usage of 3D scanning technologies in the medical area. This paper will help doctors for best treatment to the patient with high knowledge, minimum risks and maximizing benefits.

Materials and methods: A large number of the relevant research papers from 2008 to April 2018, identified through Scopus are studied using bibliometric analysis, thus to determine strength & limitation and to undertake application analysis.

Results: Year-wise, Journal-wise and relevant applications wise study undertaken in the medical field through Bibliometric research to identify the strength, limitations, and applications of 3D scanning, and other contemporaries scanning technologies.

Conclusion: The bibliometric analysis shows that there is an increasing trend in the research work undertaken in 3D scanning application in the medical field; this also explains future potential and contribution. Corporate are exploring 3D scanning for commercial medical applications along with part analysis & designs before the actual production. It helps to create efficient implants easily and quickly. In this paper, we have summarized 3D scanning applications for

medical purposes. This technology helps to produce medical implant according to the required specification. It is used for the accurate measuring of patient's body shape, size and skin surface area or an individual part of the body. In medical, data varies from patient to patient, so for producing a 3D digital image, 3D scanning technologies are used which provide digital 3D models. We can obtain improved patient treatment through the integration of digital models with Virtual Reality and Holographic techniques. The significant limitation of this technology is that it can only scan the outer surface of the body or part/model.

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Haleem A, Javaid M, Vaishya R . "4D printing and its applications in othopaedics". Journal of clinical orhopaedics and trauma. Vol 9, pp 275-276.

Abstract

In Orthopaedic Surgery, customization challenge is undertaken effectively by different 3D printing technologies. However, the model manufactured by a 3D printing technique or even a conventional manufacturing technique is rigid, and there is no further possibility of a change of shape and size of the printed part. In living beings part grows and change shape and colour with the passage of time. So there is an essential requirement to upgrade our technologies to a level where they can produce parts which grow and change shape with the passage.

Javaid M, Haleem A (2018) "4D printing applications in medical field: A brief review". Clinical epidemiology and global health.

Abstract

Background/objectives: There are promising applications of 4D printing in the medical field. The need is to identify the research status and explore where this new set of technologies effectively can be deployed.

Methods: Research articles till September 2018 are searched from Scopus by keywords as "4D printing" and "4D printing" medical" and undertaken a bibliometric analysis of the identified papers. Further relevant papers were studied for application in the medical field.

Results: Search through Scopus identified 171 research articles on 4D printing and 13 research articles on 4D printing in the medical field. This study states that 4D printing is the latest technology that creates innovation and addresses complex medical problems. Paper briefly describes the 4D printing and details its difference from 3D printing technology. We have identified five steps to be used to create a medical model by using this technology and its prospective implementation for medical applications. Identified that research is carried out on 4D printing, but decidedly less publication is available in the medical field reporting the application of this technology. Finally, we have identified nine significant applications of 4D printing in the medical field. The main limitation is that it requires extensive investment & support for transformation.

Conclusions: 4D printing is to provide benefits to medical practitioners especially in the areas not covered by 3D printing technologies. 4D printing helps to create a 3D physical object by adding smart material layer by layer through computer-operated computer-aided design (CAD) data. It adds a dimension of transformation over time where printed products are sensitive to parameters like temperature, humidity, time etc. This technology can provide extensive support in the medical field, especially with better and smart medical implants, tools and devices. Now doctors and researchers can explore with 4D printing technology to provide better service to the patient.

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Haleem A, Javaid M, Vaishya R "5D printing and its expected applications in orthopaedics". Journal of Clincal orthopaedics and trauma.

Abstract

In the past few years, 3D printing has explored its potential applications in the different field of engineering, medical, dentistry, aerospace, and their associated areas. The concept of 4D printing was introduced recently in 2014, and the need is to undertake associated research on its applications in different fields. American universities gave the concept of 5D printing in 2016. Today, it is being implemented by Mitsubishi Electric Research Labs (MERL) through their senior principal research scientist, William Yerazunis.

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Mohammad Asjad, Azazullah Alam, Faisal Hasan, (2018) "A comparative study of classifier techniques for lift index data analysis", Benchmarking: An International Journal, Vol. 25 Issue: 2, pp.632-641, https://doi.org/10.1108/BIJ-09-2016- 0137

Abstract

A classifier technique is one of the important tools which may be used to classify the data or information into systematic manner based on certain criteria pertaining to get the accurate statistical information for decision making. It plays a vital role in the various applications, such as business organization, e-commerce, health care, scientific and engineering application. The purpose of this paper is to examine the performance of different classification techniques in lift index (LI) data classification. The analyses consist of two stages. First, the random data are generated for lifting task through computer programming, which is

then put into the National Institute for Occupational Safety and Health equation for LI estimation. Based on the evaluated index, the task may be classified into two groups, i.e. high-risk and low-risk task. The classified task is considered to analyze the performance of different tools like Artificial Neural Network (ANN), discriminant analysis (DA) and support vector machines (SVMs). The work clearly demonstrates the accuracy and computational ability of ANN, DA and SVM for data classification problems in general and LI data in particular. From the research it may be concluded that SVM may outperform ANN and DA. The research is limited to a particular kind of data that may be further explored by selecting the different controllable parameters and model specification. The study can also be applied to realistic problem of manual loading. It is expected that this will help researchers, designers and practicing engineers by making them aware of the performance of classification techniques in this area. The objective of this research work is to assess and compare the relative performance of some well-known classification techniques like DA, ANN and SVM, which suggest that data characteristics considerably impact the classification performance of the methods.

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Khurana S, Mannan B, Haleem A "A Comparative Study of Practices for Integration of Sustainability With Innovation for Micro, Small & Medium Scale Manufacturing Enterprises (Msmes) in India and in England".

Abstract

The Brundtland report in 1987 has started a wide dialogue on incorporating sustainability into innovation, that is, the fusion of environmental and social aspects into products, processes, and organizational structures. While previous research has often focused on the large firms, the last decade has seen the main target of research being shifted to small industries that are now being increasingly recognized as main contributors to sustainable development. Also, in case of the Indian perspective, the Indian Government decided to declare 2010 as a Decade of Innovation. So this provides us with an opportunity to create a roadmap for Sustainable Oriented Innovation. MSME have been discussed in brief taking into account the Indian perspective. A study of literature on sustainability, sustainable development, sustainable manufacturing and innovation has been done. The need and benefit of integrating sustainability with innovation have been emphasized. Also, literature is obtained indicating how integrating sustainability with innovation acts as an enabler for MSME's to enhance their opportunities and also to increase their development potential. The manufacturing enterprises in developed (UK) and a developing country (India) which have incorporated sustainability with innovation are compared. Finally, the differences and the similarities in the magnitude of incorporation of sustainable oriented innovation are discussed.

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Khan S, Shariff S, Ahmad A, Alam M S (2018) "A Comprehensive Review on Level 2 Charging System for Electric Vehicles" Smart sciences. Vol. 6, pp 271-293.

Abstract

The commercialized deployment and fast adoption of electrified transportation system, i.e. electric vehicles (EVs) and plug-in hybrid-electric vehicles (PHEVs) necessitate the fast, reliable and economical electric vehicle supply equipment (EVSE) infrastructure (i.e. EV chargers). As a matter of fact, EVs are the best supplement of ICEVs due to their energy efficient and environmentally friendly nature. But their wide adoption has checked by the insufficient charging infrastructure in the world. The work presented in this paper provides state of the art review of Level 2 charging technologies for EVs and their sustainable employment, characteristics, and standards available in the open literature, as well as sustainable smart grid interaction and potential safety measures. The manuscript also forecasts comprehensively a coherent view of the current status economic assessment, power market operation and control and safety aspects of EVSE to assess the marketable viability of Level 2 charging system. The work will be extremely useful to researchers in this field, industry personals, and investment representatives and groups as a ready reference of the charging system of EVs, with information on significant characteristics and standards of xEV charging system.

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Khan S, Ahmad A, Ahmad F, Shemami M S, Alam M S, Khateeb S (2018) "A Comprehensive Review on Solar Powered Electric Vehicle Charging System". Journal of Smart Science. Vol. 6

Abstract

Electric vehicles (EVs) are becoming increasingly popular in many countries of the world. EVs are proving more energy efficient and environmental friendly than ICEVs. But the lack of charging stations restricts the wide adoption of EVs in the world. As V usage grows, more public spaces are installing EV charging stations. On the other hand, if EVs are charged via existing utility grid powered by fossil fuel-based generation system, then it aspects the distribution system and could not be environmentally friendly. As solar has great potential to generate the electricity from PV panel, the charging of EVs from PV panels would be a great solution and also a sustainable step toward the environment. This paper presents a comprehensive analysis of solar PV-EV charging systems and deployment in the

world. Analytical methods were proposed to obtain information about EV charging behavior, modes of charging station operation, and geolocation of charging station users. The methodology presented here was time- and cost-effective, and very helpful to the researchers and students in this field.

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Saxena L K, Jain P K, Sharma A K (2018) "A fuzzy goal programme with carbon tax policy for Brownfield Tyre remanufacturing strategic supply chain planning". Journal of cleaner production. Vol. 198, pp 737-753.

Abstract

A comprehensive tyre remanufacturing supply chain strategic planning model is proposed under uncertainty and group decision making environment for reconfigurable supply chain to integrate business economics with carbon tax policy. To solve the proposed fuzzy multiobjective mixed integer programme model, a methodology is designed by combining various techniques. Numerical experiments were conducted to provide important policy insights for industry practitioners and the government such as (1) developed carbon tax-reward policy and carbon-tax- reward-forex policy other than carbon tax policy for future tyre remanufacturing supply chain carbon emission policies, (2) evaluated the possible influence of distance of used product suppliers from initial deposit facility on reconfigurable tyre remanufacturing strategic supply chain planning, (3) designed the measure of the greenness i.e. the greenness index of various tyre re-manufacturing supply chains to compare various supply chains in the tyre remanufacturing industry, (4) suggested the foreign exchange (forex) reward rate for a tyre remanufacturing supply chain on basis of its greenness index in the tyre remanufacturing industry.

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Mufazzal S, Muzakkir S M (2018) "A new multi-criterion decision making (MCDM) method based on proximity indexed value for minimizing rank reversals". Computers & Industrial Engineering. Vol. 119, pp 427-438.

Abstract

The identification of best alternative from amongst the available choices is a complex task dependent upon the user priorities that needs to be graded on a rating scale requiring careful consideration of all influencing characteristic features of individual alternative. Several multi criterion decision making techniques are available to facilitate the decision maker arrive at a best alternative by ranking the alternatives in an order of preference. However, it has been observed that with the addition of new alternatives or deletion of existing alternatives, the ranks of the available alternatives, indicating their suitability to a particular set of requirements, is not maintained. This is often described as rank reversal phenomenon by many researchers. The commonly used MCDM methods are particularly incapable of preventing this rank reversal phenomenon. Thus, addition of new alternative/s or deletion of existing alternative/s creates a modified order of preference which may, sometimes, lead to erroneous decisions/results. In the present research work, an effort has been made to critically examine the rank reversal phenomenon with an aim to propose a new method to obviate this problem. In order to establish the feasibility and effectiveness of the proposed method in preventing the rank reversal phenomenon, several case studies covering different technological specializations from the reported literature work have been considered. The results indicate that the rank reversal issue was found to be minimal with the use of proposed method and a good correlation was found to exist between the rankings obtained by the proposed method and the other commonly used MCDM methods. The proposed method is thus capable of preventing the rank reversal phenomenon, arising out of change in available alternatives.

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Rathee S, Maheshwari S, Siddiqui A N, Shrivastava M (2018) "A Review of Recent Progress in Solid State Fabrication of Composites and Functionally Graded Systems Via Friction Stir Processing", Journal Critical Reviews in Solid State and Materials Sciences. Vol. 43, pp 334-366.

Abstract

Friction stir processing (FSP) is a rapidly emerging newer solid-state technique for composite fabrication. It involves surface modi_cation which in turn enables successful adaptation of surface properties through plastic deformations in solid state. During initial years of FSP inception, it was primarily employed in development of metal matrix composites of light metal alloys like aluminum. However, recently, it has gained an alluring role in fabrication of composites of various nonferrous and ferrous metal alloys as well as of polymers. In addition to composite fabrication, FSP has evolved as a revolutionary technique in developing functionally graded systems/surfaces (FGS) of metal matrix. This article covers all aspects of FSP in which reinforcement particles are embedded in the base matrix to develop composites and FGS. It presents a critical review on domains of recent developments, eÀÛàÜects of diÀÛàÜerent types of reinforcement particles and properties enhancement of composites, and FGS fabrication. In addition to this, various issues, challenges, and future work that demand attention are systematically addressed.

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Haleem A, Javaid M, Saxena A (2018) "Additive manufacturing applications in cardiology: A review". The egytian heart journal. Vol. 70, pp. 433-441.

Abstract

Background: Additive manufacturing (AM) has emerged as a serious planning, strategy, and education tool in cardiovascular medicine. This review describes and illustrates the application, development and associated limitation of additive manufacturing in the field of cardiology by studying research papers on AM in medicine/ cardiology.

Methods: Relevant research papers till August 2018 were identified through Scopus and examined for strength, benefits, limitation, contribution and future potential of AM. With the help of the existing literature & bibliometric analysis, different applications of AM in cardiology are investigated.

Results: AM creates an accurate three-dimensional anatomical model to explain, understand and prepare for complex medical procedures. A prior study of patient's 3D heart model can help doctors understand the anatomy of the individual patient, which may also be used create training modules for institutions and surgeons for medical training.

Conclusion: AM has the potential to be of immense help to the cardiologists and cardiac surgeons for intervention and surgical planning, monitoring and analysis. Additive manufacturing creates a 3D model of the heart of a specific patient in lesser time and cost. This technology is used to create and analyse 3D model before starting actual surgery on the patient. It can improve the treatment outcomes for patients, besides saving their lives. Paper summarised additive manufacturing applications particularly in the area of cardiology, especially manufacturing of a patient-specific artificial heart or its component. Model printed by this technology reduces risk, improves the quality of diagnosis and preoperative planning and also enhanced team communication. In cardiology, patient data of heart varies from patient to patient, so AM technologies efficiently produce 3D models, through converting the predesigned virtual model into a tangible object. Companies explore additive manufacturing for commercial medical applications.

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Javaid M, Haleem A (2018) "Additive manufacturing applications in medical cases: A literature based review". Alexandria Journal of Medicine. Vol 54.

Abstract

Background: A significant number of the research paper on Medical cases using Additive manufacturing studied. Different applications of additive manufacturing technologies in the medical area analysed for providing the state of the art and direction of the development.

The aim of work: To illustrate the Additive Manufacturing technology as being used in medical and its benefits along-with contemporary and future applications.

Materials and methods: Literature Review based study on Additive Manufacturing that are helpful in various ways to address medical problems along with bibliometric analysis been done.

Result: Briefly described the review of forty primary applications of AM as used for medical purposes along with their significant achievement. Process chain development in the application of AM is identified and tabulated for every process chain member, its achievement and limitations for various references. There are five criteria which one can achieve through medical model when made through AM technology. To support the achievements and limitations of every criterion proper references are provided. The ongoing research is also classified according to the application of AM in medical with criteria, achievement and references. Eight major medical areas where AM is implemented have been identified along with primary references, objectives and advantages.

Conclusion: Paper deals with the literature review of the Medical application of Additive Manufacturing and its future. Medical models which are customised and sourced from data of an individual patient, which vary from patient to patient can well be modified and printed. Medical AM involves resources of human from the field of reverse engineering, medicine and biomaterial, design and manufacturing of bones, implants, etc. Additive Manufacturing can help solve medical problems with extensive benefit to humanity.

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Javaid M, Haleem A (2018) "Additive manufacturing applications in orthopaedics: A review". Journal of Clinical Orthopaedics and Trauma. Vol. 9, pp. 202-206.

Abstract

The applications of Additive Manufacturing (AM) have increased extensively in the area of orthopaedics. The AM applications are for making anatomic models, surgical instruments & tool design, splints, implants and prosthesis. A brief review of various research articles shows that patient-specific orthopaedic procedures provide multiple applications areas and provide directions for future developments. The purpose of this paper is to identify the best possible usage of additive manufacturing applications in orthopaedics field. It also presents the steps used to prepare a 3D printed model by using this technology and details applications in the field of orthopaedics. AM gives a

flexible solution in orthopaedics area, where customised implants can be formed as per the required shape and size and can help substitution with customised products. A 3D model created by this technology gain an accurate perception of patient's anatomy which is used to perform mock surgeries and is helpful for highly complex surgical pathologies. It makes surgeon's job accessible and increases the success rate of the operation. AM provides a perfect fit implant for the specific patient by unlimited geometric freedom. Various scanning technologies capture the status of bone defects, and printing of the model is done with the help of this technology. It gives an exact generation of a physical model which is also helpful for medical education, surgical planning and training. This technology can help to solve present-day challenges as data of every patient is different from another.

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Sutrisno A, Gunawan I, Vanany I, Asjad M, Caesarendra W (2018) "An improved modified FMEA model for prioritization of lean waste risk". International Journal of Lean Six Sigma. doi.org/10.1108/IJLSS-11-2017-0125.

Abstract

Proposing an improved model for evaluating criticality of non-value added (waste) in operation is necessary for realizing sustainable manufacturing practices. The purpose of this paper is concerning on improvement of the decision support model for evaluating risk criticality lean waste occurrence by considering the weight of modified FMEA indices and the influence of waste-worsening factors causing the escalation of waste risk magnitude. Integration of entropy and Taguchi loss function into decision support model of modified FMEA is presented to rectify the limitation of previous risk reprioritization models in modified FMEA studies. The weight of the probability components and loss components are quantified using entropy. A case study from industry is used to test the applicability of the integration model in practical situation. The proposed model enables to overcome the limitations of using subjective determination on the weight of modified FMEA indices. The inclusion of the waste-worsening factors and Taguchi loss functions enables the FMEA team to articulate the severity level of waste consequences appropriately over the use of ordinal scale in ranking the risk of lean waste in modified FMEA references. When appraising the risk of lean waste criticality, ignorance on weighting of FMEA indices may be inappropriate for an accurate risk-based decision-making. This paper provides insights to scholars and practitioners and others concerned with the lean operation to understand the significance of considering the impact of FMEA indices and wasteworsening factors in evaluating criticality of lean waste risks. The method adopted is for quantifying the criticality of lean waste and inclusion of weighting of FMEA indices in modified FMEA provides insight and exemplar on tackling the risk of lean waste and determining the most critical waste affecting performability of company operations. Integration of the entropy and Taguchi loss function for appraising the criticality of lean waste in modified FMEA is the first in the lean management discipline. These findings will be highly useful for professionals wishing to implement the lean waste reduction strategy.

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Kumar S, Luthra S, Haleem A, Garg D, Singh S, Mangla S K (2018) "An integrated approach to analyse requisites of product innovation Management". International Journal of Business Innovation and Research. Vol. 16.

Abstract

Product innovativeness, in terms of significantly improved/ new features, functions, usage, properties and aesthetics, etc., may be appreciated as an increasingly important research area for attaining business sustainability nationally/ internationally. This paper attempts to identify, understand and analyse key requisites for product innovation management in Indian firms. Literature review approach has been utilised for identifying requisites and benefits of product innovation management. Interpretive structural modelling is utilised to understand and analyse contextual relations and hierarchical levels of requisites of product innovation management. Further, through decision making trial and evaluation laboratory methodology used to segregate requisites for product innovation management in to cause and effect groups. This paper may also help practicing innovation managers of various Indian firms and multinational firms seeking business in/from India towards identifying, developing an understanding and analysing 'strengths and weaknesses' of their firms in managing activities and resources involved in 'product innovation management processes'.

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Wahid M A, Siddiquee A N, Khan Z A, Sharma N (2018) "Analysis of cooling media effects on microstructure and mechanical properties during FSW/UFSW of AA 6082-T6".

Abstract

The aim of the present study is to investigate the effect of cooling media on the temperature distribution, microstructure and mechanical properties of the joint produced during Underwater Friction Stir Welding (UFSW) in normal water, cold water (water with crushed ice (CFSW)) and air (FSW), for aluminum alloy (AA) 6082-T6. The results showed that peak temperature during UFSW and CFSW were significantly lower than the FSW. The temperature at the advancing side (AS) of the joint was

higher than the retreating side (RS). Substantial reduction in TMAZ/HAZ width was observed during UFSW and CFSW as compared to FSW. Al-Mn-Fe-Si intermetallic phases were seen in all the joints along with the BM. The main strengthening precipitates found in UFSW and CFSW was â" (Mg Si) which changed to â (Mg Si) precipitates during FSW due to increased temperature. The tensile strength of the joints was best during UFSW followed by FSW and CFSW. The controlled temperature distribution resulted in improved tensile strength whereas both under cooling and overcooling resulted in decreased tensile strength, however, increased cooling rate does not improve the elongation. A typical 'W' shape hardness profile was observed in all the joints irrespective of the cooling media used. Maximum hardness was obtained in the UFSW joint due to refined grain structure, high-density dislocations and presence of â" phases.

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Hussain M Z, Khan S, Sarmah P, Khan U (2018) "Analysis of erosive wear of MWCNTs/MnO nanocomposite". Materials today: proceedings. Vol. 5, pp. 23559-52367.

Abstract

This paper presents the erosive wear of MWCNTs/MnO nanocomposite. The nanocomposites with 5, 10 and 15 wt% of MWCNTs were fabricated using cost effective powder metallurgy technique. The mass density analysis shows that the green and sintered mass density of the nanocomposites increases with addition of MWCNTs from 5wt% to 10wt% and then decreases from 10wt% to 15wt%. The decrease in density from 10wt% to 15wt% may be due to agglomeration of MWCNTs in the nanocomposites. The erosive wear test was done by self designed erosive wear tester. The erosive wear test indicates that 10 wt% MWCNTs/MnO nanocomposite exhibits higher erosive wear resistance as compared to 5 and 15 wt% MWCNTs/MnO nanocomposite. The field emission scanning electrone microscope (FESEM) surface morphology of fractured surface shows that the nanocomposites were brittle fractured during erosion process. The erosive wear of the nanocomposite depends highly on its mass density, hardness and dispersion of multiwalled carbon nanotube in H SO (aq) solution.

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Kumar P, Haleem A, Qamar F, Khan U. (2018) "Analysis of maiden modal shift in coal transportation supply chain using SAP-LAP technique". International Journal of Logistics System and management. Vol. 30.

Abstract

This paper presents a case study in a SAP-LAP format in respect of a maiden modal shift logistic project in India. The purpose of this paper is to show how a modal shift from railways to inland water transportation led to improvement in supply chain qualitatively and quantitatively (cost wise). SAP-LAP framework has been applied and major actors instrumental in the modal shift are briefly taken up. It is a real-life project initiated and piloted by the Government of India through Inland Waterways Authority of India (IWAI). This paper helps to understand the project for implementing IWT by modelling its enablers using interpretive structural modelling (ISM) technique and analysing various issues using SAP-LAP framework in order to improve the economics of supply chain. Structured modelling has helped in understanding the critical enablers. Based upon the inputs from experts, major actors suggested a different set of incentives. A concessional user charge for the use of fairway and cargo assurances as opposed to cash subsidy approach was the game changer. It provides a good model for the improvement of economics of supply chain.

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Wahid M A, Khan Z A, Siddiquee A N, Shandley R, Sharma N (2018) "Analysis of process parameters effects on underwater friction stir welding of aluminum alloy 6082-T6". Journal of Engineering Manufacture.

Abstract

In friction stir welding of heat treatable aluminum alloys, the thermal cycles developed during the joining process result in softening of the joints which adversely affect their mechanical properties. Underwater friction stir welding can be a process of choice to overcome this problem due to low peak temperature and short dwell time involved during the process. Consequently, this article presents a study pertaining to the underwater friction stir welding of aluminum alloy 6082-T6 with an aim to develop a mathematical model to optimize the underwater friction stir welding process parameters for obtaining maximum tensile strength. The results of the study reveal that the tool shoulder diameter (d), tool rotational speed (ù), welding speed (v), and second-order term of rotational speed, that is, ù2, significantly affect the tensile strength of the joint. The maximum tensile strength of 241 MPa which is indeed 79% of the base metal strength and 10.7% higher than that of conventional (air) friction stir welding joint was achieved at an optimal setting of the underwater friction stir welding parameters, that is, tool rotational speed of 900 r/min, the welding speed of 80 mm/min, and a tool shoulder of 17 mm. The article also presents the results of temperature variation, the macrostructural and microstructural investigations, microhardness, and fractography of the joint obtained at the optimal setting for underwater friction stir welded (UFSWed) joint.

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Gangil N, Maheshwari S, Nasr E A, El-Tamimi A M, El-Meligy M A, Siddiquee AN, "Another Approach to Characterize Particle Distribution during Surface Composite Fabrication Using Friction Stir Processing". Metals 2018. Vol. 8, pp. 568-585.

Abstract

Surface composite fabrication through Friction Stir Processing (FSP) is evolving as a useful clean process to enhance surface properties of substrate. Better particle distribution is key to the success of surface composite fabrication which is achieved through multiple passes. Multiple passes significantly increase net energy input and undermine the essence of this clean process. This study proposes a novel approach and indices to relate the particle distribution with the FSP parameters. It also proposes methodology for predicting responses and relate the response with the input parameter. Unit stirring as derived parameter consisting of tool rotation speed in revolutions per minute (rpm), traverse speed and shoulder diameter was proposed. The particle distribution was identified to be achieved in three stages and all three stages bear close relationship with unit stirring. Three discrete stages of particle distribution were identified: degree of spreading, mixing and dispersion. Surface composite on an aerospace grade aluminum alloy AA7050 was fabricated successfully using TiB2 as reinforcement particles. FSP was performed with varied shoulder diameter, rotational speed and traversing speed and constant tool tilt and plunge depth using single pass processing technique to understand the stages of distribution. Significant relationships between processing parameters and stages of particle distribution were identified and discussed.

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Shihab S, Khan N, Myla P, Upadhyay S, Khan Z, Siddiquee A N (2018) "Application of MOORA method for multi optimization of GMAW process parameters in stainless steel cladding". Management Science Letters . Vol. 8, pp. 241-246.

Abstract

Gas Metal Arc Welding (GMAW) is widely used to perform cladding so as to enhance corrosion resistance and several other properties of substrate material. However, the success of cladding us-ing GMAW depends on the optimal selection of its critical parameters. Therefore, in this study, the cladding of stainless steel over mild steel substrate using GMAW process is investigated with an aim to optimize the GMAW process parameters. Three GMAW process parameters i.e. current, voltage, and torch angle were selected and their effect on the time required to complete the cladding and arc power was investigated and optimized. Multiple objective optimization based on ratio anal-ysis (MOORA) method was employed to evaluate and optimize the effect of the selected process parameters. It was found that the current and voltage have significant effect in reducing the time and power required for the cladding process.

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Haqqan A, Sweih N, Ahmad S, Khan S, Joseph L, Varghese S, Khan Z (2018) "Azole-resistant Candida blankii as a newly recognized cause of bloodstream infection". New Microbes and New Infections. Vol 26, pp. 25-29.

Abstract

Candida blankii is a newly recognized human pathogen. Here we describe a case of bloodstream infection in a preterm neonate. The yeast was repeatedly isolated from blood, and its identity was confirmed by PCR sequencing of rDNA. Additionally, C. blankii DNA was detected directly in a blood sample. The isolates initially developed pink colonies on CHROMagar Candida which later turned into dark metallic blue similar to Candida tropicalis. Inaccurate identification by the VITEK 2 yeast identification system as Stephanoascus ciferrii and intrinsic resistance to fluconazole (MIC 12–16 ìg/mL) underscore the need for its accurate identification for appropriate therapeutic management.

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Nagmash, Armghan H, Ahmad I, Armghan A, Khan S, Arsalan M (2018) "Backstepping based non-linear control for maximum power point tracking in photovoltaic System". Solar Energy. Vol. 159, pp. 134-141.

Abstract

The increasing energy demands, depleting fossil fuels and increasing global warming due to carbon emission has arisen the need for an alternate, overall efficient and environment-friendly energy system. Solar energy is considered to be one of the most promising alternative energy sources, but it has the problem of low efficiency due to varying environmental conditions. To increase its efficiency, a maximum power point tracking (MPPT) algorithm is required to harvest maximum power from the Photovoltaic (PV) array. In this paper, a non-linear backstepping controller is proposed to extract the maximum power from the PV system. A non-inverting buck-boost converter is used as an interface between the load and the PV array. Reference voltages for the controller are generated by a regression plane. Asymptotic stability of the system is verified through Lyapunov stability analysis. The performance of the proposed controller is tested under MATLAB/Simulink platform. The simulation results validate that the proposed controller offers fast and accurate tracking. Comparison with perturb & observe and fuzzy logic controller is provided to show the performance of the

proposed controller under abrupt variation of the environmental conditions.

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Arora R, Haleem A, Farooquie J A (2018) "Barriers affecting successful technology enablement of supply chain: An Indian perspective". IOP Conference Series: Materials Science and Engineering. Vol. 330.

Abstract
In order to compete, organizations need to focus on improving supply chain and technology acts as a major enabler. Technology enablement of supply chain has not always been successful and has been examined by many researchers. The purpose of this paper is to do a systematic literature review of technology enabled supply chain from a strategic viewpoint. The literature is examined from two perspectives. Firstly, it studies the growing interest in technology-enabled supply chain in India. Secondly, it studies barriers affecting technology enablement of supply chain. The literature review identifies that technology enabled supply chain helps in improving performance via effective decision making, monitoring entire supply chain, faster reaction to customer service problems, etc. The research has emphasized the importance of 12 barriers affecting technology enablement. This research will help as a guide for practitioners in order to successfully implement technology and fills the gap in existing literature by highlighting and consolidating the significant research work done in past.

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Ahmad M, Hengyi H, Rahman Z U, Khan S, Khan Z (2018) "Carbon emissions, energy use, gross domestic product and total population in China". Energy Policy. Vol. 2, pp. 32-44.

Abstract
The current study explores the impact of energy consumption, total population, gross domestic product on carbon emissions by utilizing time series data of 1971-2013 for China. Earlier studies concentrated on testing the present form of an environmental Kuznets curve not taking total population in a model. Specifically, this study focuses on analyzing the long run existence of environmental Kuznets curve. The methodology of auto regressive distributed lag model is utilized. The quadratic linkage between national income and emissions of carbon have been detected, confirming the presence of long run linkage between quadratic national income and emissions of carbon. Granger causality test divulge one-way causality between gross domestic product and carbon emissions. The empirical findings also reveal that the energy use and national income are important factors of carbon emanations in the long run. Total population has an insignificant positive influence on emissions of carbon. It is suggested that government should focus to extract that substitute sources of energy which is more environmental friendly.

Iqbal F, Jha S (2018) "Closed Loop Ball End Magnetorheological Finishing Using In -situ Roughness Metrology". Experimental Techniques. Vol. 42, pp. 659-669.

Abstract
Ball end magneto rheological finishing (BEMRF) is a recently developed advanced finishing process. Over the past decade the analytical and qualitative research has been established on various materials with this process. No work is done to automate the BEMRF process; this research work first establishes a time based reduction in roughness for the surfaces in BEMRF process. Suitable machining parameter sets are found for optimum time based finishing, a parameter selection algorithm is developed to select the next best parameter set to achieve maximum ÄRa in the next finishing cycle. A dedicated NC part program controls the operation of BEMRF process automatically. An in-situ roughness measurement system is used to get the roughness feedback after every finishing cycle to determine the initial Ra for next finishing cycle. Using the NC part program and developed algorithm the closed loop implementation of BEMRF process is carried out. Using closed loop finishing roughness parameter Ra from 800 nm range is brought down to 60 nm range in finishing time of 200 min, the same roughness reduction is achieved in 360 min of finishing time.

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Chen X, Su C, Wang Y, Siddiquee A N, Sergey K, Jayalakshmi S, Singh R A (2018) "Cold Metal Transfer (CMT) Based Wire and Arc Additive Manufacture (WAAM) System". Journal of Surface Investigation: X-ray, Synchrotron and Neutron Techniques. Vol. 12, pp. 1278-1284.

Abstract
The forming system of wire and arc additive manufacture (WAAM) based on cold metal transfer (CMT) is a high build rate system for production of near-net shape components layer by layer, which is composed of industrial robot operation system and 3D path simulation software. In the 3D path simulation software, the working layout of the off-line virtual robot is carried for the imported three-dimensional model to screen the model wall thickness, correct process library, set process parameters, slice, layer, plan deposition path, form simulation and upload program to execution system. Among the whole system, the 3D path simulation software provides essential database for process control and an innovative planning path to coordinate industrial robot platform to build parts layer by layer.

Furthermore, the experiment is also performed to study the stability of aluminum alloy forming using the WAAM-CMTsystem by establishing different experimental models and changing process parameters and process modes of industrial robot and Fronius digital welding machine embedded on robot operation platform.

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Khan S, Ismail A, Gong Y Y, Akhtar S, Hussain M (2018) "Concentration of Aflatoxin M and selected heavy metals in mother milk samples from Pakistan". Food Control. Vol. 91, pp. 344-348.

Abstract

Mother milk is the primary food source for neonates that if contaminated with certain toxic compounds may result in lifelong complications in the breastfeed infants. Present study was designed to evaluate the concentration of Aflatoxin M (AFM) and the four most toxic heavy metals i.e. lead (Pb), cadmium (Cd), mercury (Hg) and arsenic (As) in mother milk samples. AFM was found in the range of <0.001–0.044 ìg/L and 6.4% mother milk samples were found above the EU permissible limit (0.025 ìg/L). Pb and Cd concentrations were found above the normal ranges proposed by WHO while Hg was found slightly above the WHO proposed level.

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Javaid M, Haleem A, Kumae L (2018) "Current status and applications of 3D scanning in dentistry". Clinical Epidemiology and Global Health.

Abstract

3D scanning technologies are used to convert a physical model into digital 3D computer-aided design (CAD) file. This digital output is well used for designing and fabricating customised parts through additive manufacturing (AM) technologies. There is a need to identify the contemporary level of adoption of 3D scanning technology in the dental area. This structured literature review based research first tries to identify different types of scanning technologies and then the necessary steps as used to create a design and manufacture dental implant using the 3 D scanning. A large number of the relevant research papers on 3D scanning applications in dentistry are identified through Scopus and analysed using bibliometrics. This analysis indicates towards an increasing trend of research on 3D scanning applications in the field of dentistry. Different applications of this technology are discussed in the context of dentistry and observed that this technology create innovation in dental products for a dentistry lab. The dentist can take advantages of this technology towards designing custom teeth, crown, braces, dentures, veneers and aligner. 3D digital models also support teaching in dental education for better understanding and practice of the teeth anatomy. Along with the scanning of the complete denture of the patient, direct printing of the same is done by using AM technology produces denture which directly fits the mouth of the patient. It helps reduction of the complexity and production cycle time. 3D scanning technologies seem to have the potential for denture positioning and denture retention and improvement in existing dental implants.

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Khan M I, Haleem A, Khan S (2018) "Defining Halal Supply Chain Management". Supply Chain Forum: An International Journal. Vol. 19.

Abstract

To develop a rational understanding of Halal from Supply Chain perspective and to cater the imminent research in this area a comprehensive de_nition of Halal Supply Chain Management (HSCM) is proposed. This paper identi_es, categorises & analyses the de_nitions of HSCM available in the literature. Seven, well-known de_nitions of the HSCM from the existing literature were investigated for their preparedness and reviewed against the identi_ed characteristics of Halal and the Supply Chain Management. The analysis exhibits that identi_ed de_nitions narrowly addresses the characteristics of both Halal and Supply Chain Management. Thus, we have proposed a comprehensive defenition of HSCM comprising of all the characteristics of Halal and the Supply Chain Management. The present work suggests that all the activities of Halal Supply Chain needs to be managed to extendHalal & Toyyib till the consumption point with improved performance. This de_nition is very much required by the researchers of this area in theory building, de_ning, standardising (or making process oriented) and testing relationships among the component of HSCM. Supply Chain executives also benchmark or standardise the Halal Supply Chain metrics against other competing Supply Chains/industries. This can help the stakeholders involved in advancing the Halal practices in Supply Chain environment.

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Ali H (2018) "Distinct Mechanisms of 6 Links, 7 Joints and 1F Kinematic Chains.". IUP Journal of Mechanical Engineering. Vol. 11, pp. 69-77.

Abstract

The paper develops a new, easy, reliable and efficient method to detect isomorphism and prepares a catalogue of fixed link and its corresponding equivalent links in the distinct mechanisms in kinematic chains of 6 links, 7 joints and 1F kinematic chains. It helps the new researchers/ designers to select the best kinematic chain mechanism and to perform the desired task at the conceptual stage of

design. The proposed method is presented by comparing the structural invariants 'Sum of the absolute values of the Characteristic Polynomial Coefficients' (SCPC) and 'Maximum absolute value of the Characteristic Polynomial Coefficients' (MCPC) of Joint-Joint [JJ] matrices. These invariants may be used to detect isomorphism in the kinematic chain mechanism having simple joints. The method is explained with the help of examples of planar kinematic chain having simple joints.

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Rathee S, Maheshwari S, Siddiquee A N, Shrivastava M (2018) "Distribution of reinforcement particles in surface composite fabrication via friction stir processing: Suitable strategy". Materials and Manufacturing Processes. Vol. 33, pp. 262-269.

Abstract

Fabrication of metal matrix surface composites (SCs) is an emerging trend of friction stir processing applications. Key factors aÀÛàÜecting the properties of SCs are process parameters, tool geometry, tool dimensions and reinforcement strategies. In this research, effect of different reinforcement strategies and varying tool ofset positions on dispersion of reinforcement particles in the base matrix are investigated. The experiments were performed in two phases using AA6063 as base metal at constant process parameters of 1120 rpm rotational speed, 40 mm/min. reinforcement strategies on the reinforcement particles distribution and defect formation was studied. It was found that groove method with tool ofset in retreating side (RS) exhibited better homogeneity in reinforcement distribution out of the six reinforcement strategies considered. In the second phase, effect of variation of tool ofset in RS was investigated. Results from second phase of experimentation reflected that the best dispersion of reinforcement powder with larger stir zone area was found with 1.5 mm tool ofset which is numerically half of the tool pin radius. The results were supported by macro and microstructural images obtained from the optical microscope and scanning electron microscope.

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Furqan M, Suhaib M, Ahmad N (2018) "Dynamic analysis of six-axis Stewart platform using flexible joints". IInntteerrnnaattiioonnaall JJoouurrnnaall ooff Meecchhaanniissmss aanndd Roobboottiicc Syysstteemss. Vol. 3.

Abstract

This paper presents the dynamic modelling and finite element analysis for a six-axis Stewart platform. The paper is divided into three parts. In the first part, the dynamic modelling of the Stewart platform including inverse dynamic is presented to evaluate the various parameters for the Stewart platform using MATLAB. The second part includes the fabrication and finite element analysis of the model. The modal analysis is used to determine the mode shape or natural frequencies of the six-axis Stewart platform using ANSYS. In the third part, the experimental set-up is presented and the model is validated with the help of ANSYS and MSC ADAMS. There is a close agreement between the modal analysis results obtained by ANSYS and ADAMS. The vertical transmissibility is also obtained for each natural frequency. The corner frequency obtained by the experimental result is the same as the frequency predicted by the harmonic analysis using ANSYS.

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Hussain M A, Khan N Z, Siddiquee A N, Khan Z A (2018) "Effect Of Different Tool Pin Profiles On The Joint Quality Of Friction Stir Welded AA 6063". Materials Today: Proceedings. Vol. 5, pp. 4175-4182.

Abstract

In the present paper an attempt has been made to investigate the effect of different tool pin profiles on the joint quality in terms of tensile strength during Friction stir welding (FSW) of 6063 aluminium alloy. 4.75 mm thick plates of AA6063-T6 were welded using FSW. Five different pin profiled tools of hot die steel were employed. Results of the study revealed that tapered cylindrical tool pin profile exhibited maximum tensile strength. Also, formation of tunnelling defect in the welded joint was discussed and recommendations of elimination/minimization of this defect were made.

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Sharma N, Khan Z A, Siddiquee A N, Shihab S K, Wahid M A (2018) "Effect of process parameters on microstructure and electrical conductivity during FSW of Al-6101 and Pure Copper". Materials Research Express. Vol. 5.

Abstract

Copper (Cu) is predominantly used material as a conducting element in electrical and electronic components due to its high conductivity. Aluminum (Al) being lighter in weight and more conductive on weight basis than that of Cu is able to replace or partially replace Cu to make lighter and cost effective electrical components. Conventional methods of joining Al to Cu, such as, fusion welding process have many shortcomings. Friction Stir Welding (FSW) is a solid state welding process which overcomes the shortcoming of the fusion welding. FSW parameters affect the mechanical and electrical properties of the joint. This study aims to evaluate the effect of different process parameters such as shoulder diameter, pin offset, welding and rotational speed on the microstructure and electrical conductivity of the

dissimilar Al-Cu joint. FSW is performed using cylindrical pin profile, and four process parameters. Each parameter at different levels is varied according to Taguchi's L standard orthogonal array. It is found that the electrical conductivity of the FSWed joints are equal to that of aluminum at all the welded sections. FSW is found to be an effective technique to join Al to Cu without compromising with the electrical properties. However, the electrical conductivity gets influenced by the process parameters in the stir zone. The optimal combination of the FSW parameters for maximum electrical conductivity is determined. The analysis of variance (ANOVA) technique applied on stir zone suggests that the rotational speed and tool pin offset are the significant parameters to influence the electrical conductivity.

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Chaudhary T, Siddiquee A N, Chanda A K (2018) "Effect of wire tension on different output responses during wire electric discharge machining on AISI 304 stainless steel". Defence Technology.

Abstract

WEDM is used in machining conductive materials where it is required to obtained complicated and intricate shapes with high accuracy. Various applications are in the field of automobile, medical industries, aerospace etc. WEDM is an economical machining option with short product development cycle. Surface roughness, kerf width, Material removal rate, Recast layer hardness and surface microhardness in WEDM are most important responses. In this paper, effect of varied Wire tension on SR, KW, MRR, RCL hardness and surface microhardness on AISI 304 have been investigated. Pulse on time, pulse off time, current and dielectric fluid are taken as fixed parameter. Results show that Wire tension influences the SR, MRR and Surface microhardness and has no effect on kerf width in case of Stainless steel 304.

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Pervez M A, Khan D A, Ijaz A, Khan S (2018) "Effects of delta-tocotrienol supplementation on liver enzymes, inflammation, oxidative stress and hepatic steatosis in patients with nonalcoholic fatty liver disease". Turkish Journal of Gastroenterology. Vol. 29, pp. 170-176.

Abstract

Materials and Methods: The present study was a randomized, double-blind, placebo-controlled pilot study conducted in patients aged >20 years, belonging to both sexes, having ultrasound-proven fatty liver disease, having a fatty liver index (FLI) of e"60, and persistent elevation of alanine transaminase. A total of 71 patients were assigned to receive either oral ä-tocotrienol (n=35, 300 mg twice daily) or placebo (n=36) for 12 weeks. At the baseline and at the end of the study, clinical and biochemical parameters, including lipid profile, liver function tests, high-sensitivity C-reactive protein (hs-CRP), and malondialdehyde (MDA) were measured. Body mass index and FLI were calculated, and ultrasound grading of hepatic steatosis was performed.

Results: Out of 71 enrolled patients, 64 patients, 31 in the ä-tocotrienol group and 33 in the placebo group, completed the study. After 12 weeks of supplementation, ä-tocotrienol showed greater efficacy than placebo by decreasing serum aminotransferases, hs-CRP, MDA, and FLI score ($p<0.001$). However, it did not improve hepatic steatosis on ultrasound examination. No adverse effects were reported.

Conclusion: Tocotrienol was safe, and it effectively improved aminotransferase levels and inflammatory and oxidative stress markers in patients with NAFLD. Large-scale randomized clinical trials are warranted to further support these findings.

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Kumar D, Deepak K B, Muzakkir S M, Wani M F, Lijesh K P (2018) "Enhancing tribological performance of Ti-6Al-4V by sliding process". Tribology - Materials, Surfaces & Interfaces. Vol. 12, pp. 137-143.

Abastract

The exceptional combination of mechanical, physical and anti-corrosive properties of Titanium alloy Ti-6Al-4 V (Ti64) makes it idle material for the applications like aerospace, automobile, chemical, medical etc. However, Ti64 exhibits poor tribological (friction and wear) properties, which limits its implementation in the intended applications. The tribological performance of the Ti64 can be enhanced by developing a protective layer or coating on its surface. It has been reported in literatures that through rubbing process the oxide layers can be achieved at much lower temperature compared to external heating process. Therefore, an endeavour is made in the present work to achieve a tribo-oxide protective layer on the surface of Ti64 through rubbing process. For this, at _rst the tribological behaviour of tribo pair: Ti64 pin-alumina disc is studied under dry ambient condition for diverseloading and sliding speed conditions, using pin on disc experimental set-up. The obtained results are compared with literatures. The tribological performance is quanti_ed in terms of coeffcient of friction (COF) and wear rate. To investigate the tribological mechanism and behaviour, in-situ analysis was performed on the pin's surface using (i) scanning electron microscopy, and (ii) energy dispersive analysis of X-ray. The mechanical properties like nano-hardness and elastic modulus of the pins surface were also determined. It was envisaged that the tribological behaviour were extremely transient and depend greatly on what the surface has precisely experienced Based on the experimental

observations, the experimental conditions providing (i) Case1: deprived tribological properties and (ii) Case 2: higher oxide layer is selected. Now, to enhance the tribological behaviour of Case 1, the pin with high oxide layer, i.e. Case 2 is used. For this experiment is performed initially for Case 2 conditions for the sliding distance of 1000 m (for developing oxide layer) and the experiment is continued for next 1000 m for Case 1 condition. The experimental results in terms of COF and wear rate are presented and corresponding enhancement in their values are discussed.

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Shariff S, Alam M S, Khan S, Shafaati M (2018) "A Review on Sustainable xEV charging System in Sun Rich Nations". 2018 International Conference on Computing, Power and Communication Technologies (GUCON).

Abstract

Two big transitions world is facing in generation and transportation sectors simultaneously. At present, both are fossil fuel-based viz. transportation system is propelled by gas and oil, and power generation system is fueled by coal and nuclear. To supplement this with renewables, there are many social and economic challenges too. The lack of commercially viable charging infrastructure particularly in developing countries is one of the major cause restricting the wide adoption of EVs. Conversely, if the EVs are charged using existing fossil fuel powered utility grid, then it increases the localized pollution at generation sites, hence could not be environmentally friendly and also affects the distribution system. Solar energy is abundant in nature and has huge potential to make the electrical energy by PV panels. Hence the deployment of solar PVEV charging infrastructure would be a feasible and sustainable step towards the environment particularly in sun-rich nations like India. This paper reviews comprehensively the deployment of solar PV-EV charging systems. Several methods are suggested to acquire the knowledge about the charging pattern, geo location of charging equipment, and modes of operation etc. The work is cost and time-effective, and much useful to the students and researchers on this subject.

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Haleem A, Khan M I, Khan S, Ngah A H "Assessing Barriers to Adopting and Implementing Halal Practices in Logistics Operations". IOP Conference Series: Materials Science and Engineering. Vol. 404.

Abstract

Due to the increasing demand for Halal products, a need of adopting and implementing Halal Logistics (HL) practices are observed. This paper presents a structural model for barriers to adoption of HL practices with conventional logistics. Halal goods and services are becoming popular in public domain because of the improving disposable income of the masses. Another reason for this emergence as Halal appeals to the consumers who care about the origin of the product, fair trade, sustainability, cleanliness and humane animal husbandry, as Halal products are based on ideas of cleanliness, purity, safety and wholesomeness and set of ethical values. Through this paper, significant barriers to theadoption of HL practices in conventional logistics are identified which are instrumental in delivering consumables with Halal attributes. A structural and hierarchical model of the identified barriers is developed using Interpretive Structural Modelling (ISM) technique. Then, MICMAC analysis has been done to categorise these barriers against their driving and dependence power. We identified that the HL is not mandatory for the issuance of a Halal certificate for Halal manufacturers and this is the primary reason for the lack of demand. The structural model obtained, is in harmony with expert's opinion and literature, this model can help in mitigating these barriers towards effective adoption and implementation of HL practices and ultimately guarantee Halal integrity till consumption. The model so generated can be quite helpful in adopting and implementing HL practices. Through structural and hierarchical model this paper provides a basis for defining the problem faced by practitioner and policy planner involved in incorporating Halal practices in a logistics operation.

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Varshney B, Shoeb M, Siddiqui M J, Azam A, Mobin M (2018) "Azadirachta indica (neem) leaves mediated synthesis of SnO /NiO nanocomposite and assessment of its photocatalytic activity". AIP Conference Proceedings. https://doi.org/10.1063/1.5032475.

Abstract

SnO /NiO nanocomposite are prepared by using a simple cost effective and ecofriendly green soft template method followed by ultrasonication treatment further by calcination at 300 °C. The resulting nanocatalysts were characterized by X-ray diffraction (XRD), UV-Visible spectroscopy and transmission electron microscopy (TEM). The SnO –NiO photocatalyst was made of a mesoporous network of aggregated NiO and cassiterite SnO nanocrystallites, the size of which was estimated to be 16.68 nm and 13.17 nm, respectively, after calcination. According to UV– visible spectroscopy, the evident energy band gap value of the SnO –NiO photocatalyst was estimated to be 3.132 eV to be compared with those of pure SnO , that is, 3.7 eV. Moreover, the heterostructure SnO –NiO photocatalyst showed much higher photocatalytic activities for the degradation of methylene blue than those of individual SnO and NiO nanomaterials. This behaviour was rationalized in terms of better charge separation and the suppression of charge recombination in the SnO –NiO photocatalyst

because of the energy difference between the conduction band edges of SnO and NiO as evidenced by the band alignment determination. Finally, this mesoporous SnO "NiO heterojunction nanocatalyst was stable and could be easily recycled several times opening new avenues for potential industrial applications.

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Afridi Z, Haleem A, Khan M A, Ahmad R, Rashid M, Arooj S, Artfeen S, Azmatullah (2018) "Ewing Sarcoma of Adrenal Gland Causing Cushing's Syndrome; An Exceptionally Rare Tumor". Journal of Medical Science. Vol. 26, pp. 128-130.

Abstract
Ewing's Sarcoma (EWS) or peripheral neuroectodermal tumors (PNET) are rare tumors. These mostly arise in the diaphyses of long bones but can also occur in various extra skeletal tissues and carry poor prognoses. Multimodality treatment of surgery and chemoradiation is needed to improve survival. EWS of adrenal gland is very rare and the associated Cushing's syndrome is exceptional. Here in, we present a case of EWS adrenal gland with associated Cushing's syndrome.

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Kamboj S K, Karimi M N (2018) "Exergy Analysis of Internal Combustion Engine Based Cooling Cycle". Int. J. of Thermal & Environmental Engineering. Vol. 16, pp. 113-118.

Abstract
In this paper, exergy analysis of a lithium bromide water vapor absorption refrigeration system is analysed. The different alternative fuels (iso-octane, 10% ethanol blended with iso-octane & 10% methanol blended with iso-octane) were used in a spark ignition engine. It is well known that an IC engine has an efficiency of about 35-40%, which means that only one-third of the energy in the fuel is converted into useful work and about 60-65% goes waste into environment. In which about 28-30% is lost by cooling water and lubrication losses, around 30-32% is lost in the form of exhaust gases and remainder by radiation, etc. The heat of exhaust gases of these alternative fuels was used to run the lithium bromide water vapor absorption system. The exergy destruction in various components of the absorption system analyzed. The results of the study shows that the maximum exergetic efficiency was for the absorption system operated with exhaust gases of isooctane followed by E10 and M10 fuels. The maximum refrigerating effect was for the iso-octane exhaust gases based absorption system followed by M10 and E10 fuels. The maximum exergy destruction was observed in the generator.

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Singh B, Khan Z A, Siddiquee A N, Maheshwari S (2018) "Experimental study on effect of flux composition on element transfer during submerged arc welding". Vol. 23.

Abstract
The effects of flux composition on transfer of the elements have been studied through developed agglomerated fluxes on mild steel plates. The elements transferred to the welds have been shown in terms of a delta (Ä) quantity, which may be positive, negative or zero depending upon the composition of flux, wire and base plate. Carbon and manganese contents both show negative Ä quantity for most of the welds, indicating that both have been transferred from the weld metal to the slag. The results of this study show that for most of the welds, desulphurization and removal of phosphorus have been reported. The amount of element transferred is different for different welds depending upon the flux composition, dilution and slag metal reactions. Response surface methodology has been used for developing models for element transfer. The suggested model has been given for sulphur transfer to the weld.

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Yadav M K, Siddiquee A N, Khan Z A (2018) "Fabrication of promising material titanium aluminide': methods and issues (a status report)". Materials Research Express. Vol. 5.

Abstract
Various methods such as selective laser melting, electron beam melting, casting, friction deposition and friction stir processing are used to produce materials required by different industries. For example, low weight and high strength material is required to be produced to meet the ever increasing demand raised by fast growing aero industries. But the materials produced by these processes are found to lack in ductility and also residual and thermal stresses are formed during these processes that could adversely alter the mechanical properties of the material. Present scenario demands for the development of an eco-friendly method to produce durable materials possessing better mechanical properties. This paper presents a review on various best possible methods to produce high strength to weight ratio Ti-Al alloys. Further, it also compares the conventional and novel alloy making processes and their limitations and also explores the possibilities of making the hybrid process to get desired results. The paper can help the researchers to use the suggested hybrid processes so as to minimize the individual process limitations leading to an improved and efficient process.

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Khan M I, Khan S, Haleem A (2018) "Facilitating Fair Trade Practices as a Development Strategy". IOP Conference Series: Materials Science and Engineering. Vol. 404. https://doi.org/10.1088/1757-899X/404/1/012009.

Abstract

Fair Trade emerged as a response to the unjust and inequitable nature of contemporary globalisation It aims at providing greater economic justice to the disadvantaged producers and workers by redesigning the pattern of international trade. This paper gives a brief overview of Fair Trade and critically examines the barriers to the adoption of Fair Trade practices in the conventional international business model. The identified barriers are evaluated using Decision Making Trial and Evaluation Laboratory (DEMATEL) approach. DEMATEL categorised these barriers into influential and influenced group which helps to understand their inter-relationship. The findings suggest that lack of awareness about Fair Trade and absence of well-defined criteria to decide fairness of trade practices are the most influential barrier in mainstreaming the Fair-Trade practices in thebusiness operations. This work empowers policymakers, professionals, consumers, and practitioners to design strategy for adoption of Fair Trade practices to ensure minimum decent living conditions and access to health and education to economically disadvantaged producers, especially women and indigenous people and to protect children from exploitation in the production process.

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Haleem A, Kumar S, Luthra S (2018) "Flexible System Approach for Understanding Requisites of Product Innovation Management". Global Journal of Flexible Systems Management. Vol. 19, pp. 19-37. https://doi.org/10.1007/s40171-017-0171-7.

Abstract

Innovation may be a key towards business success and winning over competition prevailing in the market. Effective management of innovations may be recognized as a requirement to sustain the existing position of an organization and also to attract new customers for gaining a competitive advantage over other players in the market. Product innovativeness, regarding 'new'/'significantly improved': features; functions, aesthetics etc., may be valued as an increasingly important research area in Indian context for domestic and international business sustainability. It has been attempted to identify and understand important requisites for product innovation management in Indian organizations. Literature review approach has been used for identifying requisites and benefits of product innovation management. AHP methodology has been used to understand the importance of requisites of product innovation management. 'Total interpretive structural modelling' has been utilized to develop and appropriately construe interpretive structural model of requisites and benefits of product innovation management. This paper may also help to practicing innovation managers of various Indian organizations to identify, understand and analyse 'strengths and weaknesses' of their organization in managing resources and activities involved in 'product innovation management processes'.

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Wahid M A, Siddiquee A N, Khan Z A, Majeed T, Sharma N (2018) "Friction stir welding of AA-5754 in water and air: a comparative study". Materials Research Express. Vol. 6.

Abstract

The present research work is conducted to examine the effect of rotational speed on the microstructure and mechanical properties of aluminum alloy-5754 (AA-5754)—H 22 during friction stir welding (FSW) in water and air. The results of the study revealed defect free joints at different rotational speeds during FSW in water (UFSW) whereas FSW conducted in air resulted in defective joining at the rotational speed of 1120 rpm. Dynamic recrystallization in stir zone (SZ) composed of much finer and equiaxed grains were observed in both FSW and UFSW samples regardless of cooling medium and rotation speed. UFSW joints fabricated at different tool rotational speed revealed fine grains, better tensile properties and microhardness as compared to FSW joints. This improvement in mechanical properties during UFSW can be accounted for microstructural changes and solid solution strengthening caused by low peak thermal boundaries.

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Hussain M Z, Khan U, Jangid R, Khan S (2018) "Hardness and wear analysis of Cu/Al O composite for application in EDM electrode". IOP Conference Series: Materials Science and Engineering. Vol. 310. 310 012044 https://doi.org/10.1088/1757-899X/310/1/012044

Abstract

Ceramic materials, like Aluminium Oxide (Al3O2), have high mechanical strength, high wear resistance, high temperature resistance and good chemical durability. Powder metallurgy processing is an adaptable method commonly used to fabricate composites because it is a simple method of composite preparation and has high efficiency in dispersing fine ceramic particles. In this research copper and novel material aluminium oxide/copper (Al O /Cu) composite has been fabricated for the application of electrode in Electro-Discharge Machine (EDM) using powder metallurgy technique. Al O particles with different weight percentages (0, 1%, 3% and 5%) were reinforced into copper matrix using powder metallurgy technique. The

powders were blended and compacted at a load of 100MPa to produce green compacts and sintered at a temperature of 574 °C. The effect of aluminium oxide content on mass density, Rockwell hardness andwear behaviour were investigated. Wear behaviour of the composites was investigated on Die-Sink EDM (Electro-Discharge Machine). It was found that wear rate is highly depending on hardness, mass density and green protective carbonate layer formation at the surface of the composite.

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Ansari M Z, Shoeb M, Nayab P S, Mobin M, Rahisuddin, Khan I, Siddiqui W A (2018) "wear behaviour were investigated. Wear behaviour of the composites was investigated on Die-Sink EDM (Electro-Discharge Machine). It was found that wear rate is highly depending on hardness, mass density and green protective carbonate layer formation at the surface of the composite.". Journal of Alloys and Compounds. Vol. 738, pp. 56-71.

Abstract

In this research work Reduced Graphene Oxide with Nickel (II) peroxide/copper (I) Oxide (Gr@NiO /Cu O NCs) have been successfully synthesized through a facile, one-step green synthesis mediated through the honey. The benefit of this methodology is that both the reducing agents themselves and also the oxidized product are eco-friendly. Additionally, reduction capability to graphene oxide, the oxidized products of honey i.e. reducing sugar could also act as capping agent and stabilizer in the synthesis of Gr@NiO /Cu O NCs, which showed good stability as a heterogeneous catalyst. This environmentally friendly approach can open up the new possible synthesis route for the graphene based nanocomposites on industrial scale production. Moreover, In this context, herein we report, an easy and effective synthesis of substituted Schiff base derivatives through the Graphene-based (Gr@NiO /Cu O NCs) green heterogeneous catalyst under ligand-free conditions, which provided good to excellent yields. The catalyst was characterized by FT-IR, XRD, SEM-EDX, TEM, RAMAN, UV and DLS analysis. The thermal stability of the catalyst was assessed by TGA and DSC analysis. Shorter reaction times, low packing of catalyst and higher yields are the benefit of this novel protocol. Its activity and simple recyclability without losing catalytic activity sort this catalyst a better replacement than another catalyst.

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Khan S, Haleem A, Khan M I, Abidi M H, Al-Ahmari A (2018) "Implementing Traceability Systems in Specific Supply Chain Management (SCM) through Critical Success Factors (CSFs)". Sustainability 2018 . vol. 10.

Abstract

Traceability plays a vital role in the success of Halal Supply Chain (HSC). HSC revolve around the essential dimension of Halal Integrity (HI), whereas traceability is seemed to be medium to assure integrity. Thus, a need is felt to identify the factors which are critical to the successful implementation of traceability in Halal Supply Chain Management (HSCM). Identified Twelve Critical Success Factors (CSFs) through an extensive review of literature and opinion of experts. Further, a contextual relationship among the CSFs is developed using Total Interpretive Structure Modelling (TISM) approach and derived a model. The structural model is analyzed using Fuzzy MICMAC (Matrice d'Impacts Croises-Multipication Applique and Classment-cross-impact matrix multiplication applied to classification) approach to identify the importance of CSFs by driving and dependence power. The primary result indicates towards; that improving the HSCM with the higher level of Halal awareness. Assuring HI will enhance the consumer satisfaction which leads to a competitive advantage for the organization. Academic researchers, industrial practitioners and Supply Chain executives can understand the complex interrelationship of CSFs by visualizing the TISM. It can help the management, lobbies and government to develop the policies regarding the implementation

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Tiwari G N, Meraj M, Khan M E , Mishra R K, Garg V (2018) "Improved Hottel-Whillier-Bliss equation for N-photovoltaic thermal-compound parabolic concentrator (N-PVT-CPC) collector". Solar Energy. Vol. 166, pp. 203-212. https://doi.org/10.1016/j.solener.2018.02.058.

Abstract

In this communication, an attempt has been made to develop modified Hottel-Whillier-Bliss (HWB) equation for N-number of fully covered photovoltaic thermal- compound parabolic concentrator (N-PVT-CPC) collector. The Analysis is based on basic energy balance equations for each component of the system as a function of design and climatic parameters. Developed modified Hottel-Whillier-Bliss (HWB) equation is applicable for various configurations namely conventional flat plate-compound parabolic concentrator (FPC-CPC), fully covered photovoltaic thermal-flat plate collectors (PVT-FPC) and conventional flat plate collectors (FPC) as a special case. The characteristic curve for thermal and electrical efficiency has also been developed for all cases considered in the present paper. Further, an experimental validation for N = 1 has also been carried out under indoor simulation condition.

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Jacob A, Maheshwari S, Siddiquee A N, Gangli N (2018) "Improvements in strength and microstructural behaviour of friction stir welded 7475 aluminium alloy using in-process cooling". Materials Research Express. Vol. 5.

Abstract

Al-Zn-Mg alloys are considered difficult to weld using fusion welding techniques. In the present study AA7475 has been welded with in-process cooling using two different cooling conditions. The mechanical properties have been carefully examined along with the micro-structural evolution. Improvements in the mechanical properties were observed. It was found that severe plastic deformation and in-process cooling resulted in extremely fine grains in the SZ region. Extremely good microstructural stability was observed in each of the samples especially ice water slush. Cooling has resulted in exceptional mechanical properties and hardness in the welds. The welds were characterized using SEM and EDX was also done on each of the samples. EDX data revealed high density of strengthening precipitates in the boundaries of the TMAZ and SZ. It also revealed high weight density of Mg along the zone interfaces.

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Haleem A, Javaid M (2018) "Industry 4.0 and its applications in orthopaedics". Journal of Clinical Orthopaedics & Trauma.

Abstract

Industry 4.0 is an intelligent manufacturing system, which focuses on the design, manufacturing and in providing customized product & services as per the individual requirements. It encourages the integration of different intelligent manufacturing systems and advanced information technologies and is also known as the fourth revolution. Customization of products is an important issue in orthopaedics and is well taken by the Industry 4.0, as it can make manufacturing systems intelligent & responsive to customer's need and the delight.

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Shrivastava M, Rathee S, Maheshwari S, Siddiquee A N (2018) "Influence of multiple-passes on microstructure and mechanical properties of Al-Mg/SiC surface composites fabricated via underwater friction stir processing". Materials Research Express . vol. 5. https://doi.org/10.1088/2053-1591/aac705.

Abstract

Friction stir processing (FSP) is a relatively newly developed solid-state process involving surface modifications for fabricating metal matrix surface composites. Obtaining metal matrix nano-composites with uniform dispersion of reinforcement particles via FSP route is an intricate task to accomplish. In this work, AA5059/SiC nano surface composites (SCs) were developed. Effect of multiple FSP passes and SiC addition on microstructure and mechanical properties of fabricated SCs during underwater condition was investigated. Results reflected that the average microhardness value of base metal (BM) increases from 85 Hv to 159 Hv in stir zone of four pass underwater friction stir processed (FSPed) SC. Highest ultimate tensile strength (UTS) achieved during four pass FSPed sample was 377 MPa that is higher than UTS of BM (321 MPa) and four pass FSPed sample developed at ambient air FSP conditions (347 MPa). An appreciably narrower heat affected zone is obtained owing to fast cooling and reduced heat conduction during underwater FSP, amounting to higher UTS as compared to BM and SC at ambient conditions. Thus, it can be concluded that surrounding medium and number of FSP passes have significant impact on mechanical properties of fabricated SCs. Analysis of microstructures and distribution of SiC particles in fabricated SCs were studied by optical microscope and FESEM respectively and found in good corroboration with the mechanical properties.

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Gangli N, Maheshwari S, Siddiquee A N (2018) "Influence of tool pin and shoulder geometries on microstructure of friction stir processed AA6063/SiC composites". Mechanics and industry. Vol. 10. https://doi.org/10.1051/meca/2018010.

Abstract.

The present study investigated the combined effect of friction stir processing (FSP) tool pin and shoulder profiles on particle distribution and microstructure of AA6063/SiC composites. Two strategies were used, in first strategy, plain cylindrical, tapered cylindrical, square and triangular tool pin profiles were used with flat shoulder design. In second strategy square and cylindrical pin profiles were used along with clock-wise (CW) and anti clock-wise (ACW) scrolled shoulder design. Single pass processing was performed to fabricate the composites. Microstructure examination of sample processed with various pin profiles and flat shoulder design reveals that tool with square pin profile was most effective. Among other shoulder profiles, ACW scrolled shoulder resulted in pancake shaped stir zone (SZ) and exhibited significant improvement in SZ size, out of which ACW scrolled shoulder with cylindrical pin profile produced uniform particle distribution without any defects.

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Hasan A "Inversions of 10 Link 12 Joint 3 F Compound Kinematic Chains". Journal of Material & Metallurgical Engineering. Vol 8, pp. 1-9.

Abstract

Author's objective is to prepare a catalogue of equivalent and distinct mechanisms in 10 link 12 joint 3 F compound kinematic chains. It will help the new researchers/designers to select the best mechanism kinematic chain and mechanism to perform the desired task at the conceptual stage of design. The suggested technique is based on the visualization of the coefficients of polynomials of the edge-edge matrix. These coefficients have been used for isomorphism checking. The illustrative example describes the technique.

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Shrivastava M, Rathee S, Maheshwari M, Siddiquee A N (2018) "Investigation on underwater FSP of Al-Mg-Si alloy surface composites". Materials Research Express. Vol. 6. https://doi.org/10.1088/2053-1591/aaebe9.

Abstract

In present research, parametric effects of underwater friction stir processing (UWFSP) upon microstructural and mechanical properties is investigated for AA6082/SiC surface composites. Experimental design was accomplished using Taguchi technique and three factors at three levels each were utilized. These factors include- rotational speed of tool, traverse speed of tool and tool shoulder diameter. Responses such as microhardness, ultimate tensile strength (UTS), yield strength (YS) and percentage elongation (%EL) are modeled using regression analysis based on Taguchi's orthogonal array design of experiment. Optimum combinations of process parameters were determined for the selected responses. It was found that each of three process parameters significantly affects the responses. Tool shoulder diameter is found most significant parameter affecting microhardness, YS, and %EL. However, rotational speed of tool is found most significant parameter affecting the UTS. An enhancement of ~27% in microhardness was achieved at optimum condition. The study on microstructural evolution and examination ofdispersion of reinforcement particles was carried out with the aid of optical microscope. Results revealed that at optimum combination of process parameters, uniform dispersion of reinforcement particles and enhanced mechanical properties were achieved. Conclusions of this research clearly correlate observations with mechanical properties and microstructural evolution.

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Kumar R, Islam M, Hasan M M (2018) "Investigations on Single-Phase Liquid Flow through Semi-Circular Microchannels". International Journal of Applied Engineering Research. Vol. 13, pp.6870-6880.

Abstract

An experimental investigation has been conducted to explore the validity of classical correlations based on conventional size channels for predicting the flow and heat transfer behavior in single-phase liquid flow through semi-circular microchannels. The test piece used in the experiment was made of copper and consists of ten microchannels in parallel having hydraulic diameter of 214 ìm and 60 mm length of semi-circular shape. The experiments were performed with deionised water as coolant and Reynolds number ranging from 238 to 1250. The experimental results obtained for friction factors showed that conventional theory for fully developed laminar flow is applicable with the range of our experiments. Classical correlations for macrochannels are evaluated with average Nusselt number obtained for microchannel with the assumption of constant wall heat flux. Slight deviations were observed in the experimental results obtained for Nusselt number when compared with earlier correlations, due to conjugate effect, variation in measurement of interface temperature and neglecting heat transfer through other surfaces of MCHS. 3-D conjugate heat transfer analysis is performed numerically for steady state condition. To predict heat transfer rates accurately, the entrance effects, conjugate effects, axial heat conduction and boundary conditions must have to be carefully considered.

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Rathee S, Maheshwari S, Siddiquee A N (2018) "Issues and strategies in composite fabrication via friction stir processing: A review". Journal of Materials and Manufacturing Processes. Vol. 33. https://doi.org/10.1080/10426914.2017.1303162.

Abstract

Friction stir processing (FSP) is an expeditiously emerging novel technique involving exterior layer modification, which enables one to successfully fabricate surface composites (SCs) as well as bulk composites of the metal matrix. SCs constitute an exclusive class of composites which exhibit improved surface properties while retaining the bulk properties unaltered. During initiative years, FSP was employed in development of SCs of light metal alloys like aluminum. But, nowadays, it has gained a shining role in the field of SC fabrication of various nonferrous alloys like aluminum, magnesium, copper, and even ferrous metals like steel etc. This article reviews the current trends, various issues, and strategies used to enhance the efficiency of the fabrication process of SCs. Factors involved in the process of SC fabrication are discussed and classified with a new

approach. Also, variation of micro structural and mechanical characteristics with these factors is reviewed. In addition to a brief presentation on the interaction between various inputs and their effects on properties, a summary of literature on SC fabrication for different metals is tabulated with prominent results. Subsequently, shortfalls and future perspectives of FSP on SC fabrication domain are discussed.

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Sutrisno A, Vanany I, Gunawan I, Asjad M (2018) "Lean waste classification model to support the sustainable operational practice". IOP Conference Series: Materials Science and Engineering,. Vol. 337. https://doi.org/10.1088/1757-899X/337/1/012067.

Abstract

Driven by growing pressure for a more sustainable operational practice, improvement on the classification of non-value added (waste) is one of the prerequisites to realize sustainability of a firm. While the use of the 7 (seven) types of the Ohno model now becoming a versatile tool to reveal the lean waste occurrence. In many recent investigations, the use of the Seven Waste model of Ohno is insufficient to cope with the types of waste occurred in industrial practices at various application levels. Intended to a narrowing down this limitation, this paper presented an improved waste classification model based on survey to recent studies discussing on waste at various operational stages. Implications on the waste classification model to the body of knowledge and industrial practices are provided.

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Sharma N, Siddiquee A N, Khan Z A, Mohammad M T (2018) " Material stirring during FSW of Al–Cu: Effect of pin profile". Journal of Materials and Manufacturing Processes. Vol. 33. https://doi.org/10.1080/10426914.2017.1388526.

Abstract

Friction Stir Welding (FSW) joins the material in solid state, and it gets evolved as a new and effective technique to join dissimilar materials such as aluminum and copper. FSW tool design and configuration critically affect the joint quality. This study has evaluated the effect of different pin profiles used during FSW of AA5754 Al alloy and commercially pure copper in a butt configuration on the microstructure, material movement, and micro hardness for the different joints. The joining is performed through the different pin profiles of cylindrical, taper, cylindrical cam, taper cam, and square shape at the rotational and welding speed of 900 rpm and 40 mm/min respectively. Among all joints, the square pin profile provides good joining and micro hardness. Square tool pin profile facilitates good amount of mixing at nugget zone, which consequently increases the hardness. The material movement in square tool pin profile joint is also studied on the longitudinal plane to understand the effect of pulsating and stirring action on the material mixing pattern in dissimilar FSW. It is evident that the softer material in the stir zone gets more stirring, and the flow lines are clearly visible for the stirred material.

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Khan N Z, Ubaid M, Siddiquee A N, Khan Z A, Al-Ahmari A (2018) "Microstructural features of friction stir welded dissimilar Aluminium alloys AA2219-AA7475". Materials Research Express. Vol. 5. https://doi.org/10.1088/2053-1591/aac4e1.

Abstract

High strength, good corrosion resistance, light weight make aluminium alloys a material of choice in many industrial sectors like aerospace, marine etc. Problems associated with welding of these alloys by fusion welding processes restricted their use in various industries. Friction stir welding (FSW), a clean solid-state joining process, easily overcomes various difficulties encountered during conventional fusion welding processes. In the present work, the effect of rotational speed (710 rpm, 900 rpm and 1120 rpm) on micro-hardness distribution and microstructure of FSWed dissimilar aluminium alloy joints were analyzed. Plates of AA7475-T761 and AA2219-O having thickness of 2.5 mm were welded by fixing AA7475 on retreating side (RS) and AA2219 on advancing side (AS). Welded joints were characterized by Vickers micro-hardness testing, scanning electron microscopy (SEM) and optical microscopy (OM). Results revealed that rotational speed significantly affects the micro-hardness due to increase in grain size, coarsening and dissolution of strengthening precipitates and re-precipitation. Higher micro-hardness values were observed in stir zone due to grain refinement and re-precipitation. Minimum micro-hardness value was observed at the TMAZ/HAZ of advancing side due to thermal softening.

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Khan N Z, Siddiquee A N, Khan Z A, Ubaid M, Bajaj D, Atif M, Khan A (2018) "Microstructure evolution of Friction Stir Welded Dissimilar Aerospace Aluminium Alloys". IOP Conference Series: Materials Sciene and Engineering. Vol. 404. https://doi.org/10.1088/1757-899X/404/1/012002.

Abstract

Aluminium alloys exhibiting properties such as high strength to weight ratio, high corrosion resistance etc. has made them a choice for many industrial applications. Therefore, joining of aluminium alloys is of utmost

importance, especially for the aerospace industry. Friction stir welding (FSW), a clean novel solid-state joining process, is being used to effectively join dissimilar materials for making different parts of space shuttles, aircrafts etc. 2.5 mm thick dissimilar aluminium alloys, AA2219-O and AA7475- T761, were joined using FSW. Evolution of microstructure for the traverse cross section of welded joint was studied. As a result, significant refinement of grains was observed in stir zone along with dissolution and coagulation of strengthening precipitates due to high rise in temperature and severe plastic deformation. Partial recrystallization was observed in TMAZ along with coarsening of grains and strengthening precipitates. In HAZ, coarser grains and strengthening precipitates was observed with no extent of plastic deformation.

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Yin L, Wang J, Chen X, Liu C, Siddiquee A N, Wang G, Yao Z (2018) "Microstructures and their distribution within HAZ of X80 pipeline steel welded using hybrid laser-MIG welding". Welding in the World (2018). https://doi.org/10.1007/s40194-018-0582-x.

Abstract

Large microstructure gradient in the heat-affected zone (HAZ) in the joints of large thick material welded by the hybrid laser-MIG welding technology reduces the in-service reliability and durability of the welded structure. It is of great importance to characterize and analyze how the microstructure distribution and evolution occur in the HAZ of the laser-MIG hybrid welded joints fabricated with X80 pipeline steel. In this article, the HAZ is found to comprise these characteristic zones, namely banded microstructure HAZ (BMHAZ), fine-grained HAZ (FGHAZ), transitional microstructure HAZ (TMHAZ), and coarse-grained HAZ (CGHAZ). The zone of the HAZ contains quasi-polygonal ferrite (QF), M-A component, polygonal ferrite (PF), and bainite ferrite (BF). From the base metal side towards the weld center with the decrease in the distance, the size of the M-A components decreases and its distribution is more dispersed, while the content of QF decreases in the HAZ. The average diameter of the original austenite grain increases gradually and so does the content of lath microstructures.

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Lijesh K P, Doddamani M, Muzakkir S M (2018) "Multi-objective optimization of stacked radial passive magnetic Bearing". Journal of Engineering Tribology. https://doi.org/10.1177/1350650117733374.

Abstract

Modeling, design, and optimization for performances of passive magnetic bearings (PMBs) are indispensable, as they deliver lubrication free, friction less, zero wear, and maintenance-free operations. However, single-layer PMBs has lower load-carrying capacity and stiffness necessitating development of stacked structure PMBs for maximum load and stiffness. Present work is focused on multi-objective optimization of radial PMBs to achieve maximum load-carrying capacity and stiffness in a given volume. Three dimensional Coulombian equations are utilized for estimating load and stiffness of stacked radial PMBs. Constraints, constants, and bounds for the optimization are extracted from the available literature. Optimization is performed for force and stiffness maximization in the obtained bounds with three PMB configurations, namely (i) mono-layer, (ii) conventional (back to back), and (iii) rotational magnetized direction. The optimum dimensions required for achieving maximum load without compromising stiffness for all three configurations is investigated. For designers ease, equations to estimate the optimized values of load, stiffness, and stacked PMB variables in terms of single-layer PMB are proposed. Finally, the effectiveness of the proposed method is demonstrated by considering the PMB dimensions from the available literature.

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Gangli N, Maheshwari S, Siddiquee A N (2018) "Multipass FSP on AA6063-T6 Al: Strategy to fabricate surface composites". Materials and Manufacturing Processes. Vol. 33. https://doi.org/10.1080/10426914.2017.1415448.

Abstract

Surface composites were fabricated on AA6063-T6 base metal using silicon carbide (SiC) reinforcement particles by friction stir processing (FSP). Influence of multiple FSP passes was investigated on the SiC particle distribution, processed zone dimensions, and microhardness of fabricated composites. The rotational speed, traverse speed, and tool tilt were kept constant and the numbers of passes were varied at 2, 4, 6, and 8. The particle distribution in processed zone was analyzed using OM and SEM, while microhardness were evaluated by Vickers indentation test. The results reveal that with increase in FSP passes there is increase in processed zone dimensions and elimination of defects such as agglomeration of particles and void. The microhardness of reinforced region was increased uniformly with increasing passes which is attributed to homogeneous distribution of reinforcement particles. The peak microhardness value of 81.9 Hv was obtained in sample which is processed with eight numbers of FSP passes. Processed zone indicates good bonding with the substrate and grain refinement.

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Gangli N, Maheshwari S, Siddiquee A N (2019) "Novel Use of Distribution Facilitators and Time–Temperature Range for Strengthening in Surface Composites on AA7050-T7451". Metallography, Microstructure, and Analysis. Vol. 7, pp. 561-577.

Abstract

High-strength AA7050-T7451 finds widespread applications in aircraft and aerospace applications. Enhancement of its peak strength is highly useful and extremely challenging. Strengthening due to reinforcement largely depends on homogeneity of distribution. Common distribution approach is to perform multi-pass FSP. Heat input associated with every pass is detrimental to strength. Newer approach for effective distribution and identification of temperature range that is innocuous to T7451 strength is the ideal solution to address this issue. This paper has proposed a maiden and novel approach to add low softening temperature HCP metal powder to the ceramic reinforcement which aids in particle distribution in single FSP pass. The experimental investigation was performed using Taguchi's L27 orthogonal array. The single-pass FSP demonstrated that in many experiments, the strength of fabricated surface composites surpassed the strength of 7050-T7451. Conditional analysis through a coded MACRO identified the range of temperature and processing time which provides net strengthening in the fabricated surface composites.

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Ehtesham N, Mujherjee S, Suhaib M (2019) "Object Size Determination Grasped by a Four-Finger Gripper Using Workspace Analysis". Intelligent Communication, Control and Devices. Vol. 624, pp. 791-798.

Abstract

The performance of a multi-finger robotic gripper is measured in terms of its capability to grasp and manipulate objects successfully. Manipulation of an object is possible only if it is stable within its grasp. Moreover, most of the manipulation task is done only when the object is grasped by precision grasping rather than power grasping. Also, the manipulability of the object by a gripper depends upon size and shape of the object. It is, therefore, important to evaluate the shape and size range that a robotic gripper can grasp to understand its area of application. The work presented here proposes a method to identify the maximum size of an object which a gripper can grasp by precision grasping. The workspace of the hand is utilized for this purpose. The methodology is demonstrated on a new four-finger tendon-driven robotic gripper developed in the laboratory.

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Chaudhary T, Siddiquee A N, Chandra A K, Khan Z A "On Micromachining with a Focus on Miniature Gears by Non Conventional Processes. A Status Report". Archive of Mechanical Engineering. Vol. 1, pp 129-169.

Abstract

Recent developments in automation and technology have revolutionized the way products are made. It is directly seen in the evolution of part miniaturization in the sectors such as aerospace, electronics, biomedicine and medical implants. Micromachining is a promising technology to fulfill the need of miniaturization. A review has been done on the micromachining processes such as micro electric discharge machining (micro-EDM) and wire EDM (WEDM), micro electrochemical machining (micro-ECM). Recent literature were studied and categorized in terms of materials, process parameters, performances, product manufactured, and miniature product generation. Starting with brief introduction to micromachining, classifications and applications, technical aspects of discussions from the literature have been presented on key factors such as parameters and the response variables. Important aspects of recast layer, heat effected zone, micro-hardness, micro cracks, residual stress, etc., have been given. A special focus is given to the status of the research on microgear manufacturing. Comparison has been made between other conventional process suitable for micro-gear manufacturing and WEDM. The miniature gear machined by WEDM shows the defect-free microstructure, better surface finish, thin recast layer and improved gear quality parameters such as profile and pitch. Finally, the research gaps and future research directions have been presented.

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Muqeem M, Sherwani A F, Ahmad M, Khan Z A (2018) "Optimization of diesel engine input parameters for reducing hydrocarbon emission and smoke opacity using Taguchi method and analysis of variance". Energy & Environment. https://doi.org/10.1177/0958305X17751393.

Abstract

The aim of this paper is to optimize the input parameters of diesel engine with respect to hydrocarbon emission and smoke opacity through experimentation and Taguchi approach. Four parameters, namely, compression ratio, fuel injection timing, air temperature, and air pressure were varied at five different levels and their effect on hydrocarbon emission and smoke opacity under no load, half load, and full load conditions were recorded. The optimum combination of control/input parameters leading to the optimum values of performance parameters/response variables, were determined using signal-to-noise ratio, analysis of means, and analysis of variance. Confirmation tests were performed to check the validity of the results, which revealed good agreement between the predicted and

the experimental values of the response variables at optimum combination of the input parameters.

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Sharma A, Muqeem M, Sherwani A F, Ahmad M (2018) "Optimization of diesel engine input parameters running on Polanga biodiesel to improve performance and exhaust emission using MOORA technique with standard deviation". Energy Sources, Part A: Recovery, Utilization, and Environmental Effects. Vol. 40. https://doi.org/10.1080/15567036.2018.1511647.

Abstract

Fast exhausting fossil fuel reserves and high rise in the air pollution levels due to combustion of these fuels bound us to discover some cleaner and environment friendly fuels for the engines. Biodiesel from edible and non-edible seed oils has been identified as a better alternate of the diesel fuel in engines with a little sacrifice in terms of power output but with an improvement in exhaust emissions. The aim of the present research work is to optimize the input parameters of diesel engine running on Polanga biodiesel to improve performance and exhaust emissions. The input parameters selected for optimization are fuel injection timing, fuel injection pressure, Polanga biodiesel blend, and engine load with respect to brake thermal efficiency, brake specific fuel consumption, hydrocarbon emission, smoke opacity, and emission of nitrogen oxides. Relative weights of the response variables were calculated by standard deviation. The optimum combination of input parameters was obtained by Taguchi-based Multi-Objective Optimization by Ratio Analysis. Experiments were performed according to Taguchi's L orthogonal array in a random manner in which three replicates of each experiment were noted. The optimum combination of input parameters for maximum performance and minimum exhaust emissions found to be as fuel injection timing 27° bTDC, fuel injection pressure – 220 bar, biodiesel blend – B40, and engine load – 60%. The optimum values of the response variables, at the obtained optimum combination of input parameters, were predicted by Taguchi method and then verified experimentally and a good relation was found between them. These optimum values found to be as brake thermal efficiency – 36.351%, brake specific fuel consumption – 0.322 kg/kW-h, hydrocarbon emission – 2.193 ppm, smoke opacity – 80.925 HSU, and NO emission – 690.987 ppmv.

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Afridi Z, Ahmad M, Ahmad M, Haleem A, Ahmad R, Ahmad I (2018) "Pilonidal sinus: An experience with Bascom procedure". Pak J Surg 2018. *Vol. 34,pp. 125-130.*

Abstract

Objectives: The aim of the study was to evaluate the results of the Bascom's procedure of natal cleft lift / elevation & off midline primary closure (lateralization) in the patients suffering from primary pilonidal disease. Material & Methods: It was a prospective observational study & has been carried out in Khyber Teaching Hospital Peshawar, Fauji Foundation Hospital Rawalpindi & Central Hospital Hafar Al Baten KSA from Jan, 2008 to Jan, 2017. Simple random sampling technique was used and after inclusion and exclusion criteria, all those patients with primary Pilonidal disease (PND) who gave consent for the Bascom procedure were included in the study.

Th e patients' details entered in the special Proforma. Post-operatively, note was made of the seroma, hematoma, infection, hospital stay, wound healing time & recurrence. Th e results analyzed at the completion of the study & compared with the literature. Results: A total of 53 patients were included in the study in which male to female ratio was 52:1. Study population largely comprised of male patients of relatively younger age with no co-morbid. Th e mean hospital stay was 3.32 days ± 1.61 SD and mean duration of wound healing was 12 days ± 2.16 SD. Post-operative infection was the most common complication (7.6%) followed by seroma (5.7%). While the recurrence was noted only in 2 (3.99%) cases. Conclusion: Th e results of the Bascom cleft lift , midline shift are satisfactory and the practice of leaving the wound open should now be abandoned in favor of the primary, off mid line closure.

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Khan M I, Khan S, Haleem A, Javaid M (2018) "Prioritising Barriers towards Adoption of Sustainable Consumption and Production Practices using TOPSIS". IOP Conference Series: Materials Science and Engineering. Vol. 404 https://doi.org/10.1088/1757-899X/404/1/012011.

Abstract

Unsustainable form of consumption and production in current business practices and lifestyle of the consumers seems inviting problems for the planet, such as scarcity of natural resources, environmental issues and increase in waste generation. Therefore, industries and consumers need to focus to integrate Sustainable Consumption and Production (SCP) practices in their daily operations to resolve these emerging problems and ensure sustainable development. However, the adoption of SCP practices faces many challenges due to the presence of various barriers. This paper identifies ten major barriers towards the adoption of SCP practices through extensive literature

review and supportedby experts. Further, these barriers are prioritised using the Technique for Order Preference by Similarity to Ideal Soltion (TOPSIS). The finding of this study suggests that the lack of proper awareness consumers is the most significant barriers among the identified barriers towards the adoption of SCP practices. The prioritising of these barriers can be beneficial for the policy makers, managers and government in developing a framework to mainstream the SCP practices.

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Khan N Z, Siddiquee A N, Khan Z A (2018) "Proposing a new relation for selecting tool pin length in friction stir welding process". Measurement. Vol. 129, pp. 112-118.

Abstract

In this paper, an empirical relation to determine tool pin length for a specific set of Friction Stir Welding (FSW) parameters such as base material thickness, tool shoulder diameter, tool pin diameter and tool tilt angle is derived and proposed. The effectiveness and suitability of the proposed relation was verified through FSW experiments. Tool pin length was obtained from the relation and FSW of dissimilar aerospace grade aluminium alloys (AA7475 and AA2219) was performed. Three welds were made: one using the FSW tool with the pin length obtained from the proposed relation; second with the pin length smaller and third with the pin length greater than that obtained from the proposed relation. Subsequently, the three welds were compared and it was found that the tool having pin length obtained from the proposed relation resulted in smooth surface morphology and proper material mixing with good consolidation of flowing material at the bottom of the joint. Value of pin length smaller than that obtained from the proposed relation resulted in heavy flash due to larger plunge depth. Value of pin length larger than that obtained from the proposed relation resulted in surface cracks along with insufficient mixing and lack of bonding at the bottom of the joint due to insufficient plunge depth. Joint fabricated with optimized pin was characterized by mechanical testing, microstructure and fractography.

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Wahid M A, Khan Z A, Siddiquee A N (2018) "Review on underwater friction stir welding: A variant of friction stir welding with great potential of improving joint properties". Transactions of Nonferrous Metals Society of China. Vol. 28, pp. 191-219.

Abstract

Friction stir welding (FSW) is a solid-state welding process which is capable of joining materials which are relatively difficult to be welded by fusion welding process. Further, this process is highly energy-efficient and environmental-friendly as compared to the fusion welding. Despite several advantages of FSW over fusion welding, the thermal cycles involved in FSW cause softening in joints generally in heat treatable aluminum alloys (AAs) due to the dissolution or coarsening of the strengthening precipitates leading to decrease in mechanical properties. Underwater friction stir welding (UFSW) can be a process of choice to overcome these limitations. This process is suitable for alloys that are sensitive to heating during the welding and is widely used for heat-treatable AAs. The purpose of this article is to provide comprehensive literature review on current status and development of UFSW and its importance in comparison to FSW with an aim to discuss and summarize different aspects of UFSW. Specific attention is given to basic principle including material flow, temperature generation, process parameters, microstructure and mechanical properties. From the review, it is concluded that UFSW is an improved method compared with FSW for improving joint strength. Academicians, researchers and practitioners would be benefitted from this article as it compiles significantly important knowledge pertaining to UFSW.

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Haleem A, Javaid M (2018) "Role of CT and MRI in the design and development of orthopaedic model using additive Manufacturing". Journal of Clinical Orthopaedics and Trauma. Vol. 9, pp, 213-217.

Abstract

Objective: To study the role of Computed tomography (CT) and Magnetic resonance imaging (MRI) for design and development of orthopaedic model using additive manufacturing (AM) technologies.

Methods: A significant number of research papers in this area are studied to provide the direction of development along with the future scope.

Results: Briefly discussed various steps used to create a 3D model by Additive Manufacturing using CT and MRI scan. These scanning technologies are used to produce medical as well as orthopaedic implants by using AM technologies. The images so produced are exported in different software like OsiriX Imaging Software, 3D slicer, Mimics, Magics, 3D doctor and InVesalius to produce a 3D digital model. Various criteria's achieved by CT and MRI scan for design and development of orthopaedic implant using additive manufacturing are also discussed briefly. AM model created by this process show exact shape, size, dimensions, textures, colour and features.

Conclusion: AM technologies help to convert the digital model into a 3D physical object, thereby improving the understanding of patient anatomy for treatment as well as for educational purpose. These scanning technologies have various applications to enhance the AM in the field of orthopaedic. In orthopaedic every patient model is a customised unit, sourced from the individual patient. 3D CAD data captured by these scanning technologies are directly exported in standard triangulate language (STL)

format for printing by AM technologies. Crossestion of the physical model fabricated by this process shows a patient's anatomy if the model prepared by using the bone-like material.

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Asjad M, Talib F (2018) "Selection of optimal machining parameters using integrated MCDM Approaches". International Journal of Advanced Operations Management. Vol. 10. https://doi.org/10.1504/IJAOM.2018.093270.

Abstract

Depth of cut in a CNC milling machine on material removal rate and surface roughness has been studied. The three multi-criteria decision making (MCDM) techniques have been implemented to select the optimal machining condition for a CNC milling machine. Nine experiments as per Taguchi's standard L9 orthogonal array were performed on the machine parameters. Subsequently, multi-response optimisation was performed using grey relational analysis (GRA), technique for order preference by similarity to ideal solution (TOPSIS), and multi-objective optimisation on the basis of ratio analysis (MOORA) coupled with principal component analysis (PCA). The results revealed that the same optimal condition has been obtained by all the three techniques. This piece of research work will be helpful to academician, researchers, and other stakeholders in understanding the importance, severity and benefits obtained by the application, implementation and optimisation of the controllable parameters of a CNC milling machine using GRA, TOPSIS and MOORA.

Nadeem M, Khan W, Khan S, Shoeb M, Husain S, Mobin M (2018) "Significant enhancement in photocatalytic performance of Ni doped BiFeO nanoparticles". Materials Research Express. Vol. 5. https://doi.org/10.1088/2053-1591/aac70d.

Abstract

In the present work, we have investigated the effect of Ni doping on the microstructure and photocatalytic properties of BiFeO samples. All the compositions of BiFe Ni O (0 d" x d" 0.07) have been synthesized via cost effective ethylene glycol based sol-gel method. The Rietveld refinement of the XRD data revealed rhombohedral crystal structure with R3c space group. The FTIR spectroscopy confirms the formation of BiFeO compound. UV–visible DRS result affirmed that the band gap of the samples can be tuned towards visible range by the Ni substitution. The photoluminescence spectra indicate lower intensity with the Ni content, signify reduction in recombination rate of the electron-hole pairs. The photocatalytic response of the nanoparticles was examined for the degradation of methylene blue (MB) dye under visible light irradiation and the highest photocatalytic response was observed for 7% Ni doped sample. Therefore, the observed results suggest potential application of the synthesized nanoparticles for wastewater treatment purpose.

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DEPARTMENT OF MECHANICAL ENGINEERING
Faculty of Engineering and Technology
Jamia Millia Islamia (NAAC-'A' Grade University)
Maulana Mohammed Ali Jauhar Marg
New Delhi (INDIA)