June 2019, Volume : 4, Number : 6

IEI Epitome

CONTENTS

Dr. Wooday P Krishna, *FIE*

Member of the Council, The Institution of Engineers (India)

• Nominated as a Member of the Executive Committee of Bharatiya Vidya Bhavan's Gandhi Centre for Science and Human Values, Bengaluru for three year term.

• Chaired the Inaugural Session of 'Management Conclave 2019' on 'Industry 4.0: Future of Learning' organized by Karnataka Private Postgraduate College Association' on May 3, 2019 at Bengaluru.

Mr. Prabhudev M S, *FIE*

Head, Department of Mechanical Engineering, Selection Grade Lecturer, Government Polytechnic College, Kalaburgi, Karnataka

• Invited as Guest Speaker during 'World Water Day-2019' organized by The Institution of Engineers (India), Kalburgi Local Centre on March 28, 2019.

• Invited as Guest Speaker to deliver address on 'Success Tips' at NSS Annual Camp organized by Government First Grade College, Kalburgi on March 29, 2019.

• Invited as a Resource person to deliver Talk on 'Career Choices and Opportunities', 'Developing Employability Skills', 'Job Hunting', 'Facing Interviews', 'Group Discussion' and 'Entrepreneurship in One Day Career Guidance Programme' on April 7, 2019 organised by Internal Quality Assurance Cell, Government First Grade College (GFGC), Kalgi, Karnataka.

Mr. Vishnu Rajaram Bankar, *AMIE*

Ph.D Scholar, Department of Production Engineering, Savitribai Phule Pune University, Pune

Invited as Chief Speaker in AMIE Guidance Programme for Summer-2019 in The Institution of Engineers (India), Pune Local Centre, on May 18, 2019.

Dr. Manoj Kumar Mahawar, *AMIE*

Scientist, Horticultural Crop Processing Division, ICAR-Central Institute of Post-harvest Engineering and Technology (CIPHET), Punjab

Recipient of 'Young Scientist Award' for the outstanding contribution at National Conference on 'Identification, Convergence, Implementation and Extension of Researchable Issues for Sustainable Development' organized by New Age Mobilization Society, New Delhi in collaboration with Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut during April 20-21, 2019.

Mr. Srinivas Vasam, *MIE*

Research Scholar, Department of Civil Engineering, Jawaharlal Nehru Technological University, Hyderabad

Awarded Doctor of Philosophy in Civil Engineering by Jawaharlal Nehru Technological University Hyderabad on the topic, 'Investigation on Performance of Different Grades of SCC using Recycled Concrete Aggregate' on April 26, 2019.

Dr. Dipen Kumar Rajak, *AMIE*

Assistant Professor, Department of Mechanical Engineering, Sandip Institute of Technology and Research Centre & Sandip University, Nashik, Maharashtra.

• Conferred with the Award as 'Young Scientist' on 'Research Excellence and Academic Awards (REAA-2019)' by Combined Society for Educational Research and Development at Mumbai, India on February 1, 2019.

• Conferred with 'Young Scientist' in International Award Conference on 'Research, Analyse, Communicate and Evaluate (RACE-2019)' at Kasetsart University, Bangkok on February 10, 2019.

Mr. Darshan J Mehta, *AMIE*

Assistant Professor, Faculty of Civil Engineering, Dr S & S S Ghandhy Government Engineering College, Surat, Gujarat

Invited as 'Reviewer' in International Journal of Advances in Science, Technology and Engineering System.

Mr. Saadat Ali Rizvi, *MIE*

Workshop Superintendent (Faculty Member), University Polytechnic, Jamia Millia Islamia, New Delhi

Delivered Keynote Address on 'Application Welding in Railways' in GLA University, Mathura on April 28, 2019.

Mr. Vinay Kumar Shukla, *MIE*

Manager, Instrumentation Department, National Fertilizers Limited, Guna, Madhya Pradesh

Awarded First Prize in Fire Service during Week Essay Competition organized by Central Industrial Security Force- Fire-Wing during April 14-22, 2019.

Dr. Krishna Nirmalya Sen, *FIE*

Head EHS (MMH), Larsen & Toubro Limited

Presented paper titled, 'Scaffolding Safety in Construction Industry–Important Aspects' at *7th ASSP India Chapter Professional Development Conference* in IIT Madras, Chennai held during April 27-28, 2019.

107th Indian Science Congress

January 3 - 7, 2020

Venue:

University of Agricultural Sciences, Bengaluru

Theme: **Science and Technology : Rural Development**

Please visit the following link for submission of papers :

https://www.ieindia.org/WebUI/ajax/Downloads/WebUI_PDF/HIGHLIGHTS_DOCUMENT-125.pdf

Prof. Umesh B Deshannavar, FIE

Head, Department of Chemical Engineering, KLE Dr M S Sheshgiri College of Engineering and Technology, Belagavi, Karnataka

Title of Paper: 'A Model to Determine Maximum Heat Flux under Forced Convective Heat Transfer Regime for Crude Oil Fouling Studies,' *Applied Thermal Engineering*, Vol.156, pp.485-493, 2019 [http://scienview.com.cn/paper/5654580]

Co-author: M. Ramasamy

Abstract

Reactive species such as asphaltenes play an important role in crude oil fouling. Crude preheat trains in petroleum refineries are the most affected due to crude oil fouling. Fouling characteristics of crude oils are generally determined through experiments in lab-scale or pilot-scale units using very high surface temperatures/heat fluxes. At very high surface temperature values, the heat transfer regime may change from forced convection to boiling. Determination of maximum heat flux or surface temperature beyond which heat transfer regime changes from forced convection to boiling is important for the study of crude preheat train fouling. In the present study, experiments were conducted using two Malaysian crude oils to estimate the maximum heat flux/surface temperature and a model to determine the maximum heat flux has been developed and validated with the experimental data. This will form the basis for selecting the operating conditions (heat flux/surface temperature) prior to the crude oil fouling characterization studies.

Keywords: *Crude preheat train; Heat flux; Boiling; Fouling; Asphaltenes; Crude oils*

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Mr. Sitikantha Chattopadhyay, *MIE*

Assistant Professor, Department of Computer Science and Engineering, Brainware University, Barasat, West Bengal

Title of the Paper: 'An Advanced Slab Based Image Steganography Technique for 8-bit Color Images by Introducing Diagonal Searching', International Journal of Innovative Knowledge Concepts, Vol.7, Special Issue 1, 2019, pp.81-85.

[http://www.ijikc.co.in/index.php/ijikc/article/view/1817]

Abstract

Slab based image steganography is a well-known and widely used technique now-a-days. It uses popular LSB insertion technique. Here I have used 8-bit image of 150 X 150 size and divided this into slabs and sheets. Then each sheets of individual slab will be searched both row and column wise for an exact match with secret message. This searching domain is increased by introducing diagonal searching. The proposed technique is applied to real images and result and analysis shows some promising result. In this technique, cover image is slightly modified but gives better matching compared to the existing algorithm.

Keywords: *Steganography, LSB insertion technique; Gray-scale image*

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Mr. Kshira Sagar Sahoo, *AMIE*

Assistant Professor, VNR Vignan Jyothi Institute of Engineering and Technology, Hyderabad

Title of Paper: 'Toward Secure Software-defined Networks against Distributed Denial of Service Attack', *Journal of Supercomputing*, 2019.

[https://link.springer.com/article/10.1007/s11227-019-02767-z]

Co-authors: Sanjaya Kumar Panda, Sampa Sahoo, Bibhudatta Sahoo, Ratnakar Dash

Abstract

The newly emerged software-defined networking (SDN) paradigm provides a flexible network management by decoupling the network control logic from the data plane, which could effectively resolve many security issues of legacy networks. One of such security issues is distributed denial of service (DDoS) attack, which is a rapidly growing network threat. SDN can easily detect the DDoS attack due to the centralized control provisioning and network visibility. At the same time, the changes of fundamental architecture and the developments of various design entities pose a severe DDoS threat to the SDN platform. This paper presents a concise up-to-date review of security concerns of SDN, possible DDoS attack in individual layers of SDN and ongoing research efforts on SDN-enabled DDoS detection solutions.

E-mail: *kshirasagar12@gmail.com*

Dr. Raja Sekhar Dondapati, *AMIE*

Associate Professor and Research Coordinator, School of Mechanical Engineering, Lovely Professional University, Punjab

Title of Paper: 'Computational Investigation on Thermohydraulic Characteristics of High-Temperature Superconducting (HTS) Power Cables', *Physica C: Superconductivity and its Applications*, Vol. 559, 2019, pp. 25-31.

[https://www.sciencedirect.com/science/article/abs/pii/S092145341830460X]

Co-authors: Sudheer Thadelaa, V V Rao, Rahul Agarwal

Abstract

High-Temperature Superconducting (HTS) cables are emerging as an effective alternative for conventional power transmission system in reducing transmission losses, electrical impedance and Right-of-Way (RoW). Rare earth based superconducting tapes such as Bismuth strontium calcium copper oxide (BSCCO-2223) and Yttrium barium copper oxide (YBCO-123), whose critical temperatures are 110 K and 90 K respectively, are preferred in manufacturing of HTS cables, due to their potential to handle high current load, in cryogenics environment. Moreover, for retaining the superconductivity, these HTS tapes are preferably cooled by Liquid Nitrogen (LN2) (boiling point ~ 77 K), in order to remove the heat flux from different sources such as AC losses in HTS tapes, heat-in-leak due to axial conduction through the current leads and radial heat-in-leak from the ambient through the insulation. Therefore, it is essential to estimate the cooling capacity of HTS cables and associated pumping power required for circulation of LN2 between end terminations. Hence, in the present work, the thermohydraulic analysis relevant to the design of long length HTS cables is presented. The computational model of LN2 flowing through corrugated pipe of HTS cable is developed, followed by the estimation of pumping power and cooling capacity, using the commercial code FLUENT. The obtained results are validated with the experimental measurements available in literature.

Keywords: *HTS cables; Liquid nitrogen; Thermohydraulic analysis; Pressure drop; Heat transfer; Computational analysis*

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Mr. Pranjal Sarma, *AMIE*

Assistant Professor, School of Technology, Don Bosco University, Guwahati, Assam

Title of Paper: 'Fabrication of Metallic Micromixers using WEDM and EDM for Application in Microfluidic Devices and Circuitries', Micro and Nanosystems, Vol. 10, No. 2, 2018, pp. 136-146.

[DOI: 10.2174/1876402911666181128125409]

Co-author: Promod K. Patowari

Abstract

Micro-mixers having various simple and complex micro channel is an inevitable part of almost all the micro-fluidic devices and circuitries nowadays. Particularly the metallic micro-mixers are very important for many chemical and process industries. Fabrication of metallic micro-channels still remains a challenging task. The work focuses on the fabrication of micro-channels of different geometries and intrinsic features on metals. Here, an alternate approach for fabricating micro-channel in metals is demonstrated, which is easy and doesn't demand a very high level of expertise. The fabrication is carried out using Wire-Cut Electric Discharge Machine (WEDM) and Electric Discharge Machine (EDM) and accomplished in two stages: 1) Micro-tool fabrication in WEDM; 2) Micro-channel machining in EDM. Parametric investigation of the processes is also carried out for understanding the influence of different parameters in micro-fabrication. Different serpentine micro-mixer configurations are fabricated on copper and aluminium. Open channel configuration of metallic micro-mixers of average micro-channel width 400 µm is fabricated as per the design. During micro-tool fabrication in WEDM, parametric conditions: pulse on time 25 µs, pulse off time 6 µs, input current 1A and wire feed rate 75 mm/min gave optimal results among the investigated parametric combinations. During the second stage of micro-fabrication using EDM, the effect of input parameters, viz. input current, pulse on time and pulse off time on the output parameters viz. machining time, over cut, edge deviation and tool depletion are investigated. Results highlight the importance of careful selection and control of all these process parameters for manufacturing metallic micro-channels by EDM. The proposed method is able to give rise to micro-features like micro-channel on metals with reasonable ease and accuracy. The fabricated micro-mixers can be used for Lab on Chip (LOC), Point of Care (POC) devices or/and micro-reactors. The metallic micro-mixers can be used to handle various corrosive species and reagents which the conventional polymeric substrate can't handle. Thus, it can lead to further advancement in the field of micro-fluidics.

Keywords: *Micro-fabrication; Open channel; Micro-mixer; Micro-channel; Micro-fluidics; WEDM; EDM*

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Dr. Swati Arora, *AMIE*

Associate Professor, Department of Electronics and Communication, Swami Keshvanand Institute of Technology, Jaipur, Rajasthan

Title of Paper: 'Annealing Effects on Properties of Se(1−x) Sbx Nano Crystalline Thin Films', *Journal of Nano-electronics and Optoelectronics*, Vol. 14, pp.1–6, 2019 [http://www.aspbs.com/jno.htm]

Co-author: Hemlata Panwar

Abstract

Se (1−x) Sb x Heterostructure of 200 nm Thin Films with different stoichiometry ratio (x = 0.25, 0.50, 0.80) of Se: Sb deposited on glass plate substrate by thermal evaporation method under the vacuum of about 3*10−5 torr using vacuum coating unit under the deposition rate of 10 Å/sec. It was observed that optical band gap decreases exponentially with Increases the Photon Energy (Eg). It is also observed that absorption coefficient in Optical Band Gap decreases exponentially with increases wavelength of Photon (nm). Prepared thin films deposited on properly cleaned glass substrate at different stoichiometry ratio (75:25, 50:50, 20:80) at constant thickness of 200 nm). Nano Crystalline thin films were kept at without annealed, annealed at 150 C and 200 C to examine the effect of annealing in recrystallization. At without annealing prepared thin films were found amorphous in nature. Samples were studied by X-ray diffraction (XRD) and scanning electron microscopy (SEM) to obtain comprehensive and consistent microstructural information. UV-VIS NIR Spectrometer is used to measure Optical properties of thin films. X-ray Photo-Electron Spectroscopy (XPS) was used to measure the elemental composition of thin films. A picosecond laser pump-probe system was used to investigate the phase-change time between amorphous and crystalline states, by measuring the reflectivity of the material. Raman Spectra Analysis technique used to observe and analysis optical spectra to examine the surface morphology of thin films.

Keywords: *Photo-electron spectroscopy; Vacuum coating unit; UV-VIS NIR spectrometer*

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Prof. S K Mazumder, *FIE*

Former AICTE Emeritus Fellow and Professor of Department of Civil Engineering, Delhi Technology University, New Delhi

Title of Paper : 'Waterway for a Bridge in Meandering and Braiding Flood Plain of a River-Some Case Studies', *Indian Highways*, March 2019, pp.11-19

[https://drive.google.com/file/d/0B4ELJHaC7dzOdEh1QmIzbWJTZ0RRYjhhTmZkUjZtRE5kQlNN/view]

Abstract

Sometimes a bridge engineer is compelled to construct bridges on the wide flood plain of meandering / braided rivers where the flood plain width far exceeds Lacey's regime width. Underestimation of waterway and scour may result in failure of a bridge, loss of properties and outflanking of bridge. Overestimation of waterway, on the other hand, will not only increase the cost of the bridge, it will also provide an opportunity to the river to play in its meandering / braiding belt under the bridge resulting in non-uniformity of flow distribution which may result in high scour under some of the bridge spans and silting in some others. After briefly discussing the fundamentals of meandering and braiding processes, authors have made an attempt to develop some important hydraulic and cost criteria for fixing the waterway of bridges constructed in meandering / braiding flood plains. Waterway provided for three important bridges on flood plains of rivers Ganga, Yamuna and Brahmaputra have been illustrated under case study.

Keywords: *Waterway; Meandering; Braiding; Afflux; Flow choking; River stability*

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Dr. T L Prasad, *FIE*

Senior Scientific Officer, Chemical Engineering Group, Bhabha Atomic Research Centre, Mumbai

Title of Paper: 'Low Temperature AOP Studies for Spent Reverse Osmosis Module Components', *Separation Science and Technology*, Vol. 54, No. 9, 2019, pp.1533-1541.

[DOI: 10.1080/01496395.2019.1584223]

Co-authors: S Avilasha, V L Sandhya, R C Bindal

[contd. P-7]

Abstract

Membrane based separations are becoming popular and membrane technology using Reverse Osmosis (RO) is long established as a large scale industrial membrane process for desalination. Membranes need to be managed after its life cycle. Advanced oxidation processes for aqueous organic waste handling are known and are being practiced in industries. The effectiveness of various Advanced Oxidation Processes (AOP) based on hydrothermal process techniques to liquefy and depolymerise the different components of the Thin Film Composite (TFC) membranes have been discussed in this paper. This helps in conversion of bulky molecules into smaller ones and facilitates towards meeting environmental regulations. For economic and environmental reasons, other reuse, recycle and disposal options must be considered and investigated. The effect of factors such as temperature, duration, radiation and concentration of reaction media on liquefaction / depolymerisation of different components of spent RO module has been presented.

Keywords: *Desalination; Reverse osmosis membranes; Depolymerisation; AOP studies; Hydro thermal processes*

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Prof. Basavaraj Paruti, *FIE*

Department of Civil Engineering, Alliance College of Engineering and Design, Alliance University, Bangalore

Title of Paper: 'Characterization of Leachate In Solid Waste Landfill Site: A Case Study of S Bingipur in Bangalore', ANNALS of Faculty Engineering Hunedoara– International Journal of Engineering, Tome XVII, 2019

[http://annals.fih.upt.ro/pdf-full/2019/ANNALS-2019-1-32.pdf]

Co-author: B. Santhaveeranagoud

Abstract

Living standards in developing urban areas can be improved by using proper solid waste management techniques. This helps in maintaining better health and sanitation standards. Sanitary land filling is the best method for achieving the same. The only drawback of having landfills is leachate and landfill gases that are produced. This byproduct if not controlled effectively is harmful to the health and environment. Bengaluru city has identified many disposal sites for the scientific disposal of municipal solid waste generated in its jurisdiction. This paper reviews the Characterization of Leachate, age of leachate and the nature of municipal solid waste present in one of the Solid Waste Landfill sites at S Bingipur in Bengaluru urban district. The leachate present at the study site was characterized by collecting two leachate samples (one from the leachate outlet of underground pipe network, other in the landfill area due to rains). The study reveals that the leachate has excess of organic compounds and very low heavy metal concentrations, which indicates it was domestic in nature. The age of landfill was foundto be 5-10 years.

Keywords: *Municipal Solid Waste; Leachate; Landfill; Infiltration*

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Dr. M Parthiban, *MIE*

Assistant Professor, Deparment of Mechanical Engineering, PSG College of Technology, Coimbatore

Title of Paper: 'Design and Fabrication of Rotary Axis for WEDM (Wire Electrical Discharge Grinding)', *Journal of Advancement in Machines*, *MAT Journals*, Vol. 3, No. 3, 2018, pp.19-24.

[DOI: http://doi.org/10.5281/zenodo.1490930]

Co-author: M Santhosh Kumar

Abstract

The paper gives an overview of designing of rotary axis for WEDM and fabrication of the same. WEDG the combination of WEDM with grinding a Hybrid Machining Process, WEDM has lot of advantages so all the Hybrid Machine are use the help of WEDM but here WEDG is used to produce the micro components like probe and micro electrodes. One such combination is wire electrical discharge grinding (WEDG), which is commonly used for micro-machining of fine and hard rods. Here the work piece need the tendency to rotate where the wire is pass through based on spark erosion principle the rod can be grinded to our required small and precise diameters like 0.4mm, the existing WEDM can only used to produce through holes with the help of this we can able to reduce the components diameters and lengths WEDG also has an ability to produce micro components with high aspect ratios the rotation of workpiece is taken cared of with the help of spindle that coupled with ac motor.

Keywords: *WEDM; WEDG; Hardness; Aspect ratio*

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Mr. Seelam V S V Prabhu Deva Kumar, *AMIE*

Research Scholar, Department of Electrical Engineering, Pusan National University, Busan, South Korea

Title of Paper: 'Reliability Analysis and Performance of 3 input CMOS Look Up Table (LUT) in Various Nano Technologies', *IEEE VLSI Circuits and System Letter*, Vol. 5, No. 1, February 2019

[https://ieeecs-media.computer.org/media/technical-activities/tcvlsi/newsletters/2018/VLSI_Circuits_and_Systems_Vol-5_Issue-1_2019-Feb.pdf]

Co-authors: Shyam Akashe, Hee-Je Kim

Abstract

In this paper, the degradation in n-channel and p-channel MOSFETs are evaluated correspondingly. Negative Bias Temperature Instability (NBTI) and Positive Bias Temperature Instability (PBTI) are illustrated using different classification methods. Gate-diode or direct current IV is used to estimate trap generation (TG) during BTI. BTI tests are performed by DC Stress with different pressure biases and Temperature (T) values with discrete pulse duty cycle (PDC).The determined TG can show the remarkable similarity between NBTI and PBTI stress in DC pressure. Here, we examine the aging of transistor due to NBTI, PBTI & HCI (Hot Carrier Injection) of 3-input complementary look-up tables (CLUTs) by performing diverse executions over enlisted cadence simulations. Delayed degradation due to transistor aging differs on the alignment configure, the convention (input signal probability) as well as the peculiar CLUT implementation. Furthermore, CLUT has a substantial impact on the delayed configuration of the existing format used in the represented configuration LUT. Accurate aging and reliability analysis are crucial in considering these effects in the design cycle. Moreover, we figured out the leakage current, voltage, noise margin and power of designed CLUT. By this research methodological result, we proposed that our techniques can enhance the lifespan of LUT as well as FPGA in different nano scale ranges of 90 nm-45 nm-22 nm-11 nm technologies. This detailed analysis has been done using Cadence Virtuoso tool.

Keywords: *Reliability; PBTI; NBTI; HCI; Aging; 3 input CLUT; Nano Scale*

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Mr Kavarthapu Srinivasa Rao, MIE

Scientist / Engineer, ISRO, National Remote Sensing Centre, DOS, Hyderabad

Title of the Paper: 'Harnessing Solar Power for in House Electrical Energy Requirements of ISRO', International Journal of Innovative Technology and Exploring Engineering, Vol.8, No.6, 2019, pp.1846-1849

[https://www.ijitee.org/wp-content/uploads/papers/v8i6/F3747048619.pdf]

Co-authors: C Rajesh kumar, K Ashok Kumar

Abstract

Solar energy, a clean renewable resource with zero emission has got tremendous potential which can be harnessed using a variety of devices. With recent developments, solar energy systems are easily available for industrial and domestic use with the added advantage of minimum maintenance. The National Solar Mission is a major initiative of the Government of India to promote ecologically sustainable growth while addressing India's energy security challenge. The immediate aim is to set up an environment for solar technology penetration in the country both at a centralized and decentralized level. ISRO, in its ever growing ambitious space programme has to meet the widening supply-demand gap for electrical energy in the country. In line with this, initiatives have been taken for harnessing solar energy. This paper elucidates the recent initiatives of ISRO as a utility in harnessing solar power.

Keywords: *Photovoltaic cells; National solar mission*

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Prof. K Sujatha, *MIE*

Department of Computer Science and Engineering, Dadi Institute of Engineering and Technology, Anakapalle, Visakhapatham

Title of Paper: 'Person Tracking and Counting System Using Motion Vector Analysis for Crowd Steering', *Part of the Lecture Notes on Data Engineering and Communications Technologies Book Series*, Vol. 28, *Springer*, April 2019, pp.249-256

[https://link.springer.com/chapter/10.1007/978-981-13-6459-4_25]

Co-authors: S V S V P Rama Raju, P V Nageswara Rao, A Arjuna Rao, K Shyamanth

Abstract

Video surveillance has been in use since a protracted time as an assistance to beat security and other problems. Historically, the video outputs area unit monitored by human operators and area unit sometimes saved to tapes for later use. Sensitive areas like

shopping malls, banks, huddled public places want a strict police investigation and may require management of the flow of individuals mechanically. To do such automation, a wise video closed-circuit television is required for today's world equipped with machine learning algorithms. In this project, a sensible visual closed-circuit television with person detection and following capabilities is bestowed. This can be used to regulate the flow of persons into the sensitive areas, which is often achieved by count the persons who are getting into and going through these areas, so knowing the overall capability a sensitive space is holing at any specific purpose of your time. Motion vector analysis is that the main construct that is used here to realize the following of the persons. This has a tendency to count the persons who are getting into and going out stationary cameras fixed points, the capability is obtained as distinction between the count of the persons entered and count of the persons who left the sensitive space. Any sensitive space would have a restricted house to accommodate. So it is necessary to prohibit the persons from getting into sensitive space, once the capability is reached to threshold price.

Keywords: *Video surveillance; Sensitive areas; Motion vector analysis; Moving person detection and tracking; Background subtraction; Person counting*

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Dr. Jitendra Virmani, *MIE*

Senior Technical Officer, Grade – II, CSIR- Central Scientific Instruments Organization, Chandigarh

Title of Paper: 'Effect of Despeckle Filtering on Classification of Breast Tumors using Ultrasound Images Biocybernetics and Biomedical Engineering', *Elsevier*, February 27, 2019.

[https://www.sciencedirect.com/science/article/abs/pii/S0208521618302766]

Co-authors: Kriti, Ravinder Aggarwal

Abstract

Ultrasound is the most widely used imaging modality for screening of breast tumors. However, due to the presence of speckle noise in an ultrasound image, the diagnostic information gets masked and the interpretation of the breast abnormalities becomes difficult for the radiologist. The texture of the tumor region and the shape / margin characteristics are considered to be important parameters for the analysis of the breast tumors. In the present work, exhaustive experimentation has been carried out for the design of CAD systems for classification of breast tumors by considering (a) original images only, (b) despeckled images only and (c) both original and despeckled images together (hybrid approach). Total 100 breast ultrasound images (40 benign and 60 malignant) have been used for the analysis. Initially, these images have been despeckled using six filters namely Lee sigma, BayesShrink, DPAD, FI, FB and HFB filters. Total 162 features (149 texture and 13 morphological features) have been computed from both original and despeckled breast ultrasound images and SVM classifier has been used extensively for the classification. The results of the study indicate that the hybrid approach of CAD system design using texture features computed from original images combined with morphological features computed from images despeckled by DPAD filter yield optimal performance for classification of benign and malignant breast tumors with a classification accuracy of 96%. From the promising results of the study it can be concluded that the proposed hybrid CAD system design could be used as a second opinion tool in clinical setting.

Keywords: Breast ultrasound; Despeckle filtering; Texture features, Morphological features, Feature space dimensionality reduction, Classification

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Dr. Kush P Mehta, *AMIE*

Assistant Professor, Department of Mechanical Engineering, School of Technology, Pandit Deendayal Petroleum University, Gandhinagar, Gujarat

Title of Paper: 'Conventional and Cooling Assisted Friction Stir Welding of AA6061 and AZ31B Alloys,' *Materials Science and Engineering*, *Elsevier*, Vol. 759, pp. 252-261

[https://www.sciencedirect.com/science/article/pii/S0921509319306677]

Co-authors: Pierpaolo Carlone, Antonello Astarita, Fabio Scherillo, Felice Rubino, Poojan Vora

Abstract

Conventional and cooling assisted friction stir welded Al–Mg joints were investigated by visual inspection, optical macro plus microscopy, scanning electron micrographs, energy dispersive X-ray spectroscopy, X-ray diffractions, tensile testing and micro hardness indentation. The nugget zone is characterized by onion rings composed of different phases such as Mg in an Al matrix, Al in an Mg matrix as well as intermetallic compounds, Al3Mg2 and Al12Mg17. A diffusion layer was detected on the Al side of the joint between the nugget and thermo-mechanically affected zones identifying a solid solution of Mg in Al. No diffusion layer was observed on the Mg side. The tensile strength of the dissimilar joints is enhanced by cooling assisted welding process due to the reduction in the amount of intermetallic compounds inside the weld bead. Congruently, higher hardness peaks are reported in the nugget zone of conventional FSW joint with respect to the CFSW joint.

Keywords: *Cooling assisted friction stir welding; Dissimilar joint; Mechanical properties; Microstructure; Intermetallic compound*

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Activities by Institutional Members

National Workshop on
'Tribology of Green Composites (TGC-2020)'

to be organized at

K Ramakrishnan College of Engineering

Tiruchirapalli, Tamilnadu

July 04-05, 2019

☎ 09842927212; ✉ mechanand2003@gmail.com

National Workshop on
'Hands on Experience in Welding Technology'

to be organized at

Aditya College of Engineering & Technology

East Godavari District, Andhra Pradesh

July 12-13, 2019

☎ 9177314748; ✉ iei_coordinator@acet.ac.in

National Conference on
'Advances in Electrical Technology for Green Energy'

to be organized at

Christian College of Engineering & Technology

Bhilai, Chhattisgarh

July 12-13, 2019

☎ 9437146538; ✉ ritesh89pm@gmail.com

Activities by Institutional Members

National Level Workshop on
'Solar and Smart Energy System for Sustainable Environment'

to be organized at

Selvam College of Technology

Namakkal, Tamilnadu

July 25-26, 2019

☎ 9750939938; ✉ deanacademic@selvamtech.edu.in

National Seminar on
'Engineering Analysis with ANSYS Workbench (EAAW-2019)'

to be organized at

Swami Vivekananda School of Engineering & Technology

Bhubaneswar, Odisha

July 28-29, 2019

☎ 9439195483; ✉ croutray2017@gmail.com

National Conference on
'Application of Electronics and Instrumentation in Betterment of Human Health Care'

to be organized at

Hindustan Institute of Technology

Coimbatore, Tamilnadu

August 02-03, 2019

☎ 9629183233; ✉ luckshanthpaul@gmail.com

Activities by Institutional Members

International Conference on
'Biotechnology & Biological Sciences BIOSPECTRUM 2019'

to be organized at

University of Engineering & Management

Newtown, Kolkata, West Bengal

September 08-10, 2019

☎ 8017259210; ✉ dibyajit.lahiri@uem.edu.in

National Conference on
'Device Modeling and Soft Computing for Real-time Applications'

to be organized at

Mallabhum Institute of Technology

Bishnupur, West Bengal

September 13-14, 2019

☎ 9433782630; ✉ abhattacharya@mitbishnupur.ac.in

National Conference on
'VLSI, Communication & Computer Networks'

to be organized at

A M C College of Engineering

Bangalore, Karnataka

October 17-18, 2019

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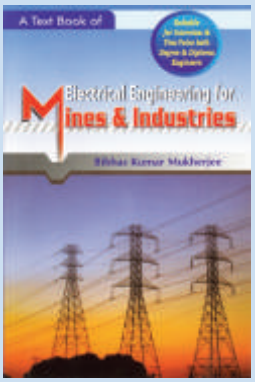
Book Review

A Text Book of Electrical Engineering for Mines & Industries

Bibhas Kumar Mukherjee, *FIE*



There has been significant development and advance in the field of mining industries (like coal and metal ferrous). This publication has made an attempt to understand in a better and logical presentation in the respective working fields in simplified language. In addition, this book may be a very useful guide to the Electrical Engineers of underground and open cast mines. The suggestions of practicing electrical engineers and electricians for their constructive comments towards the improvement of this book in future are welcome. This book covers basic understanding of electrical safety, induction motor, transmission & distribution lines, measuring instruments, maintenance scheduling, SCADA, electrical regulations related to mines etc.

Published by: Lakshmi Prakashani, Kolkata 700 009

Notification for R&D Grant-in-Aid

To promote appropriate technology, assist in building up design & research talents and, most importantly, to help in nurturing potential R&D venture amongst engineering students pursuing Diploma/UG/PG/PhD courses, The Institution of Engineers (India) had instituted the R&D Grant-in-Aid program way back in 2001. Like every year, the Institution invites applications for the session 2017-2018 for funding industry-oriented R&D projects and research initiatives aimed at improving the life-style of common people from engineering students pursuing Diploma/UG/PG/Ph. D courses. The application form and guidelines are available in our website https://www.ieindia.org. The projects should be carried out under the guidance of faculty members who are Corporate Members (AMIE/MIE/FIE) of IEI. Membership criteria for students are as follows:

Project Category	Student/Applicant Membership
Diploma	Not mandatory, Membership of Students' Chapter is desirable
UG (B.E/B.Tech/AMIE/Equivalent)	Should be 'Student Member' (SMIE)
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PhD	Should be 'Corporate Member'

The soft copy of the duly filled-up applications (in editable format), as per the given proforma, should be sent through email to research@ieindia.org and one printed copy of the same should reach the following address:

Director (Technical)

The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700 020

Applications received in format other than that available on our website will not be accepted. Application should be forwarded through the Guide, Head of the Department or Head of the Institution. Please note that preference will be given to project proposals received from Institutions who are members of The Institution of Engineers (India). Kindly go through the guidelines (visit link https://www.ieindia.org/PDF_IMAGES/R&D/General%20Guidelines.pdf) carefully before filling up the application.

The grant is not intended for the faculty members who have access to other avenues of research funding. Proposals received will be scrutinized and the recipients of R&D Grant will be informed accordingly.

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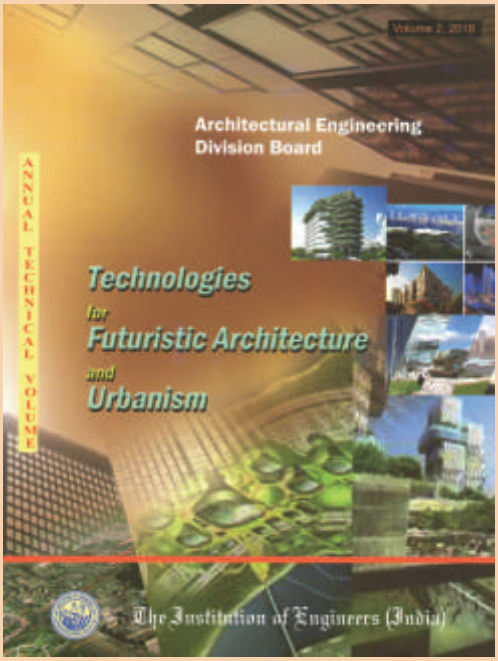

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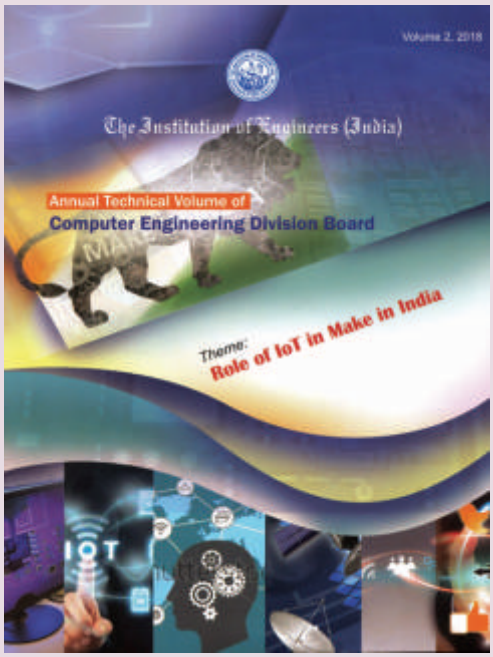

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