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Discussions and Closures

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Discussion of "Chromium Transport Modeling in Tannery Effluent from a Surface Water Body to Groundwater Regime: Case Study in Kodaganar Basin" by J. Colins Johnny, M. C. Sashikkumar, J. Rajesh Banu, and Gopalakrishnan Kumar

R. K. Prasad and Dipteek Parmar



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Periodic pattern mining from spatio-temporal database using novel global pollination artificial fish swarm optimizer-based clustering and modified FP tree

Pragati Upadhyay, Manoj Kumar Pandey & Narendra Kohli

Soft Computing 25, 4327–4344 (2021) | Cite this article

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Abstract

The pattern of the object movement is periodic, but there occur few uncertainty issues during tracking and locating the movable object. Moreover, discovering the hidden periodic pattern from the historical moving object is a challenging task which may lead to an eventual periodic pattern. Therefore, a spatiotemporal database regarding probability is introduced to investigate the processing and also to detect probabilities concerning uncertainties. In this

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Document details - A Novel FLC Based Closed-Loop V/f Control of Five-Level Inverter Fed Open-End Winding Induction Motor Drive

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Journal of The Institution of Engineers (India): Series B

Volume 100, Issue 3, 1 June 2019, Pages 193-200

A Novel FLC Based Closed-Loop V/f Control of Five-Level Inverter Fed Open-End Winding Induction Motor Drive(Article)

Kumar, S., Agarwal, P.

^aHarcourt Butler Technical University (Formerly HBTI Kanpur), Kanpur, India

^bIndian Institute of Technology, Roorkee, India

Abstract

A fuzzy logic based closed-loop V/f control scheme for five-level inverter-fed open-end winding induction motor drive is proposed and experimentally validated in this paper. To the best of the authors' knowledge, closed-loop V/f control for open-end winding induction motor has not been explored so

Cited by 2 documents

Dhamudia, S., Rathore, V., Yadav, K.B.
Closed-Loop V/f Control of Symmetrical 6-Phase Induction Motor Using Cascaded H-Bridge Multilevel Inverter

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Original research article

Study of optical parameters of sulphur doped Se-As thin films as optical materials

Anjani Kumar ^{a, b}, R.K. Shukla ^b, Rajeev Gupta ^a

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Abstract

A conventional thermal evaporation technique has been used for thin film preparation of $\text{Se}_{40}\text{As}_{60-y}\text{S}_y$ ($y = 0, 10, 20$) chalcogenide materials. Optical characterization has been done in the wavelength range of 600–2700 nm in the thin films of above mentioned materials. Various optical parameters like refractive index, extinction coefficient, dielectric constant, dielectric loss, absorption coefficient and



RESEARCH ARTICLE

A REVIEW ON MATHEMATICAL MODELS FOR NANOPARTICLE DELIVERY IN THE BLOOD

Rekha Bali, Bhawini Prasad and Swati Mishra

Department of Mathematics, School Of Basic & Applied Sciences, Harcourt Butler Technical University, India, 208002.

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Nanoparticles, Nano-Drugs, Diffusion, Stenosis, Catheter, Non-Newtonian Fluids, Nanofluids

Abstract

One of the ubiquitous causes of deaths are the Cardio Vascular Diseases or CVDs. The implementation of nanotechnology in the treatment of CVDs has evinced better bio-compatibility and enhanced cell interactions. This provides a strong potential for their mathematical modeling with the diseased blood vessels. In our current study we have reported various mathematical models used for the treatment of CVDs employing nanotechnology. Mathematical modeling provides a tool to comprehend the type, shape and size of the nanoparticles that can be employed as possible drug delivery systems. Mathematical models help to predict how nano-drugs have many improvements like expanded drug loading capacity and programmable pharmo-kinetic properties over the conventional drugs. The amalgamation of mathematical models with clinical data provides for designing these optimal therapies. This review encapsulates the current state of mathematical modeling approaches to treat CVDs using nanoparticle targeted drug delivery.

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Introduction:-

Mathematical models simulate a few hundred blood vessels and generate information in a suave format for the whole circulatory system. The mathematical models take into account nanoparticle circulation, endocytosis and drug release. Therefore, these theoretical models outstrip the curbs foisted by experimental data in-availability. Thus, it may be used to predict drug solubility and diffusion coefficient more convincingly before clinical trials.

Nanodrugs are a revolution. They offer a robust mechanism for providing the remedies of cardiovascular diseases due to their capability of interacting with cellular processes and guiding their functions. The pharmaceutical use of nanotechnology offers persistent and controlled delivery. Mathematical modelling of nanoparticles in the blood flow offers proper functioning and designing of nanoparticles through complex vasculature that consists of blood vessels of different diameters, fluctuating from centimeters to microns. Mathematical models predict pressure, velocity, temperature etc. to examine the nanoparticles interactions in a systematic way. Models of ordinary differential equations, partial differential equations, matrices, linear programming and algebraic equations are used for scheming the nanoparticle targeted drug delivery models. These theoretical screenings are relatively easy in computer simulations. The models help in accomplishing smarter clinical designs because they replicate the drug delivery procedure covering all lengths and time dimensions.

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Pre-configured cycle protection with optimal wavelength converters

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Rachna Asthana

Professor HBTU Kanpur

Abstract

The pre-configured protection cycles (λ -cycles) plays an important role in providing protection to WDM networks. In these networks working paths and protection paths via λ -cycles should possess 100% wavelength conversion capability. This will necessitate the presence of wavelength converters at every node for both paths. The use of many converters will make the network highly expensive due to its high cost. We are investigating λ -cycle protection with the use of optimal number of wavelength converters. It is found that instead of full wavelength conversion, changing the routing of working traffic with lesser converters path and dedicating single wavelength to every protected λ -cycle will employ lesser converters. This will make the network less costly as fewer converters will be used for establishing working paths and λ -cycles. However, spare capacity required will increase thereby increasing the fiber length. But this fiber added will cost much lesser as compared to high cost converters.

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A heuristic approach for pre-configured cycle protection with optimal wavelength converters

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Professor HBTU Kanpur

Abstract

The protection of wavelength division multiplexed (WDM) networks can be achieved very successfully by pre-configured protection cycles (p -cycles). In these networks there is requirement of 100% wavelength conversion for working paths as well as for p -cycle protection paths requiring wavelength converters at every node. As wavelength converter is costly device so there is a need to use them efficiently. In this paper, we propose a heuristic approach of Optimal Wavelength Converter for p -Cycle (OWCP) to choose p -cycles with optimal wavelength converters. The developed algorithm gives cost effective solution of protecting WDM network using p -cycles with lesser number of converters. It reduces the optimization complexity and provides effective solution with reduction in computational time.

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Section



Discussion of “Water Quality–Based Environmental Flow under Plausible Temperature and Pollution Scenarios”

by Shushobhit Chaudhary, C. T. Dhanya, Arun Kumar, and Rehana Shaik

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The discussers appreciate the authors for their excellent work on estimation of water quality based minimum environmental flow (Eflow) of a river under the impact of different plausible scenarios based on pollution loading and climate change using the QUAL2K water quality simulation model. The study has given an insight into the Eflow assessment, especially by use of water quality charts. However, the discussers feel that there are certain clarifications, especially in the context of study area, hypothetical scenarios, and calibration. It will be appropriate to enumerate these points to give a comprehensive and updated information about pollution management in Delhi stretch of the Yamuna river. These are discussed as follows:

1. In the “Introduction” section, the authors mention presenting a water quality modeling approach for deriving the quantity and quality of flow at headwaters to meet the water quality in the river downstream. However, details of this approach are missing (possibly because of word limit). It is understood that the authors have used QUAL2K and specified the water quality (in terms of BOD and DO) to simulate the downstream water quality. This of course would involve repeated use of QUAL2K by trial method so as to arrive at the desired water quality. In fact, flow augmentation requirements are invariably determined by a method of successive approximation in which a given flow condition is established, water quality predicted, and flow adjustments made (Worley et al. 1965; Hall and Dracup 1970). The discussers opine that a brief description about the modeling approach used by the authors would have been more beneficial for the readers of the journal.
2. To quote from page 2 of the authors paper, “Walling et al. (2017) estimated the Eflow to be 700–800 m³/s.” The discussers have studied this aspect and based on the simulation results obtained using QUAL2E, a flow of 90 m³/s in the headwater [with biochemical oxygen demand (BOD) of 2.3 mg/L and dissolved oxygen (DO) of 8.3 mg/L] would be sufficient to improve the water quality and attain a DO of 4 mg/L throughout the 22 km long Delhi stretch of the Yamuna river. To substantiate this contention, Figs. 1(a and b) present the BOD and DO profile for two separate scenarios marked as S-12 and S-13. In S-12, the minimum statutory requirement of 10 m³/s, as prescribed by the Supreme Court’s order of 1994 is released from Wazirabad

barrage. In S-13, a requisite flow of 90 m³/s for satisfying a DO of 4 mg/L in the entire Delhi stretch of the Yamuna river is estimated using QUAL2E. An interesting observation is that the BOD standard is still not satisfied and BOD varies from 2.78 mg/L at 0.15 km to 13.92 mg/L at 18.0 km (Parmar and Keshari 2018). This could be attributed to the fact that in Scenario S-13 no treatment was given to the drains, which would have reduced the BOD.

3. The authors mention on pages 2, 3, and 5 that they have simulated the water quality–based Eflow under plausible and hypothetical scenarios of varying level of treatment with an incremental increase of 20% BOD removal. The discussers believe that because the treatment technologies available presently can be categorized under primary, secondary, tertiary, and advanced treatment systems capable of removing BOD of around 35%, 70%, 85%, and 95%, respectively, it would have been better and more realistic if the authors had chosen these treatment levels. Also, an assumption of having treatment plants at the outfall of drains into the river could have been mentioned at an appropriate place in the paper. Furthermore, it is opined that few more practical scenarios as follows could have been considered in the study:
 - a. Varying the discharge of Najafgarh drain by use of a control structure or by diversion;
 - b. Varying discharge in river (by controlling the flow from Wazirabad barrage); and
 - c. Varying the discharge from Hindon cut. This could be done by controlling the flow either at the canal headwork near Mohan Nagar, Ghaziabad, or Chilla canal regulator near Mayur Vihar, Delhi.
4. To quote from page 4, “for calibration a sequential and reach specific technique developed by the authors was adopted.” It is opined that a brief mention of the parameters that were calibrated in the study would have been beneficial for the readers. This point assumes significance in this study as the authors have simulated the Eflow under various hypothetical scenarios using QUAL2K, which basically is an indeterminate model. An indeterminate model indicates a model that yields similar results under various combinations of model parameters. For example, if the simulated BOD compares well with the observed BOD under a given set of values of model parameters, such as K_1 and K_3 , the same simulation results can be obtained under different combinations of K_1 and K_3 . When such indeterminately calibrated models are applied to the treatment and flow augmentation scenarios, the model results become very sensitive to the indeterminately determined calibrated parameters. This is because of the fact that such indeterminate models use a particular equation for finding the model parameters. These equations may not yield reliable results when applied to rivers different than the one for which they were developed. For example, QUAL2E uses the O’Connor and Dobbins (1958) equation to estimate the value of K_2 . This equation may not necessarily be the best to use



A Framework for Evaluating Personal Behavioural Interviews

Prabhat Verma*

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Abstract— Personal Interview is the integral part of recruitment process which is carried out to judge the suitability of the candidate's behavioural attributes to the offering post. In this paper, we propose a framework that can be helpful in the selection processes like SSB interviews conducted for Defense Services in India. The idea is to perceive the nonverbal communications from the candidate by the psychologist observer and transfer / code these observations in the form of a signal waveform on a computer in real time through real time plotter (data visualization). The waveform is synchronized with real clock time. This signal is analyzed using a computation model that computes the value for behavioural variable on a point scale 0-10 for the overall assessment of the Interviewee from psychological and behavioural perspective for the selection / hiring purpose. The framework offers a simple and elegant solution to objective assessment of overall personality of a candidate. The proposed framework can be easily customized as per the requirements and set policy. This work is the first of its kind for it demonstrates a novel application of signal processing in the field of behavioural assessment.

Keywords—Signal Processing; Behaviour Science; Tool for Personal Interview; Behaviour Coding; Behavioural Variable

I. INTRODUCTION

Psychological and behavioural interview is of prime importance in certain services like defense since the objective of interview is to select candidates with a specific set of attributes. Unlike subjective, knowledge based interviews, psychological and behavioural interviews pose greater challenges in assessment of the candidate. In subjective interview, assessment is based on how nicely, the candidate has given answers to the posed questions and how many are correct. In Psychological and behavioural interview the candidate is assessed during each fraction of second for the duration of the interview. In other words, subjective interviews are assessed using some discrete process whereas the assessment of behavioural interviews is a continuous process. Each and every moment of the interview duration is equally important in such assessments. Assessments are generally based on behavioural attributes of candidate as evident from various inputs like his face expression, body language, gesture, eye contacts, confidence in communications etc. As the interview goes on, the psychological expert keeps observing the candidate for behavioural inputs from him / her and on the basis of these inputs, an overall assessment of the candidate is made. But now the question is, will the observer be able to keep in his mind each and every observation from start to end of the interview session to incorporate them in the overall assessment? A computer assisted tool can be much helpful in such cases as the observer can use its GUI to plot or mark the candidate behaviour in exact chronological order. This coded information can be used to compute the overall performance of the candidate.

Efforts have been made to assess face expressions, emotions, gesture, body language etc. using image processing techniques separately. But when it comes to overall assessment of an interviewee from psychological and behavioural point of view, it becomes very difficult to integrate these techniques to achieve a workable solution as they are complex techniques in themselves and they are not full proof and robust. As a result, there is a wide gap in the working tools for the purpose.

It is a well known fact that computational tasks can be better handled by computers than by human. Contrary to this, there are certain tasks where human beings excel computers e.g. perception, cognitive tasks etc. Providing the computers capabilities to perform this category of tasks is the concern of Artificial Intelligence. Such tasks are complex and difficult to be handled. Scientists have been continuously trying to empower computers with this type of capabilities. The question is, have we optimized our computers for tasks of earlier category in which they excel to human beings? On the flip side, have we optimized our capabilities as human beings before subletting our designated tasks to computers for which 'they' are not fit? This paper tries to explore such issues also in its approach by maintaining a fine balance in work division between the two based on their primary capabilities.

SSB (Services Selection Board) test process is reckoned as one of the toughest test in the world for the selection of defense personnel. The personal interview in SSB selection process is the psychological assessment of candidate by the Interviewing Officer (IO). The IO already has on his hands candidate's filled self description form, results of psychological written test, group task, individual tasks with comments before the candidate is called inside the room. Thus, the job of IO is just to cross check the candidate by triggering some questions and get the responses from the candidate to judge his personality. Besides, the candidate also exposes some of his personality facets through non verbal communications during the communication that can be interpreted by a psychologist expert.



A Novel Power-Efficient Data Aggregation Scheme for Cloud-Based Sensor Networks

Ashwini Bajaj (Applied Engineering College, Karnul, India), Shashank Yadav (Maharaja Engineering College, Karnul, India), Naveen Tiwari (Patna Engineering College, Karnul, India), Anil Yadav (Parvati Bahu Technical University, India) and Mani Chandra (Patna Engineering College, Karnul, India)
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Abstract

Research sensor nodes are being deployed everywhere as per the applications and real-time data analysis. A major concern of this implementation is the limited battery power and data rate generation. The data redundancy can also be a cause of battery drain. The scheme searches the energy based on priority. The method also uses a mobile agent for the data collector from the sensor nodes, when it is combined with optimal cluster head along with marking of suitable aggregation gives a satisfying performance. This approach is divided into three phases as clustering of sensor nodes from computing PSDAG and finally select a mobile agent. Our approach of PSDAG reduces disturbance in an advanced manner which develops an energy-efficient system and also looks for energy aware network when it is needed the most. The proposed model was simulated and verified using network simulator-3. Implementation and analysis of the algorithm prove that the research study has improved the lifetime of the entire network and also provide a stable and robust network while comparing it with CSMA/CD and ALOHA scheme.

Article Preview

1 Introduction

MOTION VECTOR ESTIMATION USING A NOVEL SEARCH PATTERN FOR THE FAST BLOCK MATCHING IN TEMPORAL CODING

Awanish Kumar Mishra*, Narendra Kohli

PDF

Keywords: Motion vector, Motion estimation, Search parameter, Block matching, Current frame, Reference frame

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ABSTRACT

For eliminating temporal data redundancy, block based motion estimation is commonly employed in video compression. However, substantially reducing the computing complexity of motion estimation remains a major challenge. Many algorithms employ movement information from geographically and temporally associated neighboring blocks to adapt their search patterns to that information since nearby blocks have high correlations. A unique dynamic initial search pattern approach is described in this work for fast estimation of blocks movement. The suggested search methodology is generated using repeated number of occurrences of motion vectors of blocks adjacent to the source block, because it is quite obvious that the motion vector of the current block will definitely be very similar to the motion vector of the adjacent blocks. This block information in this new object will

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Abstract: In this paper, a three phase two level converter as a shunt active power filter (SAPF) is proposed to compensate the harmonics present in source current of the aircraft electric power system due to non-linear loads. DC Link voltage of the capacitor used in Voltage Source Converter is balanced by a PI controller. Conductance based Fryze current minimization algorithm is used as control scheme for determination of reference compensation of currents. Hysteresis Current Control (HCC) is employed for the switching of Voltage Source Converter. The simulations are carried out in Simulink/MATLAB in which the steady state as well as unbalance performance is demonstrated. In proposed active power filter, THD of supply current is found well within MIL-STD-704F as well as IEEE Std. 519.

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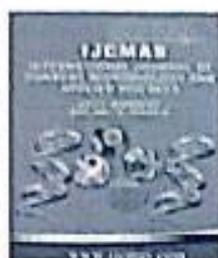
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Application of Microbes for Recovery of Residual Crude Petroleum

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Abstract:

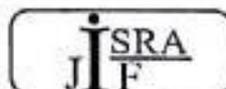
After the three-stage recovery processes employing physical, mechanical and chemical methods fail to recover the remaining crude oil. Biotechnology plays an important role to enhance crude oil recovery from the oil reservoirs so as to solve stagnant petroleum production. Microbial enhanced oil recovery (MEOR) is an biotechnologically enhanced oil recovery process which involves injecting specially selected natural bacteria into the reservoir or stimulating indigenous reservoir microbes to produce certain metabolic events that lead to improvement of oil recovery. This paper reviews the mechanisms of oil release and the use of microbes and their metabolic products to enhance oil recovery. Alteration of oil/rock/water interfacial tensions properties and changes in flow behaviour assist the enhancement of oil recovery. Oil recovery can be improved by injecting gases and solvents or by stimulating their production by reservoir microflora in situ for reservoir repressurization and carbonate rock dissolution. The role of microbial surfactants in oil mobilization and that of biopolymers in oil-depleted zones for selective plugging have been delineated. The uses of solvents and organic acids in MEOR have also been briefly reviewed. Some results of laboratory studies are discussed. However due to accumulated toxic metabolites causing growth inhibition, poor yield of metabolic products of useful microbes and longer incubation time, the MEOR potential has not been fully realized. A complete assessment and evaluation of MEOR from an engineering standpoint based on performance, economics and applicability is required to further improve the efficiency of the process. Thus, this review attempts to address the methods of oil recovery, MEOR past and recent trends and its future prospect.

Keywords: MEOR, Bio surfactant, Selective plugging, Solvents

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Review Article

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Solution for Sustainable Development for Developing Countries: Waste Water Treatment by Use of Membranes - A Review

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ABSTRACT

In developing countries, industrialization is the main cause of water pollution because of the various industries which generate wastewater that is needed to be discharged. The availability of fresh clean water is becoming increasingly limited in many areas of the world resulting in scarcity of potable water in many regions around the globe. The membranes have emerged as an efficient compact technology for municipal and industrial wastewater treatment. The separation and retention of biological solids has been widely applied as one of the alternatives to the conventional activated sludge process. The absolute retention of all microorganisms by membranes makes it possible to treat wastewater effectively. The membrane bioreactor is responsible for the remaining biochemical oxygen demand (BOD) removal, while the refractory matter (contributed to COD) is removed. This paper provides an overview of membranes fouling and studies conducted to identify mitigating strategies for fouling in Membrane bioreactors. Classes of foulant, including biofouling, organic foulant, and inorganic fouls, as well as factors influencing membranes fouling are outlined. Recent research attempts on fouling control, including the addition of coagulants and adsorbents, a combination of aerobic granulation with Quorum quenching also offers a strong potential for fouling control, but pilot-scale testing is required to explore the feasibility of full-scale application.

Keywords

Membrane,
Wastewater,
Fouling.

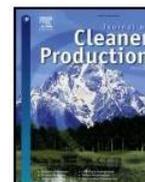
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Introduction

Expansion of population in developed and developing countries cause the scarcity of

pure water and pollute it by releasing waste water into the rivers and ponds. In developing



Review

Environment friendly, renewable and sustainable poly lactic acid (PLA) based natural fiber reinforced composites – A comprehensive review

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ARTICLE INFO

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ABSTRACT

The Environmental concern and awareness around the globe have led to the development of sustainable bio composites which are derived from renewable resources. Biodegradable polymers and natural fibers derived from different renewable resources have played a vital role in the manufacture of bio composites. Poly lactic acid or polylactide (PLA) is one of the versatile aliphatic linear thermoplastic biodegradable polymers obtained from fully renewable sources such as wheat, corn, rice and sweet potato, and it has unique characteristics like renewable, sustainable, biocompatible and compostable. PLA has distinct advantages like low energy consumption and emission of low greenhouse gas during production and suitable for 3D printing applications. It also has some demerits such as low gas and water barrier properties, poor toughness, low glass transition temperature and is hydrophilic in nature, which limit its use in commercial applications. To overcome this, PLA is blended with various natural fibers in order to improve the thermal, water barrier, crystallization, mechanical, antimicrobial and degradability properties. Moreover, inclusion of natural fibers not only decreases the cost of PLA products but also helps in producing good competitive commercial products which are used in different industries. Hence, this review focuses on the synthesis and degradation of PLA, its applications in various sectors and manufacturing methods involved in PLA composites. Moreover, this review discusses about the different types of natural fibers and their influence on the unique properties of PLA based natural fiber reinforced composites. The overall aim of this paper is to provide a holistic idea about PLA based bio composites to academicians, industry personnel and researchers.

1. Introduction

The continuous advancements in science and technology have resulted in the increase in demand for natural resources all over the world (Rangappa et al., 2020). This development has led to concerns such as scarcity of materials and conservation of environment (Thyavihalli Girijappa et al., 2019). In addition, the rapid depletion of oil reserves, greenhouse emissions due to the extensive usage of

petroleum-based products and their non-biodegradability, have triggered researchers to explore novel materials that are biodegradable, renewable and recyclable (Scaffaro et al., 2018a). Biodegradable composites are one such material that can be employed to address these issues and simultaneously ensure a sustainable environment. These composites contain matrix materials that are derived from agricultural and forestry feedstock and they are reinforced with cellulose fibers (Campilho, 2015). End-of-life disposal is not an issue when bio

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Corrosion and its control in sugar industry

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ABSTRACT

Corrosion occurs in sugar industry in various instruments and process equipments like boilers, juice extraction units, cane preparation units, heat transfer equipments etc, because of the corrosive environment created due to processing of sugar. Corrosion rates depend upon various process parameters like pH, temperature, cane juice brix, dissolved oxygen content etc. The losses due to corrosion may lead to unexpected failures, plant breakdown and poor quality & contaminated product. The remedial measures should be taken for the prevention of corrosion like application of protective coatings after the adequate surface preparation or proper selection of the materials of the process equipments.

Introduction

CORROSION is the destructive alteration of a metal caused by chemical or electrochemical interaction with the environment. It is common to all chemical process industries and sugar industry is no exception to it. Corrosion and rapid wear of factory equipment are widely recognized as major production-cost and quality problems in the sugar industry. The short life of equipment and the need for excessively frequent cleaning and maintenance - often involving disruption of crop processing - can make producing sugar an excessively expensive exercise. Even the quality of the sugar is affected.

The problem in the processing of beet and sugarcane in sugar industry is that the materials to be handled are highly corrosive and abrasive. Nature of the steels used to construct the plant equipment is another factor for the corrosion. Since sugarcane juices are acidic and contain sulfites, sulfates etc, which are corrosive in nature hence, due to the raw materials corrosion occurs in sugar industry. Corrosion also takes place due to processing conditions e.g., high temperatures, pH and prolonged contact. Not only corrosion process takes place due to these effects but

abrasion and erosion also occur and almost all the equipments are affected to varying degrees. Sugar producers used to use almost exclusively carbon steel for their equipment, on grounds of its low cost but due to its poor performance in terms of corrosion and abrasion resistance, the use of carbon steel proved a false economy. Stainless steel, however, is strong on exactly these two points. The general environment created by abrasive particles, moisture, heat, acidity and exposure to the elements is hostile to conventional steels.

There are two main raw materials from which we make sugar: Sugar cane or sugar beet. Sugar cane accounts for about two-thirds of the world's sugar production.

After Brazil, India is the largest sugar producer in the world and it leads in sugarcane production. However, if

alternative sweeteners such as khandsari (sort of raw sugar) and gur (jaggery) are included in the fold, then India would be the largest overall producer of sugar. Brazil accounts for approximately 22 percent of the global sugar production and India contributes almost 14 percent.

Sugar is a broad term applied to a large number of carbohydrates present in many plants and characterized by a more or less sweet taste. Juices of sugarcane (*Saccharum officinarum*) and sugar beet (*Beta vulgaris*) are rich in pure sucrose, although beet sugar is generally much less sweet than cane sugar. These two sugar crops are the main sources of commercial sucrose.

Manufacturing process of Sugar

Generally sugarcane is classified into three varieties early, general and unapproved. Cane is sowed during February and October every year. The first seed growth is known as the plant and subsequent growth after harvesting from the stem is known as Ratoon. The early variety has more sugar content than the general variety. Every farmer within the command area of the Mill is provided with a calendar, which tells him when he can expect a Mill Supply Ticket (Purchny), against which he will deliver the sugarcane. He then harvests the cane and transports it either in a bullock cart or tractor trolley to the mill. Cane is also



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**Professor in Paint Technology

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Article

Modified 7-Chloro-11*H*-Indeno[1,2-*b*]Quinoxaline Heterocyclic System for Biological Activities

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Abstract: Recent advances in functionalized organic Spiro heterocyclic compounds composed of nitrogen bonded five- and six-membered rings have been made, establishing them as a synthetic target in organic-based biomedical applications. In this work, we report a synthesis of spirocyclic compounds under a one-pot reaction using 1,3-dipolar cycloaddition in a regio and diastereoselective manner. The higher atomic economy with higher yield (95%) and regio and stereoselectivity were achieved by a multi-component reaction of L-proline (1), Indenoquinoxaline (2), and the dipolarophile of malononitrile (3) solvents followed by reflux conditions. The reaction intermediate comprised azomethine ylides derived from reactive primary amines, and the spiro derivatives were synthesized up to a + 95% yield. The structural and characteristic chemical components of the as-prepared Spiro compounds were characterized by ¹H-NMR, FTIR, and Mass spectroscopy. The functionalized spiro-pyrrolizidines were found to be effective for biological uses by considering their in vitro screening and antimicrobial impacts. Spiro constituents were found to be much more effective for Gram-positive bacteria due to the stronger lipophilic character of the molecules, and they resulted feasible membrane permeation in a biological system. Based on the planarity geometry of the Spiro pyrrolizidines, meta-substitution possesses steric hindrance and hence shows less effectiveness compared to para-substitution on the same nucleus, which shows a marginal steric effect. The biological studies showed that the derived spiro heterocyclic systems have an inhibitory effect of 50%.

Keywords: spiro heterocyclics; quinoxalin-11-one; one-pot synthesis; azomethine ylides; biomedical uses

1. Introduction

Spiro pyrrolizidines have attracted much attention because of their multi-component processing and applicability towards multifunctional uses in the modern age of chemical

On the Thermodynamic Properties and Flow of Different shapes of Nanoparticles in A catheterized Stenosed Artery

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ABSTRACT

A modern area of fluid dynamics, called nanofluid dynamics has become increasingly popular in novel hematological treatments. Motivated by these recent developments in the field of nanotechnology, a theoretical model for catheterized stenosed artery having permeable walls, treating blood as a base fluid for various shapes of nanoparticles suspended, is presented. The disposition of blood is described to be that of a viscous nanofluid. The calculations are executed using mild stenosis conditions with heat and mass transport phenomenon. The varying shapes of nanoparticles which include bricks, platelets, cylinders and blades have been given due attention using Hamilton-Crosser equation that used to obtain expressions for thermodynamic properties like thermal conductivity and viscosity using the appropriate boundary conditions. The comparative effects for velocity and temperature have been depicted graphically. This physical model has useful application in nano-drug delivery for the cure of various cardiovascular diseases.

KEYWORDS: Composite Stenosis, Nanoparticles, Hemodynamics, Nanofluids, Hamilton-Crosser model

1. INTRODUCTION

The blood motion analysis through unhealthy arteries is a crucial domain of bioengineering research and analysis. Enhanced clinical data for mathematical models and recent developments in the computational tools has attracted ample consideration in the contemporary years. The most recurring arterial ailment is atherosclerosis. The unusual or unhealthy development in wall of artery at distinct locations in circulatory system, in medical terms is defined as stenosis[1]. Apparently, the enlargement of stenosis in an artery lessens in flow of blood. The growth of such plaques in blood vessels can cause sporadic blood flow rate, high arterial wall shear stress and boundary layer detachment[2]. Ku [3] in his review mentioned about the energy losses, turbulence and other aspects of hemodynamics.

Numerous assessments established on the principle of dynamics of fluid address the problems on blood motion in composite stenosed artery having a catheter. Catheter is designed using medical grade polyvinyl chloride and polyester constructed

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thermoplastic polyurethane etc. [6]. The incorporation of catheter effects the hemodynamics. Srivastav [9] explored composite stenosis in presence of a catheter with permeable walls. Srivastava and Srivastava [10] analyzed a stenosed artery with catheter as well as without catheter. Srivastava et al [11] studied the problem of composite stenosed artery with catheterization considering blood modeled as non-Newtonian fluid. Ellahi et al [12] explained flow of blood in arteries with composite stenosis while characterizing blood as a micropolar fluid.

The fast pace technological evolution over the past years has caused increasing stipulation for novel medical treatment methods, surpassing the conventional ones, to improve the therapeutic effects and lessen the side effects. Nobel laureate Richard P. Feynman introduced the term nanotechnology, and since then there have been various revolutions in this field[13]. Miscellaneous applications in energetics and bio-medical science of nanoparticles in a base fluid has been classified under nanofluid dynamics, a



Riemann problem for non-ideal polytropic magnetogasdynamic flow

Pooja Gupta ^a  , L.P. Singh ^a, R. Singh ^b

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Highlights

- Solution of the Riemann Problem for non-ideal magnetogasdynamics flow is obtained.
- Lax entropy and R–H conditions are used to derive elementary wave solutions.
- Density and velocity profiles for 1- and 3-shock wave is presented.
- Effect of non-idealness of the gas in the presence of magnetic field is analyzed.

Abstract

The main motive of the present paper is to derive the analytical solution of the Riemann problem for magnetogasdynamic equations governing an inviscid unsteady one-dimensional flow of non-ideal polytropic gas subjected to the transverse magnetic field with infinite electrical conductivity. By using the Lax entropy condition and R–H conditions, we derive the elementary wave solutions i.e. shock wave, simple wave and contact discontinuities without any restriction on the magnitude of initial data states and discussed about their properties. Further, the density and velocity distribution in the flow field for the cases of compressive wave and rarefaction wave is discussed. Here we also compare/contrast the nature of solution in non-ideal magnetogasdynamic flow and ideal gas flow.

 Previous

Next 

Keywords



Modeling the impact of biolarvicides on malaria transmission

Surabhi Pandey ^a✉, Seema Nanda ^b✉, Amit Vutha ^c, Ram Naresh ^d

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Highlights

- We study use of biolarvicides for prevention of malaria using a mathematical model.
- Model is calibrated to biolarvicide and malaria incidence data from endemic regions.
- The R_0 formula captures transitions in the analysis and is corroborated by data.
- Equilibria and bifurcations reveal qualitative features of population dynamics.
- We determine model sensitivity to parameters and their significance.

Abstract

Biolarvicides are in use in several parts of the world for malaria vector control. We propose a five compartment dynamical systems model to study malaria transmission when biolarvicides are administered, to study the impact of this environmentally safe method on malaria spread. A comprehensive analysis of the model is presented. Model analysis shows that the basic reproductive rate R is larger in the absence of biolarvicides as compared to their presence. Theoretical analysis is corroborated by data from field studies. We show that there exist intermediate parameter regimes that separate disease-free and endemic states, which can in turn be modulated by biolarvicide use. Using Latin hypercube sampling we study the sensitivity of the model to parameter value changes. Calibration of our model to mosquito population and biolarvicide data for indoor and outdoors scenarios, yield parameter values hitherto not available or measurable. We validate our model with malaria incidence data from a region in India and provide predictions for malaria incidence in the presence and absence of biolarvicide. This model provides a prognostic tool to field work involving biolarvicide use in control of malaria.

The Transition of Advertisement from Conventional to Interactive: A Systematic Literature Review

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Abstract

Advertising has seen a drastic change in today's digital world. Organizations have come up with interactive advertisement in this dynamic scenario to capture the interest of the consumers provide



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A Study of Competitive Advantage by Human Resource Excellence in Indian Software Industry

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Abstract

In a rapidly changing competitive atmosphere, human resources are one significant basis of competitive advantage. Human resources is considered the assets of each nation, which proved to make competitive advantage compared with countries depend on natural resources. Speedy changes in technology development and importance of globalization



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RESEARCH ARTICLE

A Study of Challenges and Practices Related to HRM in Software Industry

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ABSTRACT:

In the present competitive business surroundings, it is so hard to satisfy the requirements of organizations and personnel. HR and organization performance can generate competitive advantage in an organization by following effective HRM practices. IT industry is a wealth and job creating industry, which has in just a few years, grown to US \$ 1 trillion, employing millions of professionals worldwide. The IT industry of India has burgeoned, presenting almost 50% compounded yearly expansion rate over the recent years. Being a knowledge-based industry, a high intellectual asset lends competitive advantage to a firm. With a universal detonation in market-opportunities in the IT sector, the scarcity of manpower both in figures and skills is a major challenge for HR professionals. The associated issues are different certainly: recruitment of world-class staff and their retention, compensation and career planning, technological obsolescence and employee turnover. This research paper tells regarding different HR challenges and practices in software Industries.

KEY WORDS: Competitive Advantage, HRM, software industry, HR Strategy, Services..

1. INTRODUCTION:

The economy has transitioned to financial system in which gross domestic product is progressively more dominated by services. Services permeate each aspect of our lives. We use restaurant services; transportation services; hotels; electricity and telephones; postal, services of hairdressers; courier and maintenance services; services of public dealings and marketing firms; dentists physicians; lawyers; stockbrokers and insurance agents; film theatres; and swimming pools. When we do buy goods, such as new car or a washing machine, we often still rely on services to keep them running and repair them when they break down. Services permit us to budget our time as well as our wealth. "The twentieth century was the age of machine; the twenty-first century will be the age of people".

Buzzwords like globalization, traverse functional teams, downsizing, empowerment, learning organizations and knowledge workforce are changing the way of life of managers and the approach they handle people.

2. STRATEGIES and POLICIES OF SOFTWARE INDUSTRIES:

2.1. Motivation and Retention of Employees:

Retention and motivation of employees are key HR concerns today. People a Gartner group company specializing in management of individual capital in software organizations has analyzed that the common tenure for a Software expert is less than three years. Further, the employ of new technologies, the support of learning and teaching, and a tough atmosphere ranked higher than competitive pay structures as efficient retention practices. Our own recent survey of 280 software professionals from 4 Indian software companies, showed that while the professional gave importance to personal and cultural job-fit, HR managers believed that the key to retention was salary and career satisfaction. Money was a principal motivator for 'starters', but for those into their third or fourth jobs, their

Performance Measurement System in Telecommunication Services: A Study of Select Indian Companies

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ABSTRACT

Fast changing technology, increased competition and dynamics in consumer usages in telecommunication services has sidelined the company's focus of excellence in services shifting their strategy from customer to technology. This has further led to increased non-standardized services in telecommunication services in India. The aim is to not only sustain in field, but also compete in the market. This study is an effort to address the questions, which includes: (a) the different performance measurement systems adopted by Indian companies in telecommunication services; (b) the approaches used to measure the performance of the organization in telecommunication services in India; (c) the different factors distorting the PMS of the organization and (d) the effectiveness of PMS and need for the change in the existing PMS. The primary data as well as secondary data has been used to decipher the trends in performance measurement practices in telecommunication services in India. The findings of the study indicate the inspiring facts to study the performance measurement system in India.

KEYWORDS

Corporate Performance Management, India, Performance Measurement System (PMS), Telecommunication Services

1. INTRODUCTION

Performance of any organization is one of the mechanisms to gain people's commitment towards achieving the stated objectives of the organization (Yadav, 2014). Increased competition, rapid technological change, clutching government regulations, and mounting customer expectations have all combined in such a way that organizations are being expected to do miracle in achieving more out of less. The changing Indian political, economic, and demographic structure has led to changes in life style at a faster pace than economic growth. The fast-changing technology complicates the task of creating and providing different services as per standard practices and demanded by different customers over time. Sometimes government regulations invalidate the services in a newer manner. Thus, measurement of these services becomes complex especially in the telecommunications industry. The government regulations and changing technology in the Indian telecommunication industry also hinders in planning and effective implementation of a Performance Measurement System (PMS).

Traditionally, companies in telecommunication services place heavy emphasis on the quantitative measures such as the number of subscribers, coverage area, revenue per user, and so forth. The role of qualitative and non-financial indicators such as customer satisfaction, call drop rates, and advanced technology becomes important as they determine the competitiveness of a business as well as its ability to sustain profitability in the future. Incorporation of non-financial indicators in performance measurement process is crucial particularly in the face of intense competition, shorter technology /

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Analyzing the efficacy of Traditional Media and Digital Media in Educational Institutions of India: A Study of Undergraduate Students at HBTU, Kanpur

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ABSTRACT-Notice boards play a pivotal role in information dissemination within and outside the organization. In educational institutions notice board has always been the strongest medium of broadcasting crucial information; news, circulars, notifications, announcements, events, and so on. Students are updated concerning any academic activity through notice boards. But in order to draw upon the resourcefulness offered by the advances in digital technologies, institutions impart information through online notice boards. The emergence of technology alternative options to notice board has also made their strong presence. In media e-platforms like chat boards, e-notice boards, virtual notice boards, social media, mobile application etc. are in maximum use by youth. Virtual notice boards are an efficient medium of passing important notices and announcements and keeping students updated from time to time. The use of this medium results in the creation of a paperless community where the youth of contemporary digital era are inclined to access information through online notice boards. This paper seeks to evaluate the effectiveness of information delivery medium in higher education institutions. The proposed paper also investigates whether IT-savvy students seek information by visiting departmental notice boards or they regularly access virtual notice boards, without any constraints on their location. The methodology adopted for this paper is survey based on questionnaire to do comparative analysis of notice boards and websites.

Keywords: information dissemination, notice boards, digital technologies, mobile applications